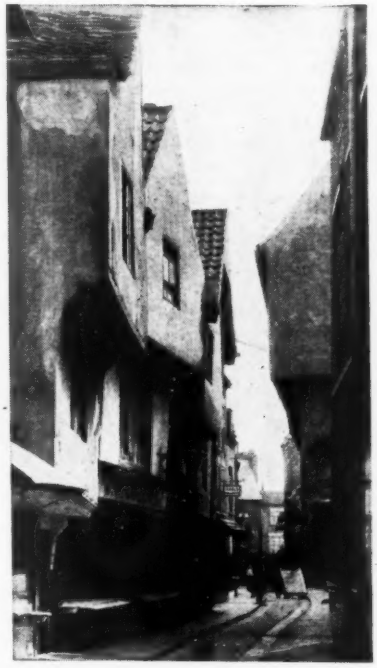
THE SHOPPING STREET AND INDIVIDUAL SHOP

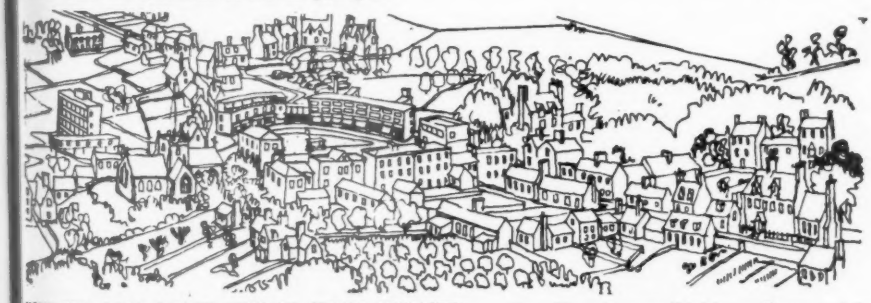
In the 18th and early 19th centuries the shopping street first became continuous; before that shops were mere haphazard booths tucked into the ground floors of houses in narrow alleyways. For example the 18th century shop in a fashionable quarter of the town was designed on the assumption that people drove up in a carriage, were ushered into the shop by their own footman and the obsequious shopkeeper, that they looked and lingered at leisure and were not caught outside or invited by the shape of the doorway: shopping was rather like calling at a private house.



To-day the retail distributor has to push a hand out into the street and catch passers-by by the lapel of the coat, and drag them in. This reaching hand is created by planning and new materials and new lighting and, of course, display. All these matters are the active concern of our Shop Survey Division.

Modern shopping streets are designed as a whole; but the shop is still an individual place. This problem of retaining individuality within the governing framework demands skill and ingenuity. Problems such as the relationship of shop exterior to interior, the adjusting of the shopfront to the class of trade, must all be taken into consideration.

The shopping centre is planned in relation to the civic needs of the town. But the shop remains, within this new orderly framework, an individual problem, affected by the wants of the public and the business of the shopkeeper.



HOW OUR SHOP SURVEY DIVISION SERVES ARCHITECTS. *Our Shop Survey Division collects, and is assembling constantly, opinions, facts and views on shop planning from shop owners, managers, stock-controllers, display men, and all people connected with the business of retail selling. We make a study of the tradition, history and trend of shop design, and our knowledge is at your service.*

WHAT THE PUBLIC WANTS

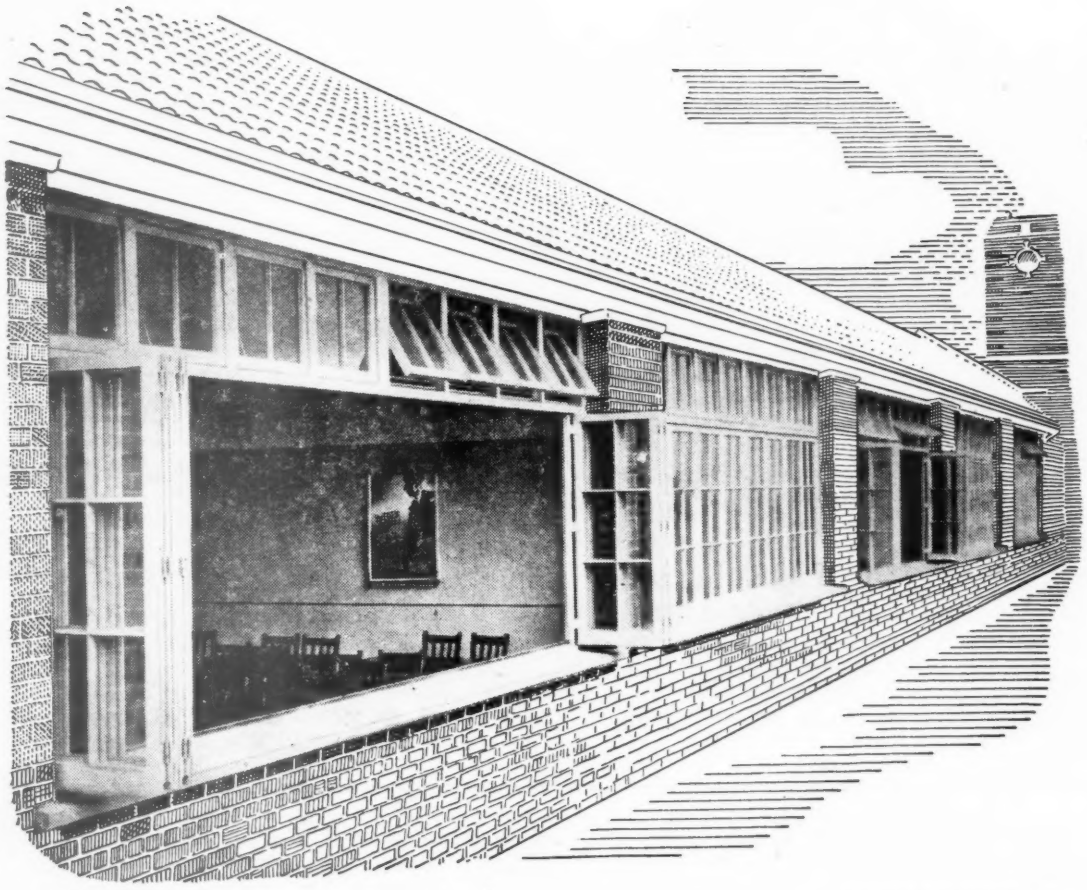
Investigation shows that the shopper is not particularly interested in shops as architectural problems, and is interested only from the point of view of his or her own comfort and convenience. People want to shop in comfort; to see an abundant display of merchandise; to be able to *look* and walk around without being jostled; to be served quickly and get the cash transaction over smoothly and efficiently. When personal and careful selection is essential, a degree of privacy is demanded. Women ask for safe parking facilities for prams and children. This applies also to cycles when possible.

WHAT THE SHOPKEEPER WANTS

To bring the public into his shop. First-class facilities for selling speedily and efficiently. Doors which help the public — easy to operate and big enough to prevent congestion. Plenty of doors — too long a line of windows, unbroken by doors, tends to keep the public OUT, not to invite it in. Doors correctly placed both in relation to street traffic and interior traffic in the store. Windows easily accessible from *inside* the shop for convenience of display staff. Good receiving and dispatching facilities for merchandise.

Alphabetical Index to Advertisers

For Appointments (Wanted or Vacant), Competitions Open, Drawings, Tracings, etc., Educational Legal Notices, Miscellaneous, Property and Land Sales—*see* pages xlii and xliv.



Architects: Biram & Hatcher, A.R.I.B.A. *Grange Park Senior School, St. Helen*

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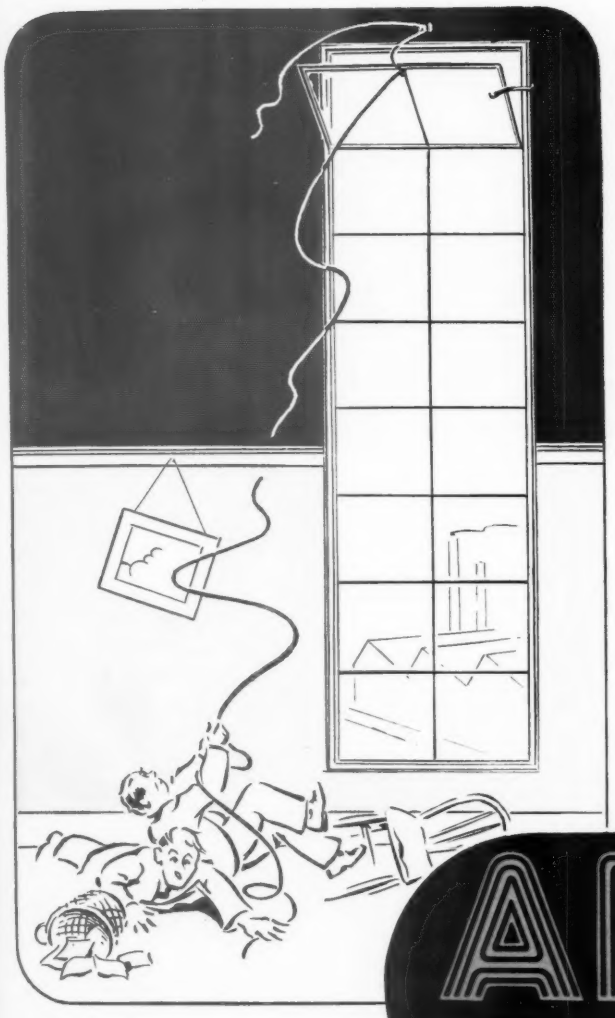

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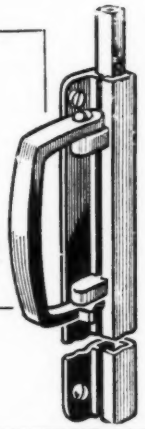

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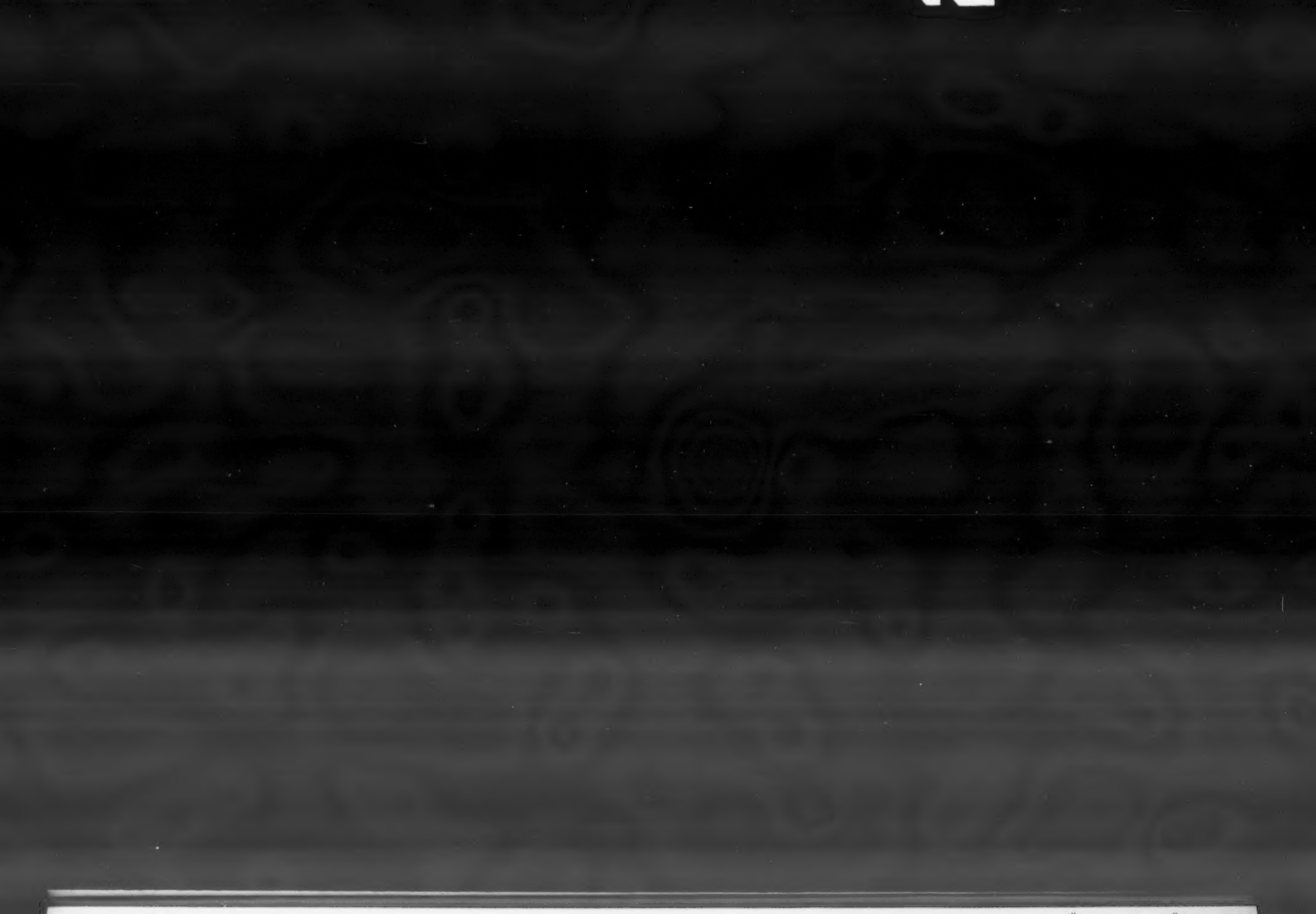

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Meanwhile all our efforts in every department must and are being directed in helping to bring Victory nearer.

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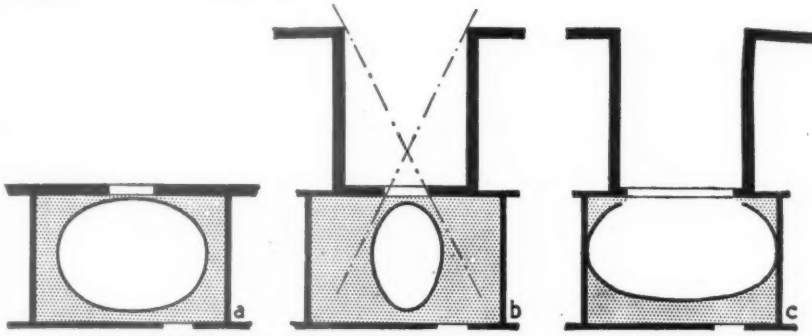

Unobstructed window—even penetration and spread.

Narrow window with adjacent vertical obstruction—good penetration, bad spread.

Obstruction corrected with wide window, giving good penetration and spread.

Fig. 10.

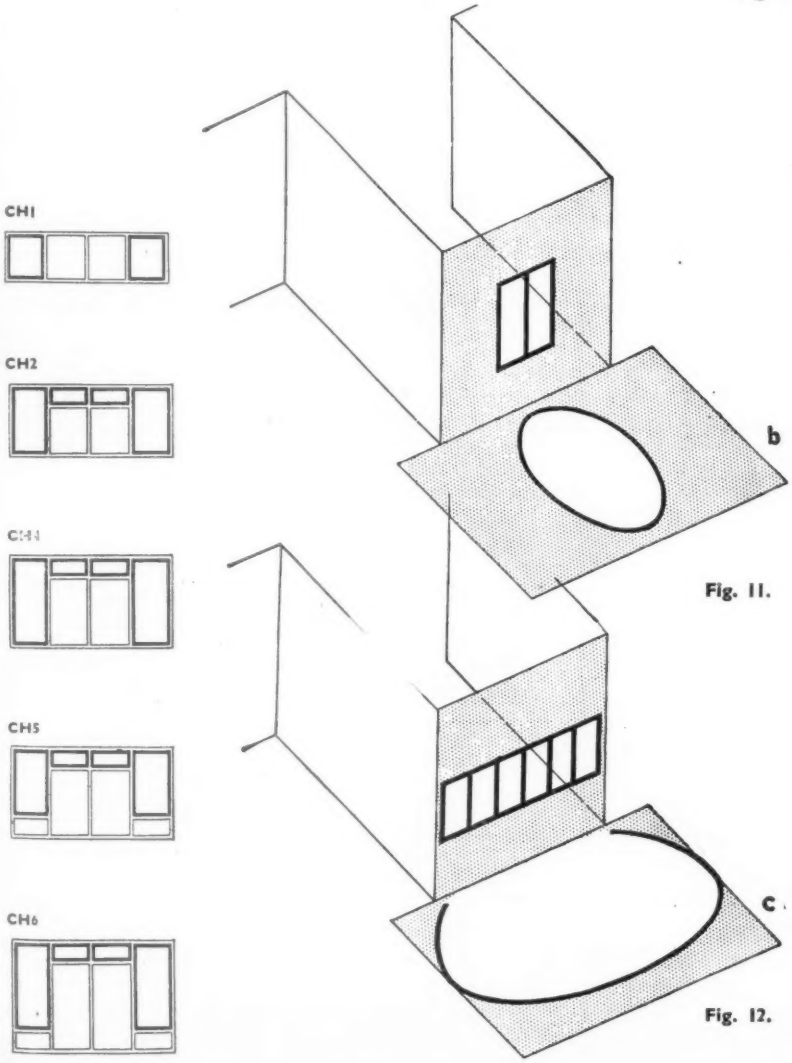

Fig. 11.

Fig. 12.

In the design of their standard range, EJMA have taken great pains to provide windows that will give adequate light in your building, whatever conditions you may be faced with. The greatest difficulty is to provide sufficient light at the back of the room and the taller ranges are intended to cope with this problem. There may, however, be occasions when the trouble is not inadequate *penetration* but inadequate *spread* of light into the room. This arises when the light is obstructed by a *vertical* wall line, or, perhaps, trees, which may restrict the view of the sky to a narrow slit. The diagram shows the result of an obstruction of this nature on the daylight-factor contour (Fig. 10)—if a high narrow window (Fig. 11) is used there will be a narrow cone of intense light in the middle of the room with gloom at the sides. In cases of this sort a wider window (Fig. 12) is better, even if it is not so high, and will help to restore the evenness of illumination. The EJMA 3- or 4-light windows are ideal for the purpose, and may be placed side by side if desired.

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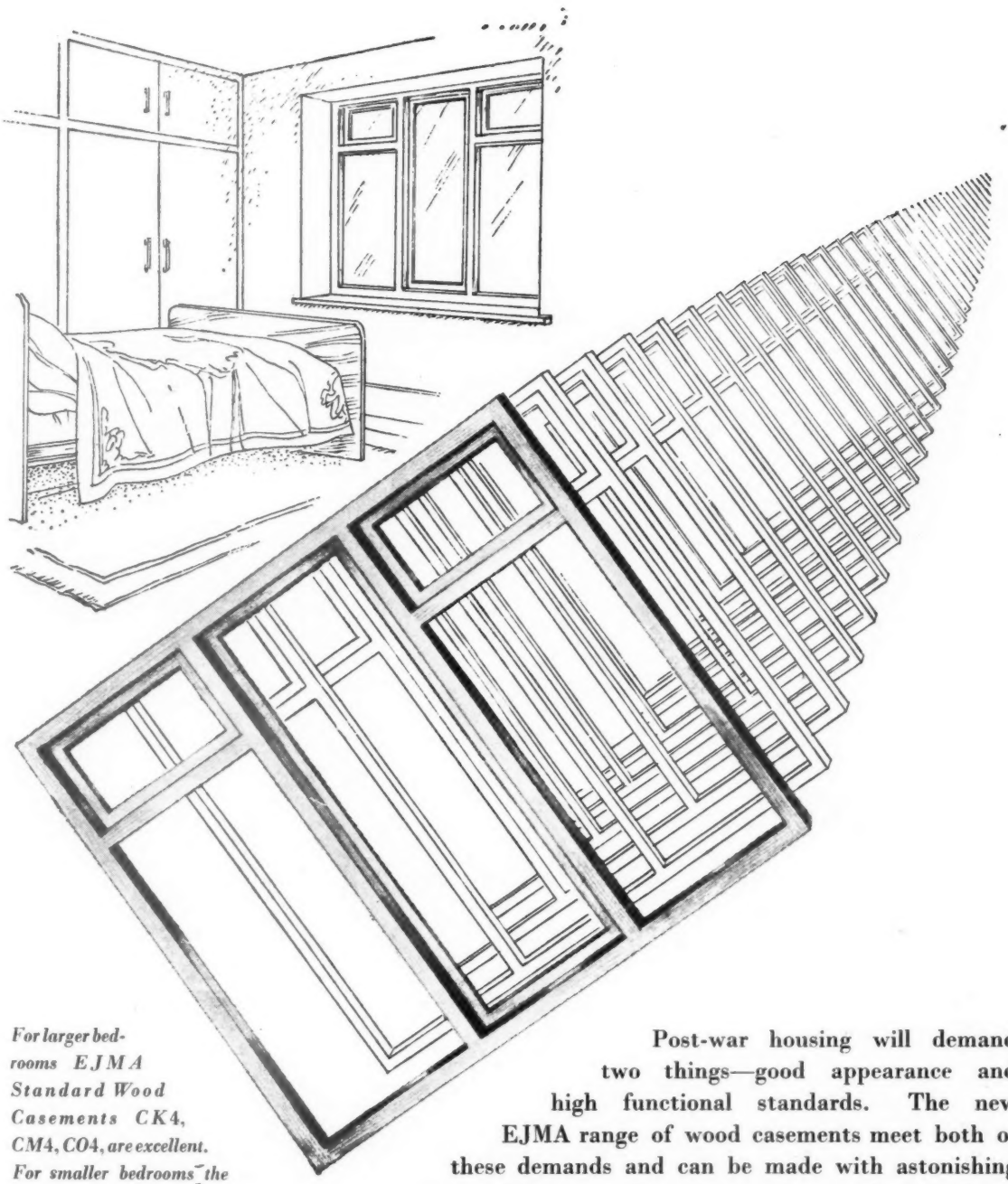

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In the days of post-war construction there will be many uses for pipes, and although we cannot now deviate from the greater task of war production, we are ready to discuss any of your post-war problems which may involve the use of manipulated pipes and standard or special machined fittings.

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PIPES FOR EVERY PURPOSE

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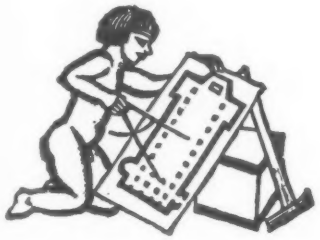
In common with every other periodical this JOURNAL *is rationed to a small part of its peacetime needs of paper. Thus a balance has to be struck between circulation and number of pages. We regret that unless a reader is a subscriber we cannot guarantee that he will get a copy of the* JOURNAL. *Newsagents now cannot supply the* JOURNAL *except to a "firm order." Subscription rates: by post in the U.K. or abroad, £1 15s. 0d. per annum. Single copies, 9d.; post free, 11d. Special numbers are included in subscription; single copies, 1s. 6d.; post free, 1s. 9d. Back numbers more than 12 months old (when available), double price. Volumes can be bound complete with index, in cloth cases, for 15s. each; carriage 1s. extra. Goods advertised in the* JOURNAL, *and made of raw materials now in short supply, are not necessarily available for export.*



DIARY FOR APRIL MAY AND JUNE

Titles of exhibitions, lectures and papers are printed in italics. In the case of papers and lectures the authors' names come first. Sponsors are represented by their initials as given in the glossary of abbreviations on the front cover.

BIRMINGHAM. *Homes They Come From Exhibition.* (Sponsor, HC.) APRIL 20-28

DARLINGTON. *Royal Sanitary Institute Sessional Meeting.* 10.30 a.m. At the Town Hall, Darlington. Welcome by the Mayor. *Housing and Town Planning*, by Mr. Ernest Minors, Borough Engineer and Surveyor, Darlington. Discussion opened by the Town Clerk, Mr. Henry Hopkins. Darlington's colour film, *Health Services.* 1.0 p.m. Luncheon by invitation of the Mayor and Corporation at Spark's Café, Northgate, Darlington. 2.30 p.m. Visit to Greenbank Health Centre, including Maternity Hospital (36 beds), and the Memorial Voluntary Hospital (240 beds); or 40 Infectious Diseases Hospital (160 beds) and Hunden's Lane War-time Nursery (80 places), open 24 hours. APRIL 29

GLOUCESTER. *Rebuilding Britain Exhibition.* At Gloucester Technical College. Guide lecturer: Miss Henry. (Sponsor, BIAE.) APRIL 24-MAY 6

GT. YELDHAM. *Twenty Women at Home Exhibition.* (Sponsor, HC.) APRIL 21-28

HYDE. *Living In Cities Exhibition.* At Bayley Hall, Hyde. (Sponsor, BIAE.) APRIL 20-MAY 6

Twenty Women at Home Exhibition. At Leigh Street Senior School. (Sponsor, HC.) APRIL 21-28

ISLE OF WIGHT. *Homes to Live In Exhibition.* Accompanying CEMA Design Exhibition. (Sponsor BIAE) APRIL 24—MAY 23

KIDDERMINSTER. *Homes to Live In Exhibition.* At Kidderminster Public Library, Museum and Art Gallery. Guide lecturer, Miss Kapp. (Sponsor, BIAE.) APRIL 20-29

LONDON. *MOW Building Mission to USA Exhibition.* At 5, Old Palace Yard, Westminster. Selected photographs, architectural drawings, tools and other material collected in the United States by the mission appointed by the Minister of Works. Exhibits will include illustrations of methods of obtaining speed in building, including information given to contractors before tendering, time and progress schedules, building methods and architectural drawings, district heating, plant and tools. American methods for providing incentives to output will be illustrated, including news sheets and certificates and badges awarded to craftsmen. Details of American methods of standardization (including modular design) and the use of various materials such as timber, wall, ceiling and roof linings, composite walling material and tiles will be shown. APRIL 20—APRIL 28

The Town House Exhibition. At the Housing Centre, 13, Suffolk Street, S.W.1. APRIL 20-30

John Gloag. *Design for Industry.* Second lecture on The Artist and Reconstruction. Under the auspices of the Artists' International Association. At the National Gallery, Trafalgar Square, W.C.2. Admission 1s., members 6d.; 3 p.m. APRIL 23

Sir George Burt. *Post-War House Construction.* At the Housing Centre, 13, Suffolk Street, S.W.1. 12.45 p.m. Buffet lunch. Members 1/9, non-members 2/-. 1.15 p.m. Meeting. APRIL 25

Architects' Benevolent Society Annual General Meeting. At the RIBA, 66, Portland Place, W.1. Chairman, Mr. Percy Thomas, the President. 12 noon. APRIL 26

W. N. C. Clinch and F. Lynn. *The Design and Performance of Domestic Electric Appliances.* At the Institution of Electrical Engineers, Savoy Place, Victoria Embankment, W.C.2. 5 p.m. MAY 4

George Laws. Chief Sanitary Inspector to the Richmond Corporation. *A Hundred Years of Sanitary Progress.* At the Royal Sanitary Institute, 90, Buckingham Palace Road, S.W.1. Chairman, Kenneth R. Hay. 2.30 p.m. MAY 9

AA Election of Officers and Council for Session 1944-45. At ordinary general meeting at 34-36, Bedford Square, W.C.1. 6 p.m. MAY 16

Dr. J. H. Paterson. *The Welding of Plastics.* At Institution of Civil Engineers, Great George Street, S.W.1. (Sponsor, Institute of Welding.) Dr. Paterson's paper will be followed by a demonstration. 6 p.m. MAY 17

SMETHWICK. *The Englishman Builds Exhibition.* At Holly Lodge High School for Girls, Smethwick. (Sponsor BIAE) APRIL 27—MAY 11

THRAPSTON. *Homes to Live In Exhibition.* (Sponsor, CEMA.) APRIL 26-MAY 2

WEST HARTLEPOOL. *Rebuilding Britain Exhibition.* At West Hartlepool School of Art. (Sponsor, BIAE.) APRIL 20-MAY 1

NEWS

THURSDAY, APRIL 20, 1944
No. 2569. VOL. 99

Though no feature in the JOURNAL *is without value for someone, there are often good reasons why certain news calls for special emphasis. The* JOURNAL'S *starring system is designed to give this emphasis, but without prejudice to the unstarred items which are often no less important.*

★ *means spare a second for this it will probably be worth it.*

★★ *means important news, for reasons which may or may not be obvious.*

Any feature marked with more than two stars is very big building news indeed.

In a commentary on the County of London Plan, Lewisham's General Purposes Committee ENVISAGES A CIVIC CENTRE in Catford.

The Committee suggests that the civic centre should include the Town Hall, a central library, a youth centre, secondary schools, technical institute, art schools, art gallery, a museum and multi-storied flats. Another suggestion is that there should be no further development of Lewisham. There is no necessity, the committee believes, for a great number of flats. The committee mentions that if 316 acres of private open space in the borough, suitable for the public, are taken over, the borough will then have four acres a 1,000 population, as recommended by the County of London Plan.

The Convention of Royal Burghs, held in Edinburgh, urged the erection of BIGGER POST-WAR HOUSES FOR SCOTLAND.

Strong criticism was made at the meeting of the Scottish policy of estimating the capacity of houses in terms of rooms rather than bedrooms. In Scotland the two-roomed house complex has persisted, while the policy of estimating housing capacity on rooms instead of bedrooms has resulted in serious overcrowding of even three- and four-room houses. The cottage type was generally favoured in preference to the block type, which was condemned on grounds of drab monotony. The temporary house policy, while approved as an expedient, was emphasized as being only an expedient. More permanent houses must be provided at an early date. Temporary houses for ten years would not do.

from AN ARCHITECT'S *Commonplace Book*

LONDON FOG IN 1661. [*From* Cleanliness and Godliness, *by Reginald Reynolds* (*Allen and Unwin*)]. Lest any reader should imagine our sooty skies to be any very new thing in London, I commend to his attention a passage in *Fumifugium*, a work written by the diarist John Evelyn, and published in 1661. For, so early as that, this observer of men and their ways could write of his indignation that London *should wrap her stately head in clouds of smoke and sulphur, so full of stink and darkness.* And he speaks of the immoderate use of sea-coal, and that not from the culinary fires, *but from some few particular tunnels and issues, belonging only to brewers, dyers, lime-burners, salt and soap boilers, and some other private trades.* So then, he speaks of industrial smoke and an industrial fog, which was no small matter by his reckoning, for he likens London, where such smoke belches from the sooty jaws of industry, to Mount Aetna, the Court of Vulcan, Stromboli or the Suburbs of Hell. And he says that when in all other places the air is pure and serene, in London the sun is hardly able to penetrate this gloom and impart daylight; also that the traveller can smell the city before ever he sees it.

★

The President of the RIBA's nomination of assessors for housing competitions DOES NOT IMPLY THE ROYAL INSTITUTE'S APPROVAL of the different forms of construction asked for by the promoters.

The official statement of the RIBA reads: Several competitions are being held or are in contemplation for the design of houses of different forms of construction. The RIBA is, of course, always ready to help in advising on the holding of such competitions, but it should be made clear that the fact that the President has nominated an assessor or assessors for any particular competition does not imply the approval or blessing of the Institute on the particular form of construction concerned.

Mr. A. N. Malcolm has been ELECTED PRESIDENT OF THE GLASGOW INSTITUTE OF ARCHITECTS.

Other elections at the annual meeting of the Glasgow Institute of Architects were: Messrs. J. Steel Maitland and John Stewart as vice-presidents; Dr. Colin Sinclair and Mr. William Baillie as council members. Mr. Alexander Wright, the retiring president, outlined the year's work and stressed particularly the co-operation given to the Secretary of State for Scotland on post-war reconstruction planning. Of the proposals advanced to cover water supply, electrical power, uniformity of building regulations and regional planning, many have proved acceptable and are now being advanced as general policy. The Clydebank reconstruction scheme was commended as an attractive example of what is possible and desirable, and the action of the responsible architects in inviting criticism was welcomed as a valuable method of instructing and interesting the community in architectural work.

Wardens at Post No. 1 Westminster FIGHT AIR RAIDS ON A MODEL costing thirty-five shillings.

The model, built to scale by three of the wardens in their off-duty time, and acknowledged by the City of Westminster Civil Defence authorities to be more elaborate than their own, is used for exercise purposes to stage realistic results of an air raid. Fragments of cardboard packing cases were used for the framework; twigs, with cotton wool foliage dyed with green ink, for the trees; and silvered South American baisa wood for the barrage balloons. On the set are models of ambulances. Among the incidents arranged are an electrically lighted public-house with red windows to show that it is on fire, a block of flats wrecked by a direct hit, and a broken ignited gas main in its crater. The flame is fed by petrol from a miniature tank concealed below the model.

★

TDA is organizing a COMPETITION FOR A TIMBER HOUSE such as might be produced in quantities to help in solving the housing problem.

The assessors are Messrs. C. Cowles Voysey, F.R.I.B.A.; E. Brian O'Rorke, F.R.I.B.A.; Frederick Macmanus, F.R.I.B.A., Architect to the EJMA; Bryan Latham, Vice-President of the Timber Trade Federation; G. W. Grosvenor, Chairman of the Timber Building Manufacturers' Association. Premiums to the value of £400, viz.: First, £250; second, £100; third, £50. Last date for submitting designs, Saturday, September 30. Conditions of the competition, available on May 1, may be obtained from the Timber Development Association, Ltd., 75, Cannon Street, London, E.C.4. Exhibitions of the winning and other commended designs will be held.

In its second report on post-war planning the British Waterworks Association recommends the APPOINTMENT OF A MINISTER OF WATER.

The Minister, the report states, should be responsible for the conservation and utilization of the water resources of the country in the best interests of the nation. Other recommendations are: That the water resources of the country, from whatever source, should be regarded from a national rather than a local aspect. The establishment of a central water authority to conserve the water resources of the country and to consider and decide conflicts between various authorities interested in water. The setting up, in addition to the Central Water Authority, of a Board of Public Water Supply, to whom the problems of water supply undertakers should be submitted.

Mr. Maurice Charles Jarrett, A.R.I.B.A., has been AWARDED THE ASPITAL PRIZE.

The Aspital Prize (books to the value of £20) is awarded to the candidate who, taking the RIBA Final Examination to qualify as an Associate, shall most highly distinguish himself among the candidates in the Final Examinations of the year.

Model made by Westminster Wardens to stage realistic results of air raids. (See news note).

MOW Grain Silos in Uncovered Concrete

New architectural features which the war has brought to the English countryside are the grain-silos needed for the drying and storing of our increasing harvest of home-grown wheat. The above is a typical example of these silos, fifteen of which have now been built by the Ministry of Works for the Ministry of Agriculture (see Information Centre, No. 1332, December 23, 1943, p. 470). A feature of the construction of these silos, each of which takes nine months to build, is the intricate job of casting the reinforced concrete bins. Two methods of formwork have been used —(*a*) the creeping or continuous, operated by a system of jacks and (*b*) the leap-frog or climbing, operated by a system of detachable clamps. With the continuous system, construction joints are avoided, but in the leap-frog system horizontal joints are formed which, together with the vertical joints made by the formwork provide a definite surface texture on the uncovered concrete, as can be seen in the photograph above. Uncovered concrete is the subject of this week's leading article which has been inspired by the final ASB lecture in the recent series at the RIBA on new developments in the design of concrete formwork by Mr. C. Parry, published on pages 304-306.

★

British architects are invited by the RIBA to submit photographs and drawings for an EXHIBITION OF CONTEMPORARY BRITISH ARCHITECTURE.

It is the intention of the Council of the RIBA to hold an exhibition of contemporary British Architecture which, it is hoped, will be the first of a series of periodical exhibitions indicating the progress of the art in this country. The first exhibition will be held at the RIBA in September, 1944, and in order to obtain an exhibition as fully representative as possible of British architecture an open invitation is being extended by the President and Council of the Institute to all British architects to submit for selection photographs, also drawings or models of work executed or proposed since 1935. It is the earnest desire of the Council that members on war service should have, as far as can be arranged, an opportunity to exhibit, and an early announcement will be made by the Royal Institute concerning the method of submission and selection.

Preliminary post-war reconstruction plans for Frinton have AMAZED THE COUNCIL.

Among the suggestions of the reconstruction committee is one that a site should be set aside for a factory. Members expressed amazement at the proposal, and one councillor declared, We don't want a factory at Frinton, however superior it may be. The Council agreed to defer consideration of the proposal.

On May 6, in a Northamptonshire Church, will be dedicated a STAINED GLASS WINDOW OF Mr. CHURCHILL and President Roosevelt, signing the Atlantic Charter.

The memorial window, which shows the signing of the Charter on the deck of the battleship *Prince of Wales* in August, 1941, is the gift of United States Servicemen stationed in the East Midlands.

The ideal of building 300,000 *HOUSES IN THE FIRST TWO YEARS after the war is a bold one in view of the difficulties.*

But unfortunately, states a memorandum by TCPA, the housing programme is being shaped in the absence of fundamental planning decisions. Local authorities, in selecting the sites for houses, have only the guidance of pre-war planning schemes which, in the light of the Barlow, Scott and Uthwatt recommendations, are now out of date. Measures are required for guidance on the location of industry, restriction in congested areas, encouragement to go to suitable places by trading estates and facilities. New legislation for compensation and betterment is required. Powers should also be given to local authorities to buy land for redevelopment at not more than the 1939 value.

CONCRETE AND TEXTURE

AN abstract of the last lecture in the ASB series recently given at the RIBA—Mr. Parry's talk on developments in the design of concrete form-work—is published in this issue.* Insufficient attention has been given to this important subject by architects, who have tended to regard concrete cast on the site as a material to be concealed. Much money has been spent on facing materials and external decoration, often with loss of character and integrity as in the case of the otherwise fine design of the new Waterloo Bridge, a reinforced concrete structure faced with Portland stone.

There has been some justification for this practice, for too often have concrete surfaces been spoiled by blemishes, cracks, stains and defective joints. These deficiencies are, however, not an inherent feature of concrete and it is technically possible to obtain good-looking concrete surfaces where the exposed texture of the material is used as a means of architectural effect.

There appears to be a vicious circle here. On the one hand, the efforts of the concrete industry to produce attractive-looking surfaces have been restricted by lack of demand. Few contractors can be relied upon to carry out efficiently such methods as are available and the supply of materials needed for these processes is not as good as it might be. On the other hand, architects responsible to their clients are naturally reluctant to take the risk of relying on exposed concrete surfaces with all their possible deficiencies. There is no doubt that the ill-considered use of uncovered concrete has been bad propaganda for contemporary architecture, and has had a serious retarding influence on the whole modern movement. The attempts to cover concrete with rendering which looked as immaculate and hygienic as a surgeon's apron during the first week after completion (the photographer being at hand to record the building on a panchromatic plate during a few lucky moments of dramatic sunshine) but which became within a short while blotched, crazed and drab, have been in most cases as unfortunate.

Faience has proved to be one of the few effective covering materials, which being patently merely a skin has not broken the modern credo. Nevertheless the difficulty of finding pleasing surface textures remains a problem in reinforced concrete, that splendid new material which, so far as structural form is concerned, has so vastly increased the scope of the architect. Until the important question of texture is solved (as well as that of apt and careful detailing, the importance of which in modern architecture the Swedes alone seem to have appreciated), the sound tenets of the modern movement will continue to be misunderstood by the general public, whose support is essential to its full development. In the cause of fine building, to paraphrase an observation of

*See pages 304–306.

Pope's, blunt truths may often do more harm than nice falsehoods.

Mr. Parry's lecture shows that with carefully designed form-work and good workmanship satisfactory results in uncovered concrete can now be obtained. Uncovered concrete has been satisfactorily used hitherto only in large engineering works, such as silos and bridges, where a rough, crude finish is in character and scale with the building. Much research obviously remains to be done in concrete form-work technique† for its use to be entirely satisfactory in small-scale work, but provided form-work is carefully controlled by the designer and not left, as it too often is, to the contractor, it may well become in the future at least one adequate solution to the problem of providing surface textures in concrete buildings which are both permanent and æsthetically pleasing.

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

NOTES & TOPICS

ART AND UNREASON

A little monthly magazine called *Art and Reason* has just come into my hands—(columnists, you may have noticed, never buy magazines. They always let them come into their hands like ectoplasmic golf clubs from some ghostly caddie).

★

Privately produced in that new hub of the nation's artistic and cultural activities — Cheam, Surrey — its declared purpose is "to combat theories of artistic expression that have no starting point in the visual experiences of normal people," and among its subscribers are many of those artists who have recently, in the correspondence columns of *The Times*, been berating CEMA for its taste in Art.

★

Plain speaking has always been popular with artistic disputants from Turner and Whistler to Ruskin and Sir Reginald Blomfield, and *Art and Reason* dashes straight into the fight. Phrases like "valueless daubs . . . art-foolery . . . addled art . . . sensational oddities . . . spiritual leprosy" pepper the pages. A Mr. Noble writes to suggest that modern art is merely "a purulent eruption, festering to a sensational head, but ultimately dispersing to leave the main Blood-stream of Art normal, healthy, and traditionally pure." The late Mr. Austin Freeman has a go at the Tate, and a Mr. Hayes (from Dublin) leaning forward until his eyes are no more than slits, says darkly, if ungrammatically, "I could tell you a thing or two of art over here."

★

Superficially there is no harm in all this. The more Art is talked about *on every level of intelligence* the better. It may help to bridge the gulf between the artist and the public, which (in between the wars) has never been wider. It is true that much nonsense is talked—the jargon of the art critic, whether he is discussing Frith or Les Fauves, is always tiresome and hopelessly without humour—and also that the circle of converts to which *Art and Reason* appeals is probably as self-centred and constricted as that round any magazine-with-a-mission. Why then bother to notice such unimportant nonsense?

★

Simply because reactionary arguments of this type with their insistence on so-called normality, are strongly reminiscent of Hitler's campaign against what he called Cultural Bolshevism. Much of contemporary art (and architecture) is of course second-rate or mere pastiche, and nobody but a fool would rate, say, a poor Miro above a good Etty, just because Miro is "modern" and Etty is not. But to suggest that modern art is just a gigantic swindle foisted on the public by a silently laughing conspiracy of artists, critics and dealers is more than nonsense—it is dangerous nonsense.

★

Incidentally, there are no surprises in the list of distinguished supporters published on the cover of *Art and Reason*. It contains all the names you would expect. But what perhaps you would *not* expect is that there is a supplementary list (equally distinguished) of persons who *used* to support *Art and Reason*, but are no longer able to do so because they are dead.

★

Few magazines, I suspect, would think of publishing a list of dead subscribers, even if those who were left alive could only be described (artistically anyway) as moribund.

AIRCRAFT DESIGN

Admiring the other day a perfect formation of eight Dakotas flying overhead—so much swifter than the train for which I was waiting—I was reminded once again that a good design doesn't date as quickly as high-powered salesmanship would like us to think, even in an industry where progress is as rapid as in aviation.

★

The Dakota, which is the most widely-used transport aircraft of to-day, is very definitely a pre-war design. The first of the type took the air in 1936—eight years ago; moreover it was in essentials only a larger version of the DC-1, produced in 1932. As the Douglas DC-3, the Dakota was known on all the major American airlines (and most of the European ones) long before the outbreak of World War II.

★

But, in spite of the Dakota, to me the Spitfire, whether on the ground

† For information in the A.J. on this subject see Information Centre items Nos. 1048-1050, Feb. 4, 1943; No. 1133, May 6, 1943; No. 1458 in this issue.

or flying, seems far and away the most beautiful of modern aircraft, and presumably it was only the fact that its designer, R. J. Mitchell, is dead that robbed him of the distinction of being the first aircraft designer to be honoured with the RDI.* Even so, the designer of the Wellington was scarcely an obvious choice. Was the RDI awarded to him because the Wellington's *mechanical* design was considered good, or because it combined efficiency with pleasing appearance? If the former, then it is difficult to see what relation the achievement, engineering merit, and the reward, RDI, have to one another. If the latter . . . *de gustibus non disputandum.*

POETS' CORNER

LINDY-LEWIS PLAN.

How worthy he who from a nameless pen,
Maintains a stand against that Breed of Men,
Who mouth their pleas and trace their plans on air,
Who criticize and stand about and stare.
O weaklings of the script and printers' proof,
Who never planned a 'plane upon a roof,
Nor cut clear vistas through a city maze,
Exposing private charms to public gaze.
You never will achieve the Wren-like touch,
The style of Haussmann or Le Notre or such—
See, others plan a City-for-To-day,
Quite easily, before they hit the hay.
They don't waste time in monkeying about—
What Urban Survey's worth a Roundabout?
They have no time for members of your creed.
The miserable few, who stoop to read.
They never liked the kind who dare to kiss
the Rod of System and Analysis.
The chance to plan at all is good enough.
Let's face it, chaps! *We're driving from the rough!*

Impartial Partisan.

BOOM IN DESIGN

Market in design must be booming. In one day's issue of *The Times*, no less than four manufacturers were advertising for designers, in pottery and plastics and light metals. One even dared to ask for a combination of engineering training with creative ability. In the small-advertisement columns of the weekly papers I found a firm of manufacturers offering £150 for a house-mark applicable to their products, and an industrial-design concern anonymously offering £600 for a manager. This last advertisement provides a smile. Its concluding sentence warned applicants that a knowledge of industrial design was *desirable.*

WOOLTON LEASEHOLD

Lord Woolton made his reputation in the world of retail distribution. He appeared to have consolidated it beyond reach of damage in the Ministry of Food. But now he seems to have encountered something much tougher than either the buying public or the eating public. The landlords are apparently prepared to show that his reputation is nothing like a freehold. It is only leasehold and, in their view, the term is nearly up. Does the future belong to the freehold reversioner? If so, one might summarise the present position of the Uthwatt Report in the terms of a notice familiar to all:

OWING TO EXPIRATION OF LEASE AND THE CONSEQUENT REMOVAL OF WOOLTON ENTERPRISES LTD. EXTENSIVE RANGE OF VACANT SHOWROOMS TO LET. APPLY LANDLORDS' AGENTS.

ASTRAGAL

* Royal Designers in Industry Award.

The Dakota transport aircraft. See Astragal's note on preceding page.

LETTERS

Sydney Tatchell, F.R.I.B.A.
(Chairman, Architects Registration Council)

G. D. Marshall

Architects and Professional Conduct

SIR,—An important decision has recently been given by the Discipline Committee appointed under Section 7 of the Architects (Registration) Act, 1931, to investigate complaints of professional misconduct.

It will be recalled that it is contrary to the Code of Conduct for an architect to be a principal, partner or manager in a company whose activities are connected with the building industry.

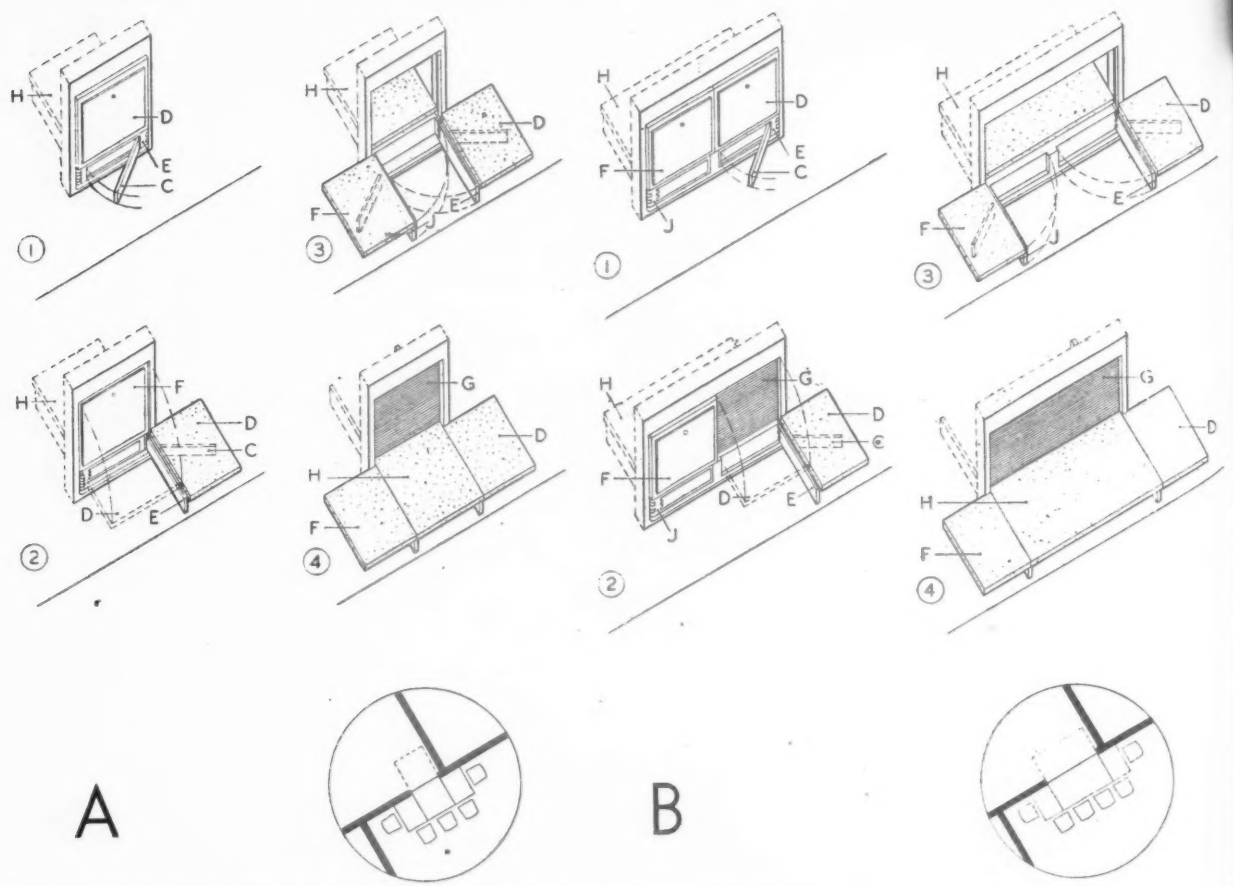
While a breach of the Code is not necessarily disgraceful conduct within the meaning of the Act, the Committee has now decided that it is disgraceful for an architect to be director of a building company, even although the company was formed for the purpose of, and mainly concerned with, developing properties in which the architect was himself beneficially interested as a large shareholder in a property-holding trust.

The Discipline Committee on this occasion consisted of five members—one appointed by the Law Society, two members appointed by the Minister of Health and the Minister of Works respectively, and two architects appointed by the Architects' Registration Council.

I understand that the view taken by the Discipline Committee is that an architect must be above suspicion. It is not sufficient that in holding a position as director of a building company he is careful not to act improperly as between builder and client. No architect should lay himself open to any criticism on the ground that he has an interest in the building trade which might possibly influence his judgment.

Any architect who is in doubt as to his

HATCH AND DINING-TABLE FITMENT



What will be the future of the dining-table in flats and houses? Will it continue to occupy permanent floor-space in the centre of the dining-room or dining-annex? Will it find its way into the kitchen? Will it do neither, but become part of the mechanism of the kitchen hatch? Above are illustrated two embodiments (A and B) of an invention by Malcolm Mactaggart showing how this third possibility can be fulfilled. Hatch and table form together a fitment capable of being built into a partition wall. Figure 1 in both instances shows the fitment viewed from outside the kitchen. Hinged bracket-arm C is first pulled outwards, and (Figure 2) hinged flap D is pulled down to rest upon it. Bracket-arm C is itself hinged to bracket-arm E, and C, D and E are thereupon together swung horizontally to one side. Hinged flap F is next similarly dealt with in the other direction. Roller blind G, covering the hatch opening, is then raised (Figure 2B) and the centre portion of the fitment H (which runs on rollers along a track formed by the upper surfaces of the two bracket-arms E and J), together with plates, cutlery, glass, food, etc., is pushed or pulled through the opening into line with the two side-flaps D and F, thus forming a table already partly laid. Roller blind G is then lowered. Clearing away after a meal involves the reverse procedure and, if the kitchen has been suitably planned, should bring the used plates, cutlery, glass, etc., into position immediately beside the sink ready to be washed-up without further handling.

position in such matters would be well advised to write to the Registrar of the Council for advice and guidance.

London. SYDNEY TATCHELL

Post-war Car Designs

SIR,—I was very interested in the reference in Notes and Topics to Post-war Design for Cars, in your issue for March 2.

I would point out that although the Aston-Martin car illustrated is only a hypothetical design, one model has been produced, and this was tested and illustrated in the *Autocar* in November, 1940. This car is the 2-Litre Aston-Martin Mighty Atom.

Although Mr. C. F. Kettering, of General Motors, and Sir Miles Thomas, of the Nuffield Group, have stated that there is no development or experimentation going on during the war, there are several British manufacturers who have got new designs well past the drawing board stage, and which are quite revolutionary in appearance, etc., when compared with 1939 models. Examples of these cars, other than the Aston-Martin, are the 4¼-Litre Bentley Corniche and the Austin models reviewed in the *Autocar* during the latter part of 1941.

Motor-cycle manufacturers have not been idle in the design department during the war. A notable patent announced in the November 4, 1943, issue of *Motor Cycling* was for a machine employing frameless construction, stub axles to both wheels, torsion bar suspension for front and coil for rear wheel, car type steering and a special type twin cylinder two-stroke engine. This patent was taken out by the Vincent-H.R.D. Co.

From the above I think it will be seen that the automobile industry, although very busy on war production, has not let design stagnate during hostilities.

With regard to the last paragraph in Notes and Topics concerning rear-engined cars, there is no actual technical reason why engines should be at the front of a vehicle. Proof of this is to be found in the fact that most of the Armoured Fighting Vehicles used by the British Army have rear engines. Examples are the Daimler Armoured Scout Car, the Daimler Armoured Car, and the Morris Light Reconnaissance Vehicle.

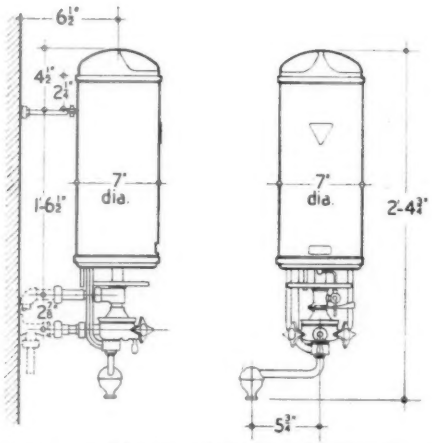
The successful Auto-Union racing car, used by the Germans before the war, had its engine at the rear, as had the 14-h.p. Mercédès-Benz and the German People's Car, which were ordinary family cars. A modified version of the K.d.F. or People's Car has been used by the Germans in Libya as an army vehicle. A report by the Humber Motor Co. has been recently published on one of these cars captured by us in Libya.

The difficulties of a rear engine in a normal production type car are: providing remote control satisfactorily for engine, gear-box, etc.; cooling the engine; excessive overhang to tail of car.

These can, however, be overcome, and if rear engines come into favour in post-war cars, I am sure the British motor industry can provide us with some very good examples of this type of construction.

Eltham G. D. MARSHALL

ASCOT BOILING WATER SINK HEATER—Type RS 52/1



BOILING WATER SINK HEATER RS 52/1.

SPECIFICATION :

Output : 520 B.Th.U./minute, or from 0.85 gallons heated by 60°F. to 0.5 gallons heated by 100°F., or 2-3 pints of boiling water per minute.

Input : 650 B.Th.U./minute, or 1.3 cu. ft. per minute of 500 c.v. gas.

Exterior Finish : White vitreous enamel. Polished metal parts chromium plated, castings dull nickel plated.

Automatic Valve and Temperature Control : Prevents gas passing to the burner unless water is flowing through the heater. It incorporates a water volume governor which automatically controls the flow of water, irrespective of the inlet pressure, at the settings "hot" and "boiling." A temperature selector is provided with three settings : "warm," "hot" and "boiling."

Heating Body : Consists of a cylindrical combustion chamber with a central heating chamber which is surrounded by a fin-type heat exchanger. The heating chamber contains a float valve, which precludes the wasteful formation of steam by permitting more water to enter the chamber through a by-pass tube as soon as the temperature has reached boiling point.

Burner : Pinhole type, incorporating pilot safety device.

Main Gas and Pilot Cocks : Interlocking.

Outlet Spout : Special design to separate steam and water. Standard length 6 in. Non-Standard lengths (at extra cost) 10 in. and 14 in.

INSTALLATION SPECIFICATION. RS 52/1.

(a) Gas.

Connections : Straight connection with union, lining with ½ in. tapered B.S.P. male thread, or bent connection with union and lining suitable for ½ in. pipe.

Supply Pipes : ½ in. for up to 15 feet run from the meter ; for longer runs, ¾ in.

Meter : Rated capacity to be not less than 80 cu. ft. per hour excluding requirements for all other appliances.

Stop Cock : Must be fitted on the supply pipe close to the appliance to facilitate maintenance and regulation.

(b) Water.

Connections : Straight with union, lining with ½ in. tapered B.S.P. male thread, or bent connection with union and lining suitable for ½ in. pipe.

Available as an extra : Elbow union with wall plate and lining for ½ in. pipe.

Supply Pipes : ½ in. to ¾ in., depending on length of run and available pressure. (See Information Sheet, Domestic Water Heating 13).

Stop Cock : (With valve secured to lift with the spindle) must be fitted on the cold water supply close to the appliance to facilitate maintenance and regulation.

Head of Water : 15-20 ft. measured from the level of water in the tank to the outlet spout. May be connected direct to the main where pressures do not exceed 110 lbs./sq. in.

Hardness of Water : Maximum permissible temporary hardness : 13 Clark.

(c) Flue.

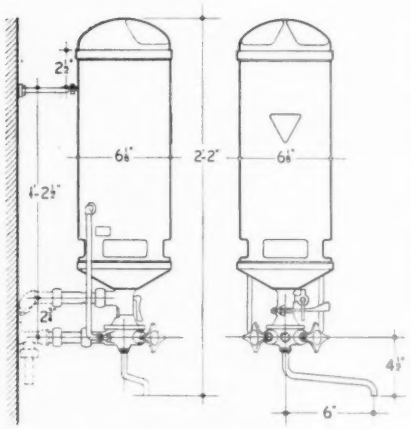
Not normally required. Where ventilation of the room is bad, or where use expected to be heavier than normal domestic conditions, a draught diverter (available as an extra), and 3 in. flue should be fitted.

[TURN OVER

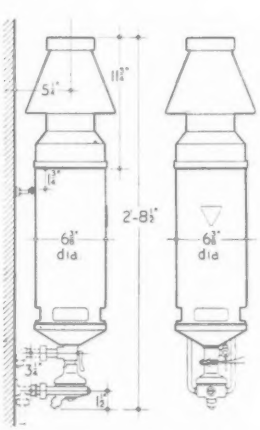
INFORMATION SHEET 935

CONTINUED

ASCOT SINK HEATER—Types R 12/4 and RA 12/5 and SMALL MULTIPOINT—Type RA 14/1.



SINK HEATER R 12/4.



MULTIPOINT R 14/1.

SPECIFICATIONS :	R 12/4 RA 12/5	RA 14/1
Output :	500 B.Th.U.	560 B.Th.U.
Gallons/min. heated 60°F.	0.8	0.9
Gallons/min. heated 100°F.	0.5	0.6
Input :	650 B.Th.U.	750 B.Th.U.
Cubic feet of 500 c.v. gas per min.	1.25	1.5

Exterior Finish : White vitreous enamel, polished metal parts chromium plated, castings dull nickel plated.

Automatic Valve : Prevents gas passing to burner unless water is flowing through the heater. Sink heater type R 12/4 incorporates hot and cold taps.

Heating Body : Cylindrical combustion chamber, with finned heat exchanger. RA 12/5 and RA 14/1 have pressure-proof coil-heating bodies.

Burner : Pinhole type incorporating pilot safety device.

Main Gas and Pilot Cocks : Interlocking.

Outlet : R 12/4—standard spout 6 in. Non-standard at extra cost—10 in., 14 in. and 18 in. RA 12/5, RA 14/1—lining for ⅜ in. pipe.

INSTALLATION SPECIFICATION. R 12/4, RA 12/5 and RA 14/1.

(a) Gas.

Connections : Straight connection with union, lining with ½ in. tapered B.S.P. male thread, or bent connection with union and lining suitable for ½ in. pipe.

Supply Pipes : ½ in. for up to 15 ft. run from the meter ; for longer runs, ¾ in.

Meter : R 12/4 and RA 12/5 rated capacity to be not less than 80 cu. ft. per hour excluding requirements for all other appliances.

RA 14/1 rated capacity to be not less than 100 cu. ft. per hour.

Stop Cock : Must be fitted on the supply pipe close to the appliance to facilitate maintenance and regulation.

(b) Water.

Connections (Cold) : Straight with union, lining with ½ in. tapered B.S.P. male thread, or bent connection with union and lining suitable for ½ in. pipe.

Available as an extra : Elbow union wall plate and lining for ½ in. pipe.

Supply Pipes : ½ in. to ¾ in., depending on length of run and available pressure. (See Information Sheet, Domestic Water Heating 13).

Stop Cock : (With valve secured to lift with the spindle) must be fitted on the cold water supply close to the appliance to facilitate maintenance and regulation.

Head of Water : Should be not less than 20 ft. measured as difference in level between level of water and the outlet spout or highest draw-off.

(c) Flue.

Not normally required with appliances Type R 12/4 and RA 12/5. Draught diverter for 3 in. asbestos cement flue available where use is heavy or ventilation bad and space confined. RA 14/1 should always be fitted with a flue, draught diverter supplied as standard.

Issued by Ascot Gas Water Heaters Ltd., North Circular Road, Neasden, N.W.10. Telephone : Willesden 5121 (14 lines).

PHYSICAL PLANNING

33 index

The Job

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26. Forestry — R. Bourne
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30. Transport Part II. — L. F. Richards
31. Leisure Space — John Bolland
32. Public Utilities Part I. — Leslie Hardern
33. Public Utilities Part II. — L. B. Escritt
34. Realization — David Brookes

L. B. Escritt, author of this week's article on water supply and drainage, is an Assoc. M.Inst.C.E., M.I.S.E., M.R. San.I., Hon. M.Inst.S.P., and F.G.S. In normal times he is a consulting sanitary engineer, and is among the exponents of regionalization of water supply and drainage and the co-ordination of public utility services. He has written a number of technical books, the most recent of which is Regional Planning.

THE JOBS TO BE DONE

This second article on the planning of public services deals with the problems of water supply and drainage. As the author points out the many aspects of the subject are so closely related that it is essential for the matter to be viewed as a whole if it is to be properly understood and co-ordinated. The necessity for improved legislation, revision of boundaries and the proper co-ordination of waterworks and drainage of all kinds has been recognized for many years, but little effective action has been taken. Recently the enthusiasm for planning and reconstruction and the attitude of the Government have given encouragement to those who would like to see improvements made. One item which has received attention is the necessity for regionalization, and the ideal size of a region for each purpose has often been mentioned. But, in addition to this, the needs of authorities, public and private, should be assessed by a government department empowered to direct the manner in which natural water supply shall be used in the interests of the nation.

WE MUST PLAN SERVICES WITHIN A NATIONAL POLICY

Part 2, by L. B. Escritt

water supply and drainage

One of man's peculiarities is that he is able to make adjustments by which adverse environments are rendered tolerable and this, and his adaptability, are responsible for his habitations being found in varied climates. Nevertheless he is always compelled to have access to water and where water cannot be found or supplied human habitation is impossible. In ancient times the positions of towns and villages were very much controlled by local water supplies and while at the present time water can be brought long distances, the siting of towns is still restricted by extreme shortage of water.

It must not be imagined that, except in very rare cases, water is responsible for the growth of towns—this depends on other economic considerations; it is its lack which acts as a deterrent to original establishment. This is less true than formerly because of the advances of engineering science, but still water considerably influences urban and rural development in many details.

Once water has fallen as rain or been deposited as dew it may run off the surface of the land and gravitate by streams and rivers to the sea, or it may soak into the ground, its ultimate destination again being the sea. At many stages during its seaward course evaporation, or transpiration by plants, may take place and thus there is a continual cycle of evaporation from land and sea and precipitation from the clouds.

In its flow from the clouds to the sea and even during transpiration, water serves many purposes, the chief of which is maintaining life. As far as man is concerned its principal uses are for domestic and agricultural supplies. But it also serves as a means of transport, of goods in rivers and canals, and of filth in sewers, and it is a source of mechanical power.

The engineering that relates to the exploitation of water and also the prevention of damage or inconvenience that would occur if stream and river flow were not controlled comes under several heads which may be approximately set out as follows :—

1. *Water Supply*
(*a*) Town supplies for domestic and other purposes.
(*b*) Diversion of watercourses to serve canals, etc.
(*c*) Irrigation. Supply of

water by gravitational systems for agricultural purposes.

2. *Drainage*

(*a*) River works. The improvement and maintenance of natural watercourses and the prevention of flooding.

(*b*) Agricultural drainage. The removal of surplus water from waterlogged soil so as to render the soil more useful for agricultural purposes.

(*c*) The drainage of marsh land, earthworks, aerodromes, etc., so as to render foundations stable or to prevent earth movements, etc.

(*d*) Soil sewerage. The removal of used domestic water, together with refuse transported thereby.

(*e*) Surface water sewerage. The removal of rain water from the paved areas of towns and roofs of buildings by means of a system of underground sewers and the discharge of surface water to natural watercourses.

3. *Hydro-electric power* (including direct utilization of water power). The conversion of the energy dissipated by water gravitating to the sea into a form in which it can be used and transported.

4. *Canal construction.* The construction of new navigation canals and the improvement of natural watercourses to render them navigable.

lack of co-operation

These branches of work are closely related and in many respects interdependent. For example, water supplies may be obtained from rivers and sewage effluents are discharged into rivers. Thus, the flow in rivers interests the water engineer, while the discharge of storm water sewers may cause embarrassment to the river engineer. Moreover, water supplies are often taken from rivers containing sewage effluent, and therefore the activities of the drainage engineer may adversely affect the interests of the water supply authority.

Clearly, *the matter requires to be viewed as a whole* if it is to be properly understood and co-ordinated. But at the present time conditions are not what they ought to be. The sections of work have become subjects of specialization because they require extensive knowledge and experience, and all engineers who practice in, say, sewerage are not experts on water supply or well informed on river work. In fact, so seldom are these branches of civil engineering considered together that there is no collective term that can be applied to them.

What is much more well known is that there is lack of co-operation between river, water and drainage authorities, etc. and, what is still more deplorable, lack of co-operation between various authorities dealing with the sections that make up one river catchment. Also there are too many water authorities, some controlling areas far too small, and too many authorities responsible for sewerage.

regionalization

The necessity for improved legislation, revision of boundaries and the proper co-ordination of waterworks and drainage of all kinds has been recognized for many years, but little effective action has been taken. Recently the popular enthusiasm for planning and reconstruction and the attitude of the Government have given encouragement to those who would see improvements made. The principal technical bodies have prepared memoranda and opinions have been expressed by many leading authorities, in which considerable agreement has been shown. One item which has received no small amount of discussion is the necessity for regionalization, and the ideal size of a region for each purpose has often been mentioned. There are, however, differences in the requirements of the several branches of engineering concerned and these deserve separate treatment.

river catchments

The limitations of the desirable area of administration for a river are obviously determined by the catchment area. There is no disagreement on this. If the whole catchment area of a river is under the control of one authority, prevention of pollution is most easily enforced and records of flow, etc., more easily compiled. Engineering works become consistent and calculations can be made in the correct systematic manner. One of the disadvantages of control of only part of rivers is that the engineers working in those sections have insufficient knowledge of conditions and for this reason they cannot make satisfactory calculations of flow or design works in such a manner that they will be certain not to interfere with the interests of other authorities.

water supply area

The limitations of the region as regards water supply are generally considered to be the same as the river catchment area : but on this there is some disagreement. As was pointed out at a recent conference, the gathering ground of a water supply company does not necessarily coincide with the catchment of surface run-off : geological conditions have to be taken into account, for water may enter a region (as determined by the surface water catchment) by underground flow from areas outside the catchment. Moreover, it is sometimes necessary for water to be collected from one catchment and delivered to a town situated in another drainage area which is not of sufficient size to supply the amount of water that the town requires. Liverpool and Manchester are outstanding examples. In determining the boundaries of a water supply area judgment has to be exercised, but it may often be found that the boundaries will coincide generally with those of the river catchment in which the water supply authority is situated.

From the administrative point of view, water supply areas should coincide with the areas from which the waters are gathered as regards that section of the authority's work which is concerned with collecting, treating and storing water. On the other hand, distribution in town and country can be a local matter and this, and the collection of rates, could be dealt with by local offices or by subsidiary companies.

national aspect of water supply

Natural and artificial drainage are local matters. In the main they do not influence, and are not influenced by, considerations outside the natural region determined by the catchment. This is not true for water supply. The demands of a large town or conurbation for water for domestic and industrial purposes, and sometimes the demand for untreated water made by a canal, may not be met by resources within the catchment in which the town, conurbation or reach of the canal is situated. As in the cases of Liverpool and Manchester, water may have to be transported long distances from those parts where it is abundant to the regions where it is scarce.

The conflicts likely to arise as a result of the requirements of local authorities or undertakings that are unable to obtain sufficient supplies of water in their own localities could be overcome more easily than at present if water were conserved nationally and supplies administered by a central body. This does not mean that all water undertakings should be administered by the government or by a vast organization set up to control supply to the consumer ; but the experience of the past has proved that there should be some legislation by which natural supplies of water in and on the ground could be preserved against pollution and that it should not be possible for supplies to be taken indiscriminately by private persons. The needs of all authorities, public and private, should be assessed by a government department empowered to direct the manner in which natural water supply shall be used in the interests of the public as a whole.

The latest opinion expressed on this matter is that of the British Waterworks Association which, in its second report on post-war planning issued on March 24, recommended among other things that there should be a Minister of Water appointed to be responsible for the conservation and utilization of national water supplies.

sewerage areas

The size of a region for sewerage purposes as determined by ideal technical conditions does not coincide with that preferred from the administrative point of view. Generally, sewerage areas of ideal proportions technically are too small for the best administration. A rural district or village may have a little soil sewerage scheme which employs very few men. The sewage treatment works may be in the hands of an intelligent labourer who would have neither the knowledge nor the equipment

for testing the effluent and for ascertaining that no stream pollution was occurring. It would not be practicable or economic to discharge the sewage from such an area into the sewerage system of a large town unless that town were actually adjacent and the discharge could be made without undue capital or running costs. Rural schemes of this kind should be administered by large authorities of size sufficient to support a highly competent chief officer, assisted by a chemist and other technical and administrative officers, and there should be money available for research. Such a sewerage area might coincide with the boundaries of a small river catchment, but in other cases it would be desirable for the sewerage area not to be so great that communication between the outlying sewerage systems and treatment works and the head offices and laboratories would be difficult.

From the technical point of view the drainage areas for soil sewerage are more limited and this is a point which has not been sufficiently kept in mind in determining the size of some regional sewerage schemes. In certain cases regional schemes have been such that sewage from all parts of the administrative region has been brought to one or two large treatment works regardless of the conformation of the land or of the distance that the sewage has to be delivered. This arrangement is uneconomic, for it is almost certain to necessitate pumping, and pumping can be a very large part of the cost of sewage disposal. But it also leads to difficulty of working and the results can be unpleasant, if not deleterious to health. Sewage should be given bacteriological treatment as soon as possible after it has been discharged to the sewers. While fresh, it is most amenable to treatment, least liable to become offensive, and at the same time it has not lost as much of its manurial value as it would have done had it been stored without treatment for many hours. Sewage is continuously undergoing change and while in the sewers the biological demand for oxygen has removed most of its oxygen, rendering it liable to support those bacteria which lead to septic decomposition. When sewage has turned septic it becomes highly offensive. To avoid the likelihood of septicity main sewers are kept as short as possible and rising mains in particular should be of minimum length. Rising mains often cause much more delay to flow than gravitating sewers and it is sometimes necessary to sterilize the sewage entering them. These considerations reduce the size of the individual catchment delivering to a treatment works and make it doubly important that pumping of sewage from other catchments should be avoided.

Taking all these matters into account, it may be said that an ideal sewerage area would consist of a number of components of a catchment, each of which is drained by gravitation to its individual treatment works. The size of each component would be determined by local conditions. The total size of the administrative area would be decided by a convenient radius for travelling from point to point. It would be part of a river catchment or might, in the case of a small river, include the whole catchment, but rarely if at all would the sewerage area extend beyond a natural drainage area.

the co-operation of planners

Co-operation between civil engineers, town planners and architects is more than desirable. In the past there has been lack of co-ordination which was quite as much technical as administrative. Many of those concerned with choice of site, zoning and estate layout in broad outline and in detail have not displayed adequate knowledge of the sciences relating to their work. Areas have been laid out and developed to be afterwards supplied with water at extravagant cost, or drained in as economic a manner as the circumstances permit. Rarely have plans been altered for the sake of the sanitary engineer. It is true that the engineers have been content to accept this position, and always to come in *afterwards* and apply their skill to the problems which developers of all kinds have made for them. But such is not a right approach to planning or one likely to lead to the most economic results.

influence of natural drainage

Natural drainage, water supply and sewerage influence the layout of estates in different ways.

Natural drainage is closely related to the conformation of the land. In some parts of England water has had much to do with the formation of hills and valleys, particularly those minor variations of surface gradient which affect the values of land for different purposes. In the south-east of England, for example, particularly the London area, it is very noticeable that the alluvium deposited by the Thames and its tributaries in its lower reaches, together with other flat level deposits, is the formation on which a very large proportion of industries has been sited. Generally, flat land is most easy to develop for factory purposes because it does not necessitate costly excavation and because heavy goods can be handled most easily on the level.

Several industries need water in quantities far in excess of that which they could afford, had they to use company's water. Old transport routes have, in many cases, tended to follow the low-lying land near rivers and industry prefers to be near to main highways, railways and canals. The alluvial lands satisfy all these requirements and, provided they are not liable to floods, they are favourable for factory sites.

The disadvantage of this low-level land is that it is the least easy to drain and it is not considered the best for housing purposes. In greater London nearly all the earlier residential properties were sited on the higher level deposits of gravel, etc. Preferably, housing estates should be on the sloping hillsides that are easily drained rather than in the valley bottoms, where industry has a prior claim.

Hilltop areas sometimes serve for industrial purposes because they may be level and certain highways are known to take level upland routes. But they are seldom associated with water and therefore the types of industry that will congregate on them are limited. Moreover, level uplands often have good soil and may be the best agricultural land available in any particular area, in which case they should be reserved for the use of farmers. These level uplands are often difficult to drain and there is a danger that if they are used for housing purposes, development may extend beyond natural catchment areas, leading to deep sewers or to pumping schemes which add to cost and maintenance difficulties.

influence of water supply and sewerage

Water supply and sewerage influence estate development in detail in different ways, the differences being due to the methods applied in the design of water mains and sewers. Water is distributed under pressure and the mains may run up and down hill without leading to technical difficulties, provided they do not rise so high as to have an inadequate pressure in them for service purposes, or fall so low that the pressure is excessive. Water pressure in mains should not exceed 100 lb. per square inch approximately, i.e. the mains should not be more than 230 feet below the highest level in the reservoir from which they are served. A minimum pressure of 45 lb. is desirable for town services and although in some cases this pressure may be reduced, generally it should be maintained not only to make supplies available conveniently to high buildings but also to render fire fighting possible without the aid of pumps.

The effect of these limits of pressure in water mains is that each service reservoir can supply only a zone lying not less than approximately 100 feet below the bottom of the reservoir and not more than 230 feet below the top water level. If a developed area extends beyond these limits an additional reservoir or reservoirs may be required to supply additional supply zones. Thus it is to the advantage of an estate developer to know the limits of existing supply zones so as to be able to arrange that all buildings may be supplied with water at reasonable pressures. By this means he will be able to avoid placing a few buildings in positions where their water supply would involve undue cost.

Sewerage differs from water supply in that the majority of sewers are designed as if they were open watercourses. They must run downhill and at those gradients which produce velocities of flow that would prevent the settlement of solids. In the ideal case the sewers would be laid a few feet below ground level and in such

directions that they would slope continuously at satisfactory gradients to the treatment works or other point of outfall. For practical reasons sewers are usually laid in, or parallel with, the carriageway of roads, and in spite of suggestions to the contrary it is most probable that this practice will continue in the future. Thus, the direction of roads affects the efficiency of a sewerage system and particularly its cost.

There are ideal arrangements of subsidiary roads which assist drainage and they are compatible with highway layouts from the point of view of efficient transport. This need not be unduly stressed because sewers are not the main consideration in the layout of estates; but everyone who decides the layout of streets and the positions of buildings should always keep in mind the necessity of drainage, and be certain that every individual building can be satisfactorily drained.

reservation of sites for public utilities

The reservation of land for catchments for water supply or for wells and waterworks generally is of primary importance. Such lands should be reserved at an early date, the sources of water being determined prior to detailed preparation of town plans. Very often the best sites for wells, etc., have been lost owing to lack of foresight.

Wells cannot be put anywhere. Their positions depend on local geological conditions and in adverse circumstances very few alternatives may be available. Moreover, in some places adequate water supply for urban purposes cannot be obtained locally: and it is no use going ahead with the plans of a town which cannot be supplied with water.

The selection of sites for sewage treatment works should also be considered at an early stage in the preparation of a town plan. In certain sections of town planning literature one sometimes comes across reference to sewage treatment works and the suggestion that they should be placed on the leeward side of a town in order that any smells therefrom would be blown away from habitations. This is not practicable as a rule, for sewage treatment works are almost invariably sited so that the sewage from the town can gravitate to them at the "self-cleansing" gradients already mentioned. Any position other than below the town and near to a point of outfall to which discharge of effluent can be made must involve disproportionate expenditure. There are generally very few sites that can be considered practicable for any particular town and the best of these must be reserved for the purpose.

The site for a sewage treatment works should consist of a more than adequate area of land allowing for all possible future extensions. Preferably the land should fall slightly towards the point of outfall. It should be above flood level and if there is any choice in the matter the soil should be of a porous nature and the level of the natural water table comparatively low. Unless one of the activated sludge methods of treatment is to be employed, the sewer discharging from the town to the treatment works should have its invert about 12 feet above the highest flood level of the stream into which discharge is to be made.

the future

Certainly, advances will be made in the sciences that relate to the flow of water. No doubt hydro-electric schemes will become more common in the British Isles. Canals may be improved, although it is doubtful if they will be extended very much. Rural water supplies will become more adequate and main drainage will be extended to places at present served by cesspools. But it must not be imagined that startling innovations will be made in the near future.

While it is not safe to make pronouncements about the future, the writer wishes to emphasize that at present there is no evidence of any drastic changes in methods applied to river works, water supply or sewerage. Research is taking place and results are being obtained where previous experiments have failed. But the work that is in hand is mainly related to slight improvements of present methods; and the improvements of existing methods generally tend to stabilize their use.

PLANNING REVIEW

WATER SUPPLY

The Times announced, on April 12, that the first of the impending Government White Papers to be issued would be that on a national water policy presented to Parliament on April 18. In addition to the general proposals for improving the nation's water supply, this Paper will state the Government's immediate intentions for encouraging by Exchequer assistance an extension of piped water supplies — and sewerage schemes — in rural areas, which is regarded as the most urgent short-term problem. A Bill to deal with this problem of the rural areas is to be introduced soon by the Minister of Health. Lord Beaverbrook stated, in a recent House of Lords debate, that it is the Government's intention to spend £20,000,000 for water and sewerage in the rural districts alone. Exchequer assistance on this scale would suggest a generous measure of help for the rural areas, but for the duration of the European war, and for some time afterwards, the extension of rural water supplies will depend mainly on the labour and materials available.

MIDDLESBROUGH SURVEY

In an article in the *Middlesbrough Evening Gazette*, Max Lock, Town Planning Consultant to the Middlesbrough Corporation, describes the principles upon which his team will act in the diagnosis of the social, economic and administrative aspects of Middlesbrough on which they have started work. He points out that Middlesbrough is the first city officially to encourage such a team and to base its plan upon their results. The team comprises architects and town planners under Miss Albery, late of the Ministry of Works and Building; economists and sociologists for the time being being under Miss Rowntree and later under the periodic direction of Mrs. Glass, of the Association for Planning and Regional Reconstruction; a geographer yet to be engaged, and the Wartime Social Survey (investigating housing needs), a Government Department set up under the Ministry of Information for the purpose of finding out what people do, what they like, and what they want so far as everyday needs are concerned in the field of home, work and play. After explaining the scope of the survey, Max Lock shows how adjustments between desirable goals and practical possibilities determine a plan. There are three programmes for the economic, social and physical development of Middlesbrough—the war-time programme; plans for the demobilization period, and long-range plans. In these programmes it is necessary to assign responsibilities between public and private enterprise; to consider the appropriate financial structure and provisions; and to plan for administrative machinery capable of implementing the proposals. Indeed planning should never stop. Once the basic survey has been made, year by year a revaluation of all the plans is necessary to keep abreast of changing conditions. Max Lock's team are there to start the process which, he believes, it will not be difficult to continue.

PLANNING EXPERTS

The Parliamentary Correspondent of the *Observer* reported, on April 9, that reflections on the difficulties into which the Government has got itself over the Uthwatt, Scott, Barlow, and Beveridge Reports, have resulted in the decision not to rely on outside experts, if it can be helped, except as witnesses or advisers to committees. To carry out this policy fully, the Government will need a first-rate cadre of economists and social scientists competent to get the best expert knowledge on anything. In the Government service in war-time there is the nucleus of such a team. Issuing from Government sources, but under the general surveillance of the Minister of Reconstruction, are to come the White Papers on land policy, on national water supply policy, and on full employment, regarded by the Government as the key to them all. Sir William Beveridge is studying full employment separately, the Government having cut communications between him and his experts and its own men. Parliament will devote most of its time after the Easter Recess discussing these White Papers and certain other matters of broad policy.

WALES AND THE COAST

The Lleyn Committee, which represents the religious, cultural and social interests of North Wales and of Caernarvonshire in particular, has issued a statement which begins, "once again, the lack of an authority with power to protect the interests and amenities of Wales has become conspicuous. A Government department has contracted to sell a tract of Welsh coast to an exploiting company without reference to any local authority or regard for local opinion." On April 9 the *Observer* pointed out that Whitehall has made its own coastal survey and has its own Ministry of Town and Country Planning. Yet one Department can render utterly futile the good intentions of the other. The Lleyn Committee asks for delay in order that future arrangements may be governed by public interest alone. Practical proposals are made for putting the site of a proposed holiday camp to the best possible purposes in the service of the nation's health and education.

NEW LITERATURE

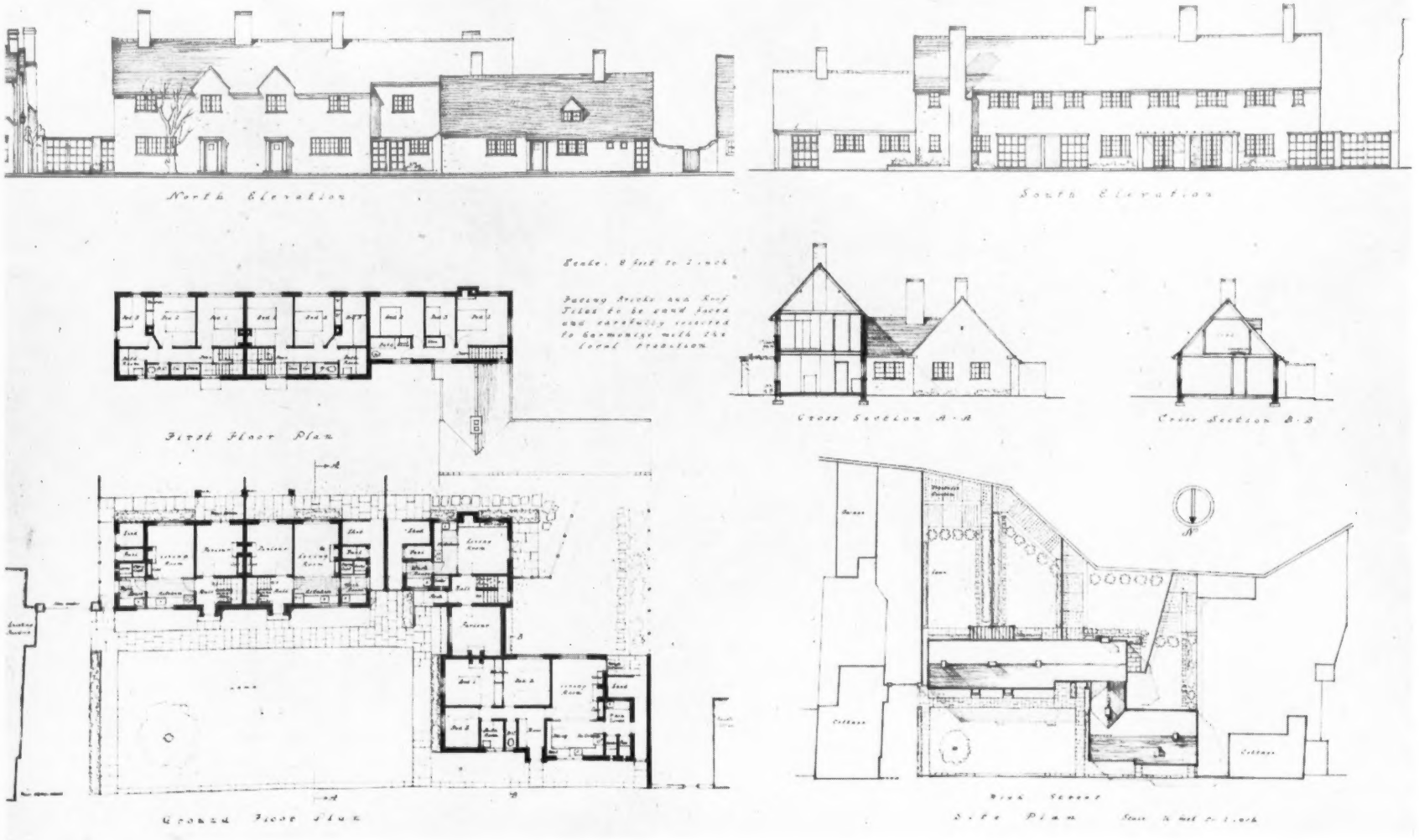
Houses and Towns after the War: Elizabeth G. McAllister. Design for Britain Series, 30. J. M. Dent & Sons, Ltd. 6d.

Fine Building: Maxwell Fry. Faber and Faber. 15s.

Annual Report of the National Housing and Town Planning Council: National Housing and Town Planning Council. 41, Russell Square, W.C.1.

WEST WYCOMBE RURAL COTTAGES COMPETITION

Promoted by the National Trust and assessed by Darcy Braddell, Edward Maufe and William Weir. 257 designs were submitted.

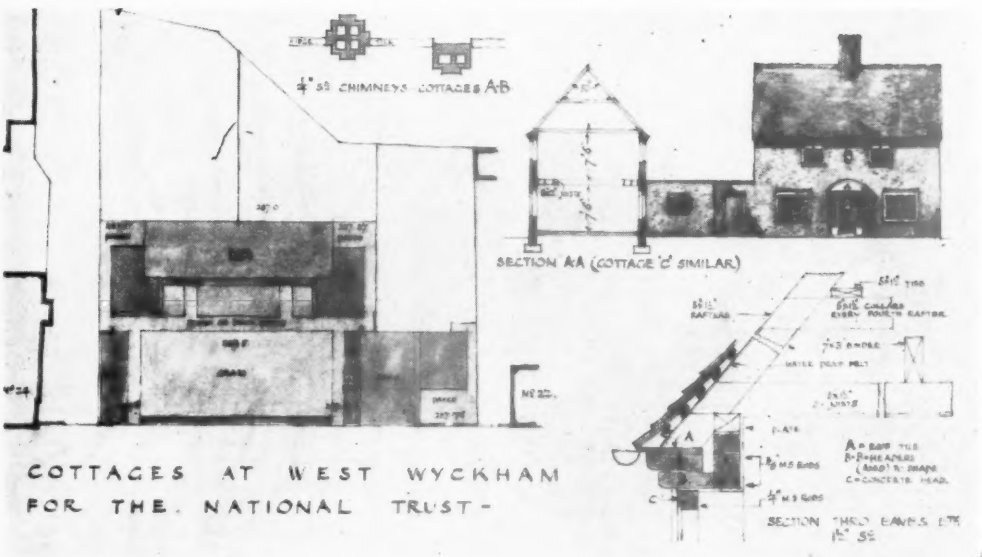


THE FIRST PREMIATED DESIGN (Prize: One hundred guineas).

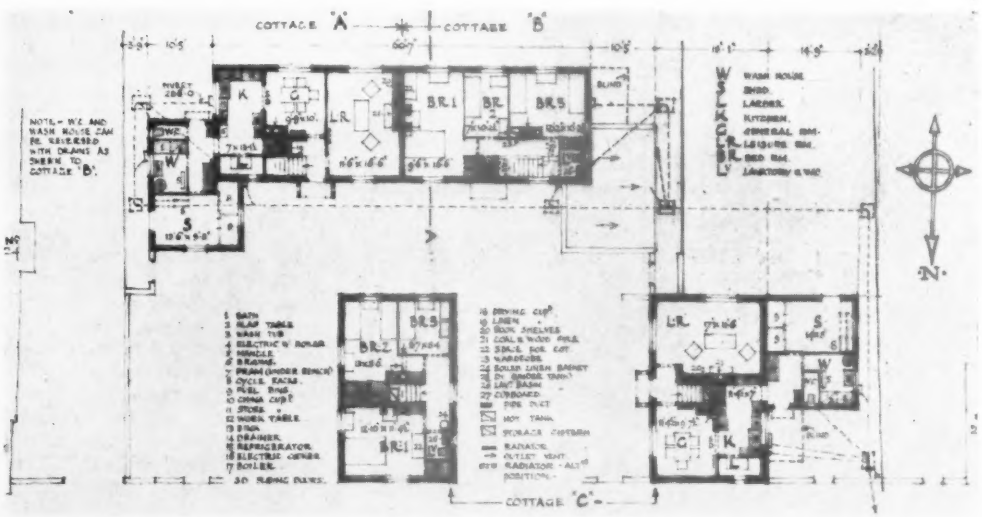
BY T. MELLOR, G. GRENFELL BAINES and J. A. ASHWORTH

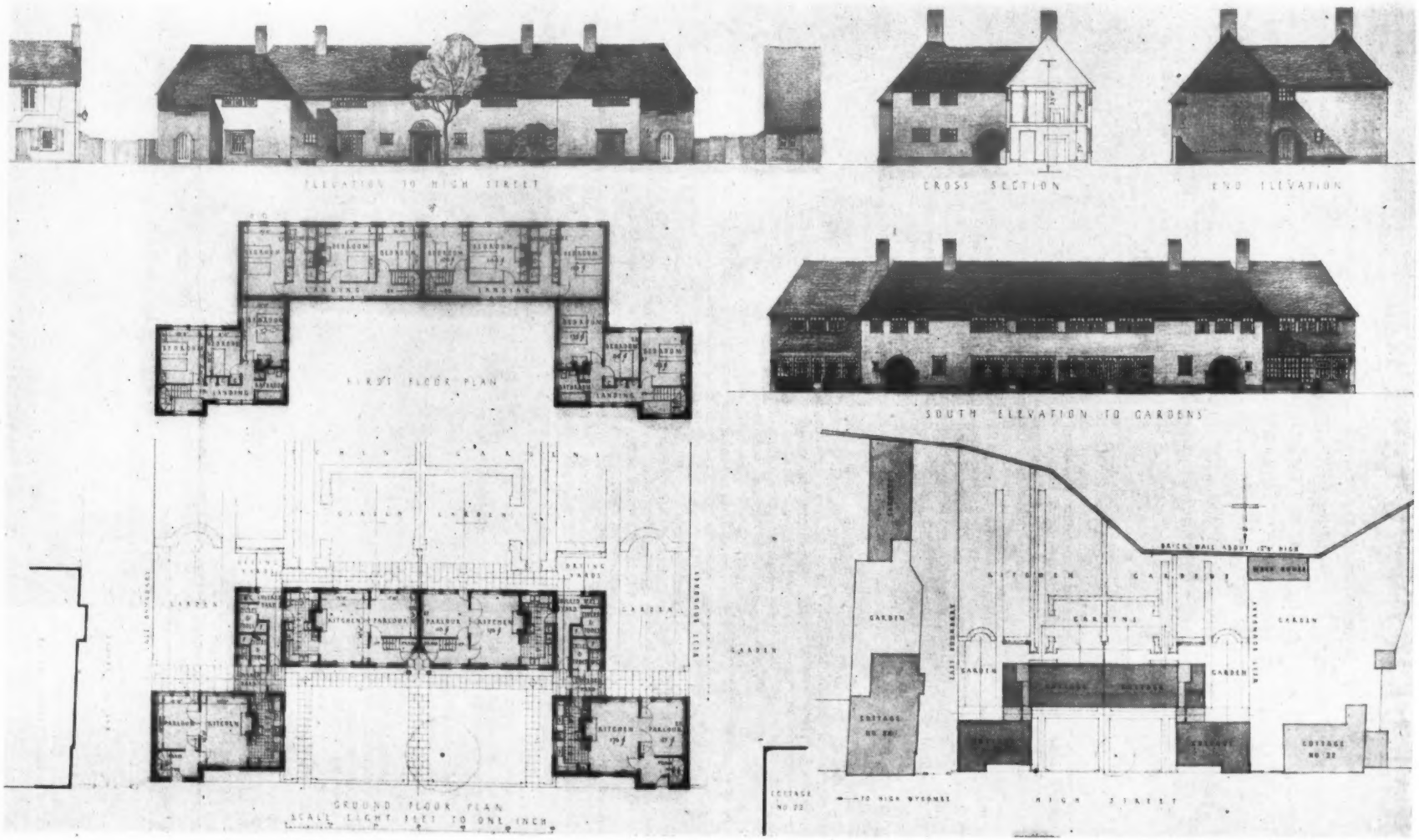
SECOND PREMIATED DESIGN (30 guineas)

BY G. BLAIR IMRIE



COTTAGES AT WEST WYCKHAM FOR THE NATIONAL TRUST -





THIRD PREMIATED DESIGN (20 guineas). *BY JOHN L. DENMAN*

The assessors specially commended eight additional designs from the following competitors: Frank H. Bromhead (2 designs submitted), H. Farquharson & D. A. McMorran, C. Roy Fowkes, G. Mary McKenzie, McKewan & McKewan, E. S. North, Philip Evans Palmer. All the designs will be exhibited at the Regent Street Polytechnic School of Architecture from May 29 to June 3. The cottages are designed in red brick and timber in the traditional style to harmonise with the character of the sixteenth and seventeenth century village, and to blend with two old cottages on either side.

INFORMATION CENTRE

The function of this feature is to supply an index and a digest of all current developments in planning and building technique throughout the world as recorded in technical publications and statements of every kind whether official, private or commercial. Items are written by specialists of the highest authority who are not on the permanent staff of the Journal and views expressed are disinterested and objective. The Editors welcome information on all developments from any source, including manufacturers and contractors.

STRUCTURE

1456 *Architecture and Concrete*

ARCHITECTURE AND REINFORCED CONCRETE. *Paul Weidlinger.* (*New Pencil Points, August*, 1943, *pp.* 58-66.) Intricacies of building design in concrete. Period of transition. Characteristic shapes of sincerely designed structures. Development of new æsthetics. Responsibility of architects.

Reinforced concrete, though known as a building material for almost 60 years, is still in many ways a new material. In part its importance lies in the fact that its production and use form an industrial process rather than a skilled craft. Building design in concrete is based, even more than in other materials, on calculation. The engineer who calculates a concrete structure has not only to design according to the laws of statics and strengths of material, but he must take into account economies which can be attained in erecting the structure.

In general, saving can usually be made in two ways : in material and in labour. Accordingly there is a noticeable difference in reinforced concrete design in the USA (and England) and in Europe. In Europe the cost of material is relatively higher than the cost of labour. European structures therefore are usually designed to achieve saving in the amount of reinforcing steel, which, in the end, requires increased labour costs. The result is the use of more complicated shapes, slender forms, special steel saving devices, etc. : the building codes allow proportionally higher steel stresses. In the USA and in England, important savings can be obtained through economizing in labour. This leads to a more generous disposition of materials, to simple and often clumsy shapes, and to reinforcing steel used in larger quantities, though as far as possible placed in a simple manner, with a minimum of end hooks and bending. Savings include a reduction in the work of computing and designing by the structural engineer, which may contribute to the above results. The present shortage of steel, together with the development of labour-saving devices in concrete fabrication, may well lead sooner or later to well-balanced design methods.

Reinforced concrete, like any other invention, has had to undergo a phase of adjustment. Its immediate forerunner and competitor was structural steel, and some time passed before reinforced concrete was accepted as an independent structural material rather than a supplement to or substitute for structural steel. Even to-day there is usually less difference between the steel and the concrete skeleton frame than between reinforced concrete and masonry. Distinct, detached elements appear in both steel and concrete skeletons : columns, girders, beams. In both, walls (both exterior and partition) are separately applied curtains, non-structural. This division of a structure into beams, girders, etc., is not in accordance with the basic property of reinforced concrete ; reinforced concrete is a monolithic material capable of transmitting loads in all directions. This leads to a characteristic appearance of sincerely designed reinforced concrete structures which distinguish it from any other kind of construction. The form which developed earliest is the T-beam ; that is the beam combined with the slab where the flange of the beam provides an increased compression area, and acts at the same time as part of the slab, transmitting loads to the beam. Haunched beams have been developed through distribution of material according to the distribution of bending moments. They demonstrate how, in continuous girders, bending moments increase from the centres toward the support.

These developments follow a clear progression, which may be described as proceeding from one dimension to two, and from there to three-dimensional structures. The column, the beam, the simple slab in a typical skeleton are one-dimensional elements. Their function of supporting and transmitting loads takes place along one line. Although the whole structure is three-dimensional, each element is treated individually and one-dimensionally. The first step in two-dimensional development is the two-way slab ; that is a slab supported on more than two sides. The slab which is continuous in all directions can be supported on columns, instead of along walls or beams, which leads to the idea of a flat slab. The slab, which has had hitherto a more or less passive, secondary role, then becomes the main element. The continuity of the structure is utilized to the utmost.

A logical further development is shell construction. In this system there is none of the traditional division into columns, beams, etc. The shell membrane plays a universal role, extending in three dimensions, and gives the necessary stiffness to the whole structure. This opens up tremendous possibilities. Simple forms are employed, dimensions are reduced (the thickness of the slab is usually no more than 3 inches), and the system is suitable for spanning almost any distance. It is now up to architects to exploit and adapt these new forms of construction.

The introduction of reinforced concrete has left a definite mark on the architecture of the last few decades. Only the clear, honest and uncamouflaged concrete constructions have added anything positive and basically new to the evolution of contemporary æsthetics.

It seems that severe economic conditions work in favour of the appearance of structures. Engineers and architects are forced to remove superfluous elements. The engineer must make his structure light and simple ; the architect must forgo his attempt to sophisticate and camouflage, seeking instead to accentuate the beauty of a well-balanced structure and carefully chosen material. Some excellent reinforced concrete industrial buildings have been produced, but factories usually remain unknown to architects. Yet those sober, prosaic buildings are important signs of evolution towards an æsthetic which is representative of our times.

The possibilities which still lie before us, and are yet far from exhausted, include development of new forms of plastic effects, and new organization of space and masses. Ensuing developments in reinforced concrete will exploit all the advantages of a material which can be cast in any desired form, from thin shell to heavy mass.

Much responsibility for further evolution lies on the shoulders of architects. Co-ordination between architect and engineer is to-day more important than ever before, and their education at technical schools and colleges should be along lines which would give architects the background of advanced methods of structural design and analysis, and engineers some knowledge of the æsthetics of construction. A proper collaboration would give an enormous impetus to the development of both architecture and engineering. At present reinforced concrete engineers are far ahead of architects. It is time for architects to catch up.

A skating rink in the USA, with shell concrete roof construction. From New Pencil Points. *See No. 1456.*

1457 *High Stressed Wire*

HIGH STRESSED WIRE IN CONCRETE TANKS. *J. M. Crom.* (*Engineering News Record, December* 30, 1943, *pp.* 947-949). Wires pre-stressed at 150,000 lb./sq. in. save 75 per cent. of steel and eliminate cracks.

Some of several hundred concrete tanks, built since 1931 with pre-stressed rod reinforcement, have required costly repairs. Occasionally this was due to bad workmanship, but most frequently the need for repairs was caused by shrinkage and plastic flow in the concrete which released the pre-stress, permitting the concrete to be subjected to tension, thus resulting in cracks. With steel rods conventionally used the pre-stress cannot exceed 45,000 lb./sq. in. most of which can be lost by shrinkage and plastic flow alone. (See Inf. Centre No. 1175). In order to render the pre-stress effective much higher stresses are necessary and wire of very high strength (say of a minimum yield point of 185,000 lb./sq. in.) is to be used. For the efficient performance of stretching and placing the wire round a cylindrical tank a winding machine has been developed which is hung from a supporting carriage mounted on the rim of the tank and moves at a speed of about 3 m.p.h. The concrete shell, without circumferential reinforcement, is built first. After the concrete has cured the band steel is installed and pre-stressed and then covered with pneumatically applied mortar. By this process the concrete shell is given a high initial stress in compression.

For a 1,000,000 gal. tank about 6,000 lb. of wire (roughly 22½ miles) is required. At an average rate of 2 m.p.h. a tank of this size can be wound in two days. Normally 27,000 lb. of rods would have been required for the same tank, and the time consumed for placement would have been seven days.

The use of concrete domes generally accompanies the construction of a pre-stressed tank. Here again horizontal pre-stressed wire is used to take the horizontal load thrust of the domes, thus preventing distortion and cracking. The domes can thus be lightweight and inexpensive. Most of those constructed to date are about 2 in. thick although diameters in some cases have been above 150 ft.

MATERIALS

1458 *Concrete Surface Finishes*

CONCRETE SURFACE FINISHES, RENDERINGS AND TERRAZZO. *W. S. Gray and H. L. Childe.* (*Concrete Publications. 2nd* (*Revised*) *Edition.* 8*s.* 6*d.*). Useful practical guide to subject. New edition incorporating recent developments.

The importance of the proper surface finishing of concrete has repeatedly been discussed in the Information Centre. From the architect's point of view the pretence that a concrete building is made of some other material, is undesirable. The need to avoid unnecessary use of any material in the post-war period is obvious. There are many buildings, mainly industrial, where the alternative to a good concrete finish is no finish at all.

The second edition of this useful book is, therefore, to be welcomed. The revised work incorporates the great progress which has been made in this field since the first edition appeared, and recent buildings provide the illustrations. The book deals with the causes of unsightly concrete, the means of preventing blemishes, and the various methods of obtaining good concrete surfaces from cement-washing to sliding shutter plates, exposed aggregates, painting, pre-cast decoration, etc., and finally terrazzo, mosaic and artificial marble. The aim is to enable the reader to carry out any of the methods successfully and useful, practical instructions are provided. It would seem that too little space is given to the methods of obtaining good plain concrete surfaces, the proper use of shuttering, spacing of expansion joints, etc., and too much to fancy decorations and patterns. The absence of any mention of control joints may be noted in this connection (Information Centre No. 1459 below).

Almost all the topics dealt with in this book have been discussed already in the Information Centre (Nos. 1048, 49, 50, 51, and 1133) and further detail is, therefore, unnecessary. The lack of any bibliography to guide the reader to further information is regrettable. It also seems a pity to confine the photographic illustrations to British and American examples (and two from France). Many beautiful examples could have been found, e.g. in Sweden and Switzerland (see the JOURNAL, May 6, 1943, p. 297). As the authors themselves say, the illustrations in this book have no architectural pretensions. Nevertheless they give a good idea of what can be done and may help architects to develop a style proper to modern materials rather than continue in slavish imitation of the past.

1459 *Cracking in Concrete*

PREVENTION AND CONTROL OF CRACKING IN REINFORCED CONCRETE BUILDINGS. *W. S. Merril.* (*Engineering News Record, December* 16, 1943, *pp.* 893-895). Control joints successfully eliminate unsightly patterns of cracks in reinforced concrete walls and parapets.

One of the main difficulties in the use of reinforced concrete in walls is the prevention of cracks, or, at least, the control of their location. Since it is uneconomical and impractical to provide a sufficient amount of reinforcement to prevent cracking entirely, especially those cracks that start at the corners of openings for doors, windows, or louvres, it is desirable to control the location of cracks. This can be done by providing control joints in the walls at proper intervals.

Numerous ways have been devised for forming such joints. A common way is by tacking wooden or rubber strips to the inside of the forms. After the removal of the forms and the wooden strips, a narrow vertical groove is left in the concrete on the inside and the outside of the walls. On the outside of the wall the joint is filled with a concrete-coloured caulking compound. It is essential that only such compounds should be used as are definitely known to be non-staining and which retain their plasticity and adhere tightly to the sides of the joint. The rubber strips are left in place in the wall, and no caulking of the joint is required.

The narrow grooves predetermine the location of the cracks through the wall. One half of the horizontal reinforcement is stopped off or cut at the joints to facilitate cracking at those places.

Control joints should be spaced not more than 20 ft. apart in walls with frequent openings and never more than 25 ft. apart in solid walls. The effectiveness of the control joints can be increased by the provision of horizontal construction joints and by the procedure used in placing the concrete. It is desirable to allow the various sections of concrete to shrink before new concrete is placed against them, especially where thinner sections are tied to heavier ones. Continuous placing of the concrete from the base to the top of the wall above a door opening would result in a settlement of the concrete on both sides of the door greater than over the door and this would cause unsightly cracks.

1460 *Makers of Concrete Products*

CONCRETE PRODUCTS MANUFACTURERS IN ENGLAND, WALES AND SCOTLAND. (*Cement and Concrete Association. Free of charge.*) Provides a simple method of ascertaining names and addresses of manufacturers of various types of concrete products in any locality.

The whole country is divided into areas indicated in two maps and the booklet contains a list of manufacturers in alphabetical order for each of these areas. Against the name of each manufacturer appears a series of numbers which represent the products supplied.

It is a very useful publication, which will assist all who are interested in precast concrete products. The present edition is, however, incomplete, because several firms of importance have not been included. Further, area 20, covering the South of Scotland, is missing from the list.

QUESTIONS and Answers

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. 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.

1461 *Books on Reinforced Concrete*

Q *Are there any books or other information which teach the theory and practice of Reinforced Concrete Construction, from the first principles of calculatory loads ; the study of bending moments, etc., up to the design of reinforced concrete structure ?*

A We suggest the following books :—

Reinforced Concrete Simply Explained. Oscar Faber. (Oxford University Press. 5s. 0d.).

Simple Examples of Reinforced Concrete Design. Oscar Faber. (Oxford University Press. 5s. 0d.).

Elements of Reinforced Concrete Design. Haddon C. Adams, M.C., M.A.(CANTAB.), A.M.INST.C.E. (Concrete Publications, 6s. 0d.).

Reinforced Concrete Designs Handbook. C. E. Reynolds. (Concrete Publications. 15s. 6d.).

Examples of Reinforced Concrete Design. C. E. Reynolds. (Concrete Publications. 8s. 6d.).

1462 *Qualifications of an L.R.I.B.A.*

Q *What are the needs or qualifications necessary to become an L.R.I.B.A. ?*

A To become an L.R.I.B.A. the following qualifications are necessary :—

The applicant must be British ; must be a Registered Architect ; have reached the age of 30 years ; have been the principal of a firm of architects for five successive years *or* have been in practice or studied for ten years ; and must be nominated by three Fellows of the Institute, or in the case of a member of an Allied Society be nominated by one member of the RIBA and the President or Secretary of the second Society. Drawings, etc., are needed to support the application.

1463 *Memorial Bus Shelter*

Q *I have been asked to prepare designs for a private war memorial Bus Shelter. Can you please tell me whether an order limiting the cost of expenditure on new buildings would apply in this case and if so what is the present figure ?*

A The building of a private Bus Shelter is restricted by Statutory Rule and Order 1596 (1941), which limits the cost of building to £100. For amounts over this figure, a licence has to be obtained from the Ministry of Works, but it is rather doubtful whether

this could be obtained, as the nature of the work is not urgent. In addition, it is likely that difficulty would be found in obtaining permits for materials, even within the £100 limit.

SOCIETIES AND INSTITUTIONS

Speeches and lectures delivered before societies, as well as reports of their activities, are dealt with under this title, which includes trade associations, Government departments, Parliament and professional societies. To economise space the bodies concerned are represented by their initials, but a glossary of abbreviations will be found on the front cover. Except where inverted commas are used, the reports are summaries, and not verbatim.

RIBA

ASB Lecture

February 12, at 66, Portland Place, W.1. Lecture arranged by the Architectural Science Board of the RIBA, on NEW DEVELOPMENTS IN THE DESIGN OF CONCRETE FORM-WORK, by C. Parry, D.F.C., M.I.STRUCT.E. Chairman: Alister MacDonald, F.R.I.B.A.

A. MacDonald: Mr. Parry is a professional man who designs form-work for concrete. Some of you probably think that when a building contractor, or even a firm of public works contractors, wants to contain concrete in timber framing or in any other type of framing, it just somehow happens. We have asked Mr. Parry, who spends his life in designing form-work in the same way as architects design buildings, to come and talk to us because the actual design of reinforced concrete work or solid concrete work is largely dependent upon how one contains it. The forms in which it is contained naturally dictate the design of the finished product from the architectural point of view. Mr. Parry has probably had to deal more with civil engineers; in fact architects probably have not had to use this concrete construction as much as they might have done. Mr. Parry has shown me the slides from which he is going to choose his illustrations, and I (the chairman) had ventured to remark, "This is all civil engineering, not architecture." Mr. Parry is going to give the answer to that himself.

C. Parry: I should first like to say that I feel very honoured at being invited to speak to you on this subject of moulding concrete. It is quite an interesting job. Before getting on to my notes, I should like to say that the impression we get in engineering is—and I hope I am wrong—that architects do not like this form of construction; in fact, that you hate it. Probably there is an explanation for that frame of mind. I would like to start my lecture by telling you why I think so.

You ask for a job to be built in concrete and someone hands you over something with a joint like that which is shown in this picture. But there is no reason why the contractor should not hand you over something looking like this. (Slides shown here). You get a decent-looking job in this other case. This latter picture is how we try to build to-day. It was not for the want of trying in the early days, but the equipment and experience available was such that we could not do any better and at the same time make a profit. Therefore, you got a job that looked like the first illustration. (Continuing to show further illustrations of early efforts, the lecturer remarked—) That is very much the same thing again. See all these lips and mess and this untidy finish on the top. I am not telling you where the work is, but it was one of my jobs, many years ago. This other job is very recent work. Look at all the unsightly form marks and joints. There is a job all covered with marks and lines which do not appear to fit the general design. Marks on a building like that, I imagine, would not be objected to if they fitted into the lines of the architecture, but to see a circular structure covered with marks like those does not seem to be fitting. That sort of thing would put anybody off concrete for the rest of his natural life. When you see concrete work like that you say something and you go away and do not want any more. But when you see a job like that you should say, as some of us have done, is "I am going to lick that." That is what I have set myself out to do. I think we are quietly succeeding. If you gentlemen would make suggestions to us in the early stages of design, you might be able to help us and yourselves along the right lines.

It has been mentioned that what I have to show and what I have to say relates mainly to civil engineering construction. My prompt rejoinder to that is "it is your fault," and, I am sure, my misfortune. I have not gone to the trouble of digging up anything in the nature of history relating to form-work; I live very much in the present and in the immediate future. I do not propose to anticipate or become involved in predicting future developments, I find it as much as I can do to cope with the present. I feel that if people in my position, whose duty it is to interpret your wishes, carry out their work conscientiously and have a sincere desire to produce good results, we are fulfilling our purpose in the community. If we are successful in our jobs I think the future will look after itself. It is your job to see into the future, not mine; that is, so far as building development is concerned. It is you, as architects, who must visualize the lines of the buildings of the future which may be constructed from this comparatively new medium in the form of reinforced concrete, which many of us have watched develop during our lifetime. Things have been built in concrete and in similar substances for many years we all know, but reinforced concrete as we understand it has been developed during our lives. Therefore, you can hardly expect us to have reached perfection.

I think reinforced concrete should be an ideal and delightful material in the hands of a good architect. I have worked on a number of building jobs, but you have in the main used reinforced concrete as a substitute for steel-frame structures, brick-faced concrete walls, or bricked-in panels between the rigid-frame members. I think that if I give you an account of the various features connected with the production and use of form-work and then show you a number of illustrations of jobs which are in the main connected with civil engineering, your own imagination—and it seems to me that one of the greatest assets of an architect is imagination—might lead you to a better appreciation of what might be done in the building line if some of the principles extensively used in civil engineering are given some play. In the first place, I will let you see the form-work drawings and then what the finished job looks like. It is quite likely that what I have to say will be common knowledge to most of you, but it may be new to some of you, and there may be some things which are new to all of you.

Form-work may be classified under two headings—in situ work and pre-cast work. I propose to deal only with in situ work, because this is the type of form-work with which I specialise, and it might be considered as being in the main under the heading of civil engineering or constructional work. Pre-cast work is in the main a specialised line of design and it is dealt with by the pre-cast concrete manufacturers, and might be classified very largely as a mechanical engineering job. I know that you, from an architectural point of view, are probably equally interested in pre-cast work, but I cannot deal with that very well in this lecture. For in situ work we get two distinct usual kinds of form-work. They are timber forms and steel forms. As a third kind plastics will probably develop and glass might even be used for certain purposes, but that is in the future; I do not want to get on to that now. In the past the factor governing the type of form-work has been in the main a question of economics: What is the cheapest job? I think that in future the factor will be: "What sort of a job am I going to get when it is finished?" I would like to touch on the results you get, from different kinds of form surfaces.

If you use timber forms the result will be that you will get a structure bearing board marks running horizontally or vertically. These marks can be made a feature of the work. They can be controlled by the architect. If they are controlled they can be arranged to produce satisfactory and pleasant results; if you leave them to the discretion, or rather the mercy, of anybody else they may produce an unsightly mess. Again, that is one of the reasons why I think we come up against the architects, although I very much hope that I am wrong. Your own imagination should make it unnecessary for me to comment further on the subject under this particular heading.

If you use steel forms you will get a close, hard finish on the work. The extent to which it will be marked will be contingent on the size and quality of the steel forms. Even with machine jointing it is practically impossible completely to eliminate the resulting marks which on very close examination clearly define the panels that you have used. The rivets with which we assemble these forms although ground quite smooth and flush are still faithfully reproduced on the finished concrete. You may say, "Why not weld them; if you do that you will get a nice smooth form?" The answer to that is that we have not met with much success in welding forms. Further, with steel forms we always seem to get a lot of air holes or bubbles on the surface of the finished work, and they show up more than would be the case if we used timber forms. All these indentations due to air bubbles show up much more in the finished work than they do with timber forms. With timber forms, I think, there is a better chance for the air to escape or even for the air and the water to be absorbed into the forms. Greater care must also be taken to prevent the development of upward flow of surface water. This latter feature can have very unsatisfactory effects. These upwards "rivers" are due to the less friction at the form surface and less opportunity for water to escape. The excess water tends to make its way up to the top, and when the lifts are 20 to 25 ft. deep without stopping, there is a considerable accumulation of water, which cannot gradually escape. When it does escape it causes these rivers, which flow upwards. The remark that is generally made on the job

is that something has run down the form, but it is water running up. It must be guarded against, and it can be guarded against.

If you use forms coming under the headings of plastics, glass or anything else of that kind, you will get very much the same results as with steel forms. But with plastics the production of the moulds should be more under control, more in one piece, and it might be worth considering if you have any panelling work to do to get a form made in plastics for that particular work. I think I am right in saying that for architectural work, buildings and various construction work above the surface of the ground, the timber form has so far held sway for the best resulting appearance. But that is up to you; you may prefer steel forms for certain purposes.

There are a few other remarks which ought to be made in connection with form-work if you want to see it improved upon. They are related to the various people connected with form-work. These are the architects or the designer; the quantity surveyor; the contractor; and the resident engineer, or clerk of works, as I think he is mainly called on building jobs. The designer should have a full appreciation of the methods of construction and the possibilities of the use of concrete from an architectural and an economic point of view. The old ideas—I would like to call them Victorian ideas—of architectural beauty represented what I think might be considered as the opposite of the type of architectural features which you would now go for in designing a structure to be executed in concrete. I think you should go for simplicity of outline and continuity of pattern. This does not mean that the surface should be left all flat and smooth. Any form of pattern can be introduced on to concrete, and a repetition of a small pattern cannot have anything against it, any more than there is anything against the repetition of the joints in brick work. What is objectionable from a constructional point of view is the dotting about of bits of ornaments such as sills, lintels and ornamental horizontal bands on tall structures. They are abominations from the constructional point of view. If possible, let the features of tall work run vertically or repeat at regular lift intervals—by lift intervals I mean that as you go higher you lift up your forms and repeat the feature, and on long horizontal work they should occur at regular intervals. But if you suddenly burst in on the top of a building with something like a cornice band it is a costly addition, and I feel not in keeping with concrete work.

Another aggravating thing that we find in concrete buildings, probably designed against a set of figures and theoretical requirements, is this. I will take the case of a beam and slab floor construction. For some reason it is necessary to have a stairway running up through one of the slabs. This stairway running through the slab requires special bearers and trimmers to support the loads, but for some reason these trimmers and bearers are put in with a variety of widths and depths. If they had made them all of the same depth we should not have been so exasperated.

All that should have been necessary was the thickening of the slab, or even to make the bay solid, in order to cut out all this ridiculous work. One stands inside the building and says: "Goodness, where has it all come from?" It has spoiled the lines of the whole building. Another reason why the contractor gets very fed up with that sort of construction is that he has generally got the wrong price for these bits. Because of the way it is billed in the job it has not called the contractor's attention to the fact. It is not because he cannot do the job; he can do the job all right, but he cannot do it at the price which he has got down on the bill. Yet he has no claim against you because it constitutes slab surface and because it is all measured. Why did the designer do his job that way? Because he saves a few cubic feet of concrete as a result, and the price is quoted by the cubic foot or the cubic yard. He saves half-a-dozen cubic feet of concrete, that is to say, he saves a few shillings. He, the designer, saves that and thinks he has done something. He has increased the area of shuttered surfaces, but the contractor prices this complicated work all-in with the general appearance of the work as shown on the drawing. Your client is pleased with you because he thinks he has got a cheap job, but I am not sure that he has, I feel that it would be better to introduce a general thickening of slab, slightly altering its reinforcement, and finishing up with a cleaner and more business-like job. It would probably cost only the same price, although you have introduced more concrete. The contractor would spend less time trying to find out where he could make a claim against you to get over this introduction of unnecessary complicated work which it is impossible to legislate for tendering. If the architect insists on having these complications in his work, or if the reinforced concrete designer has not brought this feature to his notice, it seems unfair not to call the contractor's attention specially to this radical departure in order to accommodate a type of construction which is arranged only because proper attention has not been given to the substance with which the work is to be constructed, namely, reinforced concrete.

So much for the designer; what about the quantity surveyor? A much more detailed survey will have to be attended to for the quantities, in order that the contractor may carefully price his job. It is useless saying, "So many yards super of walling," if this is broken up into innumerable small and irregular shapes. The amount of surface to be shuttered must be precisely defined and keyed to the drawings. Openings in most cases should be measured as wall surface and paid for, because they are frequently embraced in the operation of shuttering above and below such openings. The contractor has to make a shutter for that space, so he has all his labour against no area to be paid for. Door jambs and lintels should be measured separately, and only those which have the same width and height should be embraced in one item, because contractors must give consideration to the repetition of the use of the material. If the door jambs are of different heights and widths he cannot do it with the same unit of shuttering; he has to make a fresh item. In the case of floors, the heights and thicknesses should be given and it should be stated whether it is a second, third or fourth floor, because the supports have to be left in. That means the supply of more material than if it was a single floor. Circular work should be measured separately, and precise particulars given. In the case of columns, each type of column should be measured separately; they should not all be lumped in as so many yards super to columns. Splays and fillets to base and heads of walls should always be measured separately, together with the outer form surface on the other side of the wall. The contractor should give more careful thought to the bill and the prices of items should be carefully analysed. We make on our jobs a series of ten columns. We keep all the measurements in feet to prevent confusion. We put down the item and the quantity. We put down the cost that it would take to make a square foot of shutter to do that particular work. We then analyse how many times it is likely to be used in the job and put that down; and then we put down the cost per use. We then take the labour price to fix and strip. Then we take the price of supports by way of clamps or embedded tees. Then we put on cost contingencies and allow for weather and so on. If the items in the bill are properly segregated by the quantity surveyor the contractor has something to fall back on, to see what is done wrong or whether the item is scheduled wrongly. It ought to be possible to cover every shuttering item with a job number corresponding with the item in the bill. This will serve the dual purpose of accurately checking the estimate and the efficiency of the workmen, and will provide the contractor with a correct form of data for subsequent pricing. This may seem to be introducing a lot of work which has perhaps not been done before. That is so only so far as contractors in this country are concerned, because I know from intimate knowledge that on the Continent they go into these things very carefully.

The resident engineer or clerk of works should keep in mind that even on the most exacting precision machine work there is what is termed tolerance, and we should have some understanding as to what tolerance might be permitted in connection with the erection of concrete structures. Nothing is more aggravating to a contractor, who has taken reasonably good care to produce a good job, than to find someone walking around the site measuring up his shuttering with a rule divided into 32's. If this is to be so, it should be clearly stated in the specification, and I am quite sure that the work would then be priced accordingly. I would not attempt to enlarge upon the subject of tolerance, because it seems to me that it is something which has to be decided on each job, and even on each part of the job, or the resident engineer, or clerk of works, should have a greater appreciation of what are the requirements.

I have dealt with the people intimately concerned; now I come to the question of shape and outline of work. In circular work boards, as a general rule, should run vertically. I think that here the architect should specify the facet—that is, the width of the timber that should be used—so that when you stand and look at it it does not look silly, or so that some carpenter or somebody else on the work does not use a lot of boards of irregular widths. If the job is done with regular facets it will not be unsightly. On jobs where there is not a great deal of usage of the forms we use laminated timber ribs. A further small refinement, if you have to have double-sided shuttering with sweeps or curved ribs is, instead of taking a plank and cutting a piece out and leaving one edge straight, to cut both edges. That makes it easier to operate the forms.

It is just as easy to construct a circular column as a rectangular column. It is easier still in the case of a column of large dimensions to make it circular than it is to make a rectangular one, because the whole of your stresses will then run in tension in hoops instead of bending in yokes. We do not even care whether they are a circle when we stick them up, because the moment we place the concrete in it will make a circle. When we are concreting rectangular tall columns of large dimension, we have to resort to steel yokes because timber of sufficient dimension would be uneconomic. Whenever you want to make a fillet on a corner, make a quarter circle, not at 45 degrees.

There is generally no difficulty in arranging for special shapes or features in the direction of repetition, either horizontal or vertical. It is the departure from the line which involves expense. I feel that the control of form-work by the architect or the designer is the only line along which proper development can be hoped for. The designer should define the construction joints. The defining of the joints is governed by the design and the purpose of the structure. These are the things to bear in mind. You should keep within defined limits in regard to horizontal lengths. You should try to keep construction joints within the amount of work which can be done in the normal working day. You should consider the loads to be carried and the sequence of operations during the construction. It is no use having a part built so big that there is great expense and work involved in carrying the loads. You should also consider the direction in which the boards of the form-work should run. If the form-work is properly controlled there is no need to consider going round the job afterwards and rendering it. What happens so often is that the form-work is not properly controlled; you then go around rendering it or else you say that, having been once bitten, you will be twice shy. The

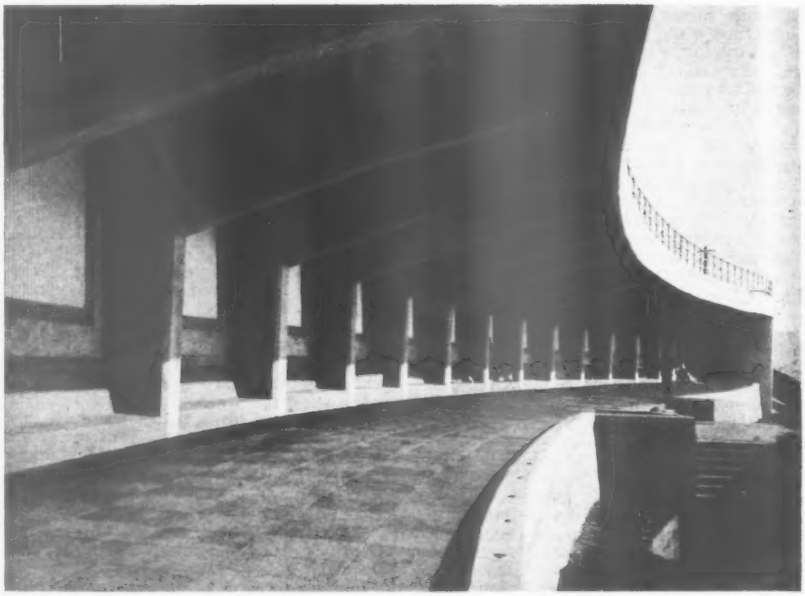
fact is that rendering frequently crazes, and often falls away.

I always feel that it is unnecessary to spend time and money trying to make concrete look like something else when it is finished. You should determine when you start a job what sort of finish you want, by settling on the face of the mould. It may be either timber, with board marks, plywood, plastic, or steel. In addition, there is the other system of chemical treatment of the form-face, and also there is bush-hammering. My feeling about those last two—and I hope it is fair comment—is that either of them can be detrimental to the work. If you use liquid materials they run down the face of the form, and it may be destructive at the joint. If you bang away at the surface with a hammer, I am not sure that you will not make fractures in the concrete and let water into the steel. Very little treatment should be necessary if you produce good form-work. The forms should be properly made and they should be kept clean. Therefore, I think the form-work should be properly supervised as regards the materials and the lifts. These recommendations should start with the architect, and the thing should not be left to the contractor's workmen's own ideas. It is important that the architect should know something of the general technique of shuttering and the factors connected with reinforced concrete design.

The next thing is the operation of construction. Wherever possible, complete the concreting of a wall or column in one continuous operation from bottom to top. Somebody is going to tell me of many jobs on which you cannot do this, but that is the thing to go for, although you may not always succeed in doing it. Joints in stress members should run in the main normal to the lines of the principal stresses. Cracks are rarely seen running horizontally; they generally run vertically. We, therefore, try to limit the distance between vertical construction joints in walls, etc. We try to put the walls in 22 ft. lengths. We find then that they very rarely show any vertical cracks. Vertical construction joints rarely leak, it is horizontal construction joints which are most prone to leak. Therefore, with reservoirs the walls are constructed either in one lift or in as deep a lift as possible, and on the intermittent block system. Architects took a lot of convincing that this concreting in one lift was good construction, but now they have found out the good results, they raise objections when other considerations dictate joints.

The placing of concrete to get good results from your form-work is very important. There is a tendency to expect contractors to use too dry a mix. It is the cause of much bad work. You get some awful jobs as a result. Your concrete should be workable. People are keen on slump tests; I am not very keen about them, because you can make a slump anything you like. That is the truth, and you might as well know these things. This raises the question of placing dry concrete by vibration. Even with vibration we do not seem able to eliminate air and water holes on the surface. This may be due to wrong application or lack of precise understanding of the technique of application. Internal vibrators, where they can be got in through the reinforcement and correctly used, appear to give the best results so far as external finish is concerned. I have tried patiently with various makes of machines, but I have only once seen a reasonably good resulting finished surface from the application of external vibrators. In this case the job consisted of a number of columns 17 in. in diameter and 18 ft. 9 in. high. These were shuttered with a very heavy steel form on which provision was made for the attachment of external vibrators at about 4 ft. 6 in. vertical centres on opposing diameters. The machines were air-operated internal vibrators of about 5 horse power, and applied externally. But even here we could not eliminate surface air holes.

The next thing is the manufacture of the form. When we make shutters we make them from the back. In the past you had a carpenter to make a shutter and he drove in nails and busted up the face with a hammer, and then he said, "Now, Jack, stick it up to be concreted." I think a lot of contractors wanted me certified when I suggested that they should make shutters with screws from the back. I went further, and said that the screws should be brass, because you could take them out and use them again. It was then said, "Now we know he's mad." But I insisted on screws anyway. By making the form from the back you greatly increase its life. When you have made a shutter it is a good thing to soak it all at once with creosote or diesel oil. That keeps the weather out.



A job in uncovered reinforced concrete. Part of the sea-front development scheme at Plymouth carried out by the Borough Engineer's Department, which includes a swimming pool.

Now I turn to the question of erection, stripping and cleaning the forms. Endeavour at all times to have a rigid line against which to grip or strut the lower edge of the form. This, on the first set-up, is usually called a necking, and it may be either continuous or intermittent blocks of wall-width, inserted when concreting the base. The time for stripping of forms is now invariably such as to permit of daily use. That is, strip and erect and fill the forms each day. What is the reason for these four, five and seven-day periods we still very occasionally see in specifications? The reason is that old shuttering methods necessitated men levering off forms and climbing about on reinforcement. With correctly designed forms this is quite unnecessary. Even with floors and slabs, etc., we take off practically the whole of the shutters in 24 hours. What we leave in are permanent strips on permanent shores. We have these panels supported in such a way that we can take them away and get more rapid use. It is frequently said that reinforced concrete buildings are slow to erect in comparison with steel-frame buildings. This is true so far as site erection is concerned, but it must not be forgotten that steel fabrication is proceeding at the works, and therefore the length of time taken to get a building erected from the word go with such a material as steel is apparently reduced as a result. It is only right to consider in the construction period the time taken to fabricate the sections at the works.

It is true that shop fabrication can be proceeding simultaneously with the excavation and general foundation work. That obviously constitutes an advantage for steel frame building as compared with concrete building, but the disadvantage of concrete for work under this heading can be very considerably reduced if the form-work for the job is completely planned long ahead of the construction, the moulds fabricated in the contractor's workshop, and delivered to the job ready for immediate use, with features connected with alterations for subsequent application, such as the reducing size of columns and beams, and so on, all embodied in the form-work, thereby reducing site labour very considerably.

In addition, the work of concreting on the site is greatly speeded up. These features, coupled with the brushing aside of obsolete theory regarding the period of removing the shuttering from the newly placed concrete, will greatly speed up the work.

The life of a timber form is contingent upon design of form, quality of timber, the manufacture, care in handling. All these factors are not difficult to control. I have seen panels on plain and counterfort wall-work which have been used 108 times and still be good for more work. If these panels deteriorate when out of use they can be revived by grinding the face when dry and fitting strips in gaps or closing the boards and refixing. A panel so revived is a good and lasting job.

Bursting pressures are taken care of with ties. Sometimes wire ties are used. I really never use a wire tie—I do not like them personally—but some people use them. If used, they should be very carefully treated by being cut back below the surface and then stopped in such a way that the stopping will not fall out or disfigure the work. Use through bolts or embedded ties. With these through bolts or embedded ties, which I use, we can make long lengths of timber form-work and then find places in the structure where finishing of the ends does not show. In some jobs, if it is a thin wall we flatten out the tie to prevent rotation when stripping. When the wall is set—that is, next morning—we take all forms off and leave the tie in the concrete. What we mean by a through tie is a tie such as is shown in this picture, which travels right through the wall, and is pulled out. Many people want to put sleeves and ferrules over a tie in the wall. We do not; we use a bright bar. We make these of sufficient diameter to prevent their being bent.

With regard to concrete pressure on thin walls, we find that the pressures are relieved to some extent by congestion of the material around the bars and arching in the forms, but when forms are filled quickly we figure the full static head at 150 lb. a cubic ft. On very deep lifts you might get very great pressure, but we limit the pressure for calculations to a three-hour head as a rule. Scantlings are

designed with a careful eye on defection as well as bending.

I come to sliding forms. In the main we have been dealing with forms which you put up and take down, put up again, and take down again. Sliding forms are only applied to work which offers some prospect of a fair continuous height. Typical application is that on the construction of grain or other storage silos, designed vertically. The system is that you commence concreting at the bottom, and when the form is filled up to the top it is raised continuously by means of a special system of jacking. The rate varies from 4 in. an hour to as much as 12 in. an hour. The advantage of the system is that it is quick, it is quite economic in cost, and it has the advantage of completely eliminating horizontal construction joints. The resultant work might also be classified as extruding a concrete structure through a shutter. Steel fixing, concrete placing and shutter moving are all taking place continuously. The work must be well organized and well thought out, and it must be very rigidly controlled right through the entire operation. There is nothing new about sliding forms, they have been in use over 30 years. (Many illustrations were shown of drawings and finished work).

As a last remark, I would like to say that the architect has had placed in his hands in the form of reinforced concrete a very useful and interesting material. I think you should hold on to the torch of progress, and keep it alight. It is no use fighting against it. You should go on and make the most of it. We have our ancient monuments in granite and other lasting stone, and we have our fine-looking buildings in brickwork—I doubt very much whether they have lasting qualities. I think that there is hope for concrete, and that if it is left to you some of the footprints in the sands of time will be of this material.

Discussion : Mr. A. Pott remarked that Mr. Parry had not touched upon the question of getting out texture by arrangement of the boards within the form-work. It would be interesting to know what were the possibilities and limitations of that.

Mr. Parry replied that the line of board marks could be a very pleasant feature, or it could be a disfigurement if left in the hands of the unskilled or the unthinking. This point was covered in the lecture. He agreed that it was not necessary to flatten off concrete work like a plaster wall.

Mr. Pott said that he wondered whether, apart from special lining materials, anything could be done by arranging the board runs to get, not a pattern exactly, but a texture.

Mr. Parry replied that it would be a job to get grain marks without getting board marks. The forms would have to be left on a little longer if one wanted these features pronounced, so that the surface was not torn when the board was taken away. That was quite interesting, but it was in the architectural line that developments of that sort would be more important than in what he called commercial work, that is, sewage work, reservoirs, tunnels, dams and things like that. But he was sure that that type of feature such as board marks would be used extensively, only they would have to keep an eye on the carpenter.

TRADE NOTES

A new varnish, produced from American corn and resin, is being widely used in the USA for coating Liberty ships, lifeboats, rescue-rafts, gas masks and various types of amphibious equipment.

Originally sought as a makeshift, because of the shortage of shellac, the new varnish is now proving superior, in many respects, to the original substance. True shellac is obtained from India and Burma, being exuded, in the form of lac, from acacia trees which have been attacked by a parasite. A series of chemical processes transforms the raw product into the familiar commercial shellac.

Some years ago the firm of William Zinsser & Co., New York, shellac merchants, commissioned Arthur D. Little Incorporated to begin a research for an efficient shellac substitute, as a far-sighted precaution against future shortage. C. G. Harford, the research chemist, who was assigned to the task, turned to a formula with which, since 1890, many others had experimented unsuccessfully, a combination of corn and resin. The corn product is zein, a gritty yellow powder.

Harford's success has exceeded all hopes. The new varnish is efficient over a wide range of uses, has stood up to the severest tests and is easy to manufacture. Experts believe it may finally displace natural shellac for industrial purposes.

R.R.

ANNOUNCEMENTS

The address of the Midland Regional Office of the War Damage Commission is now Block 8, Viceroy Close, Bristol Road, Birmingham, 5.

The General Cable Manufacturing Co., Ltd., announce the re-opening of their Birmingham Branch at new premises 204/206 Newhall Street, Birmingham. The company will now be in a position to offer a very complete and efficient service throughout the Midlands. Mr. F. W. Sutton is the manager of this branch and the telephone number is Birmingham Central 5441.

Mr. Hugh F. King of Manchester has been appointed North West England Sales Representative to the General Cable Manufacturing Co., Ltd., Leatherhead.

CLASSIFIED ADVERTISEMENTS

Advertisements should be addressed to the Advt. Manager, "The Architects' Journal." War Address: 45 The Avenue, Cheam, Surrey, and should reach there by first post on Monday morning for inclusion in the following Thursday's paper.

Replies to Box Numbers should be addressed care of "The Architects' Journal." War Address: 45 The Avenue, Cheam, Surrey.

Public and Official Announcements

Six lines or under, 8s.; each additional line, 1s.

The Incorporated Association of Architects and Surveyors maintains a register of qualified architects and surveyors (including assistants) requiring posts, and invites applications from public authorities and private practitioners having staff vacancies. Address: **75 Eaton Place, London, S.W.1. Tel.: Sloane 5615** 991

COUNTY BOROUGH OF CROYDON.

CHIEF ARCHITECTURAL ASSISTANT.
TEMPORARY ARCHITECTURAL ASSISTANT.

Applications are invited for the following appointments:—

(1) Chief Architectural Assistant in the Architectural Section of the Borough Engineer's Department, at a salary of £500—£600 per annum (plus war bonus).

(2) Temporary Architectural Assistant at a salary of £10 10s. 0d. per week (plus war bonus).

Applicants for both appointments should have had wide experience in the design and lay-out of municipal housing schemes. Preference will be given to members of the RIBA.

Form of application may be obtained from the Borough Engineer, Town Hall, and should be returned to me before the 1st May, 1944.

E. TABERNER,
Town Clerk.

Croydon. 608

COUNTY BOROUGH OF CROYDON.

TOWN PLANNING ASSISTANT.

Applications are invited for this appointment in the Town Planning Section of the Borough Engineer's Department. Salary £465—£525 (plus war bonus).

Preference will be given to candidates who are members of the Chartered Surveyors' Institution and the Town Planning Institute. Form of application may be obtained from the Borough Engineer, Town Hall, Croydon, and should be returned to me not later than the 1st May, 1944.

E. TABERNER,
Town Clerk.

Croydon. 609

SUDBURY AND DISTRICT PLANNING ASSOCIATION.

APPOINTMENT OF LOCAL PLANNING SURVEYOR

Applications are invited from members of either sex for the above appointment. Candidates will be required to prepare a factual survey, to evaluate, and to plan by imaginative projection, the post-war development of a small country town and its surrounding villages and countryside. Applicants must have had experience of planning and be either Members of the Town Planning Institute or the Royal Institute of British Architects.

The appointment is contemplated for a period sufficient to achieve the three preliminary stages of planning, and for an agreed sum. The project has the approval of the County Planning Officer and the person appointed, though working independently, would have the benefit of his guidance and assistance.

Applications, stating age, qualifications and experience, accompanied by copies of two recent testimonials and endorsed "Local Planning Surveyor" should be received not later than Monday, 8th May, 1944, by:—

MR. A. B. WALTERS,
(Hon. Secretary),
Sudbury & District Planning Association,
Sudbury, Suffolk.

610

CORNWALL COUNTY COUNCIL.

Applications are invited for the appointment of an Assistant in the Architectural Department, at an annual salary from £300 to £360, according to qualifications and experience.

Forms of application may be obtained from the County Architect, County Hall, Truro, to whom applications must be sent not later than Saturday, the 29th April, 1944, accompanied by copies of three recent testimonials.

L. P. NEW,
Clerk of the County Council.

County Hall, Truro.
6th April, 1944. 605

Architectural Appointments Vacant

Four lines or under, 4s.; each additional line, 1s.

Wherever possible prospective employers are urged to give in their advertisement full information about the duty and responsibilities involved, the location of the office, and the salary offered. The inclusion of the Advertiser's name in lieu of a box number is welcomed.

SURVEYING ASSISTANT required at once for preparation of specifications in respect of war damage repairs and preparation of schedules of condition. Apply, giving full particulars to W. H. Saunders & Son, Architects and Surveyors, 2, Carlton Crescent, Southampton. 591

YOUTH wanted, aged about 16, for Architect's Department. General clerical work, aptitude for drawing an advantage. Opportunity to train as draughtsman. Full particulars to Architect, Timothy Whites & Taylors Ltd., 70, Vauxhall Bridge Road, S.W.1. 604

ARCHITECTURAL ASSISTANT required immediately, Newcastle-upon-Tyne office, experienced in general private practice. Progressive post. Particulars Box 607. [Chartered Architect.]

JUNIOR ARCHITECTURAL ASSISTANT required for West Norfolk. Apply stating experience, age and salary required, to Box 271. Permanent position with good prospects. [Architect and Surveyor].

LOCAL AUTHORITY REQUIRE JUNIOR ARCHITECTURAL ASSISTANTS (Temporary), salary £200 p.a., plus current Cost Living Bonus. Applications stating date of birth, training, experience (with dates) and qualifications, to Employment Exchange, Northampton Lane, Swansea, together with copies of two recent testimonials. 611

Architectural Appointments Wanted

Architectural Assistants and Students seeking positions in Architects' offices will be printed in "The Architects' Journal" free of charge until further notice.

COST INVESTIGATOR AND MEASURING SURVEYOR, would like situation in Lancashire district. 18 years' experience with contractor and two years' experience with Quantity Surveyors. Box 268.

ARCHITECT, A.R.I.B.A., A.M.T.P.I., would be glad to undertake preparation of drawings in own office in Birmingham district. 15 years' experience in varied high-class work. Box 269.

ARCHITECT, L.R.I.B.A., 33, married, exempt M.S., seeks permanent position in Southern Counties; 15 years' experience in private and public offices; all-round knowledge architectural design and construction; surveying, levelling, estimates, etc. Salary £600. Write Box 274.

ARCHITECT, fully qualified, A.M.T.P.I., with long practice, first-class references, seeks change. Would consider responsible position where initiative, drive and capability appreciated. Post-war development, housing, prefabrication, town planning. Reply to Box 275.

AN EGYPTIAN ARCHITECT and Inc. Quantity Surveyor desires position with an English firm intended to work in Egypt at present or after the war, high qualifications, 12 years' experience in Egypt as an architect and contractor, including about 3 years as civilian quantity surveyor with the W.D. Write to N. Morsy, 167, Khedevi Ismail Street, Cairo, Egypt, stating conditions, etc. 279

ARCHITECTURAL ASSISTANT, A.A.Dip. (25), studying for T.P.I. final exam, wants post with architects and town planning consultants in provinces. Salary £10. Box 281.

PROBATIONER, R.I.B.A., aged 17 years, with matric. and knowledge draughtsmanship, taking recognized evening course, requires permanent position in architect's office; London area. Box 282.

Classified Advertisements continued on page xliv.

ARCHITECTURAL ASSISTANT, member of the R.I.B.A., requires post with architect or group working on post-war design and planning, preferably in country near London. Experienced in housing, schools, civic buildings. Box 283.

ARCHITECT'S ASSISTANT, age 24, desires progressive post in Midlands; 6 years' experience in all types of work. Salary by arrangement. Only progressive firms need apply. Box 285.

ARCHITECT, SURVEYOR AND CLERK-OF-WORKS, with over 25 years' theoretical and practical experience in all branches of the profession, seeks permanent and responsible position. Experience includes war damage, dilapidations, property management and maintenance, and a sound knowledge of estate agency; not liable for military service, rendered war service during 1914-18. Box 286.

ARCHITECTURAL AND SURVEYING ASSISTANT (26), five years' experience, discharged Army, desires change of appointment with Local Authority or private firm. Full particulars on request. Box 287.

JUNIOR ASSISTANT requires position in London Area. School Cert. Two years' experience. R.E.P., 77, Egerton Road, N.16. 288

ARCHITECTURAL DRAUGHTSMAN, willing to prepare and draw schemes for an Architect. Able to work week-ends and evenings. Box 289.

ARCHITECT, A.A.Dipl. (28), wants position in South-west London or Surrey. All-round experience. Box 290.

ARCHITECTURAL ASSISTANT, Inter. R.I.B.A., age 21, exempt; four years' architectural training, two-and-a-half years' varied office experience. Seeks post providing experience in design and supervision of work. Box 291.

DIP. ARCH. A.R.I.B.A., 38, exempt, versatile, seeks free lance or part-time work in East London; conversions, estate and post-war development, licensed premises, factories, war damage, prefabrication, and industrial designing. BM/ZTYJ., W.C.1. Box 292

ASSISTANT ARCHITECT, Registered (36), seeks part-time appointment with firm of architects. Special experience in design, construction, heating and electrical services, etc., and specifications for industrial and commercial buildings. Box 293.

SENIOR ASSISTANT, passed A.R.I.B.A., P.A.S.I. exams., urgently requires spare-time work. Surveys, working and detail drawings, specifications, estimates, schedules of condition, war damage or dilapidations prepared at reasonable charges. Box 294.

Planning

As originators of the Auto-Recorder System of Machine Milking we have had extensive experience of planning lay-outs to accommodate the new technique. The service of our Technical Department is available to any Architect planning or modifying farm buildings for this purpose. Write in confidence to:—The Planning Dept., Gascoignes (Reading) Ltd., Gascoigne House, Berkeley Avenue, Reading. 603

Other Appointments Vacant

Four lines or under, 4s.; each additional line, 1s.

ASSISTANT EDITOR wanted for Architectural Paper. Write, with full particulars of qualifications, salary required, &c., to Box 51.

SCOTTISH YOUTH HOSTEL ASSOCIATION. EXECUTIVE ASSISTANT. Woman with organising experience; knowledge of building construction so as to be able to instruct tradesmen and/or experience in preparing publications an advantage. Commencing salary £300 to £325. Applications, stating qualifications and experience, and marked "Personal," to Hon. Secretary, S.Y.H.A., 13, Rutland Square, Edinburgh, 1. (This advertisement is authorised by the Ministry of Labour.) 606

Miscellaneous

Four lines or under, 4s.; each additional line, 1s.

A. J. BINNS, LTD., specialists in the supply and fixing of all types of fencing, tubular guard rail, factory partitions and gates. 53, Great Marlborough Street, W.1. Gerrard 4223-4224-4225.

SPECIFICATIONS AND BILLS OF QUANTITIES, etc., expeditiously and accurately typed or duplicated. Translations and Facsimile, Typewriting. All work treated confidentially. Miss G. Saunders, Typewriting Bureau, 17, Dacre Street, Westminster, S.W.1. Telephone: Whitehall 2605.

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Educational Announcements

Four lines or under, 4s.; each additional line, 1s.

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