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THE ARCHITECTS' JOURNAL
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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.

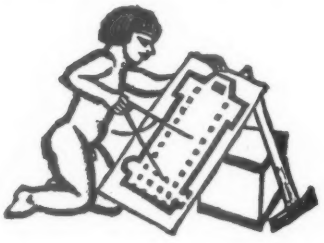
THURSDAY, JANUARY 29, 1942. NUMBER 2453: VOLUME 95

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*

"The first year let your house to your enemy; the second to your friend; the third, live in it yourself."

Old Proverb

NEWS

●

R.I.B.A.

A lecture is to be held at the R.I.B.A. on Tuesday, February 10, at 6.0 p.m., on the Reconstruction Committee's Interim Reports III and V. The subjects of these Reports are Legislation affecting Town and Country Planning and Building Structure.

M.O.W.B.

Census of Contractors' Plant,

The Minister of Works has made an Order under which all persons or undertakings, including local authorities and public utility undertakings owning certain items of contractors' plant are required, when requested, to furnish information about such plant.

The following are the main items affected by the Order :—

Excavators with their equipment (e.g., Drag Lines, Shovels, Back Acters and Skimmer); Mechanical Trenchers; Mobile Cranes, mounted on Road Wheels; Tractors, with their Equipment (e.g., Bull Dozers, Angle Dozers and Scrapers); Portable Compressors; Dumpers, mounted on Road Wheels; Concrete Mixers; Road Rollers.

L.M.S. APPOINTMENT

The L.M.S. Railway Company has appointed Mr. R. Llewellyn Davies, B.A., A.R.I.B.A., to be Development Assistant in the Architect's Office. His duty will be to act as liaison with the various sections of the Company's Scientific Research Department. He will also act as Secretary of the Building Research Committee. Mr. Davies took the Mechanical Sciences Tripos at Cambridge and the Diploma in Architecture at the Architectural Association School. He was also awarded the Diploma of the American Summer School in Paris.

SALVAGE

The great drive for waste paper, stimulated by the £20,000 National Contest, is now on its last lap. Local authorities are sending certified totals of their collections for the whole of this month to the Waste Paper Recovery Association, Ltd., 154, Fleet Street, E.C.4, not later than February 9. The country has been divided into twenty areas for the purposes of this contest, and £1,000 must be won in each area.

The country's need of waste paper is as urgent and pressing as ever. It is wanted for making nearly every kind of munitions, and on these the safety of every one of us depends. Have YOU done everything you possibly can to hunt out all YOUR waste paper and made sure that it is handed over for repulping? Have YOU gone through your plan chest, your file, your cupboards, your drawers, your collection of old drawings, specifications, bills of quantities, correspondence, etc.? If not, DO IT NOW. And if you *have* religiously gone through the accumulation of years, are you going steadily on day after day, and week after week saving every available scrap? That is what the country wants from each one of us.

An urgent appeal is being made to clerks of works and builders' foremen to make sure that cement bags are returned for repulping. The cement industry uses 75,000,000 of these bags in a year—and of these only about one-third at present find their way back to the mills. This means a loss of 15,000 tons of very valuable pulp. Shortage of paper for cement bags is becoming so acute that the distribution of cement may soon be seriously affected. The bags should not be included in local waste paper collections, but sent only to those mills which produce the special kraft paper of which they are made. The address of those mills will be given by Messrs. Harding & Pogg, Ltd., 52, Grosvenor Gardens, London, S.W.1.

SAVING MATERIALS ON PRINTS AND TRACINGS

A practical suggestion regarding the saving of material on tracings, prints and any other copies from originals sent out to contractors, etc., has been made by the Salvage and Recovery Board.

Many drawing offices and printers have the practice, when only a portion of a print is required, of supplying a copy of the whole.

The suggestion is that only the portion required should be reproduced, thereby effecting a considerable saving of valuable linen or paper.

All waste trimmings, and the old prints and tracings, when finished with, should of course be placed with the waste paper and rags for salvage.

INSTITUTION OF ELECTRICAL ENGINEERS

Following meetings have been arranged by the above Institution :—Meetings (Thursdays at 6 p.m., tea 5.30 p.m., except where otherwise stated.) 1942. February 19, J. M. Meek, M.ENG., "The Electric Spark," (Part I); March 19, "A Critical Review of Education and Training for Engineers," presented by Dr. A. P. M. Fleming, C.B.E., M.SC., for the Education and Training and Personnel Sub-Committee of the Institution Post-War Planning Committee (Part I); April 23, Dr. O. E. Buckley, the 33rd Kelvin Lecture,

John Alfred Gotch

The death was announced on January 17 of Mr. J. Alfred Gotch, M.A., J.P., Past-President of the R.I.B.A., and the Architectural Association. Mr. Gotch was remarkable as a successful provincial architect (the first man out of London to be elected P.R.I.B.A.), but even more so as an architect who played a prominent part in the offices of his home town. He became Charter-Mayor of Kettering in 1938, having been Chairman of Kettering Bench of Magistrates since 1893. One of the ways in which he used his influence was to organize art classes in the district, half a century before technical education came that way. He himself made a habit of buying the immature work of promising students. The photograph (Speight, Kettering) shows him in his mayoral robes.

" The Future of Transoceanic Telephony," (Part I) ; May 7, Annual General Meeting (Corporate Members and Associates only).

R.I.B.A. EXAMINATIONS

—The R.I.B.A. Intermediate Examination was held in London, Manchester, Leeds. Hull, Exeter and Belfast from November 14-20, 1941. Of the 95 candidates examined, 32 passed and 63 were relegated. The successful candidates are as follows :— Archer, John Philip ; Astins, Norman Percy ; Austin, Kenneth Vincent ; Badham, Douglas John ; Burstow, Ralph Ernest ; Clarke, Peter Anthony ; Cleverly, Lionel M. ; Evans, Byron John Martyne ; Freakley, Kenneth John ; Frith, Norman Laurence ; Furness, Geoffrey Gordon ; Glen-Bott, John Alexander ; Goom, Noel Joseph ; Gray, John ; Halman, James Henry ; Hobson, James Ronald ; Houston. Trevor 'Anthony ; Hughes, Maurice Howard ; Hurworth, Peter Woodall ; I'Anson, Tom Norman ; Johnson, Arthur Gilbert ; Kent, Oliver ; Lockwood, Maurice ; Martin, Wilfred ; Olley, Jack ; Pattenden, Brian Victor ; Rainton. Dennis (subject to completion of testimonies of study) ; Solomon, William Richard ; Stott, Philip Sidney ; Wallis, John Rodney ;

★ *An architect has been appointed by L.M.S. Railway to act as liaison with various sections of company's Scientific Research Department* page 85

★ *Directorate for Economy of Design has issued details of its first year's work on timber economy* page 93

★ *Letter to Prime Minister by Federation of Greater London Master Builders* page 99

Wallwork, Alan Joseph Astley ; Woodcock, George Frederick Henry.

The Final Examination, December, 1941.—The Final Examination was held in London and Edinburgh from December 10-18.

Of the 55 candidates examined, 26 passed as follows :—Passed whole examination, 17 ; passed whole examination subject to approval of thesis, 2 ; Passed Part I only, 4 ; passed Part I only subject to approval of remaining testimonies of study, 3 ; total 26. 29 candidates were relegated.

The successful candidates are as follows :—Arkcoll, Percy Bradwell ; Bird, Charles Leonard (Part I only, subject to approval of remaining testimonies of study) ; Boagey (Miss), A. Doreen ; Bone, John Bolam (Part I only) ; Bordoli, Maurice Roy (Part I only) ; Chandler, Edwin George (distinction in thesis) ; Cook, Laurence Arthur Lavington (Part I only, subject to approval of remaining testimony of study) ; Draper, Eric William (Part I only) ; Dryburgh, John ; Garner, William; Gray, Ronald Peter ; Griffiths, Jack ; Hall, Victor ; Harris, Robert James ; Heape, Edwin Husain, Saiyed Mohammed (Part I only) ; Keith, George McIntosh (subject to approval of thesis) ; Lumsden, Michael ; Moate, Frank (Part I only, subject to approval of remaining testimonies of study); Robinson, Morris Strachan (distinction in thesis) ; Searles, Donald Frederick ; Shepherd Cameron Leslie ; Talbot, Edwin William (subject to approval of thesis) ; Turley, Richard ; Wolfe (Mrs.), Anne Hilda ; and Zunz, Werner.

The Special Final Examination, December, 1941.—The Special Final Examination was held in London and Edinburgh from December 10-17, 1941. Of the 25 candidates examined, 19 passed (5 of whom sat for and passed in Part I only) and 6 were relegated.

The successful candidates are as follows :—Ahern, Timothy Joseph ; Appleton, Harold (Part I only) ; Biel, Hans ; Blouet, Douglas Montague Ralph (Part I only) ; Bodicoat, Victor Charles (Part I only) ; Cook, Ellis Jerden ; Farmer, Arthur Henry ; Fyfe, Clark (Part I only) ; Hewison, Ralph Wilbur ; Hill, Eric Davy ; Kaufman, Aubrey ; Leyshon, Sydney (Part I only) ; Light, Edward Joseph George ; Oram, William Reginald ; Quinn, Charles Joseph ; Ulrik, Otto ; Vago, Paul L. ; Walter (Mrs.), Marianne ; and Witten, Raymond Charles.

The Examination in Professional Practice for Students of Schools of Architecture recognized for exemption from the R.I.B.A. Final Examination.—The examination was held in London ahd Edinburgh on the 16-18 December, 1941. Of the 5 candidates examined, 2 passed and 3 were relegated.

The successful candidates are as follows :—Eker, Moses; and Joglekar, Shridhar Krishna.

HIGH MARKS

MR ATTLEE outlining the functions of the Ministry of Works and Buildings to the House of Commons on October 24 last year said : "The Minister will take steps to institute research into such questions as the adoption of substitutes for building materials or modifications of designs and specifications with a view to expedition and to ensure that results of past and future research are promptly communicated to all concerned. For this purpose he will make full use of the building research organization of D.S.I.R. He will be empowered to call on departments retaining responsibility for building to satisfy him that they are making full use of the results of research in this connection." This field of activity was allotted to a director for economy of design—Mr. Guthlac Wilson—early in 1941.

At first the new directorate functioned chiefly by calling other people to account, and was, like many other branches of the civil service, just a specialist department enjoying a somewhat unfortunate monopoly of its own business. There are rude men who will say buildings reached the stage when they were just about to be built, before drawings could be submitted to the directorate for economy of design to whom alone the duty belonged of seeing that they were constructed economically. Under such conditions the job of enforcing economy "without" to quote Mr. Beaver "unduly holding up work," was an impossible job. The phrase "modification of design and specification with a view to expedition" does not recommend itself to anyone closely connected with building work.

Our ministry, however, has not neglected its other powers. Without abandoning its right to examine drawings it has taken steps which may ultimately make this process more of a formality. Research has been expanded and directed on to pressing problems of the moment ; ways and means of economising materials in short supply have been invented, tested and recorded and the results have been brought to the attention of all concerned ; it is hoped that this will enable professional men to design and specify appropriately in the first place. Some of the fruits of a year's work on timber economy are described on pages 93-98 and will shortly be published by the B.R.S. as Wartime Building Bulletin No. 19.

It is encouraging to find the government at last taking on the job it has shirked for so long, of formulating standards related to the needs, circumstances and resources of the nation. No trade association or ingenious individual acting alone can hope to be aware of all the factors which may suddenly make one out of a hundred practically interchangeable methods more suitable for a time than any other, or put a premium on a particular kind of invention. The State alone is in a position to know where the shoe is likely to pinch ; in peace as well as war intelligent direction* by it can obviate

* As opposed to control.

many difficulties and need add very little to the exasperations of government control.

There appear to be two possible dangers. The work of the ministry might not be sufficiently well linked up with that of independent research organizations and so might lag behind the best, or their recommendations might develop into stereotyped regulations preventing technicians from achieving the results aimed at by better methods of their own contriving and depriving their work of interest. Neither of these dangers is apparent at the moment. One hopes that this and all other attempts to provide the nation with a thinking apparatus will go on and prosper.

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

NOTES & TOPICS

HOMES FOR HEROES À LA MODE

At the end of his inspiring speech on the Ministry of Works' attitude to reconstruction, Mr. Hicks was asked if he ever went to East Ham, by a lady who said that she frequently did ; she gave the following account of what's going on there now.

*

Evacuees are returning home in large numbers to districts where many houses were destroyed last year and more condemned. The latter are being patched up, some by semi-skilled labourers, some even by the people themselves, who afterwards crowd into them in defiance of every known standard. They care about nothing, so long as they are home again. Landlords and local authorities are naturally pleased to be collecting rent and rates again, and the consequences of it all appear to be nobody's business.

*

Mr. Hicks said this didn't really come within his sphere, nor for that matter in anybody else's. It really concerned several people. He thought the houses might not really have been condemned, just left unrepaired owing to shortage of labour. No doubt they would only be made wind and weather-proof (after more than a year mark you).

*

Suddenly he brightened up and a note of confidence returned to his voice. There's one thing, ladies and gentlemen, he said, that I think we shouldn't forget. The people in East Ham are heroes. If they had stampeded during that first Blitz, the whole country might have followed suit. If conditions in East Ham have produced characters of such quality, ladies and gentlemen, we should think twice before we interfere with them !

*

This version of homes for heroes, new at any rate to me, had a successful premiere. Members of the town and country planning association clapped enthusiastically.

*

Later I asked a friend of mine who works among evacuees why she thought they went back. She explained it this way. Many are unbelievably poor, used to relying on a high standard of social services and to eking out their income by charring and odd jobs. In the country doctors are expensive and often the only way to get to one is to walk ; there are neither odd jobs nor amusements : even knitting needles cost too much. Life in town is not particularly attractive, but acute poverty is less noticeable.

*

THANK YOU FOR NOTHING

The angry architect (R.E.) waved a copy of the ARCHITECTS' JOURNAL. "Listen to this," he said, and proceeded to read : " 'As a result of negotiations between the R.I.B.A., the War Office and the Ministry of Labour and National Service, it has been agreed that ' pupil architects ' who become available for service in H.M. Forces, and who have not expressed a preference for the Royal Navy or the Royal Air Force or, if they have expressed such a preference, have not been accepted by the service of their choice, may be posted by the Ministry of Labour and National Service as students to the pioneer group of the Royal Engineers. Selected candidates will be sent to a training battalion R.E. without any necessary nomination by the institute.'* What does that mean to you ?"

*

Without waiting for a reply, he went on to tell me what it meant to architects serving in the forces. " The story starts," he said, " with the R.I.B.A. scheme for recruiting suitable candidates for training R.E. officers, of whom there was said to be a shortage about a year ago. Applicants were asked to submit their names to the R.I.B.A., and lists were then submitted to the War Office in order that they might make a selection. Selected candi-

*Architectural Students and the Royal Engineers. Architects' Journal, Jan. 1, 1942, page 1.

dates then entered the ranks and were treated *just like anybody else*."

★

"Now look at this scheme. It has been agreed by a great many important people, after a lot of talk, that pupil architects who become available for service in H.M. Forces may be posted to the pioneer group of the R.E.; on the other hand, they may not. If they get there what does it mean? It means that, like any other recruit, they will find themselves being posted to a pioneer group of the R.E., a privilege shared by concretors, navvies, labourers, and even by illiterates. As for being sent to a training battalion 'without any necessary nomination by the institute,' all recruits who enter the army go automatically to training battalions—that is what training battalions are for."

★

"Well," I said at last, "what does it all mean then?" "It means," he said, "that the army has its own methods of selecting candidates for this and that, and refuses to be hurried or influenced by outside organizations—not necessarily a bad thing. It means that architectural students entering the army from now on can write 'pupil architect' on their enlistment paper, if they like, instead of just 'student.' Apart from that, it means Sweet Fanny Adams."

★

FOR WOMEN OUT OF UNIFORM

Last week I visited one of the hostels for women munition workers of which we have read such a lot in the last two months—usually in flamboyant articles by women correspondents headed *At Worktown* or *Near a North-West Factory*.

★

There is good excuse for the correspondent's enthusiasm. This hostel, like many others, was planned when it was decided to *coax* women into the factories, and the Ministry of Supply and its architects have made such a job of it that some bitter and excusable cracks may soon be heard from Wrens, Waafs and Ats. For those who like holiday-camp conditions, and many young women do, the hostel will run paradise close as far as accommodation goes.

★

On a site of about 20 acres, dormitory units make the best of view and aspect around a central group containing dining rooms, offices, shops, recreation rooms and an assembly hall equipped for full-scale stage and cinema shows and concerts. And here and there is a laundry where girls can do their own "smalls," a hairdressing block, sick-bay and the rest.

★

From outside the various buildings are simply shaped, low and as pleasantly coloured as the exigencies of war allow. Internally, the buildings rely entirely on colour to change a collection of wartime internal surfaces into rooms which look as if someone had taken pains with them. The results are extremely successful: and even the furniture (Ministry of Works and Buildings), although it is not Finmar, is at least much better than one would have expected. The highlight of the recreation rooms is certainly the pictures. The architects have searched the poster files of Shell, London Transport and the G.P.O., cut out the pictures, and mounted them with a wide white margin and in deep and narrow white frames. The effect on the rooms is admirable, and one hopes it will be widely imitated.

★

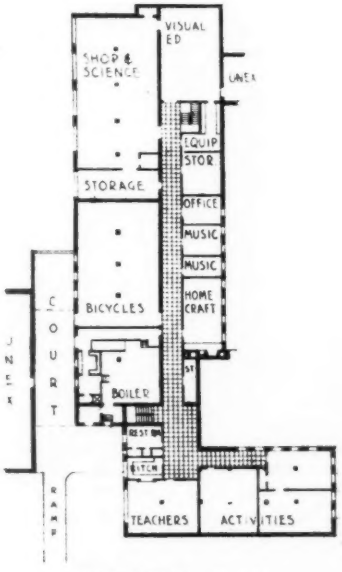
I asked one of the inmates what she thought of the hostel, and on the way to the station I brooded over her reply: "Oh, its nice!—Ever so swish!" Will living for a year or two in hostels like these have any good effect on the tastes and inclinations of 50,000 — 100,000 youngish women? It may be so. On the other hand, if the expected reaction against all war measures, methods and surroundings takes place when peace comes, 100,000 women may for ever associate reasonably well-designed surroundings and good pictures with officialdom, munitions and war: compare architect-designed council houses and the consequent prejudice in pre-war days against any well-designed small house.

ASTRAGAL

SCHOOL AT WINNETKA

ARCHITECTS: ELIEL AND EERO SAARINEN AND PERKINS, WHEELER AND WILL

Above: Eero Saarinen's special bench birch ply chairs and desks.

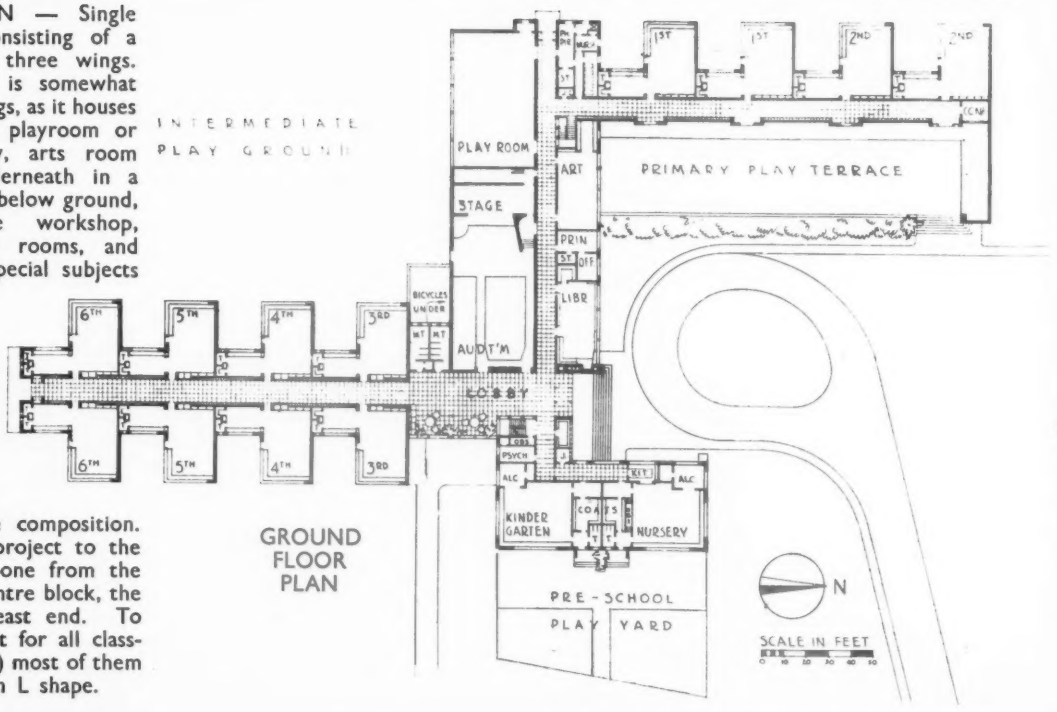


BASEMENT PLAN

GENERAL—This school for children of kindergarten and elementary school age is situated at Winnetka, a suburb of Chicago.

North Side of Central Block

ACCOMMODATION — Single storey building consisting of a centre block and three wings. The centre block is somewhat higher than the wings, as it houses the assembly hall, playroom or gymnasium, library, arts room and offices. Underneath in a basement, but not below ground, are the science workshop, teachers' common rooms, and rooms for some special subjects such as music, crafts and visual education. A slab-like tower for the main chimney flues is placed immediately to the right of the main entrance, accentuating the focal point of the composition. The three wings project to the north and south, one from the west end of the centre block, the others from the east end. To gain a south aspect for all class-rooms (except one) most of them have been given an L shape.



GROUND FLOOR PLAN

SCHOOL AT WINNETKA

BY E. AND E. SAARINEN AND PERKINS, WHEELER AND WILL

MATERIALS

Old and New

[*By E. FRANKLAND ARMSTRONG*]

This paper was the third of a series of twelve on "The Post-War Home: Its Interior and Equipment," to be read at fortnightly intervals during the present session of the Royal Society of Arts

THE story of the evolution of materials used inside a house is the story of developing civilisation: there has been continuous progress from the roughest of utility objects to things both useful and decorative.

"Out of a million lives our knowledge came,
A million subtle craftsmen forged the means;
Steam was our handmaid, and our servant flame,
Water our strength, all bowed to our machines.
Out of the rock, the tree, the springing herb,
We built this wandering beauty so superb."

JOHN MASEFIELD.

Masefield wrote these lines of a ship; they apply equally to the house.

Wood

The most important material indoors still remains wood. When local timber was all that was available, oak was the chief choice; later it was supplemented by mahogany brought into Bristol and such ports as Lancaster and Preston. How splendid was the craftsmanship of the wood workers in Georgian times is made manifest by the furniture pieces of Chippendale, Sheraton, Hepplewhite and others; even the kitchen pieces have an elegance and charm which is lacking from their Victorian prototypes. Other cheaper woods came into use, each had their vogue and they are known to all of us. Wood is still the basic material, but it is fabricated in a different fashion, and the machine and the portable tool largely takes the place of the craftsman. It is an age of plywood and veneer with a cellulose spray finish instead of french polish: plastics are used both as binding agents and as surface finishes. Either urea formaldehyde resins or paper impregnated with a phenol formaldehyde and used in a dry state serve to bond the layers of plywood together—there are British Standard Specifications for both. The trick is to use as little glue as possible, and spreaders or brushes tend to apply more than the optimum amount. Hence the discovery that the glue can be foamed up to occupy double its volume before it is poured into the spreader. Such facts illustrate the intricate nature of the modern wood industry.

Plywood

Plywood sheets and veneer are cut from the log by special tools in a manner that produces no sawdust, so that there is an absolute minimum of waste: hence a very much higher proportion of the whole log is turned to useful purpose than in the old days. Small standardised lengths are cut in such a way that they can be used as common components of many articles. As a consequence, furniture is produced which is inexpensive, good to behold and largely suited for the modern small rooms—its life period is probably satisfactory having regard to the changes in fashion.

Cellulose finishes are applied with skill to give the desired effects. The basic timber comes from the Baltic or Canada (birch); there is still a vogue for oak. Empire timbers of great beauty are beginning to appear, but their use is mainly confined to decorative purposes such as public rooms and on the "Queen Mary."

Plastics

Among really new materials for the house the greatest expectation is, perhaps, fixed on plastics. These are a most varied class of substance made by the chemist which can be moulded while plastic into the most complicated shapes, and then fixed permanently in this form, generally by heat treatment.

The industry is quite a new one, it really dates from the discovery of Bakelite, in 1900, by Dr. L. H. Baekeland, but it is progressing at a surprising rate. There are several types of plastics made from phenol (coal tar), from casein (milk), or from chemicals which originate from acetylene calcium carbide) and, indeed, many other chemical raw materials. Our telephones are made of the first of these, the last give transparent products resembling glass which can even be made into optical lenses and are unbreakable. The electrical and mechanical properties of the plastics can be varied over a very wide range, and they lend themselves to the production of highly decorative articles where design is rendered not so limited or exacting as with many other materials of construction. The public is already largely familiar with their diverse uses. In early days this was confined to small articles, but now they are definite constructional materials in all branches of mechanical engineering. As veneers on the surface of wood they are used extensively for certain qualities of furniture—as table tops, for example, they have the merit that they are not marked by hot articles. It is to be expected that they will be used more and more in the house in all manner of ways—for telephone equipment and vacuum cleaners, for laminated plywood with weather and moisture resisting qualities, for insulation and innumerable other purposes. Mass production will lead to a material reduction in cost—they will be found to wear better and to be easier to keep clean than the materials they replace. Indeed, it is not too much to say that they form a fifth class to the materials metal, wood, glass and ceramics used in the past. More than any other, we can regard them as among the most promising materials of the future.

Impregnation of wood with an appropriate synthetic resin keeps the windows and desk drawers from sticking in wet weather. As an adhesive the resins are used in plywood and in fibre wallboard, both being bonded under pressure and being in consequence extremely strong and having good heat-insulating properties.

Textiles

Ever since man learned the arts of spinning and weaving textiles have been available for the house. They are made from cotton and flax, vegetable products, and from wool and silk, animal products. Materials of great beauty and great durability have been woven for hundreds of years, whilst there is no need to mention the wealth of fabrics in many forms and varied hues available to-day. The textile industry has constantly produced new materials such as velvet and has also woven lengths containing more than one type of fibre. The general tendency has been to produce more attractive and serviceable materials at a lower cost. For many years various chemical treatments such as mercerising have been applied to the yarn to give it new and valuable properties.

A great stimulus to the textile trade was given by the invention of rayon, which consists of pure cellulose derived either from soft wood or from cotton linters dissolved in a chemical liquid which is squirted through an orifice into another fluid where the cellulose is reformed as a thread. The rayon industry has learned to do all sorts of things with this viscose rayon thread, with results which are known to all of us when it is woven. Another form of rayon involves the primary acetylation of or combination of acetic acid with the cellulose before it is dissolved, squirted and reformed: this acetate rayon has properties even more desirable than viscose, but its development

on the really grand scale has to await low-cost acetic acid. Rich lustrous satins, dull satins, spun yarns that resemble wool, treebark crepes and fabrics rivalling in beauty the finest cashmere are all being made in rayon.

Water-repellent finishes are available which render the finest fabrics resistant to spotting; fabrics can be made flame-proof by impregnation with a chemical which is obtained cheaply; they can be treated with moth-repellents or with synthetic resins so as to make them proof against creasing and wrinkling. Future advances in the production of these so-called semi-synthetic textile fibres depend on economics. Viscose is directly competitive with cotton; the urge is to make cheaper acetic acid.

During the last five years much has been heard of fibres made from casein, i.e., from milk, which will replace wool. These fibres are nearly round and smooth: they cannot be expected to have as satisfactory warmth retention nor to interweave with the firmness of wool fibres, but they are a substitute of potential lower cost, especially during a protracted war. Other protein fibres have been experimentally made from the proteins of soya bean and maize. Fibres have been made experimentally from a carbohydrate which is the equivalent of cellulose present in seaweeds: these may have new desirable properties.

Latterly, much has been heard of a wholly synthetic fibre based, so to speak, on coal, air and water, of which nylon is the first representative. Efforts have long been made to convert plastic materials into fibres: this has proved to be a problem of the utmost difficulty, but it has been solved at last, after very great expenditure of research, labour and capital in America. The new fibre has super qualities; it is as yet expensive, but a few years' experience in production will, no doubt, cheapen it, and there is every expectation that before many years, fibres of this class will play a leading part in the textile industry.

To sum up, there is clear indication that the textile industry *per se*, together with the semi and wholly synthetic fibres, will continue to provide new materials with more desirable properties and at lower prices.

The oldest textiles were beautifully coloured with natural fast dyes. Perkin's discovery of mauve, the first coal-tar colour, has been followed by thousands of others, and dyes of every hue for every purpose are available. The subject has been often described, and dyes can almost be listed among old materials; yet there is, and will be continued, progress chiefly in the direction of cheapening the faster dyes and discovering new dyes with outstanding properties.

Of textiles we can repeat the lines:

" and spread abroad the tale
of magic looms in little rooms
that make such stuff for sale."

Cellulose from wood has come to the help of the textile industry: it is also the basis of the paper industry, including the manufacture of wallpapers, a branch in which this country excels. There is ample scope for art in their design, but developments are also to be expected along the same lines as in textiles, including the use of synthetic resins. New materials, even if they are based on the old, are therefore certain in the paper industries.

The covering of walls is a highly competitive question—paper, paint, wood and various forms of wallboard all complete. In the future, the heat insulating value of such coverings is likely to be taken much more into account, since the rising cost of fuel will render it necessary to prevent loss of heat from a room. Acoustic values may also have to be considered if the habit of living in flats spreads. Materials such as calcium sulphate, asbestos, cork and similar fillings come under considerations, though for a long time the cheaper houses will have to rely on wallpaper. The whole subject of wall covering is of such magnitude that it needs separate treatment.

Fibre Board

A word must, however, be devoted to the fibre board industry. Cellulose, largely recovered from waste paper, is run to a thin sheet, which, a short time after preparation, is stuck to a second sheet by means of silicate of soda: the process is repeated till a board of the necessary thickness is obtained and the whole is compressed by passing through rollers. The surface of the board can be finished in various ways, for example, by the application of a synthetic resin to make it waterproof. Such boards have great strength and many other desirable properties. They are of value inside the house in an increasing number of ways, and form one of the most promising of the cheap new materials, provided always that the householder treats them with proper care.

Incidentally, this is a *sine qua non* with all materials whose life depends on their treatment. In recent days of easy replacement and low first cost, there is a tendency to be slack in this matter, particularly among the lower income classes, who should realise that if they would buy articles of the best quality they could afford, and look after them, much money would be saved. The lack of respect for landlords' property definitely discourages the provision of amenities.

Cellulose, when nitrated, is the basis of a range of materials which have largely replaced leather, both in motor cars and furniture. Their discovery was a fortunate one for the comfort of the motorist, for there would never have been enough hides for a tithe of the world's cars. The same nitrated cellulose is a constituent of spray paints and surface finishes for furniture, also for wood and metal. Spray painting has revolutionised the paint industry out of doors: it will be more and more used inside.

The value of paint to the household requires no emphasis; paint acts as protection alike to metal, stone and woodwork. The paint industry is developing rapidly, thanks to new materials and new methods of application. Titanium oxide has come to aid lithopone to produce white, organic solvents replace turpentine and make spray painting feasible, other chemicals act as plasticisers and cause quick setting. The synthetic resins are also helpful both to supplement the natural resins and to give novel effects. Much is to be hoped in the future from the use of paints internally in the house to give effects of considerable permanence and high decorative value. Paints, as is well known, owe much to linseed oil, a substance which is the basis of linoleum. The economic covering of the floor by a material which is both durable, warm and decorative is a major problem in the house. New materials are constantly coming forward; linoleum is supplemented by rubber, and by the magnesium oxychloride and similar floorings now used in offices, which may in time reach flats and houses.

Glass is another important material in the house which might well be more generally used. The large Victorian mirror has disappeared and our rooms are darker in consequence. The production of table glass has been allowed to pass into foreign hands, largely on the point of cheapness, though the home industry has also some leeway to make up in design: it must be made British again. Glass will be more widely used as a building material soon; there are toughened varieties at which stones can be thrown with impunity, and window glasses which cut out the heat rays but let through the health-giving ultra violet rays of the sun. The transparent synthetic resins are also going to supplement glass; at the Chicago Fair there were rooms in which floors, tiles, wall panels, mouldings and most other items were made of vinylite plastic. Such material is not yet for the lower-priced house, but it will come once people have learned to take care of it. These materials have value in being more permanent, requiring less repair and cleaning and therefore soon justifying their higher first cost. It is, perhaps, all important that some influence should be exercised over design, so as to keep it on sound lines—new materials can become the sport of the exotic as witnessed in the use of stainless steel in the modern cocktail bar.

Glass leads on to ceramics, an industry in which the goods are fired and therefore excludes organic constituents. The industry continues to progress though

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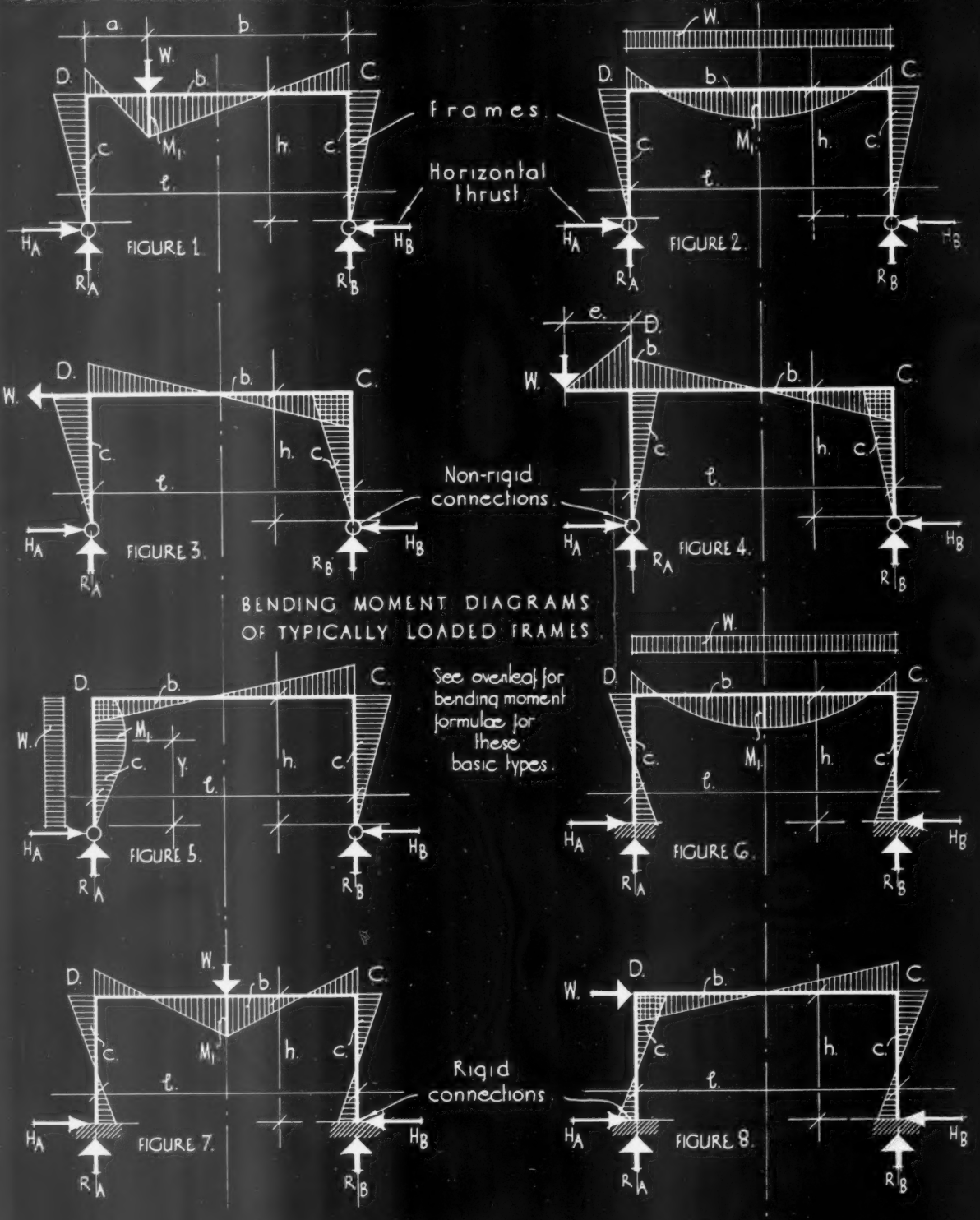
GENERAL CONSIDERATIONS AND PRINCIPLES OF DESIGN IN WELDED STEEL, Nº 13.



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INFORMATION SHEET : STEEL FRAME CONSTRUCTION, 67 : WELDING Nº 23
SIR JOHN BURNET TAIT AND LORNE ARCHITECTS ONE MONTAGUE PLACE, BEDFORD SQUARE LONDON WC

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INFORMATION SHEET
STRUCTURAL STEELWORK

• 852 •

Subject : Welding 23 : General Considerations and Principles of Design in Welded Steel : 13, Welded Frames (C).

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 steel work are analysed in relation to the normal structural requirements of buildings. The economies in cover and dead weight, resulting from the use of lighter and smaller steel members and connections, 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 thirteenth of the section illustrating general considerations and principles of design in welded steel, and is the third dealing with frames.

Stiffness :

The distribution of bending moments in all statically indeterminate frames depends greatly on the relative stiffness of the members, and, as a general rule, a stiffer member takes a larger bending moment, thus relieving others which are less rigid. The stiffness depends on the Moment of Inertia and the length of each member ; it is proportional to the Moment of Inertia and inversely proportional to the length. Stiffness is, therefore, defined as $K=\frac{I}{l}$

where I = Moment of Inertia (ins.^{4}), and
l = lengths (ins.).

To determine the bending moments from the formulae given below K must be known in every case, and therefore, the Moment of Inertia of the members must be assumed. If it is finally found that the actual Moment of Inertia is much different from that which was assumed, the formula would have to be applied again.

Diagrams :

On the front of this Sheet, the bending moment diagrams are given for eight typical loadings. In every case K_b refers to the stiffness of the beams, and K_c to the stiffness of the columns, while the other dimensions are explained in the Figures.

Positive Moments :

It will be seen from the diagram that, in every case, positive as well as negative bending moments occur, and that care must be taken to design every point of a frame for its appropriate bending moment.

Combined Loadings :

If there is a combination of loadings, e.g., Figures 1 and 2, the bending moments are to be added. The normal force in the beam is equal to the horizontal reaction, and the normal force in the columns to the vertical reactions.

Formulae for the Determination of Bending Moments :

(*a*) Loading as in Figure 1 :

$$K_b=\frac{I_b}{l} \qquad K_c=\frac{I_c}{h}$$

$$R_A=\frac{Wb}{l} \qquad R_B=\frac{Wa}{l}$$

$$H_A=H_B=\frac{Wab}{lh}\ \frac{3K_c}{6K_c+4K_b}$$

$$M_C=M_D=-Hh=-\frac{Wab}{l}\ \frac{3K_c}{6K_c+4K_b}$$

$$M_1=\frac{Wab}{l}+M_C=\frac{Wab}{l}\ \frac{3K_c+4K_b}{6K_c+4K_b}$$

(*b*) Loading as in Figure 2 :

$$R_A=R_B=\frac{wl}{2}$$

$$H_A=H_B=\frac{wl^2}{4h}\ \frac{K_c}{3K_c+2K_b}$$

$$M_C=M_D=-Hh=-\frac{wl^2}{4}\ \frac{K_c}{3K_c+2K_b}$$

$$M_1=\frac{wl^2}{8}\ \frac{K_c+2K_b}{3K_c+2K_b}$$

(*c*) Loading as in Figure 3 :

$$R_A=\frac{Wh}{l} \qquad R_B=-\frac{Wh}{l}$$

$$H_A=\frac{W}{2} \qquad H_B=-\frac{W}{2}$$

$$M_C=-H_Bh=\frac{Wh}{2}$$

$$M_D=-H_Ah=-\frac{Wh}{2}$$

(*d*) Loading as in Figure 4 :

$$R_A=W\frac{e+l}{l} \qquad R_B=-W\frac{e}{l}$$

$$H_A=H_B=-W\frac{e}{h}\ \frac{3K_c}{6K_c+4K_b}$$

$$M_C=M_{Dc}=-Hh=We\ \frac{3K_c}{6K_c+4K_b}$$

$$M_{Db}=-We+M_{Dc}=-We\frac{3K_c+4K_b}{6K_c+4K_b}$$

(*e*) Loading as in Figure 5 :

$$R_A=-\frac{wh^2}{2l} \qquad R_B=\frac{wh^2}{2l}$$

$$H_A=-\frac{wh}{8}\ \frac{11K_b+18K_c}{2K_b+3K_c}$$

$$H_B=\frac{wh}{8}\ \frac{5K_b+6K_c}{2K_b+3K_c}$$

$$M_C=-H_Bh=-\frac{wh^2}{8}\ \frac{5K_b+6K_c}{2K_b+3K_c}$$

$$M_D=-H_Ah-\frac{wh^2}{2}=-\frac{wh^2}{2}\ \frac{3K_b+6K_c}{2K_b+3K_c}$$

$$y=-\frac{H_A}{w}=\frac{h}{8}\ \frac{11K_b+18K_c}{2K_b+2K_c}$$

$$M_1=-\frac{H_A^2}{2w}=\frac{wh^2}{128}\ \frac{11K_b+18K_c}{2K_b+3K_c}$$

(*f*) Loading as in Figure 6 :

$$R_A=R_B=\frac{wl}{2}$$

$$H_A=H_B=\frac{wl^2}{4h}\ \frac{K_c}{2K_c+K_b}$$

$$M_A=M_B=\frac{H_Ah}{3}=\frac{wl^2}{12}\ \frac{K_c}{2K_c+K_b}$$

$$M_C=M_D=-\frac{2H_Ah}{3}=-\frac{wl^2}{6}\ \frac{K_c}{2K_c+K_b}$$

$$M_1=\frac{wl^2}{8}+M_C=\frac{wl^2}{24}\ \frac{2K_c+3K_b}{2K_c+3K_b}$$

(*g*) Loading as in Figure 7.

$$R_A=R_B=\frac{W}{2}$$

$$H_A=H_B=\frac{3Wl}{8h}\ \frac{K_c}{2K_c+K_b}$$

$$M_A=M_B=\frac{Hh}{3}=\frac{Wl}{8}\ \frac{K_c}{2K_c+K_b}$$

$$M_C=M_D=-\frac{2Hh}{3}=-\frac{Wl}{4}\ \frac{K_c}{2K_c+K_b}$$

$$M_1=\frac{Wl}{4}+M_C=\frac{Wl}{4}\ \frac{K_c+K_b}{2K_c+K_b}$$

(*h*) Loading as in Figure 8.

$$R_A=-\frac{Wh}{2l}\ \frac{6K_b}{K_c+6K_b}$$

$$R_B=\frac{Wh}{2l}\ \frac{6K_b}{K_c+6K_b}$$

$$H_A=-\frac{W}{2}$$

$$H_B=\frac{W}{2}$$

$$M_A=-\frac{Wh}{2}\ \frac{K_c+3K_b}{K_c+6K_b}$$

$$M_B=\frac{Wh}{2}\ \frac{K_c+3K_b}{K_c+6K_b}$$

$$M_C=M_B-\frac{Wh}{2}=-\frac{Wh}{2}\ \frac{3K_b}{K_c+6K_b}$$

$$M_D=M_A+\frac{Wh}{2}=\frac{Wh}{2}\ \frac{3K_b}{K_c+6K_b}$$

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, 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 and 851.

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there is not the same scope for new materials.

The metals are going to provide numerous new materials for the home. The applications of stainless steel and aluminium are as yet only in their infancy, particularly as both will become less costly. There will be developments in enamelled ware, as indicated by the pleasing appearance of the modern gas cooker, and a great variety of alloys—light and heavy—are awaiting application to the building trade when the needs of the aeroplane have been satisfied—the main drawback of corrosion, which applies to most metals, may be solved by these.

The new materials will all tend to reduce the labour in the house: this is the outstanding domestic requirement of the day in an age where there is a great labour shortage, side by side with widespread unemployment—it would appear that neither the male nor the female of the species is a willing worker, so that the home is powerless to compete with the cinema and the race track.

So far rubber has not been mentioned, but it, too, is a material with a future. The applications of the natural product are always increasing: in time it is going to be supplemented by synthetic rubbers with special properties, and by chemically treated natural rubbers.

It is becoming clear that we must buy British after the war, either at home or in the Empire: there will be no money to buy from abroad unless the foreigner will buy as much from us. The British manufacturer must respond to this need by producing articles of the grade required and aiming to sell them in large quantities at a popular price. They must realise that "he who ceases to aim at better things will cease to make good things."

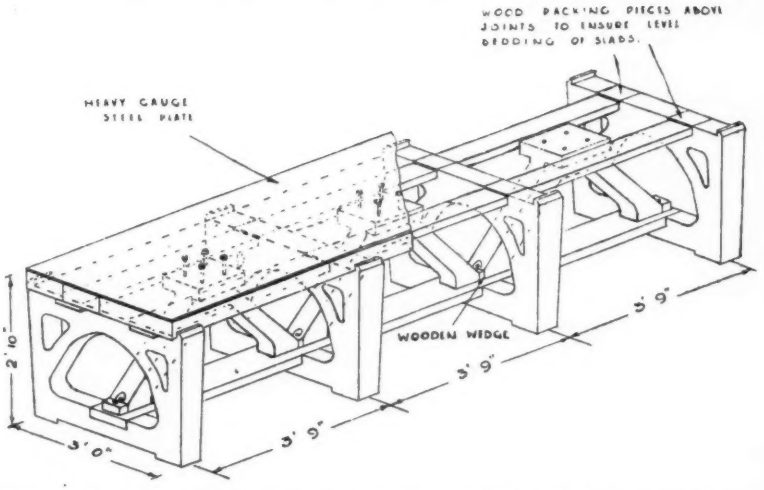
It is not for me to discuss form or design or decorative value of materials, but at least it can be said that the new materials lend themselves better to good design when mass-produced than the old. It should be possible to produce simple good art, even for the low income household: our Society can play its part in setting the standards. I believe the shops are more than willing to co-operate, and by display of the right stuff, to encourage its purchase. The shops must not be put at the mercy of those who mass-produce and advertise articles which are bad from the point of view of design.

The question of price is a more difficult one—small incomes cannot be stretched. Some attempt might be made to draw attention to the far higher prices paid for articles on the hire-purchase system. The advantages to the impecunious, who want to start with everything, are more than discounted by the inferiority and high cost of what they get. They would be far better advised to buy little by little, having due regard to quality.

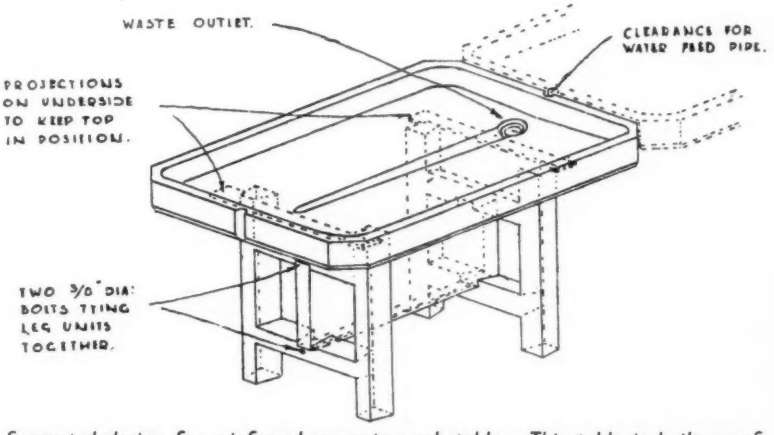
ECONOMY

The directorate for economy of design was set up in February, 1941, with Mr. Guthlac Wilson at its head. It has now been functioning for about a year, during which time it has collaborated closely with the Building Research Station. Mr. Hugh Beaver is on the Board of the Building Research Station which in turn has an officer and a permanent liaison officer at the Ministry of Works and Buildings; experiments are carried out in the B.R.S. laboratories. In some cases work that would otherwise fall to the Directorate for Economy of Design is done for it by the Director of Standardisation, Mr. T. S. Tait, whose job is to simplify the design of standard parts and to cut down the number of types available. He is at present working on standard window sections. Much of the work done so far has centred round timber economy and will shortly be published as Wartime Building Bulletin No. 19. Here are some examples of the year's work.

1. OMISSION OF TIMBER

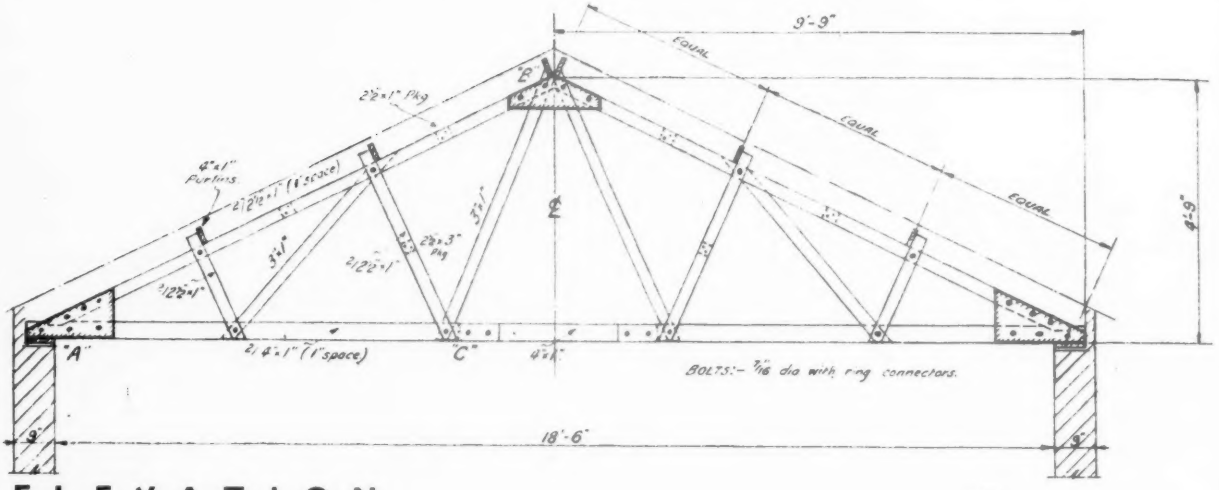


Suggested design for sawdust concrete inspection bench. It is built up of prefabricated sawdust concrete units thereby eliminating the use of timber construction members. The members are bolted together and form a very rigid and durable bench, the working size of top being 12 ft. by 3 ft. and the height 2 ft. 10 in. The units consist of four arched leg units, tied together by a 9 in. by 2 in. longitudinal member at the bottom, and at the top by two longitudinal members of 6 in. by 2 in.

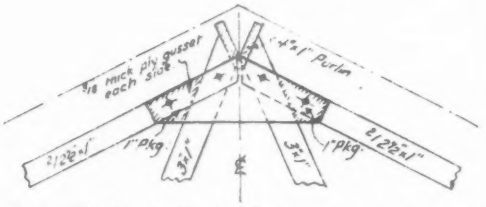


Suggested design for reinforced concrete wash table. This table is built up of pre-cast reinforced concrete units, the use of timber being entirely eliminated. Two bolts only are required for fixing the three lower members together, the top being kept in position by projections cast in the top. The framework consists of two leg units connected by a 2 in. concrete slab on edge, the whole being held in place by one bolt above and one bolt below the slab. These tables can be used end to end as shown in the diagram. Size of sink 4 ft. by 2 ft. 9 in. overall by 3 ft. deep inside. Height to top of sink, 2 ft. 7 in.

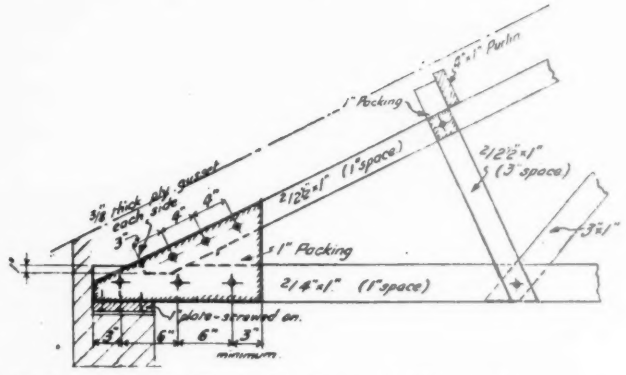
2. SIMPLIFICATION OF TIMBER ROOF



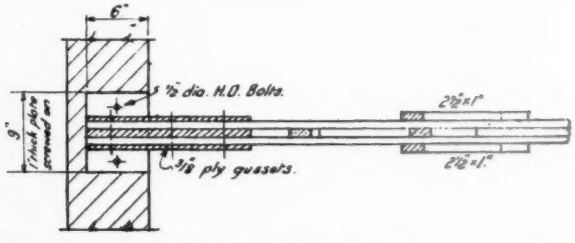
ELEVATION



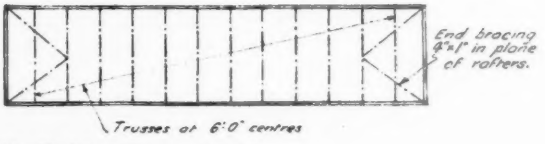
ELEVATION AT B



ELEVATION AT A



PLAN OF RAFTER AT A



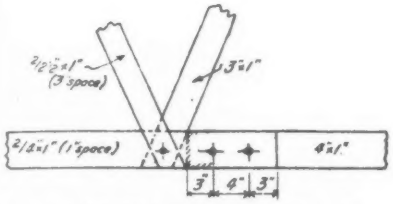
KEY PLAN

The drawings on this and facing page are reproduced from a series of sheets showing economical forms of roof construction. Note on sheet : All timbers to be exact dimension as given and in one piece between supports and connections. Timber to be good, straight, clean and free from large or loose knots. All bolts to be $\frac{7}{16}$ in. dia., with ring connectors as details. Right : Close-up showing the way the roof truss and wind brace are built-up.

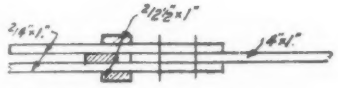
The work of the Directorate for Economy of Design on Timber Economy can be divided into sixteen different sections the headings of which give a fairly clear idea of the scope of its activities. They are :—
A The omission of timber and

DESIGN

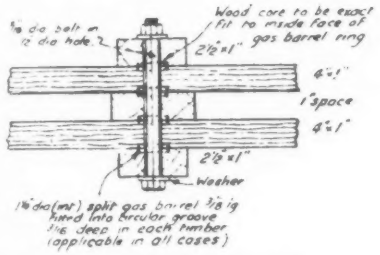
TRUSS



ELEVATION AT C



PLAN AT C



RING CONNECTORS

Interior of hut. In foreground an official is measuring the space between plumb-line and fixed brick to give the amount of deflection created by wind pressure as represented by the tension applied outside the hut. There is a plumb-line and brick beside each upright frame holding a wall section. The maximum lateral deflection recorded during the test was 1¼ in. The photographs reproduced do not apply to the examples shown in the drawings but illustrate a hut built from a typical scheme.

its substitution by other materials which are home produced and in better supply.

B The omission of timber or its cutting down when only used for trimmings or finishings

C Simplification of design and general cutting down of dimensions of timber in joinery.

D The substitution of thin plywood in light frames for solid timber.

E The use of home-grown hardwood in place of imported timber.

F The utilisation of poles and coppin wood instead of square-edged timber.

G The general cutting down of dimensions of timber in construction and the wider spacing of constructional timbers.

H Timber economy in shuttering.

J The omission of new timber from dunnage.

K Utilizing defective timber when defects do not affect the purpose.

L Saving on conversion by utilizing stock size ply.

L Saving on conversion by utilizing stock timber dimensions.

N Light roof trusses and purlins.

O Staircases.

P The utilization of sawdust, wood chips, wood flour, etc.

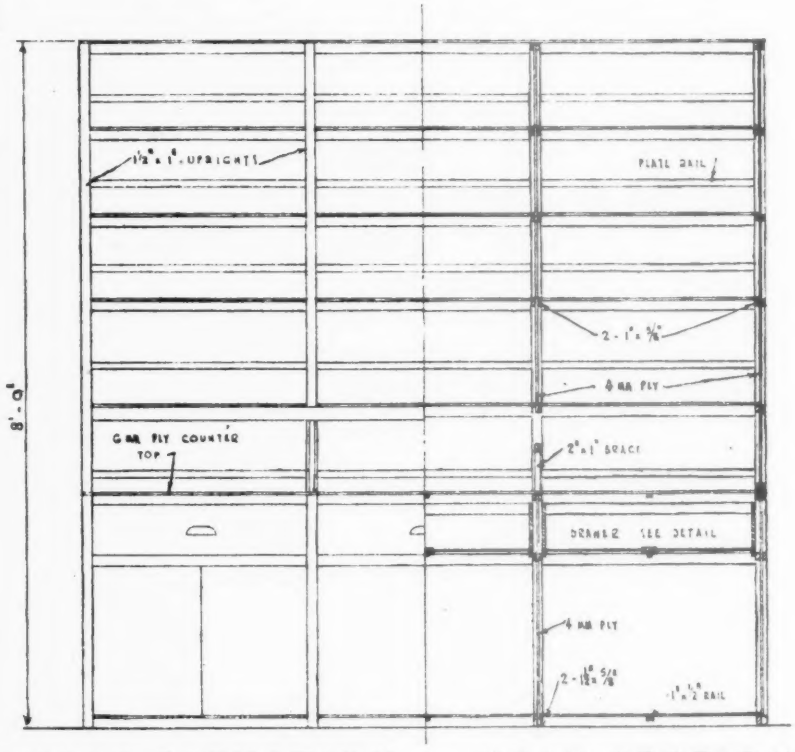
Some conclusions arrived at under headings A—J have been published already in Wartime Section Building Bulletin No. 1.

Most of these, apart from L and M, which stress points sometimes emphasised at less modern schools of architecture, deal with possible economies not usually brought to the attention of students. Some suggestions make one laugh, for instance, a plywood topped table with brick legs—but the fact remains that tables of this type are appropriate to our present state of emergency.

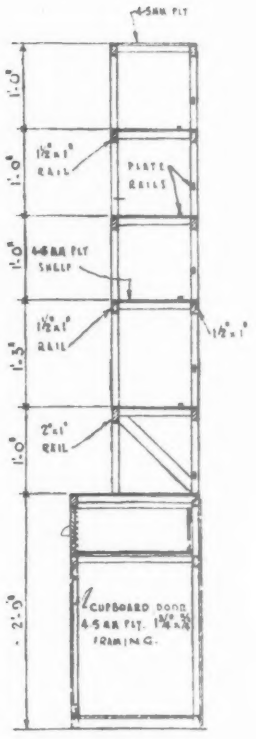
By no means all of the work done however, has an interest limited to the duration of the war. Much describes economies, some more some less important, which involve no necessary loss of amenity and are, in fact, very much in tune with contemporary feeling. For the moment æsthetics are not, of course, in the forefront, but from many points of view this is rather a relief. Too much self-consciousness in peace time was a handicap and cramped the development of new ideas in our old society. In any case this Ministry, thank goodness, is a Ministry of Building and in no way concerned with the appearance of things.

Work connected with the omission of timber and the substitution of other materials has dealt on the whole with makeshifts. Alternatives ranging from

THE NEW DRESS

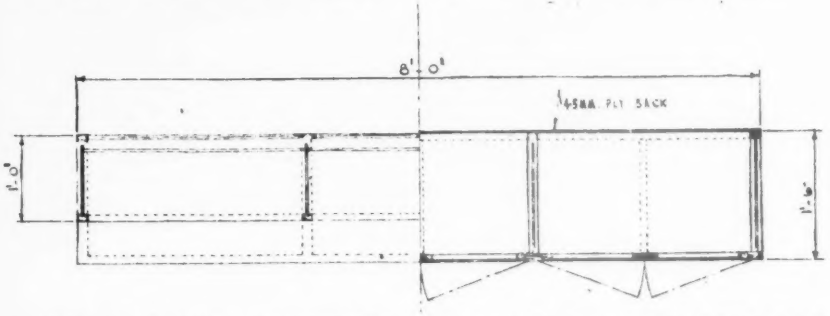


HALF ELEVATION



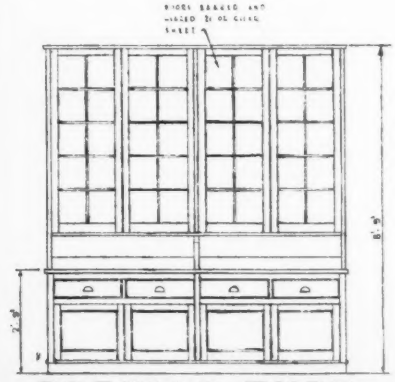
SECTION

HALF SECTION



HALF PLAN: SHELVES HALF PLAN: CUPBOARDS

THE OLD THING

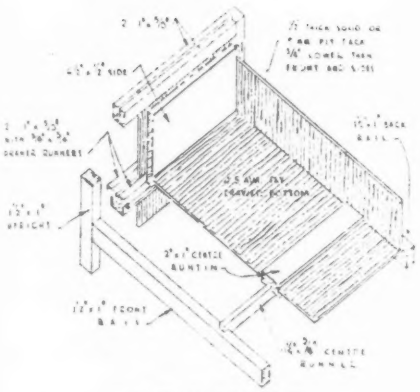


PRE-WAR TYPE

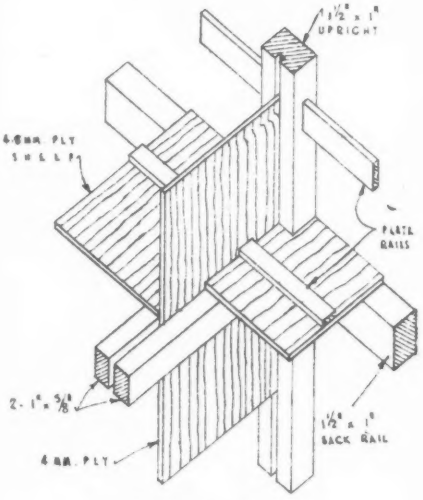
sawdust concrete to plastics are listed and suggested for uses that range from the casing of a tank to the construction of a lavatory seat: brick table legs are mentioned in this connection. Better known tricks adopted by modern architects some years ago and now beginning to pall, are also recommended for general adoption, including ruthless suppression of architraves skirtings and bargeboards without regard for the finer points of design. It is even suggested that door frames might in certain cases be omitted altogether. The idea of replacing bicycle racks by neat grooves in a pre-cast concrete floor is worth remembering, however, also the fact that Norfolk reeds when available make a satisfactory kind of shuttering for reinforced concrete which will serve afterwards as a key for plaster.

But the most interesting results so far have been produced by work connected with the economical use of material—as opposed to substitution of materials and the elimination of waste. For instance, the dear old local authority dresser has been redesigned at last in order to draw attention to certain principles of timber economy, and the result shows a saving of 70 per cent. Mr. Tait's work on window sections should be equally fruitful and results are expected to be published shortly. Ways have also been tried out and tested of using plywood on light frames to replace solid timber. This type of "stressed skin" construction usually effects econo-

S E R



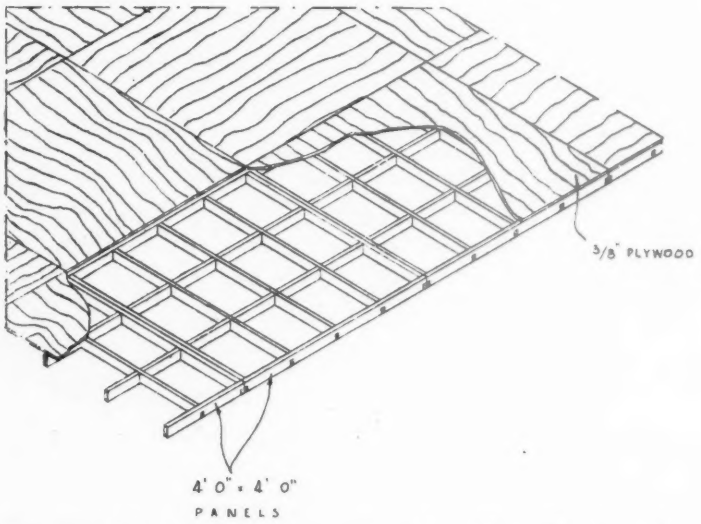
DRAWER



SHELVES

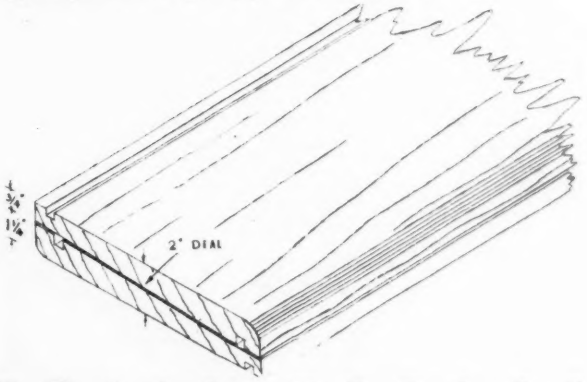
Huts used for Army or as hostels for Munition and Agricultural Workers may be erected on sites where they are exposed to high winds. Recently one of the "economy" huts illustrated here was tested by the Building Research Station. Despite the apparently light construction, the hut stood up satisfactorily to the tests. The building, 72 ft. by 18 ft. 6 in. high to the eaves, is put up in sections made in the factory. Top: Reading measurement of tension (representing wind pressure), on graduated scale below the spring, during the test by the Building Research Station of the Ministry of Works plasterboard hut. Bottom: A hand winch is being tightened to equalize the pressure on this part of the wall with the pressure on adjoining cables.

mies ranging between 300—400 per cent.; resin bonded waterproof ply has been tested and passed for use in place of teak—it is not yet known how long the material can be expected to last but experts think it may actually wear better than solid timber. Photographs of the biggest experiment yet in this connection, the Ministry's all-ply hut, should be ready for publication in a week or so. A hut of this type correctly designed is said to require no more timber (including ply) than the average non-timber hut. Other applications of the same principle include box-like posts made up of two small timber flanges joined by two strips of ply which use less than half the timber required for a solid post (4.62 cu. ft. as opposed to 11 cu. ft.), and timber box beams that can be used to give a near flat roof that is remarkably economical. A building 78 ft. by 18 ft. 6 in. can be roofed with a mere 56.8 cu. ft. of timber in this way: 18 in. by 4½ in. box beams are used at six foot centres to carry purlins spaced 3 ft. apart which support wood wool slabs or other sheet material weighing not more than 5 lbs. per cu. ft. Another interesting type of construction is the light timber truss illustrated on page 94, which has been used, slightly modified, in the Ministry's plasterboard hut photographed on the same page. With this method a building 78 ft. by 18 ft. 6 in. can be roofed with 55 cu. ft. of timber (35 cu. ft. for trusses, 20 cu. ft. for purlins). To complete the picture a system of grading is foreshadowed which will make it possible to apply engineering principles to timber construction and to specify scantlings that are



FLOOR PANELS

Typical panels with $\frac{3}{8}$ in. plywood on one side.



STAIR TREADS

Economical method of gutting two $1\frac{1}{4}$ in. tapered stair treads from a 2 in. deal.

correct for their structural purpose.

Perhaps, however, the work of the Department is best epitomised by their attitude to sawdust and wood waste in general. This humble and unpromising subject has been approached in a manner that is eminently scientific. Various ways in which wood is wasted have just been methodically listed —short ends, useless narrow strips, useless knotty places, chips from split mouldings, shavings and sawdust—on them the amounts involved have been checked, showing an average gross wastage in factories of $33\frac{1}{3}$ to 50 per cent. Causes of waste have been examined and suggestions made for avoiding them as far as possible; narrow strips of waste ply, for instance, might be used to make the box beams and posts described above, and blue sapwood need not be regarded as a fault for all purposes. Finally, unsuitable bye-products have been reviewed, a process which shows clearly how large the surplus is at present and how valuable inventions would be which could turn this material to a useful purpose. At present attention is being directed to improving the quality of sawdust concrete which is brittle, lacking in tensile strength and far from inert, but which has the advantage of being only half the weight of ordinary concrete and nailing reasonably well. The Ministry hopes to design a hut which will allow for expansion and contraction and exploit the good qualities of the material. Efforts are also being made to manufacture wall boards from compressed wood chips and sawdust.

Whether these particular experiments succeed or not is, however, relatively unimportant. The big fact is that machinery exists for applying the minds of scientists to the problems of the building industry as consistently and as methodically as they are applied to the problems of the Army, the Navy or the Air Force.

LETTERS

GILBERT T. GARDNER, F.R.I.B.A.
ASTRAGAL
NEWTON, BRUCE, VENNING & CO.,
(Secretaries, Federation of Greater London Master Builders)
G. A. JELLICOE, F.R.I.B.A.
(President, Institute of Landscape Architects)

CHRIST CHURCH MALL

SIR,—I am rather sorry that you have published my plan* in such a mutilated form and, in my view, destroying its real value (if any) by cutting off the eastern portion and thus destroying the connection to the Iffley, Cowley and Headington Roads.

No doubt the exigencies of space dictated it but I do suggest that space in other parts of the JOURNAL seems to be of little consequence, see pages 409 and 419 to 438.

My sketch was deliberately drawn with the north at the bottom so that the scheme could be viewed as from its focal point, viz. Christ Church. See Instructions on Map Reading.

I *do* wish that Astragal as well as my friend "Carfax" would take the trouble to explore the problem thoroughly on an up-to-date map and on the spot.

Astragal's suggestion that the By-Pass should start at Jackdaw Lane, cross the river near the University Boat House and thence just north of the Recreation Ground and alongside the G.W.R. is, if I may say so, fantastic and utterly impracticable consequent upon so many more or less insuperable obstacles; furthermore such a route would not serve the intended purpose.

The alternative suggested, viz., along the South Bank of the river would be so strenuously opposed that it would inevitably be abandoned.

I am definitely opposed to the "opening up of amenities" by a motor road but I support *access* to amenities.

I have not seen the Scheme II suggested by "Carfax" but no doubt he will let me see it.

The Scheme sketched and described by "Carfax" seems to me to involve the destruction of one of the most naturally beautiful portions of Christ Church Meadow and the "New Walk"

* A.J. for December 25.

would be severed from the river by a traffic road.

I walk round the Meadow almost every morning before nine and at this time of year I have it to myself, but in the summer, particularly during the last two years, a large number of people thoroughly appreciate and enjoy its natural charm.

I believe that I am as intimately acquainted with the whole of Oxford as any living man—I was born here and have worked in St. Aldate's for more than forty years.

There are very few properties in and around Oxford with which I am not intimately acquainted and I am fully alive to the oppositions likely to be encountered to any scheme of the kind under discussion.

May I add that the "Oxpens" By-Pass Road is completed for about half its length and, willy nilly, it is certain to be continued as planned to emerge at Isis Street.

GILBERT T. GARDNER.

Oxford.

ASTRAGAL WRITES :

Mr. Gardner says my plan is "fantastic and utterly impractical," but he gives no reasons. He seems to have misunderstood the purpose of the undertaking which was not to produce a perfect plan but to elicit information. It is said that a bye-pass to the High is necessary and that the only possible place for it is the shortest available route, which runs through Christ Church Meadow; to the eye of a distant observer this appears to be the only *impossible* place for it. I am still waiting to be told by someone like Mr. Gardner, who really knows the locality, exactly why all other routes are out of the question, as this is not self-evident; a 1938 survey which I have studied ad nauseam shows little built-up land south of the river apart from the narrow strip along Hinksey Road, and an extra half mile is neither here nor there on a properly designed bye-pass. I may add that I am becoming increasingly suspicious of these "more or less insuperable obstacles" which are continually alleged to stand in the way of attempts to preserve old pleasures and create new ones.

BUILDERS—A PLEA

Sir,—We enclose herewith copy of a letter which has been sent to the Prime Minister and all Members of the House of Commons.

Yours faithfully,
Secretaries,
NEWTON, BRUCE, VENNING & CO.,
Federation of Greater London
Master Builders.

Sir,—This Federation, representing nearly 1,000 Master Builders, and is, we believe, the largest organisation 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 to considerably 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.

LANDSCAPE

Sir,—The following is an extract from a letter that I have received from Mr. Ernest E. Walker, Chief Landscape Architect to the United States Department of Agriculture. It appears to have great interest in regard to problems in this country :—

G. A. JELLICOE
(President,
Institute of Landscape Architects)

Perhaps it is well to state that a great change has come over the profession of landscape architecture in this country recently. Many more trained Landscape Architects are employed by the Federal Government in connection with the National Defence program, housing, federal works, and site planning for buildings of the Army and Navy. Private practice is almost out of the picture except in isolated cases where a few of us, although in federal employment, are still called upon now and then to design special projects.

It appears that most of the work of the landscape planning nature in this country will be done, for some time to come, by government—federal, state and local. Private practitioners may have a difficult time to survive in a world of change unless perchance they are very versatile in design and tactful in dealing with the public. My definite feeling is that the services of competent Landscape Architects are going to be of greater usefulness as time goes on, and that more people will benefit by the training and experience of the profession than in the past where the unfortunate impression has been

created that only the wealthy could afford and enjoy the products of Landscape Architects. True, it will mean a different orientation of the profession toward mankind in the world, but it is my hope and belief it will be a better and richer one in welfare and happiness for Landscape Architects.

★ *REGISTERED Architects, when assisting Architects or Departments, are called by various names, such as Draughtsman, Architectural Assistant, Senior Assistant, etc. Can you explain what they all mean?* - - - - - - Q 868

★ *COULD you furnish me with the name and address of a firm who contracts for Norfolk Reed Thatching?* - - - - - - - Q 870

THE ARCHITECTS' JOURNAL

INFORMATION CENTRE

THE Information Centre answers any question about architecture, building, or the professions and trades within the building industry. It does so free of charge, and its help is available to any member of the industry.

Enquirers do not have to wait for an answer until their question is published in the JOURNAL. Answers are sent direct to enquirers as soon as they have been prepared. The service is confidential; and in no case is the identity of an enquirer disclosed to a third party.

Questions should be sent to—

THE ARCHITECTS' JOURNAL

45 THE AVENUE,
CHEAM, SURREY

Telephone: VIGILANT 0087

Q 867

ARCHITECTS, LONDON.—*Can you please inform us whether we can obtain a list of the daywork rates as agreed by the Liverpool Builders. We should also like to know if a list is published of agreed daywork rates in other parts of the country.*

Under the National Schedule of Daywork Charges agreed between the Chartered Surveyors' Institution and the National Federation of Building Trades Employers and the London Master Builders Association (which is of national application) the following percentages are to be added to the prime cost of labour and materials for overhead charges and profit :—

1. Dayworks executed during the progress of the contract and prior to the date of completion. Labour, 20 per cent.; Materials, 15 per cent.
2. Dayworks executed subsequent to the date of completion of contract. Labour, 25 per cent.; Materials, 15 per cent.
3. Daywork on jobbing work. Labour, 30 per cent.; Materials, 15 per cent.

Foreman's wages are to be included under 2 and 3 above, but not under 1. The percentages for overhead charges and profit are to include for all insurances, water, plant, tool sharpening, artificial light, supervision, etc.

You will note that this schedule only has a limited use. Work which has to be paid for on a cost plus profit basis and which is neither jobbing work nor part of a lump sum contract, can be done on any terms agreed between the parties.

The Ministry of Home Security Form of Prime Cost Contract for Emergency Work, is a useful form of contract for cost plus profit jobs. Briefly, this form of contract allows the total cost of labour, materials, subcontracts, cartage, insurances and the hire of heavy mechanical plant plus 2½ per cent. for ordinary tools and plant, plus a further percentage for overheads and profit; the latter is equivalent to 12½ per cent. for jobs up to £1,000 in value and is gradually reduced to 6 per cent. for jobs valued at £25,000.

Q 868

ENQUIRER, EDINBURGH. — *Registered Architects, when assisting Architects or Departments, are called by various names, such as Draughtsman, Chief Draughtsman, Architectural Assistant, Senior Assistant, Assistant Architect. Can you explain what they all mean, and how one arrives at the proper designation?*

It is impossible to define the work done or the positions held by the persons called by the names mentioned. Special significance may be attached to the different terms in different offices.

The work of a draughtsman is obviously likely to be confined to the drawing board and that of a chief draughtsman to being the head of a drawing office.

An Assistant Architect is immediately under the head of the firm or department and acts as his deputy.

In our opinion "Architectural Assistant" is a very general term which might mean almost anything except a Junior Draughtsman or an Assistant Architect.

"Senior Assistant" is also, in our opinion, a general term although he would normally rank immediately below the Architect or Assistant Architect (if any) and his work would not be confined solely to the drawing office.

Q 869

ARCHITECTS, NORTHAMPTON.—*Can you let us have a list of text books on the Design and Layout of Iron Foundries?*

There are, as far as we are aware, no books on the Design and Layout of Iron Foundries. In "Foundry Organization and Management," by James J. Gillespie, published by Pitman, 1937, price 12s. 6d., there is a short reference to design (pages 24-32) and a further short reference to layout.

Apart from this the only work we have been able to trace is a Thesis for the 1929 R.I.B.A. Final by G.

Bartholomew, which can be seen in the R.I.B.A. Reference Library.

You might consider writing to the British Cast Iron Research Association, 21/23, St. Pauls Square, Birmingham, but we very much doubt whether they will be able to help you.

Q 870

ARCHITECT, BERKS.—*I shall be glad if you can furnish me with the name and address of a firm who contracts for Norfolk Reed Thatching. The particular job I have in view would be in East Berkshire.*

We suggest Mr. R. W. Farmer, of North Walsham, Norwich, Norfolk, who normally undertakes work in Berkshire and, in fact, in most parts of the country.

ARCHITECTS AND NATIONAL SERVICE

R.I.B.A. informs us that it has received the following letter from the War Office.

NOMINATION OF MEMBERS AND STUDENTS OF PROFESSIONAL INSTITUTIONS FOR SERVICE IN THE ROYAL ENGINEERS.

I am directed to inform you that it is desired to obtain particulars of members and students of professional institutions who are not already serving and are desirous of consideration for commission in the Royal Engineers, either through the Army Officers Emergency Reserve or after training in the ranks.

It will, therefore, be appreciated if you will kindly forward the names of members and students of your institution who are desirous of consideration to

The Under-Secretary of State,
War Office (A.G.7),
Cheltenham.

May the following information be furnished in respect of each applicant :—

1. Date of birth.
2. Private address.
3. Occupational classification No. . *Not* industry letter. (Important.—This information if not known can be obtained from the N.S. officer at the local office of the Ministry of Labour and National Service.)
4. Registration No. under National Service (Armed Forces) Act (if registered), and date and place of registration under this Act.
5. Particulars of former military or O.T.C. service, if any, including details of any certificates obtained.

Accepted candidates, aged 31 and over, will be granted direct commissions through the A.O.E.R. Those under 31 may be granted direct commissions through the A.O.E.R. or offered entry into an officer cadet training unit, either after about six weeks training in an other ranks training unit or after the normal other ranks training (i.e. four months in a training battalion, followed by six weeks pre-O.C.T.U. training).

Any not selected for commissions at any stage will be disposed of as follows :—

(*a*) If by that time the individual would be called up under the National Service (Armed Forces) Act had he remained in civil life, he will be posted to such duties as may be thought fit.

(*b*) If he would not by then have been called up, he will be discharged.

The approximate numbers required from all sources are as follows :—

31 years of age and over, for works, services and transportation, 80 a month.

Under 31 years of age (for R.E. units, including transportation), no limit at present for suitable candidates.

The officers who are required for the Transportation Branch of the Royal Engineers, include those having experience in railway construction or track maintenance, locomotive operating, mechanical workshops and marine engineering.

In the event of any member or student of your institution receiving a calling-up notice he should immediately notify the War Office (A.G.7) in order that—

(*a*) if called up for service in the Royal Engineers, consideration may be given to his qualifications for a commissioned rank ;

(*b*) if called up for service in another arm, the question of his transfer to the Royal Engineers may be taken up, with subsequent consideration for commissioned rank.

This course is necessary in order to ensure that qualified engineers are suitably placed in the Army as quickly as possible.

B. G. VERLAND, Col.,
For Director of Organization.

The Secretary,
Royal Institute of British
Architects.

Members and students of the R.I.B.A. who wish their names to be considered are requested to write to the Secretary, R.I.B.A., giving the information required.