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NOISE 7

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NOVEMBER 1941

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HOUSES FOR DEFENSE

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PRIORITIES and the SPAB order

Under screaming headlines in the nation's press, OPM's Supply, Priorities and Allocations Board last month announced "a new policy" curbing for the duration of the national emergency all new private and public construction except that which is "either necessary for direct national defense or . . . essential to the health and safety of the people." To the bulk of the building industry—all residential builders —this "new policy" was not news, despite its headlines. For them, it merely reiterated the housing priority declaration of the preceding month (ARCH. FORUM, Oct. 1941, p. 2). SPAB's "new policy" was actually new only for non-residential builders, and they might well have anticipated it as the logical next step in the development of an industry-wide priority system.

NON-RESIDENTIAL BUILDING

For these non-residential builders, the SPAB order means just what it says. Government has tabooed all non-essential, nondefense construction projects. While the order indicated that the taboo might be policed by the refusal of local governments to issue building permits for such projects, probability is that all such building will cease of its own accord, for without priority assistance builders will be unable to obtain the essential materials (primarily metallic items) appearing on the official critical list.

Since private non-defense non-residential construction has tapered off during recent months in line with increasing uncertainties as to the future, the SPAB order hits public non-residential building hardest. Henceforth, to receive a priority rating, any proposed project (even those financed by Federal. State or local governments) must be submitted to Washington* and approved as either a direct defense project or as an essential non-defense project. Eligible for priority assistance will be tank arsenals, powder plants and strategic highways; schools, sewage disposal plants and firehouses in defense-boomed communities; urgently needed hospitals and water supply systems in non-defense communities; other such obviously essential projects. All projects approved under the \$150 million Defense Public Works program will, of course, enjoy priority assistance. On the other hand, such non-residential projects as these will ordinarily be classed as non-essential-particularly if proposed for construction outside defense areas: courthouses, office buildings, stores, hotels, churches, recreation buildings, bridges, power houses and gas stations.

Unaffected by the SPAB ban are proj-

*The new Construction Branch of Leon Henderson's OPM Division of Civilian Supply, with which Chief John L. Haynes' old Building Materials Branch has been merged. ects of all types which were under construction when the order was issued. They will receive a comparatively low priority rating entitling them to receive critical materials after more urgent new defense construction needs have been met. And, while it has yet to announce the details, Government has promised priority assistance for all non-residential repair and maintenance operations which are essential to public health or safety.

RESIDENTIAL BUILDING

Unmodified by the SPAB order, the residential building priority picture is the same as it was two months ago, although subsequent official interpretations have clarified it considerably. Priority assistance will still be limited 1) to new public and private housing in specified defense areas which is marketed at a rental of \$50 per month or less, excluding utilities, or at a sale price of \$6,000 or less, including land, 2) to residential remodeling projects in defense areas which will produce increased living accomodations and 3) to all new housing in non-defense areas which was under construction on September 1.

Herewith, the order in which the various types of residential building rate with respect to priorities and, therefore, the ease with which they may be completed:

1. Defense remodeling operations will receive (Continued on page 4)



SULLIVAN W. JONES, director of housing priorities, comments on their effect:

One week after the much heralded SPAB ban on non-essential construction, Chief Sullivan W. Jones of OPM's Housing Priorities Branch addressed New York City's Building Congress, made the most forthright statement yet to come from official sources on the outlook for private building. Worthy of particular note are these excerpts from Jones' address:

"A tremendous amount of pressure is being put on private defense housing to encourage private enterprise to go into the field and to expand that field to the Nth degree. Mr.

Palmer's* estimate is that by July 1, 1942 we shall need 525,000 new single family units in one form or another. Of that 525,000, Mr. Palmer thinks that public housing should take care of 100,000 and that private enterprise should take care of 425,000. Now, when the machinery for extending priority aid to housing was set up, the top board of OPM decided that it would be unwise to go overboard on the total program, and so approved as a starter a program comprising 300,000 units, 100,000 of which were to be publicly financed, and 200,000 to be produced by private enterprise. My own feeling is that Mr. Palmer's estimates of the amount of housing that private enterprise will produce is perhaps a little off what we are actually going to secure ...

"This is the first time that preference rating orders or priorities have been issued in the field. Heretofore, they have all gone to Washington for final documentation. I am hoping that this thing is going to work so well and so expeditiously that some of our other orders are going to be issued in the field and take some part of the paper work and the resultant load out of Washington...

"We have been severely criticized for putting ... ceilings on rent (\$50) and ownership (\$6,000), but I know, and everybody who builds small houses knows, that you can build a house anywhere in the United States, a livable house suitable for defense workers, and sell it with the land for less than \$6,000. We are standing pat on that in spite of the pressure ...

"SPAB's famous statement . . . put the whole country on beam ends; partly as a result of misunderstanding and partly from

*OPM's Defense Housing Coordinator.

shock ... I think the shock came to most of these people because of their characteristically American optimism. We must face the fact that we are not going to pull through this situation without taking it on the chin and without taking it on the belt. If I do nothing else today, I want to leave that thought uppermost in your minds. We have reached a point now where if we are going on with the defense effort, we have got to make sacrifices...

"Aside from completing buildings which are started, I want to say to you that the SPAB announcement meant exactly what it said. There will be no more non-defense construction that isn't essential...

"Now, the construction industry is pretty much up against it, and that includes the professions. I can speak with first-hand knowledge and a lot of sympathy for the architectural profession. They are out on the end of a limb. I think the time has come for the construction industry to conduct a campaign in Washington to sell the Government a program which has been sold to the Government mostly by labor or manufacturing. They put Mr. Odlum in charge of the Defense Contracts Service down there and his job is to spread manufacturing among the small units and, I think, we have got to do that in construction so that we begin to spread employment. We should not put all these huge jobs into very few baskets; they should spread out, even by subcontract, and I think the same thing must be done with the professions, the engineers and the architects. It seems to me that now more than at any time in the history of construction we need an integrated industry to be led by outstanding thinkers and planners and people with vision."

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Your idea of a sturdy bedroom may be something like the one shown at left. Designed for plenty of he-man comfort, it is built of materials to match any rough-and-tumble scuffle. Walls and ceiling, for example, are Presdwood*- a Masonite* wood-fibre hardboard with a marble-smooth surface of unusual hardness. Many architects have selected Presdwood - or its highly moisture-resistant companion product, Tempered Presdwood-for use throughout the homes they have designed. They have chosen it not only because of its durability, but because it is easy and inexpensive to install and offers unlimited decorative possibilities.

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PRIORITIES

(Continued from page 2)

the highest housing priority rating (A-2) provided they are located in defense areas and increase the living accommodations (rentable rooms or apartments) of the buildings remodeled. Reason for this high rating is that remodeling is cheaper, quicker and requires smaller amounts of critical materials than new construction. National defenders in Washington expect that some 35,000 new defense living units (rooms and apartments) will be provided each month through remodeling.

2. Defense houses for rent will receive preference ratings ranging from A-2 through A-4, may therefore be completed with comparative ease. This, however, is of but little importance to private enterprise which never has built many houses for rent and in recent months has been building a decreasing number of apartments in the under-\$50 rental range. This high priority classification will therefore be dominated by publicly financed defense housing, all of which is for rent. (Projects built under the U.S. Housing Authority's slum clearance program fall into this priority classification only if they are located in defense areas and are intended primarily for defense worker families.)

3. Defense houses for sale will benefit from preference ratings between A-5 and A-10. This is exclusively private enterprise's field of operation, for Government builds no houses for sale.

4. Non-defense houses under construction on September 1 will be aided by priority ratings in the high B's, will thus be assured of critical material deliveries. The term "under construction" is subject to local interpretation; it may mean completed footings or foundations for a single house, or merely completed excavations for a group of houses.

5. Non-defense houses proposed for construction will receive no priority assistance. (In the eyes of Government, there is no such thing as an essential non-defense house, no matter what its cost and location.) In this category fall 1) all new housing, public and private and irrespective of sales price or monthly rental, which is proposed for construction outside the 275 officially designated defense areas and 2) all proposed new public and private housing in these defense areas which will sell for more than \$6,000 or rent for more than \$50 per month. Actually, there is no law prohibiting this type of construction, but builders will undertake it without the help of priorities and, due to the operation of the priorities system, will experience the increasing difficulty and the eventual impossibility of obtaining the essential materials on Government's critical list.

PRIORITIES AT WORK

A preference rating is assigned to an eligible housing project by an OPM field

office only after the builder has applied for priority assistance at his local FHA office and the application has been checked by a field representative of the OPM's Defense Housing Coordinator. (Exception: eligible public housing projects receive preference ratings directly from Washington.) This rating signifies that OPM has allocated to the project enough of the various critical raw materials to assure its completion after all higher rated projects have received their requirements.

The system works like this: the builder of a rated project orders his materials from his local dealer who is required by law to fill this order as soon as he has filled higher rated orders and before he has filled lower rated orders. Likewise, the wholesaler or distributor fills the dealer's requirements in the order of the preference ratings accompanying them. The same procedure is repeated by the manufacturer in supplying the wholesaler or distributor. Finally, after the manufacturer's initially allocated inventory of raw materials and sub-assemblies (sufficient to start the priority system rolling) have been exhausted, Government will periodically allocate only enough additional materials to replenish stocks used in the filling of preferencerated orders.

It stands to reason that manufacturers will sell to wholesalers only on preference rated orders; otherwise they would eventually sell themselves out of business. Similarly, wholesalers and, in turn, dealers would soon find themselves without anything to sell, if they filled unrated or nondefense orders. There is small chance, therefore, that would-be builders of nondefense construction projects will be able to obtain critical materials necessary to their completion-at least not after existing inventories (which appear to be large*) have been exhausted. Thus will Government effectively curb non-essential construction without actually prohibiting it by law.

To facilitate defense remodeling operations, OPM has a separate priorities system on the fire. Yet to be officially announced, it will probably permit a defense remodeler to side-step the usual red-tape preliminaries, go directly to his dealer and merely certify that the requested critical materials are to be used in a defense remodeling operation. (OPM will police the program, punish misusers of its privileges.) This certificate will entitle the dealer, and, in turn, the wholesaler and manufacturer to replenishment of the materials sold. And as indicated above, these certificates

*An early September survey of the Department of Commerce indicated that inventories of plumbing and heating supply wholesalers were 38 per cent higher than a year ago, that electrical goods wholesalers' inventories were up 42 per cent and general hardware up 17 per cent—all at or near peak levels. Among the more general and acute shortages were the standard sizes of common nails, various items of structural and reenforcing steel, galvanized pipe and sheet metal, copper and brass pipe and other copper and brass items. will probably carry the equivalent of an A-2 preference rating. Some such system will also be developed for the obtaining of critical materials necessary for the repair and maintenance of all types of buildings, defense and otherwise.

PRIORITIES AND THE BUILDER

While a builder may learn the ABC's of housing priorities from his local FHA office, he probably cannot pick up there the administrative technicalities of the program. For this reason, the 700 odd mortgage bankers who at their annual convention (p. 38) last month questioned Assistant FHA Administrator Earl S. Draper on the meaning of housing priorities probably know more about the general program than do most builders. These are some of the more important facts they learned:

► A priority rating is no guarantee that a project will get the necessary critical materials in a hurry. It is merely evidence that sufficient raw materials (still in the ground, perhaps) have been earmarked for completion of this project and that they will be delivered when all more urgently rated projects have been provided for. The lower the rating, the longer the delivery delay.

► Priority ratings may vary from one defense area to another for the same classification of housing. Thus, defense houses for sale within easy commuting distance of a bomber plant (one of the most vital defense items) will quite logically receive a higher rating than similar housing in the neighborhood of a plant producing less vital defense items—say, rifles.

► However, all ratings in a given area will be uniform for a given classification of defense housing. Thus, taking the example above, all rental defense housing built both by Government and private enterprise within commuting distance of the bomber plant would be rated the same say A-2. And, regardless of price differentials below \$6,000, all defense housing for sale near the rifle plant would also receive a uniform, but lower, rating—say A-4.

Each project preference rating is good for four months before it expires. In other words, the builder is allowed four months within which to use the rating by ordering his materials. This does not mean that he is required to have started construction within the four months.

► While his application for priority assistance must state that preference will be given to defense worker families in the marketing of his houses, a builder will not be expected to let the houses stand empty for long while he is waiting for such occupants. He may sell to others.

► There is nothing to prevent the sale of a defense house which was originally built as a rental unit (and therefore entitled to a higher preference rating), provided the change in the marketing tactics was made (Continued on page 34)



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FORUM OF EVENTS

The Curious Story Of The Ventilating Tower

Once upon a time there was a big argument in New York about a proposed new traffic route from the Battery to Brooklyn. Commissioner Robert Moses of the Triborough Bridge Authority wanted to build a bridge. The Tunnel Authority wanted to build a tunnel. On the side of the Tunnel Authority were Manhattan real estate groups, some civic-minded and vociferous architects who feared damage to the beauties of Battery Park (see picture), the War Department (bridges are vulnerable to bombers), and, in the end, President Roosevelt.



So the tunnel won.

Fortunately for architecture, even a tunnel gets above ground sometime. For example, to get its air it needs ventilating towers.



This is a ventilating tower:

With the approval of everyone, even the OK of Commissioner Moses, the Tunnel Authority designed its tunnel, and the ventilating towers.

This one goes at the Brooklyn end,



and this was to go in the middle:



Whereupon, some of the watchful citizens who had objected to the bridge became worried about the middle tower. It was to be right out in the bay where everyone could see it. For some reason they did not worry about the other two towers. Perhaps they thought they might never see them. At any rate, they got everyone to agree to have a competition for the tower that everyone would see, and the 200-odd architects on the Mayor's list were allowed to enter. Prizes totaling \$3,750 were put up.

The lucky competitors had little to do, much to gain. They were given the structure, complete except for the facade. Theirs not to reason why, theirs but to frost the cake.

(Continued on page 12)



HOW TO HOLD PLATE GLASS IN SHOW WINDOWS

Every architect and contractor knows that plate glass must be handled and *held* with care! That's why Zouri Rolled Safety Key-Set BRONZE Sash and Bars are designed to give full cushion grip on glass. This important feature assures maximum protection against the danger and

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ILLUSTRATED STORE FRONT MAGAZINE, THE ZOURI NEWS, IS YOURS FOR THE ASKING

FORUM OF EVENTS

(Continued from page 10)



Here is the winner. The Jury gave it first prize because it *does not* look like a ventilating tower. In fact the Jury report went even further, helpfully suggesting ways of making the building look even less like a ventilating tower.

Here is the runner-up: The Jury gave it second prize because it *does* look like a ventilating tower.



This decision, a veritable judgment of Solomon, should be preserved for posterity. After all, not even the agile weathervane has ever been able to point in two directions at once.



WILLIAM L. BOTTOMLEY



DON E. HATCH



HARVEY WILEY CORBETT







ANTONIN RAYMOND



WALLACE K. HARRISON



WILLIAM LESCAZE



EDWARD D. STONE Peter Juley Photos

The pictures above show designs that didn't get anywhere. The design of Bottomley was presumably thrown out because he obviously refused to take the program seriously. This, however, does not explain the rejection of Harvey Wiley Corbett's design, the only one to see the subtle connection between ventilation and peace. Antonin Raymond made the mistake of designing a facade that showed its size and accented the building's function. So did Hatch, Weinstein and Lescaze. Edward Stone, who presumptuously looked into the technique of ventilation, found that water was liberally used in the process. His indelicate revelation of this fact quite naturally removed him from the running.

Since the New York City Tunnel Authority is not bound by the program to make any use of any of the designs, the middle tower may yet be built as shown on page 10. And this is where we came in. Perhaps what some tunnels need is a well-ventilated competition.

(Continued on page 14)

DAY IN-DAY OUT **DRIVE IN – DRIVE OUT** with Trouble-Free SATISFACTION

Rō-Wa OVERHEAD TYPE DOORS

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FORUM OF EVENTS

Award. To George Nelson, associate editor of THE ARCHITECTURAL FORUM and member of the New York architectural firm of Hamby & Nelson, the Scarab Gold Medal for 1941. The award is national, and is made annually by the Scarab Fraternity* to an architect or landscape architect under 35 for "meritorious work and future promise."

> *The Scarab Fraternity is a national organization of architectural students founded around 1909. It has twelve branches scattered throughout the country, about two thousand alumni and active members, and sponsors exhibits, lectures and a semi-annual publication. Its first Gold Medal award, last year, went to Architect William Pereira of Chicago and Los Angeles.



Life-Gehr







Mid-town Airport. To meet New York's need for more rapid and convenient air transport, Designer Raymond Loewy proposes a helicopter landing field, built high up on steel pylons over the park behind the Public Library. The helicopters would act as air taxis between the city and the main field outside. The designer claims a dual value for his scheme: it could be used over an air raid shelter, the landing surface serving to break the impact of large bombs.

Medal for Moses. Last month the American Institute of Steel Construction made its first award of the J. Lloyd Kimbrough Medal to Robert Moses, for "an outstanding contribution to the structural steel fabricating industry." Busy Commissioner Moses accepted the medal by telephone, with a speech demanding less politics in defense, flaying the steel industry for its lack of interest in post-war reconstruction, recommending a "truce as to non-defense construction."



Louis H. Dreyer



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ALUMINUM, DEFENSE, AND YOU

OCTOBER WAS A MILESTONE MONTH

There have been three other such milestones for civilian uses of aluminum during the past 18 months.

WHEN, ON MARCH 25, 1940, the price of Alcoa Aluminum ingot was reduced from 20c to 19c a pound, it automatically increased the number of civilian applications where using aluminum would be good cost arithmetic.

Every application carries its own special set of conditions. They determine how much you can pay to save a pound of weight, to get extra heat conductivity, or reflectivity, or what not. 19-cent ingot widened the circle of aluminum's usefulness.

AUGUST 1, 1940 WAS THE SECOND milestone. Economies growing out of greater volume of manufacture, and economies stemming from continuing research, brought the announcement of 18-cent ingot. The civilian manufacturer look-ing to his future could see, in the

offing, more ways to use aluminum than ever before.

Perhaps you were one of the thousands who filed away in your book of futures the reminder that "when this thing is over, we must figure on using more Alcoa Aluminum."

THIRD MILESTONE showed up almost before you got that note made. November 18, 1940 saw another reduction on Alcoa Aluminum ingot to 17c a pound, making a total reduction of 15% in the midst of a general seller's market. 17°

Defense got most of the immediate benefit, but the future of aluminum for you, and you, and you, was writ larger than ever.

THEN CAME 15c INGOT, effective Oct. 1, 1941, with accordant reductions in fabricated forms of Alcoa Aluminum. This means that the arithmetic of weight saving is all new, since last you figured on using this versatile metal in a civilian application. When the emergency is over, the fact is that all your old material cost comparisons will be as dead as a dodo.

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EINSTEIN TOWER, POTSDAM, 1920



SCHOCKEN RESIDENCE, JERUSALEM, 1936

ERIC MENDELSOHN, by Arnold Whittick. Faber & Faber, Ltd., London. E. Weyne, New York, U. S. distributors. 180 pp., illustrated with drawings and photographs. $7\frac{1}{2} \times 11$. \$7.50.

"The reason that I conceived the idea of writing this book at all was because Mendelsohn seemed to me to be, more than any other, the representative architect of the age—the era of industrialization, of the machine, of steel and concrete; because in his work one finds the most convincing expression of the fundamental characteristics of modern life."

These are strong words, for contemporary architecture is by no means in lack of great names. Claims such as this have been made for Mendelsohn before, and they have invariably provoked some controversy, for there are critics who insist that his work is bulky but negligible, that it merely follows along lines previously established by bigger men. Others base their arguments on the influence of Expressionism, easily recognized in Mendelsohn's designs; since Expressionism was a movement of minor significance, it is argued that Mendelsohn must be equally unimportant. These arguments alone tend to suggest the contrary, since mediocrity does not tend to provoke discussion. It is perfectly true that Mendelsohn was not one of the great pioneers of modern architecture, but he can hardly be blamed for appearing on the scene too late to assume such a role. And it is equally true, as a dispassionate examination of his buildings will reveal, that Mendelsohn, as early as the 1920's, made contributions that were far from negligible.

Like Gropius, Miës van der Rohe and many others, Eric Mendelsohn participated actively in the development of an architecture that has since found echoes all over the world. Like these men, too, he left his country due to political events and has since projected his buildings as well as his influence on an international scale. Mendelsohn was born in 1887 in a small town in East Prussia. From his mother he acquired a love for music which has had a profound influence on his architecture. His education was conventional, and on receiving his degree in architecture in 1912 he went into practice for himself. A promising career as a stage designer, painter and architect was interrupted for four years by the war, and he was unable to resume work until the end of 1918. The following year he had an exhibition of sketches in Berlin, and he immediately became known to a large group all through Europe, who found in these powerful and restless drawings an exciting prophecy of a new kind of architecture. In these sketches, which return again and again to the theme of the industrial building, Mendelsohn did more than provide well-ordered schemes for the shelter of production equipment: he dramatized the factory as the dominant structure of the age of power. As in the Gothic cathedral, architecture suddenly became dynamic once again, with flashing horizontals and swiftly mounting masses imparting to the buildings a sense of actual motion. While admittedly fantasies, they were structural fantasies, for in every one of the designs the potentialities of concrete, steel and glass were expressed with great emphasis and clarity. In what is probably the most famous of all his buildings, the Einstein Tower at Potsdam, Mendelsohn's early sketches found realization in three dimensions, with the plastic qualities of concrete given dramatic expression. For a counterpart to these fluid shapes one must turn to works of pure engineering, such

(Continued on page 56)



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GOODYEAR Wingfoot Rubber Flooring is built to stand up under the strains of heavy furniture and constant foot traffic – that's why more than 80,000 square feet have been installed in the new building of the United Benefit Life Insurance Company.

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Sanymetal Toilet Compartments are noted for their rugged utility. They embody sound, simple and exclusive construction features that make for easier installation and insure faultless sanitary service throughout the years to come. These features are the result of over 25 years of research and experience in making well over 50,000 installations.

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For a full description of all five types, refer to Sanymetal's Section 20/22 in Sweet's for 1941

6



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TE TALT PARTAN TAT IN ALTOR TO MAKE A TATIC BOOM ENTROPING LIEL THO WANT IT TO BE

BACKGROUND FOR ACTION

Forum:

The problem attending improvement and redevelopment of urban blighted areas are many and complicated. They involve difficult legal, procedural, and financial questions of land assembly, property improvement, and reconstruction on and off the site. Of equal importance are problems of a city-wide nature-the financial situation of the city and the extent to which it may be justified in undertaking rebuilding of blighted areas, the soundness of its city planning program and determination of desirable urban land uses, the ability of the city through its own administrative agencies to act promptly and to protect itself through suitable controls against future recurrence of property maladjustments.

There is a tendency to assume that all that is needed is for the Federal government to play Santa Claus to the cities and these problems can be solved. While admitting that many cities may need financial assistance to work out a longtime program of improvement of blighted areas, I believe that in nine cases out of ten American cities do not have the knowledge of conditions, the organization, the necessary legal aids, the planning perception, or the determination to both solve the present problems and set up safeguards to prevent future recurrences.

The Federal Housing Administrator with over three billions of insured longterm mortgages, largely on urban properties, has a real stake in the future of American cities. For this reason and because of our belief that a successful solution of these problems of blight must be promised on an informed action program by the cities themselves that we have devoted our initial studies of this problem extending over the past year to the preparation of a guide or handbook on urban redevelopment for use by cities. We believe it essential that our cities pursue studies which will give a better understanding of the problems presented than now exist-that each city set up and give adequate support to a thoroughly qualified planning agency that shall prepare a complete master plan of desirable land use and services-that a corporate arm of the city be set up to acquire by purchase, exchange, foreclosure, or gift land specified by the master plan as within blighted areas; and lease such land under longtime control for both private and public redevelopment-that cities take every step possible by legal aids and otherwise to encourage private redevelopment and rehabilitation of blighted properties in such a way as to provide for progressive amortization of redevelopment and to prevent periodic recurrence of such problems.

While urban blight can be eliminated by Federal grants conceived on the basis of post defense need for work relief, there is no assurance of intelligent, lasting reconstruction suited to the growth and changes in the city and the metropolitan area unless the city is alive to its situation, willing to pledge its own resources insofar as possible, and willing to take the responsibility for action. It is for this reason that FHA is devoting its first report on this problem to tangible suggestions for action by the cities.

Washington, D. C.

E. S. DRAPER

Intrigued by the rumor of such a report, THE FORUM requested further news from Administrator Draper. A copy of the new handbook on "Urban Redevelopment in American Cities," may be had by writing the Federal Housing Administration, Washington, D. C.--ED.

THE CURRIER CASE

Forum:

"The Strange Case of the Currier Bid" which was published in the New York Times, Friday, October 10, is most interesting and I wonder whether THE ARCHI-TECTURAL FORUM will go into it. For one standing outside the authoritative quarters it would be most illuminating to know how much is politics and how much is real technical progress. It seems to be quite impossible to make a saving of 44 per cent for 300 housing units only because the savings we all expect from prefabrication can come only step by step on an evolutionary basis: but somebody must have risked the money in order to promote such a bid. Whatever the reasons may have been, prefabrication comes here for the first time right into the political limelight of defense housing and an analysis of this case, as far as it may be made public, would be most valuable.

I hope THE FORUM will find an answer to this strange case.

WALTER GROPIUS

Cambridge, Mass.

No disclosures before the Truman Committee, including Mr. Sidney Hillman's testimony, appear to warrant any change in THE FORUM'S comment on page 330 .- ED.

POST-WAR PATTERN

Forum:

I wish to congratulate you on the Sep-

tember issue and particularly the section devoted to planning.

Aside from my interest in this as a practicing architect, I happen to be Chairman of the City Planning Commission of Chattanooga. This commission is one of those which is more or less ineffective, due to the fact that the city has not appropriated funds to maintain its staff. At present I am engaged in an intensive campaign to secure such funds and establish a staff, in order to develop a program for future development and capital investments in cooperation with various State and Federal agencies. Tennessee, as you may know, has some of the best State Legislation on planning and a very effective State Planning Commission and staff. Several of our cities are also well organized for planning work.

I do not know just what your policy may be in reference to quotations or partial reprints of material appearing in THE FORUM, but if there is any way you could give me permission to use parts of the September article on planning, with local newspapers, I believe it might be of considerable benefit as a part of our publicity campaign to secure popular backing and to arouse sufficient interest to bring about comprehensive planning and programming for Chattanooga. I will appreciate anything you may be able to do for me in this matter.

HARRISON W. GILL.

Chattanooga, Tenn.

Forum

... I congratulate you on the Post-War Pattern series. Along its broad lines the text is so clear, in purpose and in expression, that it could well be accepted as a text for Planners with one single exception. The exception is the recommendation of developing a super planning board which would impose its will on local municipalities. I am surprised to find such a flaw in a study which is otherwise excellent.

Anyone now engaged in municipal or county planning is aware that a super board can act only in an advisory capacity and that it is up to the local Planning Boards and municipalities to work out their own problems. Unless the entire tax structure of the country is revised, your plan is an impossibility.

Reconstruction is a municipal function and not that of the Federal Government.

I may remark that the comments from most of the members of your panel are disappointing. Your editorial is so objective and visionary that I am not surprised to

(Continued on page 52)

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★ Brooklyn Public Library offered an unusual opportunity to include the convenience and modern improvement of **RIXSON Builders'** Hardware, and the architects made effective use of the possibilities.

Re-designed over the steel skeleton completed in classic style a generation ago, Brooklyn Public Library is now a representative example of modern construction. **RIXSON Uni-Checks** provide a new and efficient concealed control for the fine interior doors.

The door hardware specifications in this case are an example for architects no less than the building as a whole. SPECIFY RESSON FOR EFFICIENCY, DURABILITY AND ARCHI-TECTURAL HARMONY.



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Precast in Colorful Concrete





Stabs. Color due to exposed aggregates. Architect, C. C. Hartman, Jr.; Contractor, H. L. Coble; Slabs by Arnold Stone Co., all of Greensboro, N. C.

Section of plan shows how slabs are anchored; how varied shapes permitted the coping, the spandrel slab including the return above the sign, and the lintel, each to be cast as one unit.

Precast SLABS provide color, distinctive texture, and monolithic appearance. Compare the small number of joints in this store front with the many joints in adjoining structures and consider the advantages.

Consider the advantages of precast Architectural Concrete Slabs in this small, colorful store front—

Large size and varied shape permitted use of only 26 slabs. Compare this with the small units and large number of joints in adjoining buildings. Fewer joints mean the building (1) is more weather-resistant; (2) is less subject to leakage; (3) was quicker, easier, and lower in cost to erect; and (4) required less water-proofing, flashing, and pointing.

The name, "Du Pont," was cast into the slab during its fabrication. Color is due to exposed aggregates embedded in a matrix of Atlas White cement. Color is as permanent as the stone itself.

Architectural Concrete Slabs offer architects many other advantages in new construction and modernization. Remember these basic facts.

1. Architectural Concrete Slabs are cast in a mold in almost any desired shape carefully following architect's design and ranging up to 100 square feet in area, 20 feet or more in length—and usually about 2" to 232" thick.

2. High structural strength (over 7000 p.s.i.) comes from factory fabrication, scientific proportioning, low water-cement ratio, vibration, re-inforcing with adequate galvanized steel fabric, careful curing, and selection of suitable aggregates.

3. Permanent, unfading color effects are the result of exposing selected aggregates, colored or white, such as crushed, graduated quartz, granite, ceramics, or vitreous enamels in a matrix of Atlas White Cement.

Consider thin, precast slabs for your next job. They are available from producers throughout the country. For more complete data, see Sweet's Building File, Section 4/21, or write Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Chrysler Building, New York City.

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HOUSES

HOUSE IN EAST SANDWICH, MASS.

CARL KOCH, ARCHITECT



Paul Davis Photos



THREE BEDROOMS, TWO BATHS, DINING-KITCHEN, GARAGE



All photos, Paul Davis







BASEMENT

CARL KOCH, ARCHITECT



LIVING ROOM

KITCHEN



This unpretentious hilltop house illustrates an approach to residence design which under present conditions seems completely valid. In essence it is the application of what has been learned in the course of modern architecture's development to the local level of building technique. The result here is a frame house with clapboards and a shingle roof, differing very slightly in appearance from the most common of New England types. There is no effort to excite or surprise. The plan is rational and direct, with a clean-cut simplicity that reflects the simplicity of the problem. The interiors provide an uncomplicated background for comfortable living, and offer no competition to the magnificent views. Cost: \$8,000, at about 23 cents per cu. ft.



CONSTRUCTION OUTLINE

STRUCTURE: Exterior walls - pine clapboards over Celotex Corp. Vaporseal; insidestuds, Rocklath, U. S. Gypsum Co., and plaster; fireplace wall of red cedar clapboards. INSULATION: Outside walls — Vaporseal, Celotex Corp. Attic floor-rockwool, Johns-Manville.

WINDOWS: Sash-wood casement, Andersen Frame Corp., Glass-Thermopane, plate and double strength, Libbey-Owens-Ford Glass Co.

FLOOR COVERINGS: Living room-cocoa matting. Kitchen and bathrooms-linoleum, Armstrong Cork Co.

HARDWARE: By P. & F. Corbin. PAINTS: By Pratt & Lambert.

KITCHEN EQUIPMENT: Range, refrigerator and dishwasher-Hotpoint, Edison General Electric Appliance Corp. BATHROOM EQUIPMENT: By American

Radiator-Standard Sanitary Corp. Cabinets -Charles Parker Co.

PLUMBING: Hot and cold water pipes-Streamline copper tubing, Mueller Brass Co. Soil-cast iron. Pump-Deming Co.

HEATING: Hot air system, filtering and humidifying, Gar Wood Industries. Water heater-Edison General Electric Co.

THREE BEDROOMS, DEN, SEPARATE DINING ROOM, FULL BASEMENT



The Woodridge development, a 175-acre tract a few miles outside the booming city of Hartford, was opened in 1938. Despite the strongly marked trend toward the city's outskirts, the project was opposed by the lending agencies and utilities as being too far out in the country, and their cooperation was obtained with great difficulty. There are now about forty houses in the development, representing a very substantial achievement, as selling prices run from \$9,000 to \$18,000.

The land is rolling and wooded, and includes an abandoned ice pond now being turned into a community recreation center. Lots run from a half acre to two acres; their size, in combination with the trees and uneven terrain, give each house all needed privacy. There was no attempt to standardize on the houses beyond the restriction of designs to a Colonial formula. Most of the houses were built on order for known LOWER TERRACE











LIVING ROOM

FRONT ELEVATION



buyers, which meant the preparation of individual plans in almost every case.

The house on these two pages is a good example of the larger residences. Its plan is long and informal, adapted to a sharp change in level at one end. Its three bedrooms are divided between the two main floors, and a fourth bedroom could be made out of the den, which adjoins a lavatory. There are two recreation rooms, one of which opens on a terrace at the lower level. The general appearance of the house, both inside and out, shows an attempt to recapture the spirit of the early eighteenth century house. Window muntins are heavy and panes are small; floors are a modern version of the old pegged planks, and the second floor windows, if impractical, are undeniably picturesque.

NORRIS F. PRENTICE, ARCHITECT





DEN

TWO BEDROOMS, BATH, LIVING-DINING ROOM, SPACE FOR FUTURE BEDROOMS



A very compact little house, which, if conventional in appearance is unusual in plan. The main entrance opens into the living-dining room and the vestibule creates an excellent dining alcove well out of the main lines of circulation. The service entrance is inconspicuously located on the driveway. Bedrooms and bath form a private unit at the rear of the first floor; the stair to the bedrooms above opens into the living room.



THREE BEDROOMS, BATH, DOWNSTAIRS LAVATORY, DEN



Courtesy, Hartford Courant

The square plan of this one and a half story house shows a familiar arrangement, with the den off the living room and the lavatory as the only variations. Placing the garage a short distance from the house creates a desirable horizontal appearance and provides a shelter for the service entrance as well.



TWO BEDROOMS, BATH, LIVING-DINING ROOM



NORRIS F. PRENTICE, ARCHITECT



Above, a variation of the preceding scheme of house, passage and garage. The plan shows a compact arrangement of minimum facilities. The openness of the passage is explained by the view of the small lake beyond. In the house below, the kitchen forms the link with the garage. The close relationship of the lavatory and kitchen is a good feature often repeated in the houses of this development.

TWO BEDROOMS, BATH, DEN, DOWNSTAIRS LAVATORY





THREE BEDROOMS, BATH, LAVATORY, LAUNDRY, MAID'S ROOM



NORRIS F. PRENTICE, ARCHITECT

The most interesting feature here is the long strip kitchen with laundry and service entry beyond. The lavatory, as previously noted, is treated as an adjunct to the kitchen rather than a convenience for guests, and serves as part of the maid's bath as well. A comparison of the exterior with that of the other darkpainted houses in this group suggests that the white shutters are more of a detriment to its appearance than a contribution.





CONSTRUCTION OUTLINE

STRUCTURE: Exterior walls—studs, sheathing, 15 lb. felt paper and clapboards; inside —Rocklath and plaster, U. S. Gypsum Co. Floor construction—sub-floor, oak finish. ROOF: Covered with red cedar shingles.

SHEET METAL WORK: Flashing and leaders — copper. Ducts — galvanized sheet metal.

INSULATION: Outside walls and ground floor—Balsam wool blanket, Wood Conversion Co., and Jiffy blanket, Jiffy Mfg. Co. Attic floor and roof—rockwool bats. WINDOWS: Sash—Andersen Frame Corp. Glass and glass blocks — Pittsburgh Plate Glass Co.

FLOOR COVERINGS: Main rooms—oak. Kitchen — linoleum, Armstrong Cork Co. Bathrooms—rubber tile.

WALL COVERINGS: Main rooms-wallpaper, Imperial Paper & Color Corp. Bathrooms -Veos enameled metal tile, Youngstown Pressed Steel Co.

WOODWORK: Trim and doors-Morgan Sash & Door Co.

HARDWARE: Wrought iron.

PAINTS: By Devoe & Raynolds.

ELECTRICAL INSTALLATION: Wiring system—General Electric Co. Fixtures—Plainville Metal Works. KITCHEN EQUIPMENT: Range and refrigerator—General Electric Co. Sink—Kohler Co.

LAUNDRY EQUIPMENT: Washing machine —Bendix Home Appliance, Inc.

BATHROOM EQUIPMENT: By Kohler Co. PLUMBING: Hot and cold water pipesbrass.

HEATING AND AIR CONDITIONING: Summer air conditioning, York Ice Machinery Corp., General Electric Co.; Nokol, Petroleum Heat & Power Co. Grilles—Tuttle & Bailey, Inc. Regulator — Minneapolis-Honeywell Regulator Co. Water heater—Bauer Electric Co. TWO BEDROOMS, STUDY-GUEST ROOM, LAVATORY, RECREATION ROOM



BRIDGEPORT, CONN.

VICTOR CIVKIN, ARCHITECT



LIVING ROOM



ROOM

"The House of Ideas" was built by the General Electric Company, in cooperation with a local department store, to demonstrate a great variety of electrical labor-saving devices in their proper background. Among these conveniences are 225 outlets, more than double the usual quota for a house of this size, twoway speakers at the front and rear doors, recessed fluorescent lighting, silent mercury switches, an electric package receiver and a variety of other devices.

The house is located on a slope, facing east and a view of Long Island Sound: living, sleeping rooms and porches are oriented for the view and sun. The guest room-study is placed to form a private suite with a bath. A similar treatment is given the maid's room and bath, which occupies the north wing of the house and has a separate entrance through the garage. Living and dining rooms form one large L-shaped area; their arrangement makes the problem of temporary screening a very simple one. Due to the slope of the land, the large recreation room is almost entirely above ground. The kitchen, illustrated on the next page, is laid out in a compact U, has a dining corner, and is fitted with metal cabinets and all-electric equipment. Cost: \$13,000, at about 37 cents per cu. ft.

DINING ROOM





RAGE

BASEMENT

HOUSE IN BRIDGEPORT, CONN. VICTOR CIVKIN, ARCHITECT







KITCHEN

BEDROOMS





CONSTRUCTION OUTLINE

STRUCTURE: Exterior walls-studs, diagonal sheathing, building paper, Certigrade Western red cedar shingles, Weyerhaeuser Sales Co.; inside—studs and $\frac{1}{2}$ in. precast plaster board; Wolmanized treated sills. American Lumber & Treating Co. Floor construction-sub-floor, oak finish, Weyerhaeuser Sales Co.

ROOF: Covered with Certigrade shingles. Weyerhaeuser Sales Co. Deck-covered with 4-ply built-up.

FIREPLACE: Heatilator, Inc. SHEET METAL WORK: Flashing and lead-ers—copper, Gutters—Wolmanized red cedar. American Lumber & Treating Co. Ductsgalvanized iron.

INSULATION: Outside walls and attic floor -rockwool, Johns-Manville. WINDOWS: Sash-double hung and case-

ment. Weatherstripping-Chamberlin Metal Weather Strip Co.

FLOOR COVERINGS: Living room-carpet over oak. Bedrooms and halls-oak. Kitchen and bathrooms-linoleum.

WALL COVERINGS: Living room - part knotty pine. Bedrooms, study, halls-wallpaper, Strahan Co., Paramount Co., Sigfrid Lonegren Co. Kitchen—linoleum. Bathrooms —linoleum and Carrara glass, Pittsburgh Plate Glass Co. Recreation room—Pan-L-Board, Johns-Manville.

WOODWORK: Trim-pine. Doors-6-panel wood, some glass. Garage doors-Stanley Works

HARDWARE: By Yale & Towne Mfg. Co.

PAINTS: By Pratt & Lambert, Inc. ELECTRICAL INSTALLATION: Wiring system and switches-General Electric Co. Fixtures-Lightolier Co.

KITCHEN EQUIPMENT: Complete electrical unit, General Electric Co.

LAUNDRY EQUIPMENT: Sink-Crane Co. Washing machine and dryer-General Electric Co.

BATHROOM EQUIPMENT: By Crane Co. Shower—Fiat Metal Mfg. Co. Cabinets— Miami Cabinet Div., Philip Carey Co.

PLUMBING: Soil pipes-cast iron. Hot and cold water pipes-copper tubing, Bridgeport Brass Co.

HEATING: Direct fired forced warm air system, filtering and humidifying. Boiler, thermostat and water heater-General Electric Co.

TWO BEDROOMS, BATH, BREAKFAST ROOM, GARAGE





CONSTRUCTION OUTLINE

STRUCTURE: Exterior walls-wood siding and stone veneer over frame.

ROOF: Covered with red cedar shingles. SHEET METAL WORK: Flashing, gutters and leaders—16 oz. copper.

INSULATION: Attic floor-rockwool.

WINDOWS: Sash—Silentite, wood, double

hung, Curtis Cos. ATTIC STAIR: Bessler Disappearing Stairway Co.

FLOOR COVERINGS: Main rooms-oak. Kitchen, breakfast room and bathrooms-linoleum, Congoleum-Nairn, Inc.

WALL COVERINGS: Main rooms-wallpaper. Bathrooms-Salubra paper, Frederick Blank & Co.

HARDWARE: By P. & F. Corbin.

PAINTS: By Sherwin-Williams Co., U. S. Gypsum Co., Creo-Dipt Co. and Minwax Co. KITCHEN EQUIPMENT: Range — Magic Chef, American Stove Co. Refrigerator— Frigidaire Co.

BATHROOM EQUIPMENT: By American Radiator-Standard Sanitary Corp. Cabinets —Columbia Metal Box Co.

HEATING: Direct fired warm air system, filtering and humidifying, Lennox Furnace Co. Grilles—Tuttle & Bailey, Inc. Thermostat— Minneapolis-Honeywell Regulator Co. CHAPPAQUA, N. Y.

BENSON ESCHENBACH, ARCHITECT



Rudolph Edward Seppert Jr.

The advantages of good planting are very well illustrated by the photograph above. The house is planned in the form of a simple L, with the garage added as a lean-to. There is a small breakfast room which is adequate in size for family meals. Cubage: 16,000.

FOUR BEDROOMS, MAID'S ROOM, THREE BATHS, LIVING-DINING ROOM





WILLIAM WILSON WURSTER, ARCHITECT

The house split into separate buildings is perhaps the most luxurious living scheme that can be devised. Where the climate imposes no difficulties, as here, the luxury becomes more a matter of planning than of expense. In this group there are two sleeping houses, a structure for general living and services, and an automobile court with a garage. The first three face on a broad expanse of lawn. The buildings are carried out with the utmost simplicity of form and materials; a typical illustration is the living room on the opposite page, done in natural wood walls, painted wood ceiling, and a white painted brick fireplace.





CONSTRUCTION OUTLINE

STRUCTURE: Exterior walls—wood frame, redwood siding; inside—T. & G. wood, white pine and Douglas fir. Floor construction—

pine and Douglas fir. Floor construction-concrete slab. ROOF: Covered with cedar shingles. FIREPLACE: Damper-Richardson Mfg. Co. SHEET METAL WORK: Galvanized iron. WINDOWS: Sash-sugar pine, double hung. FLOORS: Hollow tile. BATHROOM EQUIPMENT: By American Radiator-Standard Sanitary Corp. PLUMBING: Soil pipes-cast iron. Hot water pipes-galvanized wrought iron. Cold water pipes-galvanized steel. WATER HEATER: Wesix Electric Heater

WATER HEATER: Wesix Electric Heater Co.



LIVING ROOM

THREE BEDROOMS, TWO BATHS, MAID'S ROOM AND BATH, DARK ROOM







Dormand Photos

A summer and week-end house on the south shore of Long Island. Designed by the owners, it is a very creditable job indeed, pleasant in appearance and well arranged. Bedrooms are separated into two groups, and the owner's suite includes a darkroom. The heating unit is centrally located on the ground floor as water conditions make a cellar undesirable. An especially ingenious feature is the single bathtub, used jointly by the maid and guests. Cost: about 33 cents per cu. it.

CONSTRUCTION OUTLINE

STRUCTURE: Exterior walls-red cedar shingles over diagonal sheathing, building paper, studs; inside—Celotex Corp. Celotex and knotty pine. Wolmanized sills and girders and copper termite shields. Floor construc-tion—sub-floor, red oak finish. ROOF: Covered with red cedar shingles.

INSULATION: Outside walls (west side) and attic floor-4 in. bats, Johns-Manville.

WINDOWS: Sash-wood, double hung and casement, Curtis Cos., Inc. Balances-Unique Window Balance Co.

FLOOR COVERINGS: Living room and bedrooms-carpet, Bigelow-Sanford Carpet Co., Inc. Kitchen and bathrooms-linoleum, Armstrong Cork Co.

KITCHEN EQUIPMENT: Range - Estate Stove Co. Refrigerator-General Electric Co. Sink-Crane Co.

BATHROOM EQUIPMENT: By Crane Co. Cabinets-Miami Cabinet, Philip Carey Co.

HEATING: Gilbarco warm air system, fil-tering and humidifying, Gilbert & Barker Mfg. Co. Thermostat — Minneapolis-Honeywell Regulator Co. Water heater-Rudd Mfg. Co.

HOUSES FOR DEFENSE

Private enterprise prefabricates 600 for Bomber Builder Glenn Martin with walls of a single new material, puts six of them together each day. Something new in low cost construction.



During this year of booming building, many new types of low cost houses have bid for recognition. A close contender for title to the most significant development of 1941 is the small house presented on these pages. Not merely because it has already been duplicated 300 times for the benefit of defense workers at Middle River, Md. and 300 more duplicates will soon be completed there with the private financing of Bomber Builder Glenn L. Martin. Not because the Farm Security Administration has already adapted its newsworthy features to the construction of five large dormitories near the Martin plant and eight more near Ravenna, Ohio's huge ordnance works. Not because its prefabricated parts are fitted together at the rate of six houses per day by an erection crew of about 150, nor because the first 300 cost only \$2,250 each.

Real claim of this small house for significance is its composition and construction which differ radically from that of any other house ever built. Exterior walls, which even in most prefabricated houses are traditionally built up of from seven to twelve layers of wood, insulation, plaster, paint and paper, in this house are comprised of a single building material boasting all the qualities of the numerous materials replaced. Moreover, the house is roofed with but 96 unique shingles which insulate it as well as keep it dry.

MATERIAL

While as up-to-the-minute as a Martin "187," Martin's house actually dates back

to 1936 when George Swenson, now assistant to Celotex Corp.'s President Bror Dahlberg, developed a large, thick, hardsurfaced insulating board from two of his company's stock items. The invention was a "club sandwich" of two or three layers of $\frac{1}{2}$ in. bagasse fiber (sugar cane) insulating board between $\frac{1}{8}$ in. protecting layers of asbestos cement well buttered with bitustatic compound and hot-pressed together to form rigid panels up to 4 x 12 ft. size.

While Swenson's sandwich enjoyed but scant use as an exterior exposed building material, it soon found its way into many an industrial building partition. But, acceptance of the new product was disappointing, and its promotion was curtailed. Several times its production facilities were nearly thrown overboard as worthless. Each time, however, they were rescued by Inventor Swenson, an ace salesman, who was sold on his unique but unpopular board and was able to sell his boss on the probability that some day a vehicle would be developed which would sell his club sandwiches like hot cakes. (Tribute to Swenson's perseverance is the fact that more of this material has been sold during the past twelve months for use in defense houses, dormitories and industrial plants than during all its previous life, and apparently this is just the beginning.)

VEHICLE

Four years ago, the John B. Pierce Foundation, a housing research body in New York City, began a search for one material which would serve all the purposes of a conventional multi-material exterior

Club sandwich with filling of insulating board between protecting layers of asbestos cement is 134 in. thick for exterior walls, weighs 4.9 lbs. per sq. ft. This 4 x 12 ft. panel weighs about 235 lbs., is carried from stock pile to house with special fourman rig.



house wall. Swenson's sandwich entered into the experiments, but, before any conclusions were reached, the Foundation diverted all its energies plus those of Consulting Architects Skidmore, Owings & Merrill to the development of a house of horizontal plywood-girder construction (ARCH. FORUM, May 1940, pp. 365-9).

Satisfied with the results of this work, the Foundation's housing research division, directed by Robert L. Davison, turned back to its original quest, decided to adapt its patented horizontal construction system to Swenson's patented sandwich. Elaborate racking, compression, tension, rain and thermal tests on typical wall sections dispersed all doubts as to the practicability of the combination, and a test house was built on the Foundation's proving grounds at Lebanon, N. J.

Among the many housing experts invited to witness this demonstration was Designer-Builder Jan Porel, producer and manager of Glenn Martin's three-year-old 185-family brick garden apartment project at Middle River. With his plant expansion program (see p. 335) boosting his payroll from a peacetime 17,000 to 45,000 by 1941's end and with Baltimore's nearest residential neighborhood about fourteen miles to the southwest, Martin was in the market for more employe housing, and Agent Porel was out scouting for the best in low cost construction techniques. He had already studied the possibilities offered by about 30 different types of prefabricated houses when he attended the Lebanon demonstration.

Claiming to have the answer to Martin's housing problem, Pierce Foundation offered to prove it by building on Martin property another one-family house and a six-family building embodying the lessons learned at Lebanon. The latter proved to have a few technical bugs in it, but the former was a convincing show which prompted Martin to approve the construction of some 600 identical houses on two pieces of his property within walking distance of the bomber plant.

HOUSE

As detailed by Architects Skidmore, Owings & Merrill, the Martin house is a compact 41/2-room rectangle measuring 24 x 28 ft. While similar in general layout to the traditional low cost house produced by most operative builders, it features several noteworthy plan innovations first shown in the "Forum Defense House" by the same architects (ARCH FORUM, Nov. 1940, pp. 444-9): The bedrooms are separated by a battery of three generous curtained closets and two furniture niches which provide above-average storage space, permit the recessing of furniture out of the way of traffic circulation and diminish sound transmission between the bedrooms. As shown in the accompanying drawing, the balance of the house enjoys extremely open planning; the living room is combined with a small but adequate



EXTERIOR

dining alcove which runs into an in-line kitchen which, in turn, connects with a storage or work room. None of these rooms is separated from the others by doors nor even cased openings, but, thanks to a heady arrangement of spur partitions, the kitchen is visible only from the near corner of the living area and the storage room may be seen only from the kitchen. Other details seldom incorporated in houses of comparable size and cost include: (1) Two large, fixed plate glass "picture" windows in the living-dining area, each flanked with movable, screened casements. Like all the other casement windows of the house, these are divided into four panes with horizontal muntins which emphasize the horizontal construction system. (2) A covered porch. Along with the color of the exterior trim, the design and size of the front porch is the only detail of the house subject to variation in the Martin project. (3) A linen closet as well as a coat closet. (4) A shower fixture over the tile-trimmed bathtub. (5) Built-in shelves and cabinets in the kitchen. (6) Metal venetian blinds at the "picture" windows.

PROJECT

Divided into two near-equal parts, the Middle River housing project includes exactly 607 exact duplicates of this well designed small house — in the interests of economy it was decided that the basic plan should not even be reversed. The first section (now complete) contains 297 units, covers 49 densely wooded acres of a small peninsula jutting out into the upper reaches of Chesapeake Bay a half mile east of the bomber plant. Interestingly platted by Designer-Builder-Manager Jan Porel, these so-called "Stansbury Estates" measure 48 x 100 ft. on the average, face the interior courts of "super-blocks," and are serviced at the rear by concrete walks and concrete-curbed macadam roads.

Less attractive is the second, 310 house section called "Aero Acres," which covers 52 acres of a bald slope about a mile to the west of the plant. While the complete absence of both trees and a confining shore line might have permitted even more flexible, more interesting platting than at Stansbury Estates, the land planners could not get airplanes off their minds. They laid out the streets in the general (though hardly recognizable) shape of an airplane and completed the unfortunate analogy by naming them "Cockpit Street," "Dihedral Drive," "Fuselage Avenue," "Right Wing Drive," etc. Long rows of 48 x 100 ft. lots face the long straight treeless streets. Considerable landscaping, unnecessary at Stansbury Estates, is essential for Aero Acres and will be provided.

FABRICATION

General contractor for the Martin houses is Martin's Stansbury Manor Corp. headed by Porel. However, the work of his erection crews is comparatively minor, for the Martin houses are comprised primarily of "sub-assemblies" fabricated before they reach the building lots. Subcontracting fabricators, who need never see a house

(Continued on page 324)





LIVING-DINING ROOM







SITE PLAN - STANSBURY ESTATES



BEDROOMS AND BATH



go up, produce the bulk of the sub-assemblies:

► In a tent-covered shop at the edge of the project a crew of sawyers precut the seven members which form each of the house's fifteen roof trusses, nail them together on a jig table at the rate of about 120 per day and at a non-union labor cost of about 33 cents each. Operated by six mechanics and about a dozen helpers, this shop also precuts the floor joists, assembles the transverse floor girders and ledgers, fabricates the ceiling cats and nailers, the flue framing members and precuts and packages all the framing members for the porch.

► In another tent operated by eight plumbers, all members of the rough plumbing system are cut to proper lengths, threaded and secured together in easily portable sub-assemblies. A dummy kitchen-bathroom partition inside the tent facilitates the operation, assures an accurate alignment of parts on the job.

▶ Biggest subcontract is held by the Allspline Corp. of McGaheysville, Va., whose mill precuts and fabricates into sub-assemblies all the houses' above-floor structural members (except those produced at the site shop) as well as all doors and frames, windows and frames, kitchen cabinets, closet shelves, front and rear steps and gutters. It also mills the trim which is delivered conventionally in random lengths.

► Wall and partition panels are precut and packaged (31 of the former, 29 of the latter per house) and delivered directly to each building lot by the manufacturer.

► Similarly delivered are all other materials and items of equipment, including the new-type shingles (see below), plumbing fixtures, oil-fired sub-floor furnace and electric range, refrigerator and water heater.

ERECTION

As all of these materials and sub-assemblies arrive at the site by rail and truck in a constant flow, the erection crews move from lot to lot completing their respective phases of the final assembly. Unusual in many respects, this site operation merits a play-by-play description:

Foundation. After a bull-doser has taken a half-dozen swipes at the lot, leaving an excavation 3 ft. deep with sloping sides, hand shovels dig eleven holes for the 1 x 2 x 2 ft. pier footings of transit-mixed concrete. Atop these go concrete block piers in which are embedded steel strap hangers which will later anchor the house to the foundation. Next, precast concrete grade beams are cemented to the piers around the perimeter (see photo No. 7). They are further secured by concrete caps poured atop the piers to bring them to the height of the grade beams. Once a copper coated termite shield has been applied with mastic to the top of the concrete perimeter, earth is bull-dozed back to a level half way up the grade beams, thus making it easier for the succeeding erection crews to work. Forthwith the floor crew steps in, lays the precut joists on the gradebeams and the ledgers of the heavy (6 x 12 in.) transverse center beams (No. 8). These are covered with moistureproof paper and 1¼ in. fir plank flooring. Trimming the latter involves the only use of a saw during the entire erection operation.

Walls. Before the floor is finished, another crew moves in, erects the ten 4 x 4 in, fir columns. They are mortised at the mill to receive the abutting framing members and, since they are exposed inside as well as out, they are finished with two vertical grooves running the entire length of each face to relieve their otherwise plain "lumber" appearance. After these uprights have been secured to the piers via the anchor irons, they are tied together with horizontal rails which serve as window sills and are also exposed inside and out around the entire perimeter. (No. 1). Atop of the columns along both long sides of the house are affixed mill-assembled plywood girders with metal clips on the upper chord to align and secure the roof trusses (No. 2 and section, p. 325). Their bottom chords form the window heads, a function undertaken by plate strips on the shorter sides of the house. Small right angle pieces carry this horizontal trim around the corners of the house. (No. 3). With the wall framing complete, the first course of insulating board panels is nailed in place. With the second course (No. 4), the casement windows, complete with frames, copper interior screens and hardware, are also positioned.

Roof. To eliminate the possibility of damage to the third course of insulating board, it is not installed until after the roof trusses have been slid over the plywood girders and secured at 2 ft. intervals by the metal clips on the girders and by spacer strips near the roof peak. The two end trusses come to the job with ventilation louvers already in place. Once the rake cornices, eaves, fascia boards and one-piece gutters have been nailed home, the roofing crew raises a portable scaffold. begins laying the unique roof. Shingles (No. 5) are of insulating board, tapering from 11/8 to 3/8 in. and encased in 90 lb. asphalt roofing felt surfaced with colored mineral granules. They measure 7 ft. 11/4 in. x 1 ft. 33/4 in. and are laid with 13 in. to the weather, are tailor made by the manufacturer to cover the Martin house's roof with exactly 24 four-shingle courses.

Each shingle butt is thick and grooved to receive the head of the shingle below and to cover the nails which secure the latter to the shingle lath. While vertical joints were originally covered with strips of asphalt felt, the covering of one shingle now extends 3 in. beyond the insulating board, is cemented to the 3 in. of exposed insulating board of the adjacent shingle. Eave and rake joints are equally well protected. Laid on lath put down by the

ΗE



1. COLUMN AND RAILS





3. CORNER PIECE



4. WALL PANELS



0

U

5. ROOF SHINGLES

CHITECT



bull-dozer which leaves inclined sides.

7.



Foundation is comprised of poured concrete foot- 8. Floor joists rest on termite-shielded grade. 9. ings, concrete block piers and reenforced con-crete grade beams. Excavation is prepared by and ledgers of transverse 6 x 12 in. beams beams. Earth has been bull-dozed back against grade beams to furnish footing for workmen.



Framework for curtain walls is completed with columns, rails, girders, etc. Due to careful fabrication, frame is more rigid than it appears.



10. Plank flooring is applied atop joists and build- 11. Exterior walls are comprised of ten openings and 12. Light roof trusses, prefabricated ing paper, is immediately sized for protection against rain. Note floor furnace grille in center, crawl space vent above concrete porch floor.



material. Interior partitions require 29 11/4 in. panels. All are precut to size in the factory. roofers as they work up toward the roof peak, this material permits speedy application, boasts weather-tightness, high insulation qualities and the thick butts, wide

31 panels of the new 134 in. multi-function

appearance. Plumbing. Three field men install the rough plumbing sub-assemblies at the rate of one house every two working hours. A mechanical trench digger paves the way for them between the main utility lines (at the street) to the house's "basement." Requiring six interlocking lengths of 6 in. porcelain enameled steel pipe, the flue is hung from the roof, is finished with a cone on top, an elbow pipe connection to the furnace below the floor. Ashestos collars protect all adjacent lumber.

weather surfaces and the disguised verti-

cal joints present an unusual'y attractive

Ceiling. After the preassembled cats and ceiling nailers have been installed at the proper places between the roof trusses, 42 panels (4 ft. square) of interlocking smooth (ivory) surfaced insulating board (25/32 in. thick) are nailed to the bottom chords of the trusses forming the finished ceiling.

Partitions. With the aid of several templates, a two-man crew marks out the position of the partitions on the floor, raises the precut framing members, installs the 11/4 in. asbestos finished insulating board panels and trims the partitions -all in a half day.

Finishing. Completion of the Martin house includes the installation of pressed steel plumbing fixtures (the combination kitchen sink and wash tub is delivered to the house in a 7 ft. pre-assembled cabinetfrom 2 x 4's, are spaced 2 ft. on centers. Absence of bearing partitions permits flexible planning.

counter), plate glass windows, exterior trim, doors, downspouts and the painting of all exposed wood. Since the walls and partitions require no finishing, paint consumption is small: 3/4 gal. for inside trim including sash and doors; 2 gal. for outside trim, gutters, porch and the exposed fuel tank beside the rear door. Two and a half gals. of calking compound are used to weatherproof all panel joints which are further protected by the application of ashestos cement battens. Final operation is the hooking of step assemblies beneath the front and rear doors. They are removable to permit the closing (during winter) of the screened ventilative openings beneath the doors.

SIGNIFICANCE

To make the most economical use of his erection crews, General Contractor Porel's six foremen order their men from house to house according to a tight production schedule (enclosing and roofing is a 35 man-hour operation), make no attempt to complete a house as quickly as possible. On the contrary, month ago about 100 houses in Aero Acres were in various stages of construction-none finished despite 20 days of work. However, it has been estimated that if the field shop, excavation and erection crews concentrated on one house in quick succession, they could enclose and roof it in 35 man-hours, finish it in about 165 more. And, it is known that Stansbury Estates' 297 houses were finished at a rate of six houses per day.

Speedy production, however, is only one of the advantages inherent in the materials and the patented "curtain wall" horizontal construction system of the Martin houses: (Continued on next page)

► Studies indicate that the house may be heated at a cost of only \$50 per year, speak well for the insulating qualities of the unique walls and roof.

► Due to the careful detailing of all prefabricated parts (Architects Skidmore, Owings & Merrill have detailed every individual element of the house), waste is reduced to a minimum. When the first 297 houses were complete, all the waste materials were shoveled into a single truck, sold for a paltry \$30.

During a five-day test in a "rain machine," which would force moisture through an ordinary 8 in. brick wall in ten minutes, a typical wall section from a Martin house was penetrated to a depth of only $\frac{1}{8}$ in. (to the asphalt glue).

Since the walls and partitions require no paint, maintenance expenses are limited to floors, trim and equipment.

▶ Production costs, while a guarded Martin secret, compare favorably with conventional construction. Previously quoted estimates of \$1,500 to \$2,000 notwithstanding, each house probably cost General Contractor Porel about \$2,250 including everything within 5 ft. of the house's perimeter, except the contractor's normal profit. If this profit is figured at 10 per cent and if all site improvement expenses are thrown in, the total unit cost at today's prices would probably mount to \$2,750. No secret is the price bid to the Farm Security Administration fortnight ago for 200 demountable houses of almost identical design and construction: \$2,705 per unit, excluding heating equipment. Also public is the fact that the five 61-man dormitories erected for FSA at Middle River of parts largely interchangeable with those of the Martin houses cost \$18,190 per building or \$300 per man. While this is about equal to the average cost of FSA's conventionally built frame dormitories, the Middle River dormitories (right) are more quickly built, demountable and better looking.

▶ The modern design and new construction system have already passed the test of public acceptance, in that the 297 families of Martin employes who rent the first batch of houses at from \$30 to \$35 per month (depending on location) are universally satisfied with their new houses. Only complaints have concerned such minor details as the "unshaven" feeling of the fir structural members exposed on the interior and the fact that the kitchen linoleum was not extended to cover the floor of the adjacent store room. On the other hand, such important details as the open planning and the large window areas have been singled out for favorable comment. Even the non-union labor erecting the houses is enthusiastic about the operation and is favorably impressed with the house's structural qualities-a noteworthy attitude seldom held by traditionally minded mechanics working on their first prefabricated house project.

In sum, by every conceivable yardstick, the Martin houses seem to equal or sur-(Continued on page 44)



DORMITORY ERECTION-end of second day



END OF THIRD DAY



COMPLETE DORMITORY—seven days' work



INTERIOR-without partitions



Eric J. Baker

Supplemental temporary housing near Glenn Martin's Middle River, Md. plant is provided by five 61-man dormitories for unmarried workers and 250 trailers for families. The former are built like Martin's houses; many prefabricated parts are interchangeable. However, wall panels are set with screws (not nails) to facilitate eventual demounting. Note possibilities of flexibile interior partition arrangement — roof trusses make bearing partitions unnecessary. Contractor: Baltimore's Housing Engineering Corp. for Farm Security Administration. Cost: \$18,190 per building, or about \$300 per man.

HOUSES FOR DEFENSE

In Erie, Pa. Contractor Trimble builds his 500 foundations like highways, frames his walls on the floor, otherwise adheres to tradition. From cause to effect with a candid camera.

The defense housing program's three major requirements of quantity, speed and low cost have taught residential builders many a new construction trick. Some have resorted to total factory prefabrication. Others have called on factory prefabricators to handle portions of their jobs (see p. 321). Still others have, in a sense, become prefabricators themselves by precutting and pre-assembling many parts of the houses on the site. In this third and largest group is W. F. Trimble & Sons Co., builders of the 500-unit \$2 million Franklin Terrace defense housing project at Erie, Pa. But, besides capitalizing on the speed and economy of siteprefabrication, they have taken a tip from road builders in the construction of the project's foundations and floors.

Franklin Village began early this year when the Navy Department brought Erie's growing housing problem to the attention of the Office of Emergency Management's Division of Defense Housing Coordination. The problem sprang from the expansion of the General Electric Company's Erie plant, which had announced that 4,000 new workers would be needed by year-end to help the 6,000-man crew fill the Navy's huge order for steam turbines. And, G. E. is only one of ten Erie manufacturers working on defense contracts.

Forthwith, field representatives of the Defense Housing Coordinator surveyed the problem, found that 2,000 to 2,500 of the increment in defense industry workers would have to come from beyond the city's commuting suburbs and that only 761 dwelling units would be available for them: 545 city vacancies, many of which were substandard; 143 new units then under construction; 25 through the reconditioning of existing buildings and 48 vacancies outside the city but within the limits of rural mail service. Counting on private enterprise to build the greater part of the needed homes, the Coordinator solicited the President's approval of a 500-unit Government project for Erie, suggested that the Federal Works Agency's U. S. Housing Authority build it.

USHA worked fast through Erie's local housing authority, commissioned Architect Walter T. Monahan on February 11, purchased land on April 1, let the construction contract on April 9, and the first families moved into partially completed Franklin Terrace on July 4. However, G. E.'s payroll went up faster than the houses, and the Coordinator was forced to provide temporary shelter for them. At his recommendation, Farm Security Administration on April 2 let a contract for 200 trailers, immediately went to work in the G. E. plant's backyard providing roads, utilities

BACKGROUND:

Seat of Erie, Pa.'s housing problem is General Electric's sprawling plant whose payroll was upped from 8,000 to 12,000 in a year to fill turbine contracts for the Navy. About half the newcomers are from out of town.

First stop for Drill Press Operator B. J. Rogan, his wife and small son was this attic room—one of the 545 Erie vacancies quickly filled at the beginning of the industrial expansion program. Mr. Rogan earns \$42.50 per week in the General Electric plant.

Temporary shelter was provided by 200 Farm Security Administration trailers in G. E.'s back yard until U. S. Housing Authority had completed its 500unit "permanent" project. Note one of three utility buildings in right background; it contains laundry and toilet facilities.

At home, Mr. Rogan plays cards with a neighbor at a drop-leaf table, seated on pull-out seats which form one of the trailer's two Pullman-like berths at night. Left, gasoline pressure stove and heater; right, closet, sink-counter and ice box. Rent \$6 per week per trailer.





FOUNDATION

and three toilet-laundry buildings to serve the trailer camp. On May 22 the mobile project arrived in Erie to be rented to G. E. workers at \$6 per trailer per week. Today, Franklin Terrace is 100 per cent complete, 70 per cent occupied, and half of the "stop gap" trailer project has moved on to Waterloo, N. Y. for more urgent business.

So much for Franklin Terrace's background-the photographs and captions on these pages highlight the use of heavy road-building machinery and site prefabrication techniques which brought these 500 "permanent" defense houses to completion at the fast rate of 31/2 units per working day and at the low estimated construction cost of \$3,463 per unit.



Foundation trenches are dug mechanically to a uniform depth of 5 ft. Operated by a crew of two, this machine completes the excavations for a four-family, basementless building in four hours.



A versatile bull-dozer levels off the earth between the concrete block foundations, packs it down preparatory to forking, cinder filling and installation of sub-floor plumbing lines. The latter are pre-assembled in convenient lengths in a field shop.

FLOOR



Layers of asphalt paper are rolled out over the tamped cinder fill, tarred in place as a sub-floor protection against moisture. Most of the houses are built in four's.





To reenforce the concrete floor slab, heavy wire



A highway paver speeds up the floor pouring operation. Supported by a movable crane, the concrete container is shuttled to the desired location from the self-propelling, self-feeding mixer. It is operated by a crew of three. is followed by a trio of floor levelers.



FRAME

mesh is unrolled atop the asphalt paper. The entire flooring operation for a typical four-unit building - from cinders through concrete - requires less than a day.

All photos, OEM by Palme



Wall frames are fabricated horizontally on the floor from lumber precut in a field shop, are raised in place by sheer brute strength. (Crane in background of third view operates a clam-shell scoop, does not assist in the frame erection.) On this four-unit building one 40man crew fabricated the entire wall frame between 8:30 A. M. and

noon, then moved to the next building. A second crew of 40 raised the two prefabricated side wall sections, built the two end sections conventionally and completed the floor and flat roof framing by 4:30 P. M. of the same day. Like the two framing crews, all crews specialize in only one phase of the construction system. FINISH





Outside the sheathing goes building paper and large, quickly **Inside finish** is equally conven-applied shingles of asbestos cement. Window and door tional. A four-unit building is frames are assembled in a site shop, receive a primer coat completely lathed with sheets of prior to installation. Time and money was wasted by labor's insistence that windows be glazed after installation.

perforated gypsum-asbestos in a few hours by a 14-man crew.

nailed to the framing prior to erection. SITE IMPROVEMENT

building's sides, diagonally to its ends for extra strength. Nailed in place by a 14-man crew, sheathing would probably pull loose if



Road fill of rock-like slag, a waste product from nearby steel mills, is rolled prior to paving. Projecting cubicles beside rear doors of houses in background are coal bins. The two-story houses contain a living-dining room, kitchen, bath and one to three bedrooms, rent for \$25 to \$35.



Complete, except for grading and landscaping, these Franklin Terrace buildings each contain four dwelling units. Note con-trasting one-story, pitched-roof building at end of court. Estimated construction cost \$2 million, or \$3,463 per unit.

INTERIOR

NEIGHBORHOOD

photos, OEM by Palmi



Kitchen of apartment occupied by Rogan family shows last stop in attic-to-trailerto-house sequence. Utilities: gas-fired water heater, range and refrigerator; a coal-fired forced air heater is located in an adjacent utility room.

Next door to Franklin Terrace is a 23-year-old defense housing project built by Government dur-Next door to Prank in Terrace is a 23-year-old defense housing project built by Government dur-ing World War I, subsequently sold to private operators and still in good repair (rear view above, front view right). The new project will remain in Government hands after the emergen-cy, will be operated as a subsidized "slum clearance" project for families in the low income bracket. Franklin Terrace's construction agency: Erie Housing Authority for the U. S. Housing Authority. Contractor: W. F. Trimble & Sons Co. Architect: Walter T. Monahan.

Significant developments of the past month on the Building-for-Defense front: ► While the public had long since contributed some \$13.5 million for their operation. the first of more than 250 projected USO recreation buildings did not get under way until late last month. To be financed by the Government from the Federal Works Agency's \$150 million Defense Public Works fund, the construction of these spare-time refuges for military personnel has been delayed by red tape and wrangling between Federal and local agencies and the United Service Organizations. After the President had transferred the production of these buildings from FWA to the Army's Quartermaster Corps, the ZONE II office forthwith let contracts for three USO projects near Fort Dix, N. J., to cost \$70,000 each.

►While actual construction of Defense Public Works projects is trifling, as yet, more than half of the available \$150 million for this program has already been earmarked. Thus, month ago 442 projects with an estimated cost of \$85.6 million had received Presidential approval. In addition to the USO recreation centers discussed above, they include primarily schools, hospitals, sewer disposal plants and water systems. About one-fourth the total will be financed entirely by Federal funds and will thus be built either by the Army (USO buildings) or by the new Emergency Operations Unit of FWA's Public Buildings Administration. The balance are to be financed jointly by Federal and local governments and will be built via the old localized PWA procedure (involving private architectural services) under the supervision of FWA's Defense Public Works Division field officials.

► Acting as landlord for the 100,000 families to be housed in Government-financed defense projects, FWA Administrator John M. Carmody has finally indicated what rents his tenants will have to pay. While the ruling is flexible and may be varied in accordance with local conditions, it requires defense worker families to pay \$27.50 per month for a one-bedroom dwelling, \$30 for two bedrooms, \$32.50 for three. Utility costs are extra. For Army enlisted personnel receiving a regular allowance for quarters and for Army civilian employes the rental schedule is lower: \$21 for one bedroom, \$23.50 for two and three. Lower still is the schedule for Army enlisted personnel not receiving allowances: \$11, \$13 and \$15, respectively. Similar schedules for Navy personnel, whose housing program is almost complete, have been in effect for some time. (In addition to the bedrooms, most Government defense houses provide a living room, kitchen, dining space and one bath.) ► Released last month, the Federal Security Agency's report on July employment showed that 114,200 men in building construction occupations were registered at public employment offices as looking for work. This represented an 8 per cent decline during the month-a far from startling fact. "Construction occupations, unlike those in the other groups of selected defense industries," comments the report, "have a large number of registrations; in thirteen of the 23 occupations,

the number of job seekers exceeded 1,000 and in only one-connector-was there less than 100 workers available."

► Thus far this year, prices of asphalt roofing products have zoomed up 20 per cent. Last month Administrator Leon Henderson of the Office of Price Administration went to work preparing ceiling prices for the commodity, indicated that they would be below "current levels." Also abuilding are ceilings over the prices of building paper and old rags. The latter have jumped \$15 a ton during the past four months, currently range from \$36 to \$40 a ton, or about double the average of the past ten years. In addition to asphalt roofing, old rags are used in the manufacture of builder's felt, linoleum and certain grades of building paper.

► Totaling defense construction statistics as of September 1, the Office of Production Management month ago announced that \$9.7 billion was completed, in progress and definitely scheduled. Including completed and semi-completed projects, construction in place was valued at \$3.4 billion, or 36 per cent of the total program. The total military phase of the program (including cantonments) amounts to \$4.3 billion, of which \$1.7 billion or 40 per cent is already in place. Non-military defense construction totals \$5.4 billion, is comprised of \$2.0 billion of Government financed industrial facilities, \$0.3 billion of private plant expansion and about \$3 billion of private and public defense housing. On September 1, only \$1.7 billion, or 32 per cent, of this non-military phase of the total program was in place.

WHO IS DEFENDING WHAT? ____ The Currier Case

Into the open, for the first time, comes the war between entrenched AFL and invading CIO which has smoldered for months on the defense housing front. Threatening a complete stoppage of defense construction in the vital Michigan area, AFL demanded that the Government reject a clearly qualified low bid for defense housing in Detroit because the contractor proposed using CIO labor (the union chosen by his own men) to handle the project. Thus, it did not take long for the AFL to show its hand which a few hours before had thunderously applauded patriotic resolutions at its Seattle Convention. "Justifying" the AFL stand was a stabilization agreement concluded between AFL and OPM wherein the union agreed to give up certain overtime demands and agreed to submit disputes to negotiation in return for a "monopoly" of defense building. Specifically at stake in Detroit was a potential loss of \$431,000 on 200 defense houses and a loss of time, already measured in weeks.

Facts of the Detroit story, so abundantly featured in the daily press, are reviewed only briefly here. The Currier Lumber Company, producers and erectors of semi-prefabricated houses, entered a bid which was virtually \$1,300 per house lower than the next bid. Currier's bid of \$3,265 per unit is believable and comparable with costs achieved in other defense housing projects. Currier has presented evidence of its financial ability and structural competence to produce the work. Its bid provides payment of prevailing wage scales or better, and its houses, in every particular, meet specification requirements. Conclusion of the contract between FWA and Currier was prevented by a request from OPM. As this is written the contract has not been signed.

There are numerous significant sidelights to this situation. Is there any legal basis for the OPM-AFL agreement? Does such an agreement controvert the Wagner Act? Aside from its legal aspects, has such an agreement any realistic effect in view of the fact that since it has been in force there have been a number of AFL strikes on defense building projects in different parts of the country? Did AFL time its move to coincide with pending appropriation under the Lanham Act (which provides more funds for Government financed defense housing), hoping to write in even tighter freezing of the AFL monopoly? Despite its declared lack of opposition to prefabrication, is AFL prepared to go any length to force continuation of obsolete craft building methods? These questions make clear that the present situation provides in effect the threat of a mammoth Jurisdictional strike, only here the opposing forces are not departments within a single union but two great unions, one on the inside and the other trying desperately to get into Building.

If this were merely an internecine fight its

effect on the defense program would be serious enough. Actually it raises questions far more serious than the prerogatives of one union or of another. 1) Will the Government become a partner with any union which places its demands above the national defense? 2) Will the Government become a partner with any union in operating a closed shop? 3) Will the Government become a partner with any union in canceling out the proved speed and economy of prefabricated defense housing and in stopping the forward motion of new technologies which promise to make decent housing available to millions of laboring men's families, hitherto denied them? These are not legal questions, although the present controversy presents its legal side. These are not academic questions, although they will be hotly debated by labor philosophers. Neither are these expedient questions. But these are the questions which most Americans want answered-Americans who are now preparing to sacrifice comforts and necessities and peace of mind to preserve liberties and to resist restraints. These are questions to be answered not only by the Government but by any union which attempts to coerce the Government at any time, and particularly at this time, into a vicious partnership. If it should develop that a choice must be made, it should not be too difficult to decide which Union we intend to preserve, the AFL or the USA .- THE EDITORS.

BUILDING FOR DEFENSE . . . A TRIO OF MODERN PLANTS

in J & J's decentralized industrial community feature unusual fenestration. Modern architecture, marble and glass make the Ligature Building a sterile laboratory, an attractive show window.

"We are aiming at a simplified approach to every industrial task . . . a plan for a greatly simplified form of management and a direct contact with all those who work with it . . . We believe this form of decentralization makes it possible for all of us to have a better understanding of the individual industrial effort." Thus spoke Chairman Robert W. Johnson of Johnson & Johnson at the dedication month ago of his new Ligature Laboratory-the third in a series of modern plants to be completed in an organized industrial community on the rural outskirts of New Brunswick, N. J. Practicing what he preaches, Manufacturer Johnson, whose administrative and production facilities have for years been concentrated in a centralized group of multi-story factory buildings in downtown New Brunswick, three years ago purchased 250 acres of rolling farm land on either side of U. S. Route No. 1 three miles southwest of the city. There he laid out a decentralized but closely integrated project which would eventually comprise seven or more factories, an administration building, a power house, an electrical switching station, a sewage disposal plant and such accessory facilities as garages, railroad sidings, connecting roads and a warehouse.

Temporarily suspended due to national defense, this building program is already more than 30 per cent finished. As shown on the accompanying site plan, the once barren tract now supports one office building, the three utility buildings and factories for three J & J divisions; Personal Products Corp., Industrial Tape Corp. and the Ligature Laboratories.

With the exception of the office structure which, for some inexplicable reason was designed to resemble a Georgian school house, all the buildings are of in-

PERSONAL PRODUCTS BUILDING

teresting modern design from the drafting boards of Architect-Brothers R. G. and W. M. Cory, industrial specialists whose past work is notably marked by the Starrett-Lehigh industrial skyscraper in New York City. As the accompanying photographs testify, the design of each of these three J & J factories, while interrelated, has shown a progressively higher order of architectural treatment in line with their increasing prominence of location. Herewith, then a brief examination of the first two factories and a longer look at the details of the new Ligature Laboratory.

PERSONAL PRODUCTS BUILDING

Situated on the south side of the highway almost concealed from the view of motorists by a knoll, the Personal Products factory is the least attractive, least expensive building of the trio. Built coincidentally with the switching station and the power house and with the same materials, it was also the first of the three factories to be completed (March 1940).

Prime requisite was that the architects enclose 180,000 sq. ft. of production and office area with materials which would permit four-way expansion and minimum maintenance expenses at a low construction cost. Both figures were depressed (the latter to \$1.29 per sq. ft. exclusive of all services and partitions) by the use of buff structural tile as the one material for the exterior curtain walls (at an installed cost of only 53 cents per sg. ft.). Exterior walls are broken by long strip windows of multipane fixed steel sash, and on the long sides, closely paralleled by railroad sidings, by a series of overhead doors spaced and dimensioned to jibe with box car openings. The southwest facade is varied by the presence of a glass-block entrance projection and seven aluminum painted overhead doors through which deliveries of cotton and other materials are made via truck from the main J & J New Brunswick plant. Both the receiving and shipping of materials were facilitated by





All photos, Samuel H. Gottscho



the raising of the concrete floor 4 ft. above grade to the level of truck trailers and railroad cars.

Measuring 300 x 600 ft., the factory is of conventional construction — skeleton steel frame with a built-up pitch and gravel roof supported by columns 37 x 50 ft. on centers and offering a clear ceiling height of 14 ft. (total height: 24 ft.).

Like all the buildings in this industrial project, the Personal Products factory is supplied with electricity from the switching station (a 4150 volt high tension line runs conveniently across the property) and with steam piped underground from the project's power house. Three million gallons of water are pumped per day from New Brunswick's nearby reservoir, and the project's sewage disposal plant pumps waste uphill to connect with the city system. All of the J & J industrial community's utilities are now adequate to serve the future buildings.

INDUSTRIAL TAPE BUILDING

Situated on the other side of the highway and partially screened from it by trees, the Industrial Tape Corp. factory was completed this spring, was presented



INDUSTRIAL TAPE BUILDING

in detail in the June FORUM (pp. 430-1) and is now turning out miles of adhesions for use in the production of parachutes, gas masks and other defense items. In review, this factory is quite similar in design and construction to the Personal Products unit, except that it is faced on the exterior with buff-colored brick, trimmed with a maroon-glazed terra cotta tile.

Most significant detail of the exterior design is the long strip window which runs around three sides of the building, interrupted only by the entrance projection. Unsatisfied with the appearance presented by the steel sash in the somewhat similar fenestration of the Personal Products factory, the architects glazed the 3 ft. high opening with 8 ft. panels of plate glass set top and bottom in the standard stainless steel trim frequently used on store fronts. (Complete air conditioning made the provision of fixed sash feasible.) In a further attempt to give the window the effect of being one long strip of glass, these plate glass panels were separated with lucite mullions, and the steel columns behind the walls were painted black to disguise their presence from the outside. While both tricks improved the appearance of the building, neither was considered the final answer to the problem, and further experiments were made in the next factory.

LIGATURE BUILDING

Situated on a bald knoll in full view of motorists traveling in either direction is the new Ligature Laboratory — show window of the J & J industrial community. Obviously serving this function as well as its more mundane purpose as a huge surgical gut packaging machine, the building is oriented with its entrance corner pointing to the highway so that two sides are readily seen by passers-by. And, they will be seen, for these two sides of the beautifully low and modern building are veneered with Vermont marble, cut horizontally by full length strip windows without mullions and dominated at their intersection by the projecting plate glass wall of the reception foyer. Unlike a show window, however, the pleasing modern treatment of the exterior has been carried indoors where the principal building material is structural glass. In a class by itself as far as both design and function are concerned, the J & J's new Ligature Laboratory is probably the most modern monumental defense plant in the U.S. today.

Function. Like the building which houses it, the manufacturing process within the Ligature Laboratory is spotlessly clean. All the dirty work is done by another J & J subsidiary (Johnson Suture Corp.) in Chicago where the ice packed intestines of Government-inspected sheep are received from local slaughter houses, split into ribbons and shipped to the Ligature Laboratory via express insured at jewelry rates. In the new building, women wind the ligatures (also commonly known as sutures) on small reels (one per reel), insert the reels in glass test-tube-like containers which are then sterilized, hermetically sealed and packed in small boxes for shipment.

With a shop payroll of about 100 women and a small office force of both men and women, the new plant is said to be "capable of producing surgical ligatures sufficient to supply the needs of the entire



ENTRANCE



SERVICE ELEVATION





STRIP WINDOW viewed from winding room.

North American Continent" and will "permit of rapid expansion of production in the event of national emergency."

Exterior Design of the Ligature Laboratory is simplicity itself. It is a rectangular building measuring $102\frac{1}{2} \times 190$ ft. with eight courses of marble veneer extending 24 ft. above grade. Exclusive of the cantilevered stainless steel entrance canopy and the projecting corner of the reception room, only ornamentation on the entire building is comprised of horizontal grooves cut into the top course of marble. And, to create the sheer effect of monolithic construction, the marble slabs have been earefully set with but $\frac{1}{8}$ in. of mortar between them.

Relieving this- dignified expanse of marble are the long strip windows which take the place of the third course of marble. As in the Industrial Tape plant, these windows are 3 ft. 8 in. x 8 ft. sheets of heat-absorbing plate glass secured top and bottom by fixed stainless steel settings. But, continuing their experiments toward the creation of an effect of one uninterrupted area of glass, the architects specified that the sheets be butted against one another with only a thin layer of black mastic between them. As far as appearance is concerned, the experiment has proved highly successful-the heat absorbing pigment in the glass darkens the window and the mastic joints are not apparent except upon close examination. Whether or not the joints will open with the expansion and contraction of the masonry remains to be seen next spring. However, the present installation was inexpensive, and but little added labor and



LABORATORY RECEPTION FOYER

material cost will be involved if it becomes advisable to separate the glass sheets with plastic or metal strips.

Further enhancing the continuous appearance of the strip windows is the disguising of the supporting columns which run directly behind them at 19 ft. intervals. This was done by finishing the three sides of each column which were visible from the exterior with a 3 ft. 8 in. band of black, sand blasted structural glass.

Other noteworthy exterior design features include: 1) the transparent plastic entrance doors with bronze hardware, 2) the huge reception room window whose 18 ft. height is horizontally divided with five stainless steel-covered channels at each marble course and 3) the buff tile finish of the north facade which is invisible from the highway and which may be knocked out to provide for future expansion of the plant into what is now the parking lot.

Interior Design of the Ligature Laboratory reflects the same purity of materials and minimum of ornamentation that is apparent on the exterior. Columns supporting the 15 ft. ceiling and crawl space and roof above divide the interior into five bays, the first of which is partitioned off to provide employes' lounges and toilet facilities, a laboratory, first aid room and an office and reception room and their toilet facilities. Walls of employes' rooms are finished in structural glass of various colors and their fixtures and furnishings would put to shame the lounges of many a swank night club and hotel.

Paneled, like the office, in bleached walnut, the reception room is floored with marble and furnished by Architects Powell & Morgan with furniture designed by famed Finnish Architect Alvar Aalto. Its huge corner window is continuously screened with a curtain of spun glass and may be blacked out (for motion picture purposes) with a gold theater curtain which normally serves as a valance for the window.

Housing ten long glass-covered tables at which ligatures are wound on reels, the second bay of the plant is finished with (Continued on page 46)



STRIP WINDOW viewed from storage room.



WINDING ROOM



BUILDING FOR DEFENSE ... A MILLION SQ. FT. OF FLOOR

is the latest addition to Glenn Martin's aircraft plant, once a Santa Ana church. Architect Albert Kahn capitalizes on a sloping site, designs a bomber factory with a basement.

In a small abandoned church 30 odd years ago, Glenn L. Martin built his first airplane, organized the company whose name was to become synonymous with "bomber." This month Martin will dedicate his new "Plant No. 2," the latest word in modern industrial design and construction, the latest step in an expansion program which has boomed Middle River, Md. from a sleepy cross-roads town 14 miles north of Baltimore to the nation's biggest bomberbuilding center.

Between Martin's California church and the Maryland Plant No. 2 are many more factories than the name of his latest would indicate. Thus, the first move was to a nearby Santa Ana cannery, then to a real factory in Los Angeles, in 1918 to a bigger plant in Cleveland and finally in 1929 to Middle River. Early stages of this rapid growth were financed in part by Martin's pay and prizes from non-manufacturing exploits. He flew the first air mail in 1912, dropped the first bombs in a 1913 Army experiment, made the first long-distance over-ocean hop (Catalina Island and return), made \$700 a day as a motion picture stunt pilot-more than costar Mary Pickford made in a week.

PLANT NO. 1

At Middle River, Martin's production exploits have been equally daring and advanced and considerably more fruitful. Covering 81 acres, his sprawling manufacturing facilities have been financed entirely with private capital—a fact which has placed his production program ahead of the industry's and a boast which few other defense manufacturers in any industry, now busy building Governmentfinanced plants, can make. The reason is three-fold:

► In the first place, Martin came to Middle River because the nearby tidewater (an upper estuary of Chesapeake

PLANT NO. 2



Bay) was essential to launching heavy flying boats, because the seat of the national Government—always his biggest customer—was but 55 miles away and because 90 per cent of his suppliers were within a few hours' trucking distance.

Secondly, Martin preferred to concentrate his expansion at Middle River to capitalize on the abundant labor supply and the economies of centralization rather than to heed the Army's advice to decentralize to the less populous, more bombproof Mid-West. This attitude quite logically caused the Army to go slow in awarding Martin a build-and-deliver contract for Middle River. (The Army finally got its way only by asking Martin to build and operate for it a bomber assembly plant on its Fort Crook Reservation near Omaha, Neb. In this Mid-west plant, almost identical in size and design with Middle River's Plant No. 2, the Glenn L. Martin Co. will assemble bomber wings

produced by Goodyear and fuselages by Chrysler, will do only about 40 per cent of the work itself.)

► Lastly, Martin long ago foresaw the current national emergency and its need for bombers, began expanding his plant in anticipation of the war and defense orders which he confidently expected to come his way.

Result of these three facts is that Martin's Middle River project, a patch of scrubby woods in 1929, has grown to more than 3.2 million sq. ft. of industrial floor space with the completion this month of Plant No. 2.

The project is divided into three parts, each of which is a multi-building plant: Plant No. 1 is comprised of the original 1929 factory (now shops for the enlarged plant) and a small administration building which have been supplemented by several additional factory, engineering, personnel and service buildings. Newest







factory in this group, the huge two-story detached Navy building boasts a floor area of 794,500 sq. ft. Second section of the project is a 500-acre private airport where four paved runways are currently being extended from 3,000 to 4,400 ft. to accommodate the new, heavier Martin bombers and where five two-story hangars and an administration building are under construction, Plant No. 2, discussed in detail below, is the project's third section, located a mile-and-a-quarter to the east of Plant No. 1.

All told, these three sections will represent a private investment of more than \$32 million, will boost Martin's payroll from last year's 17,000 to an anticipated 42,000 by early 1942, will require 46 acres of parking lots accommodating some 15,000 automobiles. Moreover, they have already required the provision of 1,150 new dwelling units in the neighborhood-250 in temporary Government trailers, 305 in temporary Government dormitories and 609 in permanent houses. Like his plants and the 184 apartment units built in 1939. the 609 new houses are also financed with Martin money. (For a complete presentation of these significant low cost houses. see p. 321 et seq.)

PLANT NO. 2

Designed, like most of its predecessor buildings and its Omaha duplicate, by Industrial Architect-Engineer Albert Kahn and associates, Plant No. 2 will operate as an entirely separate bomber factory



PLANT NO. 2 from the air.

under the administration and engineering direction of the Plant No. 1 headquarters. To this end, the 602 x 900 ft. one-storyand-"basement" factory is surrounded by its own boiler house (50 x 100 ft.), oil house (100 x 100), drop hammer building (100 x 250) and personnel building (two stories and basement—50 x 100 ft.). Total floor area: 1,181,000 sq. ft.

Design. Major requirement given the architect-engineer was that the plant be suited to the production of the "B-26" Army bombers. While these are officially classed as "medium" bombers, they are actually large two-motored land planes about the size of commercial transports whose assembly requires considerable space. On the other hand, the manufacture of the parts and sub-assemblies may be done in more cramped quarters. Meeting these

requirements as he had in the earlier Navy building, Architect-Engineer Kahn made room for all the manufacturing processes in the "basement" whose 10 ft. concrete columns are spaced 50 x 100 ft., left the entire main floor area for the sub-assembly and final assembly operations. In most of this area there is a clear height of 22 ft. between steel columns spaced 50 x 100 ft., but in the final assembly bay running across the west end of the factory the column spacing is extended to 100 x 200 ft., the clear height to 28 ft.

Advantage was taken of the natural grade of the site to minimize excavating and filling, to permit complete fenestration of three "basement" walls and to give the final assembly bay a huge delivery door at grade. (As shown in the air view on p. 335, it opens directly upon an extension of one of the airport runways.) Slope of



PLANT NO. 2 WEST FACADE



FINAL ASSEMBLY BAY



the site also facilitated the provision of two large receiving and delivery docks, one on the south side serving the "basement" and one on the opposite side serving the main floor.

Another factor controlling the design and arrangement of the buildings in this plant was that the site is within a few hundred feet of the Pennsylvania Railroad's main line, and Martin wished to capitalize on the advertising value of the plant. Hence, all the accessory buildings, storage tanks and parking lots are hidden from view by the factory proper whose "best face" is turned north to the tracks.

Construction. Walls of the factory are reenforced concrete from the footings to a point 8 ft. above the main floor line (sill of the first strip window) where the construction changes to cement stucco applied to metal backing with a spray gun. The roof is comprised of metal decking covered with 1 in. cork insulation and built-up composition roofing. Windows are steel industrial projected sash glazed on the east and west elevations with $1/_8$ in. heat resisting and acid-etched glass, with flat drawn sheet glass elsewhere. Both concrete slabs are covered with 2 in. wood block flooring.

Typical of most large Kahn-designed buildings, this factory is topped with twoway monitors. Reason: where heavy machinery is used or where such large objects as bombers are produced, directional lighting from the more customary saw-tooth form of monitor would cast a large part of the floor area in shadow. Incidentally, the two-way monitor is probably easier to black out, since the two facing glass areas of adjacent monitors could be covered horizontally with an easily applied strip of canvas or a wood platform.

Electrical Installation. Power for the plant is taken from the local utility company at 13,800 volts, distributed to four substations through a main switch board, stepped down through 18 transformers to the bus distribution system whose 3,500 ft. blanket the factory areas. Lighting of the "basement" is accomplished by 3,500 four-tube fluorescent fixtures designed to produce 35-40 foot-candles, while the main assembly floor is lighted by about the same number of incandescent fixtures providing 54-60 foot-candles on the working plane.

Heating installation. The factory is airheated by oil-fired furnaces located beneath the first floor. Heated air is forced via concrete trenches under this floor to metal diffusers which distribute it over the surfaces of exposure in an effort to hold the heat near the floors in the occupancy zones. The system is designed to take in outside air or to recirculate inside air in any desired proportion, is therefore capable of cooling the plant and reducing excessive humidity. The office section and cafeteria are both equipped with complete air conditioning systems.

CONSTRUCTION CENSUS mirrors the industry's operating pattern: 77 per cent of the work is performed by only 14 per cent of the contractors. A market analysis underlining the importance of the big business builders.

Since the Construction Census of 1929 covered a period when the industry was swollen with prosperity and since it was limited to big builders who did a business of \$25,000 or more per year, it was an imperfect mirror reflecting a distorted image of the industry. Indeed, not until last month when the U.S. Department of Commerce announced the preliminary findings of its 1939 Construction Census, did the industry have a smooth, full length mirror for self-examination. Taking a quick look, Building could see itself as 215,050 individual establishments (exclusive of insignificant small fry) which performed \$4.5 billion of work with the help of 1.3

		ing	journeymen &	small fry)	performed	(\$ per year)	(\$ of value of	1939 work)			
63%		1AA	****	*****	HOUSES &	UNDER \$25,000	0001				165
37%			18.8	****	BUILDINGS	OVER \$25,000	00000	00000	00000	96	845
92%	IRAR	*****	*****	ŔŔŔŔŔ	SPECIAL	UNDER \$25,000	00000	000			415
8,5				łA	TRADES	OVER \$25,000	00000	00000	0C		595
23%					HIGHWAYS &	UNDER \$25,000	í				15
775	1	****	ŔŔŔŔŔ	RAAAA	HEAVY WORK	OVER \$25,000	00000	00000	00000	00000	999
86%	IŔŔ	*****	*****	*****	TOTAL - ALL THREE TYPES	UNDER \$25,000	00000				235
145				***		OVER \$25,000	00000	00000	00000	6	775

CONTRACTORS BY TYPES: number and work value of each and relative importance of large contractors

Туре		Contractors		Work Performed		
Of	Total Over \$25,000 Per Yr.			Total Over \$25,000 Per		
Contractor	Numbe	r Number	%	Value (000)	Value (000) %
ALL TYPES	215,050	30,912	14	\$4,519,794	\$3,479,671	77
BUILDERS Operative General Contr's.	33,346 3,706 29,640	12,170 1,535 10,635	37 41 36	1,282,951 109,190 1,173,761	1,083,548 90,851 992,697	84 83 85
HIGHWAY	3,627	2,667	74	590,571	579,704	98
HEAVY PROJECT	1,890	1,577	83	638,366	634,747	99
SPECIAL TRADES Paint & paper ¹ Heating & plumb Carpentry	176,187 50,019 5,ª 37,112 30,044	14,498 1,057 4,686 467	8 2 13 2	2,007,906 227,264 572,878 132,957	1,181,672 59,450 349,987 24,521	59 26 61 18
Roof & sheet met	al 11,793	1,640	10	222,174 187,655	137,472 118,128	63
Lath & plaster Concrete	6,590 4,464	702 711 397	11	90,385 57,030	54,640 32,486	60 57
Excavation ⁴ Flooring	2,257 2,178	276 296	12 14	30,543 34,192	15,710 22,766	51 67
Tile & mantel Glazing Air conditioning	2,149 1,040 798	519 180	24 17 42	48,944 17,821 40,396	35,223 12,698 35,459	72
Insulation Ornamental Iron	708	273 144	39	26,509	22,132	83 75
Steel Weatherstripping	568 419	267 56	47 13	81,375 7,214	78,350 4,856	96 67
Elevator All other ⁶	409 2,073	130 577	32 28	45,083 73,126	42,351 63,708	94 87

FOOT NOTES: 1—Includes decorating; 2—Includes some sheet metal; 3—Excludes power lines; 4—Includes foundation and grading; 5—With and without heating, plumbing and sheet metal; 6—Includes house moving. million salaried persons and wage earners who put \$2.0 billion of materials in place during 1939.

A closer look at the Census findings reveals significant operating details of the vast sprawling industry that is Building, presents a market analysis for the manufacturers, distributors and dealers who sell to the producers of houses, buildings, highways and heavy engineering-construction projects.

Covering "all persons or establishments whose *principal* business in 1939 was utilizing construction materials and labor in construction work for others, or for themselves for speculative or investment purposes," the Census includes the construction or installation departments of building material and equipment manufacturers; also, retailers and wholesalers who do an "important" amount of construction along with their regular sales business. Moreover, the term "construction" embraces alterations and repairs as well as new construction and additions.

Excluded are ship and boat building, the selling and servicing of such movable items of mechanical equipment as domestic refrigerators, oil burners, and ranges and all "force account work"-work done by persons or establishments with their own forces for their own use or occupancy. (Government's force account construction work is considerable.) Also excluded from the construction industry count were all journeymen-building mechanics who worked primarily for wages but who also performed work on a contractual basis during periods of slack employment or after their regular working hours. Running into untold tens of thousands, this uncounted shifting group builds many thousand single-family houses each year. It is a part of the large but comparatively unimportant group (64 per cent of all onefamily house builders) who build only one house a year and account for only 19 per cent of the total number of one-family houses produced each year (ARCH. FORUM, Dec. 1940, p. 535). Finally, Chief Statistician Fred A. Gosnell of the business end of the Census decided to disregard reports from some 19,000 persons who represented themselves as contractors but who performed work of less than \$500 each during 1939. Quite rightly he concluded that these men (primarily painters, carpenters, plumbers and electricians) did not make a business of building and should not therefore have their noses counted.

While it is interesting to know that, outside of the small fry, there are exactly 215,050 contractors in the entire U.S., this statistic is far less significant than its breakdown into the various types of contractors, their relative size business-wise, the volume of work performed by each group and their geographical distribution.

CONTRACTORS BY TYPE

As far as the Census Bureau is concerned, there are five general classifications of contractors:

Operative builders, those who build for themselves for investment or on speculation, number only 3,706. While speculative builders of houses for sale account for by far the biggest part of this number, they are classed side by side with builders of residential, commercial and industrial buildings either for rent or for their own occupancy. Functioning like general contractors, these operative builders in 1939 performed with their own forces work valued at \$109 million, sublet considerably more work to special trades contractors (see below).

Building contractors are those who build for others all types of residential, commercial, industrial and institutional buildings. They numbered 29,640 and turned out \$1,174 million of work in 1939, again exclusive of considerable subcontracting. Since an earlier sampling by the Census Bureau indicates that about 20 per cent of their work is done on the construction of detached houses, * (both for owner occupancy and for sale by others), it is impossible to discuss house builders as a single group with the currently available census data. Until many months hence when Bureau statisticians will have isolated house builders in their breakdown of the Census findings, it seems logical to lump these building contractors together with the operative builders and to analyze their operations under the combined title of "builders." (This procedure has been followed in the preparation of the pictorial chart opposite and the discussion which follows.)

This combined group of builders of all types of buildings numbers 33,346 and together they performed \$1,283 million of general contract work in 1939. About one-quarter of it was performed on the construction of detached houses, about 7 per cent of it on multi-family rental projects and the balance in the non-residential field.*

Special trades contractors are the most numerous group and account for the biggest share of the total building dollar. Working for general contractors and, to a much lesser extent for owners, these specialists in painting (50,000), heating and plumbing (37,000), carpentry (30,000), electrical work (16,000), and roofing and sheet metal (12,000), etc. - to name only the leading five of the 20-odd trades-total a whopping 176,187, did a \$2,008 million business in 1939. Their work is divided roughly 55-45 between the residential (detached houses 35 per cent) and non-residential fields.* As indicated below, however, the vast majority of these subcontractors is comprised of small fry who individually and collectively are unim-

CONSTRUCTION BY STATES — total work performed



As shown graphically above, the four biggest construction States are New York (\$675 million), California (\$417 million), Pennsylvania (\$363 million) and Illinois (\$322 million). Next in order come Ohio, Texas, Michigan, Massachusetts, New Jersey, Missouri and Minnesota—all with more than \$100 million in 1939. While the data on which the map is based include the value of all types of construction, the distribution of work performed solely by builders of buildings (as opposed to highway and heavy project contractors) presents approximately the same picture. The importance of each State is based upon the amount of work performed by contractors maintaining their places of business in the various States, but the map is also a good guide to the relative importance of each State from the standpoint of the amount of work actually performed therein. Of course, many of the big contractors in the big cities perform much of their work outside of their own State boundaries.

portant market factors when compared to their few big competitors.

Highway contractors, as the name implies, build roads, streets, alleys and all their appurtenances (walks, guard rails, bridges, etc.) and athletic fields and airports to boot. In 1939, all 3,627 of them performed work valued at \$591 million.

Heavy contractors, whose field covers a wide range of heavy engineering projects (railroad construction, pile driving, dredging, tunneling, flood control, sewage disposal, water supply, pipe and transmission lines, etc.), are comparatively few in number (1,890) but shared a handsome 1939 business totaling \$638 million. Since the operating pattern of these contractors closely parallels that of highway contractors, the two types have been shown as one group on the pictorial chart.

CONTRACTORS BY SIZE*

As might be expected, the comparatively small number of highway and heavy contractors are almost universally big operators with big staffs and big investments in construction machinery. (In 1929 the

*The Census Bureau divides contractors into two size-groups: those who do a business of more than \$25,000 per year and those who do less. Contractors in the first group actually performed work themselves (in addition to work performed on the same projects by others) the contract prices for which amounted to more than \$25,000 during the year. Thus, while the annual business of an establishment in this group may have amounted to only \$25,001, it may have participated in the construction of projects costing many millions. average highway contractor maintained an equipment investment of more than \$1,000 per employe as compared with the residential contractor's \$175 per employe.) More than three-quarters of them individually did \$25,000 or more work during 1939 and together accounted for all but 1 per cent of all highway and heavy construction undertaken that year.

This pattern showing the bigger group of contractors (by size) accounting for the bigger share of the total work applies, however, only to the highway and heavy construction classification. Somewhat of a surprise to the 63 per cent of the building builders, who each perform less than \$25,000 of work per year, and to the dealers and manufacturers who supply them may be the fact that they account for only 16 per cent of the work done by this type of contractor. In other words, the 12,170 builders (37 per cent of the total) who boast a business bigger than \$25,000 a year are responsible for \$1,084 million, or 84 per cent, of all the general contracting dollars spent on houses and buildings, to say nothing of the subcontracting dollars under their control.

Equally surprising to many, perhaps, is the operating pattern on the 176,187 special trades contractors. Only one out of ten of them does an annual business in excess of \$25,000, but he pockets six out of every ten subcontracted building dollars. This fact becomes increasingly significant when it is realized that only 2 per cent of the painting and carpentering subcontractors (two of the four largest groups in the special trades classification and accounting for almost half the total

^{*}These ratios are based on a 1935 sampling of the industry conducted by the Census Bureau.

number) individually do more than \$25,000 business per year. As shown in the tabulation on page 338, they are the only subcontractors in this big business bracket who do not account for at least half of all the work performed by their respective trades. More typical is the operating pattern of the heating-plumbing and electrical subcontractors (the other two groups in the topflight quartet) which shows 10-13 per cent of the firms accounting for 61 per cent of the work.

CONTRACTORS BY GEOGRAPHY

It is logical that the distribution of contractors both by numbers and by the value of work performed should closely follow the distribution of U.S. population. Thus, the map on page 339 indicates that the Middle Atlantic States of New York, Pennsylvania and New Jersey (21 per cent of the population) comprise the biggest construction arena, with 24 per cent of all U.S. contractors performing 26 per cent of the national volume of work.* While California closely follows New York as the second biggest construction State, the East North Central States of Wisconsin, Michigan, Illinois, Indiana and Ohio rank second as a geographic division. They boast 20 per cent of the population, 22 per cent of the contractors and 21 per cent of the work performed. In relation to its population, the South has the smallest supply of contractors, while the West Coast appears to be oversupplied.

More than half (55 per cent) of all the nation's construction work is performed in the 92 cities with more than 100,000 population. And, while they account for only 29 per cent of the total U.S. population, they boast 37 per cent of all the contractors. Moreover, the fourteen cities of more than 500,000 population (17 per cent of the total) alone account for 21 per cent of all the contractors and 32 per cent of all work performed. Among these fourteen largest cities. Washington, D.C. alone could muster a 1939 construction volume by \$25,000-and-up contractors which was larger than in 1929. (For the country as a whole, 1939 construction by these big contractors was down 27 per cent from 1929. During the same period the number of these contractors increased 315 to 30.912. due entirely to a 1.289 gain-to 12,170-in the number of \$25,000-and-up builders. The ranks of big highway. heavy and special trades contractors were depleted.)

CONTRACTORS AND SUBCONTRACTORS

While the foregoing summary of official census data presents an accurate picture of the construction industry's major components and their major theaters of operation, it is still a rather complex market analysis and, in a sense, an incomplete one. Thus, currently available census information does not cover the important relationship between contractors and subcontractors nor the relative importance of contractors counted by the census takers and those many small fry builders who were glossed over as insignificant individuals. However, an indication of the extent of these gaps may be seen with the aid of previously existing statistics and a little reasoning. (Tabulation below.)

Roughly 95 per cent of all the special trades contractors work on the production of buildings as opposed to highways and heavy construction projects.* And, most of them work as subcontractors on these projects under the direction of operative builders and building contractors-referred to herein jointly as builders. (Major exceptions: special trades contractors who work directly for owners on remodeling projects.) Therefore, for the sake of simplicity, let it be assumed that all of the 14,498 special trades contractors who enjoy an annual business of \$25,000 or more work as subcontractors for the 12,170 builders who are in this upper business bracket. Totaling the value of work performed by these two allied groups, it is seen that the 12,170 big builders control \$2.3 billion, or about 60 per cent, of the market.

Actually their control is still more impressive, for they also influence the work of certain of their subcontractors who fall in the \$25,000-and-less bracket. However, since it is impossible to segregate from this group of 161,689 smaller subcontractors those who habitually work for the larger builders, they are assigned en masse to the builders in their own under-\$25,000 business bracket. Thus, the 21,-176 builders in this middle bracket control work valued somewhere below the \$1.0 billion indicated by the tabulation.

Balance of the \$3.7 billion of building work performed in 1939 (ARCH. FORUM, Jan. 1941, p. 67) was controlled by persons not covered by the census, including the uncounted 19,000 who reported an annual business of less than \$500, the vast horde of owner-builders, spare-time builders or journeymen and their subcontractors. (Some of their subcontractors unquestionably come from the lower strata of the \$500-\$25,000 business bracket, further reducing the total value of work actually performed by builders in that bracket.) All that is known about this third group of very small builders is that it is big-probably more than 100,000and that it controls a comparatively small segment of the building market.

Worth repeating is the unofficial estimate, based on the foregoing over-simplified analysis of the industry, that the 12,170 builders, who individually do an annual business of more than \$25,000, control more than 60 per cent of all the building work performed each year. And, with national defense economy demanding larger scale business from the big builders and forcing many of the small fry builders out of business (wartime effects which will probably carry over into the post-war period), it becomes increasingly wise for manufacturers, distributors and dealers of building materials to aim their sales guns at the big business builders.

WORK VALUE

*See footnote p. 339, Col. 1.

BUILDING MARKET CONTROL (1939) SIZE OF BUILDER NUMBER

\$25,000 & MORE BUSINESS. ³ BUILDERS Sub-contractors ² Total	12,170 14,498	\$1,083,548,000 (29%) 1,181,672,000 (32%) \$2,265,220,000 (61%)
UNDER \$25,000 BUSINESS:" BUILDERS Sub-contractors" Total	21,176 161,689	\$ 199,403,000 (5%) 826,234,000 (22%) \$1,025,637,000 (28%)
SMALL BUSINESS:* Builders, journeymen & subs.	(uncounted)	(more or less than 11%)*
ALL THREE SIZES-TOTAL	(uncounted)	\$3,700,000,000 (100%)3

- Official data from 1939 U.S. Census of Construction Industry
- 2 Alignment of larger subcontractors with larger builders (and vice versa) is necessarily assumed due to limitations of available data. Actually, a large but undetermined number of the more important smaller subcontractors work under the control of the larger builders, and many of the smaller subcontractors work under the direction of the uncounted builders and directly for the owners of buildings.
- 3 Data on these very small builders were not collected via the 1939 Census. Include tens of thousands of builders who perform work valued at less than \$500 per year, owner-builders, journeymen who build houses in their spare time and subcontractors for all these builders.
- 4 A maximum rough estimate derived by subtracting the total of the work performed by establishments covered by the Census from the earlier Commerce Department estimate (\$3.7 billion) for total building construction performed during 1939 by all establishments and individuals (see footnote 5). While a dollar difference of some \$409 million is indicated, it probably runs many million dollars more or less due to the different sources of the basic figures.
- 5 Total value is an unofficial estimate covering all types of buildings derived from Department of Commerce data (Arch. Forum, Jan. 1941, p. 67)

^{*}The census distributes contractors according to their places of business—not according to the location of projects built.


A portfolio of recent work by ANTONIN RAYMOND, Architect

Antonin Raymond, Architect. Born in 1889 in Prague, Czechoslovakia. Graduated as Architect-Engineer, Higher Polytechnic Institute, Prague. Office of Cass Gilbert, 1910. Office of Frank Lloyd Wright, 1916. Designed Theatre du Vieux Columbier for Jacques Copeau, New York, 1917. U. S. Army Intelligence office in Europe, 1917-1919. To Japan with Frank Lloyd Wright, 1920. Practicing architect in Japan, 1921-1938. Practicing architect, engineer and designer in New York and New Hope, Pa., with Noemi Pernessin Raymond, designer (Mrs. Antonin Raymond), 1939. USHA Defense Hausing Project in Bethlehem, Pa. FWA Experimental Defense Housing in Bethlehem, Pa., 1941.

"I wish that 'modern' would mean to the public and architects a serious return to fundamental principles of good design of all times. A safe approach to good design is the elimination process leading to the simplest, most direct and most economical solution of the problem.

A good modern plan is *free*, expressive of the informal American way of living. The relation of the interior to the exterior and the materials used and their finishes are more *natural*, expressive of our re-awakened sense of the physical. Truly good *new forms* of lasting esthetic value spring from new structural design based on new materials or methods or both and from changed social conditions demanding a different organization in plan.

Imagination only or the influence of modern painting leads to false values of 'modernism', a passing fashion."











"The idea of locating an architectural office on a farm was to maintain close contact with the natural aspect of existence, to escape too close a contact with the metropolis and its unrealities. We thought that we might acquire a saner tempo, a clearer vision, do better work and live more healthful, simple lives. All may still be a question, but we do not regret our move.

"The farm is situated on a low ridge running through a wide valley, with views over meadows to wood and mountains. Nothing much was left of the original house (1725), and its venerable stones were the only thing that prevented us from tearing it down and starting anew. The west end, being in fair condition, was preserved as it was. All the inside partitions and the south wall were taken down to bring in the sun and view. To the east we added the dining-kitchen wing; to the north a glass vestibule. Where the windows are not new horizontal sliding panels, they are the original muntined windows.

"All ceilings and partitions are of cedar, the floors of oak, save that of the studio, which was re-made of fine salvaged boards. Systematically, we finished all that was stone with white plaster. All wood is natural; it has a warm deep color.

"The house proves that good things belong to no period. The strictly modern additions in the architecture do not clash with the old. Inherited pieces of furniture, French, American Colonial and Oriental, (Continued on page 345)





Stanley II. Goldsmith, Jr.

ANTONIN RAYMOND, ARCHITECT



GUEST ROOM - upper part studio

Stanley H. Goldsmith, Jr

harmonize in a setting indifferent to time. "In the studio, which occupies the entire ground floor of the house as we found it, the low ceiling is partly opened through two floors to give a sense of space. This is used as an office. Stairs lead to the balcony on the second floor, enclosed at will by sliding paper doors. At the opposite end is the master bedroom and bath. Three bedrooms and a bath occupy the third floor. There are two bedrooms, bath. laundry and utility room in the new kitchen wing on the east.

"No curtains are used. Overhangs keep out the summer sun, and in winter translucent paper screens are applied to the windows. They are a fine insulation from cold and give a sense of snugness.

"Old Pennsylvania barns are a lesson in architecture. We have one, a splendid example of perfect stone walls and good wood construction. We added the silos and modern equipment, and are gradually designing and building the additional farm buildings."





C. V. D. Hubbard Photos





MASTER BEDROOM

CONSTRUCTION OUTLINE

STRUCTURE: Exterior walls of new wing—red cedar siding, yellow pine sheathing, fir studs. Interior partitions—studs, white Highland cedar boards. Columns—cedar. Floor coverings: (1st.)— random aged mixed boards; (2nd.)—white oak. Ceilings-white cedar, bevel siding, shiplapped, installed flush.

ROOF: Covered with red cedar shingles and built-up; overhang covered with the total similars and built-up; overhang covered with tin. INSULATION: Roofs—4 in. rockwool. WINDOWS: Sash—white pine, sliding. Glass—

crystal, Libbey-Owens-Ford Glass Co. Screensbronze mesh in white pine frame. Sliding Japanese bronze mesn in white pine trame. Sliding Japanese Shoji in all windows to insulate and diffuse sunlight. WOOD AND METAL TRIM: Trim—white pine and cedar. Doors—flush gum. HARDWARE: Schlage Lock Co. ELECTRICAL INSTALLATION: Fixtures—Lum-ling Wiremolds Visionida reflector Depting score

iline Wiremold; Visionaide reflector. Drafting room lamps—Dazor Mfg. Co. PLUMBING: By American Radiator-Standard

Sanitary Corp. Washing machine—Bendix Home Appliances, Inc.

HEATING: Forced circulation hot water system. Boiler and radiators—U. S. Radiator Co. Oil burner —Tru-Heet, Inc. Thermostat—Minneapolis-Honey-well Regulator Co.

THIRD FLOOR ROOMS

PROJECT FOR A COUNTRY HOUSE

ANTONIN RAYMOND, ARCHITECT



A house to be located on the south bank of a stream, between the water and a grove of trees. There were three main points to consider: maximum openness to the south; view; complete privacy for the master's suite. The fan shape, with stone walls radiating like ribs, takes care of the first. A narrow north side has sufficient provision for view. The plan is very free, with interesting changes in level. The living room is two stories in height and offers a sharp contrast to the intimacy of the owners' apartment.







Francis G. Mayer Photos

SHOWROOM, NEW YORK CITY

ANTONIN RAYMOND, ARCHITECT



A wholesale showroom, requiring the display of complete lines of glassware comprising hundreds of separate pieces. To create an orderly appearance, the principle of mass display was followed. To bring out the best qualities of the different kinds of merchandise a great many materials and color were used: wood, translucent backgrounds, mirrors, and painted hardboard. By insistence on the form of the display as a whole, and by the repetition of standard cases the changing backgrounds have been unified. The cases were pre-fabricated, to a horizontal module of three and a half feet and a height of seven feet. Shop construction made possible the use of sprayed finishes which contribute materially to the appearance of the room. An important element is the lighting, which had not only to show off the glassware, but to keep attention away from a ceiling broken up by beams, girders and sprinklers. Lighting units consist of fluorescent troughs, direct incandescent ceiling fixtures, and spotlights. To supplement the effect of the lighting, the walls and ceiling were painted a dull neutral gray.











C. V. D. Hubbard Photos

An addition to an old house, built by two local carpenters from materials salvaged from a barn on the property. The problem was to build a living room, a bath and two bedrooms, taking advantage of extensive views to the north and south. Both living room and master bedroom have wide openings to the views; both also make very effective use of the great stone wall to the east. The wing has access to the original house on both floors. Most striking of the many handsome details is the circular stair in wood, set against a background of glass.



HOUSE IN FRENCHTOWN, N. J. ANTONIN RAYMOND, ARCHITECT





HOUSE IN FRENCHTOWN, N. J. ANTONIN RAYMOND, ARCHITECT





C. V. D. Hubbard Photos



In its May issue THE FORUM announced a series of articles which would evaluate the opportunities and the problems which Building^{*} must prepare to solve in the Post-War period. Following the introduction to this series in May, the first article on Planning appeared in September. Continuing the series, THE FORUM now presents No. 2: Standardization. Comments on these articles as they appear and suggestions for those to come are especially invited.—*The Editors*

BUILDING'S * POST-WAR PATTERN NO. 2 STANDARDIZATION Building professionals are familiar-

almost to the point of nausea—with the use of the adjective "chaotic" to describe their industry. And, relative to other 20th Century forms of production, chaotic Building indubitably is. In no other field of economic and social endeavor is production so involved, assembly so disorganized, distribution so devious. In no other field is there so large a number of separately-functioning organizations between raw material and ultimate consumer, such haphazard diversity of product, price, and performance. In no other field is the need for standardization so evident, indeed, so glaringly obvious.

This again is no new thought. The lack of coordination between the hundreds of products which must be combined to make a complete building, the pointless variation in assembly techniques that makes such coordination so difficult, the absence of agreement on modern standards of quality, safety, and performance has been bemoaned for years. Agitation for rational building standards has been carried on for some time, and with considerable effect. Most of Building's smaller necessities, such as fastening devices, electrical accessories, basic hardware, and many larger items like doors, wallboard, flooring, framing, lumber, and to a lesser extent, window sash and frames have been standardized on an individual basis. Trade associations have instituted standards of quality and performance protecting the consumer and the conscientious manufacturer from the ill effects of skimped materials and poor workmanship. Programs aimed at the better coordination of these several standards are under way and are producing results.

Nevertheless, despite the progress which has been made and is being made in all these ways, the resistance to all-out standardization on an industry-wide scale is almost as

^{*}Because our language supplies none better, the word "Building" is used in an all-inclusive sense, embracing planning, zoning, design, construction, financing, etc.-Ep,

great as the combined pressures of all of the factors in the situation which are working toward such an end. Opposition to the idea of standardization is voiced at least as frequently as support. So strong are the prejudices against the term that even the proponents of one or another type of standardization frequently attempt to push their particular ideas with arguments against standardization of other kinds, claiming that in the case of their proposals "rigid" standardization, or standardization "beyond a certain point," or standardization "which would hamper the architect" is not involved. The fact is, of course, that such arguments, when advanced from a sufficient number of points of view, cancel one another out. As an industry, our approach to the subject is still that of a circle of suspicious canines sniffing a strange bone.

The reasons for this attitude are threefold: misunderstanding of exactly what standardization means, a strong persistence of outmoded traditions of handicraft production ¹ (which have lasted in our industry as in no other), and a healthy realization that standardization is not, in itself, the cure-all that is sometimes claimed; that Building has many an equally important, if not more important hurdle to surmount before it can aspire to the status of a mass-production industry. ², ³

The soundness of the last of these points has frequently obscured the fact that it is precisely because Building is backward in other respects, and has so many special problems of its own (the size and relative immobility of its finished product, its dependence upon a fixed relationship to specialized public utilities, its job of creating new *communities* as well as physical things) that it stands in special need of the coordinating influence of standardization. Particularly because of the far-flung character of the industry, the size and complexity of its product, and the specialized nature of its other problems, Building needs the most clear-headed understanding of the principles of standardization, the most rigorous analysis of the prejudices which are retarding its application, and the most widespread and conscious desire to secure its benefits at every step of the building process. Particularly because our problems are so unique and our tasks so complex, it is important that we stop condemning standardization for what it *is not* and begin to recognize and exploit its advantages for what they *are*.

1. "We want to know what is wrong with the 'handicraft traditions' which you say persist. After all, haven't we been trying our darndest to keep the 'handicraft tradition' alive? We can't see where true 'standardization' could cramp handicraft. As a matter of fact, there ought to be some way of making standardization improve the handicrafts. If further standardization is going to mean a continued decline in handicraft, tool craft, and workmanship—we are again' it!"

F. A. KLEINSCHMIDT Department of Architecture and Allied Arts, Texas Technological College Lubbock, Texas

STANDARDIZATION DEFINED

To a button manufacturer, standardization is a relatively simple matter. It means merely to regulate the size, material, and color of his product according to the prevailing need for various sizes and types and with due regard for efficient production, the practice of other manufacturers, and the accepted dimensions of button holes. It does not mean, as some suppose, that he must make all of his buttons in a single size and color or reduce the number of types to the bare minimum needed to prevent indecent exposure—standardization may even reveal the need for greater variety. It does not mean that he must henceforth refrain from developing new types or sizes or from modifying the old. And there is nothing in the process, much as he might wish that there were, which will effectively retard the development of the zipper fastener. A similar example from within the building field is another simple fastening device, the nail. Nails have long been standardized, and this has not prevented their being developed in tremendous variety; if anything, it has stimulated this tendency. Box nails, common nails, finishing nails, roofing nails, and flooring nails are only a few of the types which are available in different sizes and metals for specialized uses, yet are manufactured in identical millions and distributed in all their variety through every hardware store in the country. And here again application of the standardization principle, in spite of the tremendous economy of production and simplification of distribution it has made possible, has not retarded the development of competitive means of fastening wood to wood; the screw, the corrugated fastener, and, more recently, the automatic staple are instances proving the contrary.

From these two examples, several basic principles of standardization can be deduced. First, and most important, is the fact that standards have their origin in the sameness of human needs, and in the diversity of human needs—and have as their objective the better and more economical satisfaction of these needs. Second, standardization does not imply cessation of development: the true standard remains fixed for only so long as the factors which brought it into being remain in the same relationship to one another; moreover, the process of standardization frequently stimulates development. Third, no standard, no matter how comprehensive, can hope to achieve, or should hope to achieve a monopoly of the means of satisfying a given need; there will always remain alternative methods and devices altogether outside the scope of any particular standard and competing with it for public acceptance.

OBJECTIVES

So far, this definition has been largely in terms of what standardization is not. It fails to state, except in very general terms, what the objectives of standardization are, and says nothing at all about how they may be accomplished. Economical production has been emphasized, but economical production is by no means the only objective of standardization, nor is it the only benefit which standardization offers Building. The tendency to stress this objective to the exclusion of others is due to another common confusion of terms in which standardization is made synonymous with mass-production—a lopsided approach to the subject which ignores entirely its great contribution to the fields of distribution and consumption. By such a definition a manufacturer of electric light bulbs would be said to be making a "standardized" product even though his lamps fitted none of the ordinary types of socket, required five times the normal voltage, and produced only one-quarter the usual amount of light per watt.

Such mass production without standardization is not only possible, it has been a common failing of our industrial system. Standardization

STANDARDIZATION VS. SIMPLIFICATION

Much that passes for standardization is merely simplification, and many of the objections that are raised to standardization arise out of a failure to make a proper distinction between the two terms. Simplification is merely a weeding out elimination of items, process-the or models, or procedures that are no longer (or never were) really useful. Insofar as waste is removed, it is beneficial. But it does not call for a redevelopment of that which is conserved; it simply discards, For this reason it is not a coordinating force, and can be practiced by any organization independently of other organizations. Standardization, on the other hand, is impossible without collective agreement, and normally results in redevelopment and improvement of the product or service involved. Simplification, may clear the way for standardization, and standardization frequently results in simplification, but their objectives are quite different and should not be confused.

2. "I am inclined to think that you exaggerate the difficulties in the way of standardization. It seems to me that industry everywhere is understanding the principle of standardization and is to a large extent accepting it. The difficulties come more from interests who think they have something to lose through standardization rather than from architects and builders."

JOSEPH HUDNUT Dean, Graduate School of Design Harvard University Cambridge, Mass.

3. "Would it be of any value to suggest that we already have, and havehad for many years, a great deal of standardization?

"Every manufacturer who sends out a catalogue must standardize; our industrial buildings are in many cases almost completely standardized (and that's why they are so good) and soare many of our commercial buildings; our apartments are too. Here in Chicago there are tens of thousands of three-story walkups built down to the standard of the local building code so much alike that you must remember the color of the brick of the one you live in. All of this is and has been acceptable. So standardization becomes a matter of degree of standardization."

> GEORGE FRED KECK, Architect

Chicago, 111.

4. "I should like to see much more emphasis on the advantages of standardized performance requirements to replace absolute standards; for example, instead of standardizing on a two- or four-hour fire rating for exterior walls, a statement that the building must withstand the maximum fire possible from its own combustible contents or from nearby external fire hazards, for a long enough time to ensure the safe egress of the occupants of the building and to minimize the hazard to adjacent property. The Bureau of Standards has information on the degree of fire resistance which would be required under different exposure conditions which could be used in framing a fire code based on performance. rather than overall arbitrary standards which cover all conditions and needlessly penalize many materials and designs.

"I am at this time particularly learful of the harm which can be done by acceptance or enforcement of standard minimum room areas. such as those originally set forth by the American Public Health Association Committee on Hygiene of Housing (of which I am a member) and by FHA and FWA. Minimum room areas of the sizes set forth by these agencies have no sound scientific basis and are rather minimum sizes which will satisfactorily handle living functions even if the room planning is poor. I have seen house plans in which rooms fell below these minimum sizes which are generally acknowledged by experts to have made better use of the total space than plans living up to the letter of the standards. Recognition of this possibility has caused the Committee on the Hygiene of Housing to modify their original recommendation concerning room sizes which was 400 cu. It. per person (in a two-bedroom house this would be approximately 100 sq. ft. of floor area). While this revision has not been officially approved, it lays more emphasis on jurnishability of bedrooms and less on absolute minimal space standards."

ROBERT L. DAVISON

John B. Pierce Foundation New York, N. Y. without mass production, on the other hand, has not only occurred over and over again (a good example is the standardized height of tables, established long before furniture was mass-produced), it provides an excellent illustration of the need for standards over and above considerations of production and, incidentally, has frequently been the means of bringing about mass production in the building field.

The object of standardization is not merely ease of manufacture—this can be achieved through simple identity. It often makes manufacture more exacting and therefore more difficult. Rather, it is a better product, more easily combined with other products, easier to distribute, easier to repair or replace, suited to a wider variety of applications, and designed to accomplish pre-determined tasks.

PRIMARY STANDARDS

The basic standards are consequently not standards of manufacture, but standards of use and value. Historically, the first recognized standards of this type were, of course, coinage, weights, and measures. It is widely recognized that the establishment of these generalized standards of usefulness and value marks an essential first step in the development of our industrial system. They still work well with relatively simple substances-the phrase a bushel of wheat, for example, still gives a fairly accurate idea of usefulness and value. Modern industry, however, with its more complex requirements, has found it necessary to set up scores of additional primary standards that were unknown or unmeasurable a century ago. Thus we now speak not only of a pound of steel, but of steel of a certain hardness, certain strength in tension and compression, of certain composition, certain elasticity, and so on. So, to a lesser extent, with Building. A modern building is not merely large or small, not merely safe or unsafe against fire and collapse. It provides a certain degree of protection to health, a certain amount of thermal comfort, certain levels of illumination, meets or does not meet prevailing standards of convenience, appearance, and obsolescence.

These criteria, and others like them, are Building's primary standards. Included under this heading are also all of the broad requirements of use which Building's end products—houses, schools, factories, churches, stores, theaters, and other buildings—must meet if they are to be considered fully livable and useful. They, in turn, are based on prevailing standards of eating, playing, working, shopping, sleeping, and so forth. Summed up, they have their basis in and are an essential element of the American Standard of Living.

But many, if not most of these standards are mere rules of thumb. They bear about the same relation to Building's modern needs as the coinage, weights, and measures of the Middle Ages bore to the requirements of a rapidly expanding commerce. They are partly a matter of law (which varies from municipality to municipality—a deadly parallel), partly a matter of general agreement, partly a matter of habit, and partly a matter of attitude. They are chaotic, confused, and, like all such primitive standards, lacking even in agreement on—or, at any rate, widespread use of accurate and adequate scales of measurement.

Before there can be an effective standardization of products, there must be standardization of the job (or jobs) the product is designed to perform. Standardized, interchangeable automobile tires are possible only because there is a generally recognized standard, not only for the dimensions of various-sized tires, but also for the functions they fulfill: their ability to carry weight, the degree of riding comfort they afford, the amount of traction provided. ⁴

So, too, with Building. Parallel to and alongside of the development and integration of standardized building parts, procedures, and designs there must be at least an equal development of primary standards of performance and usefulness. The performance standards established by organizations like the American Public Health Association (sanitation and hygiene), the American Society of Heating and Ventilating Engineers (comfort), the Illuminating Engineering Society, the American Institute of Physics (acoustics) and similar bodies must be codified and must become recognized as minimum objectives of the industry as a whole. The Federal Housing Administration's excellent beginning in mortgage risk rating-covering structural soundness, resistance to the elements, resistance to wear, livability, mechanical and convenience equipment, light and ventilation, resale value of design, and neighborhood developmentshould be expanded and improved until a complete system for certifying the value and livability of the small house has been worked out and agreed upon. The idea behind the National Adequate Wiring Bureau's standard for residential wiring and home-buyers certification plan should be applied in other fields, particularly plumbing and heating. Standards of privacy. safety, convenience, occupancy, minimum size, etc., must be formulated and applied.

Architects, especially, must play a more important part in the formulation of primary building standards. The American Recommended Practice of School Lighting, jointly developed by the American Institute of Architects and the American Standards Association, points the way to other joint A.I.A.-A.S.A. standards covering homes, factories, offices, public buildings, etc., which would benefit both the public and the profession. Architect participation in projects of this type would do much to gain general acceptance for the results and at the same time increased acceptance for the professional designer.

BUILDING CODES

Building and insurance codes are, properly speaking, primarily standards, since they have as their object the achievement of certain performance characteristics. their Besides multiplicity (a recent survey by the Bureau of Standards shows that there are more than 1,500 different local codes in use in the U.S.) existing codes exemplify lack of standardization through their static quality (many are 15-20 years old) and especially through failure to their employ performancecriteria in place of requiring particular solutions designed to attain the desired result. Thus many plumbing codes require certain venting arrangements for trans. even where it has been shown that the siphonage these vents are designed to prevent can be avoided without their use. An outstanding exception to this practice is the National Electrical Safety Code drafted (and recently redrafted) by the electrical industry under American Standards Association procedure.* With the combined weight of the insurance companies, utilities, and the electrical equipment industry behind it, plus the prestige of the A.S.A., this code has found ready acceptance by municipalities, is practically universal in its application.

Similar efforts are being pushed in other fields by Joint A.S.A.-Bureau of Standards action. Technical committees working under the supervision of the A.S.A. Building Codes Correlating Committee are now drafting a series of standards which will set up detailed requirements for various materials and will be referred to local building authorities. In July the first result of this work, an approved American Standard for reenforced gypsum construction was completed; a month later it was adopted by its first municipality: Portland, Maine. Other Standards under way include masonry, fire protection and fire resistance, chimneys and heating appliances, light and ventilation, fire extinguishing equipment, administrative requirements, excavations and foundations, iron and steel, minimum design loads in buildings, signs and billboards, wood, and grandstands-an almost complete roster of the subjects covered in such diverse ways by existing local codes. These recommendations, when completed and if accepted, should provide the advantages of a national building code while leaving the door open for reasonable local variations where these are found necessary. (Continued on next page)

*Other exceptions include the A.S.A.-sponsored elevator safety code and code of fire tests of building construction and materials. 5

5. "The Standard Building Code recommended by the National Board of Fire Underwriters meets in an excellent way most of the objections to many existing City Codes."

SHERLEY W. MORGAN Director, School of Architecture Princeton University Princeton, N. J.

BUILDING CODES, (Cont'd)

In addition to the work of the Building Codes Correlating Committee, another body, the Central Housing Committee, is doing valuable work in the building code field. As a result of work by this committee, based on research by the Bureau of Standards, plumbing work in all future government construction, including defense housing, will henceforth be governed by a new "streamlined" plumbing code, (ARCH. FORUM, Feb. 1941, p. 4) said to save \$125 per house. Private builders in with tightly drawn, cities overloaded plumbing codes have been informally encouraged to ignore unreasonable restrictions and employ the new standards on enforcement If local defense work. agencies get tough, Washington is prepared to intercede with expert legal testimony. 6

Thus building codes, long an inky splotch on the building picture, now show signs of becoming one of its more encouraging parts. A fact of prime importance to building generally, its special significance here is that this progress has been achieved through a more conscious application of the principles of standardization—in this instance on a national scale, although this is by no means the only reason for the successful result.

6. "Building codes which attempt to be nation- or state-wide take so much time to prepare and meet with so much opposition that general acceptance is unlikely and they are likely to be out of date if and when they are accepted. The best that can be hoped for is to get as large a region as possible covered by a basic code including only important controlling provisions. Detailed provisions should not be determined by legislative bodies. Legislators are not in continuous session, do not have the required experience and should not spend their time on details of building regulations. In spite of the general objection of legislators and lawyers to the delegation of legislative powers to appointed boards, details of codes, and especially amendments which will allow new materials and methods to be used promptly, should be determined by boards appointed by governor or mayor, and chosen to represent the best technical experience on the subject. If constitutions do not allow such a common-sense treatment of the everchanging problems of the great industry then the constitutions should be changed."

CHARLES W. KILLAM Architect Cambridge, Mass.

STANDARDIZED DESIGN

From the foregoing discussion, it is evident that nothing but benefit can result from the application of the true principles of standardization to building design. For, just as real standardization is essentially a design process, good design is essentially the application of the principles of standardization to a specific task: an analysis of the basic objectives, or human needs to be satisfied, followed by the working-out of the best and easiest means of satisfying those needs. And, exactly as standardization results in the codification and repetition of certain elementary forms and solutions because of their proven ability to meet particular needs especially well, design employs similar repetitive elements. The door, the window, the arch, the stair-in fact all of the elements of building design are each examples of elementary design standards of this type, just as the various styles, in their own time and appropriate setting, are instances of design standardization on a more complex scale. The conscious desire for sameness, for repetition of particular design elements in order to achieve simplicity, arose long before machine production was developed, at a time when such sameness was sometimes difficult to achieve.

Although standardization is essential to good design, it has unfortunately not always been recognized as such. All too often the idea has conjured-up visions of a civilization of robots moving in lockstep along endless streets flanked by rows of monotonous, identical dwellings—a notion that can be traced back to William Morris' assertion, in 1888, that "production by machinery necessarily results in utilitarian ugliness . . . a serious evil and degradation of human life." And, while this assertion has been disproved by actual machine production over and over again, the notion still persists that standardization—infinite repetition—monotony and therefore that standardization must be avoided at any cost.

As a philosophy, variety for variety's sake has plagued Building for years, and has done endless harm. For the evil of monotony we have substituted the vice of variety (and its handmaiden, eclecticism) with, if anything, worse results than formerly obtained (cf. modern Suburbia with a row of identical Georgian townhouses). The harmful effects of housing hundreds of families in batches of identical boxes—placed end to end, or one on top of the other—are not lessened but made more obvious by meaningless variations in the trimmings. It has done much to accentuate monotony by making it seemingly more acceptable.

Real standardization of house design, on the other hand should stimulate, and not retard the differentiation of house-types in accordance with actual need. It would almost certainly result in the development of groups of plans offering approximately the same facilities but arranged in different ways for lots facing in various directions, in plans offering differing facilities for families with different needs, in a more exact adaptation of design

HOW "TOTAL" IS THE BLACKOUT FOR NON-DEFENSE BUILDING?

In the four weeks following the SPAB announcement little has happened to reassure a building industry still stunned by the suddenness and severity of this action. Wherever building men gather there is hot debate over why the order was issued, whether it really means what it seems to mean and whether there is early prospect of relaxing some of the rules.

WHY THE ORDER WAS ISSUED

Official Government version insists that the order was dictated by absolute necessity after full consideration of defense program needs for critical materials, especially copper and other metals. For example: of the 1.8 million tons of copper expected to be available during 1942, the defense program *must* take about 1.5 million, and civilian consumers normally *would like to take* 1 million tons—more than three times as much as will be left for them. Another example: of the 89 million tons of steel to be produced next year, civilian requirements would amount to about 86 million tons and leave only 3 million for the defense program, which will actually require 35 million tons. Answer to these problems and many like them is obviously a drastic curtailment of civilian non-defense consumption.

QUESTIONS

At least the following questions seem reasonable to ask in a completely fair and patriotic spirit: Why was such a drastic decision made without consultation with building leaders? If urgent defense needs demanded it, why were the needs not anticipated sooner and some effort made to develop a plan which might have served defense fully and prevented a virtual shutdown of non-defense building? Can it really be in the best interest of defense to produce overnight such a severe dislocation of the national economy and of its Number One industry?

DOES THE ORDER MEAN WHAT IT SEEMS TO MEAN?

Despite a good deal of wishful talking THE FORUM'S opinion is that the order means what it says: no priorities for nondefense building. Obviously that does not affect all individuals and all communities alike. Some architects and many builders are already engaged in defense construction and as the program increases in size and speed others will be. Similarly, those who are located in designated defense areas are more favorably situated than those who are not. Despite the fact that many believe there are vast inventories of equipment and materials in the hands of dealers, it is unwise to assume that these inventories will carry us more than a few months. Unless regulations are relaxed or the defense program is expanded to an unbelievable degree, many competent and experienced people are going to have to look beyond building during the emergency, unless they are able to develop such specialties as modernization and maintenance for which little or no critical materials are required.

IS THERE PROSPECT OF RELAXING THE RULES—NOW OR LATER?

The answer is "iffy". On the good side are these possibilities: SPAB may have *over*estimated defense needs or may have *under*estimated (very unlikely) production of critical materials; further study may produce a plan which makes it possible to allocate critical materials to non-defense building; completion of the defense construction program in six months or a year may release critical materials for non-defense use; the war may end soon (even if it does, the defense program may continue for years). On the bad side are these prospects: we may enter the war or, in any case, vastly enlarge the defense and aid programs (very strong probability of one of these); regardless of any liberalizing action the

WHAT IS NON-DEFENSE BUILDING?

It is evident that the purpose of the SPAB order is not merely to facilitate defense construction, it is to prevent building activity which might interfere with the defense effort. But and this is a big BUT—nobody knows precisely where essential defense construction ends and non-essential construction begins. Some hint is provided by the exemption from the SPAB ban of projects which are essential for public health

A FEW ASSUMPTIONS

Government may take now or later, the psychological effect of the SPAB order has dealt a blow to public interest in non-defense building.

and safety. Undoubtedly a further examination will show that this exemption is far from adequate. Maintenance of civilian morale and defense production at peak efficiency may often mean providing complete communities. Do the regulations as presently established make sufficient allowance for this factor? In any event, early clarification of what "defense building" includes is mandatory.

Y THE ORDER WAS

Let's start with the sound assumption that everyone outside as well as inside Washington wants to see Hitler beaten tomorrow or as soon thereafter as possible. For our next assumption, let's agree that too many people, too many dollars, too many social objectives, and too much morale are at stake to dislocate *unnecessarily* any industry as major as Building. And finally, let's assume that in this emergency and in these circumstances advance planning is vastly preferable to hysterical action. The bad fumes from Mr. Ickes' gas control edict are still too fresh in our nostrils to justify supreme faith in administrative infallibility.

Because of these things and also because the building industry has already superbly demonstrated its spirit and competence with every part of the defense program allotted to it, we ask the unquestionably high-minded Washington administrators to recheck their figures now, to devise new plans, to fully consider intelligent suggestions from all sources, and in total to make a tremendous effort to keep non-defense building alive.

OUR MOST CRITICAL MATERIAL IS TRAINED PERSONNEL

It takes a lot of hard work and a good many years to produce a competent architect or engineer but it takes only a newspaper headline to put him out of business. In great degree the same thing is true of the other technicians and the other branches of building; carpenters, electricians, painters and plumbers are skilled tradesmen who have learned their trades the hard and long way. It is in the national interest during the emergency and in the critical years which are certain to follow war's end that we preserve this great body of building technicians as a working asset. They are going to be needed as badly to win the peace as to win the war if we are to keep any reasonable hope of successfully completing our No. 1 post-war objective—building a better world to live in.

HERE ARE SOME SPECIFIC SUGGESTIONS TO THE GOVERNMENT

1. USE TRAINED LOCAL PERSONNEL. There is still too much of the work being done in Washington, too little willingness to use existing and competent local organizations and people in the defense program. Thousands of men who want to and who are well able to participate in the emergency effort are being denied the opportunity. Washington bureaus should be the last, not the first resort. This is not mere pleading. If anyone thinks so, let him examine critically the defense housing program. The score in favor of private architects is ten touchdowns to none at the end of the first quarter. 2. SPREAD THE WORK MORE. It was perfectly natural at the start of the program to use the largest and best-known firms. This led to the temptation to load these firms to the bursting point. There are many competent firms available. This situation parallels the overloading of a few large manufacturers. Steps have been taken to correct the industrial situation. Similar correction should now be made in the building program.

3. REDUCE THE ARMY AND NAVY "MONOPOLY" IN ANTICIPATING CRITICAL MATERIALS. There appears to be basis for the view that the Army and Navy are hoarding critical materials beyond any reasonable need by placing orders above any known requirement and needlessly far in advance. Some correction of this situation seems in order.

4. CHECK WASTE OF CRITICAL MATERIALS IN DEFENSE PROJECTS. Even a casual examination of defense buildings suggests that easy priorities lead to extravagant use of critical materials. Where critical materials can be saved without loss of speed there is a major opportunity to increase non-defense supplies without any damage to the program.

5. CREATE AN INDUSTRY COMMITTEE. A representative committee from the building industry (including the professions) should be set up immediately to consult with appropriate Government agencies. Such a committee could aid in the development of programs, could advise on public measures and statements and could give the industry the satisfaction of knowing that its views are represented *before* any restrictive action is taken.

The sum total of these proposals may help enormously but even if they are all put into effect it seems inevitable that the situation will still leave many qualified technicians unused in the defense program and unemployed in their normal field. It is proposed, therefore, that there be instituted a

FEDERALLY FINANCED FACT-FINDING AND PROJECT DEVELOPMENT PROGRAM.

Authorities agree that total employment is the major target for the post-war era and that Building (in its broadest meaning) is the No. 1 industry to meet that need. Having already seen the results of being unprepared for defense, there is no excuse for being unprepared for peace. There can be no adequate preparation for post-war building unless the Federal Government will set community and regional fact-finding surveys in motion now. This is a major undertaking, months of intensive work are involved and it is an inescapable prelude to advance planning. Whatever the cost, it will have to be spent sometime. If the surveys are not made now much of the expense will be wasted later and the program will collapse. If the surveys are made now the entire program can proceed on an orderly and organized basis. The second stage of this program, but one which can only follow the first, involves advance project design to develop a "shelf" of carefully studied and useful post-war projects. It is reasonable to suggest that this program could now usefully employ five thousand men on work that will maintain civilian morale during the emergency. And it will pay huge dividends later in making it possible to go into action promptly and scientifically the moment the last bugle has sounded.

IS THERE A BOMBER HIDDEN IN THIS \$8,500 HOUSE?



It is claimed that there is enough critical metal in this house to build half a bomber. The editors of THE FORUM are going to rip the house to pieces, count the nails, weigh the brass, measure the steel and redesign the house to see how much of the bomber can be saved and still leave a house that will stand up and work.

But that is only half the loaf. The other half is to analyze whether critical materials are being wasted in defense building. So the editors are also going to take a typical defense factory, examine it minutely and determine whether such buildings can be designed and erected, *without loss of time*, by substituting non-critical materials in some places where critical materials are now being used.

If this demonstration succeeds it may show the Government the way to some modification of recent restrictions . . . may prove a lead into some non-defense building.

The detailed report of this study will be presented in the December and January issues of THE FORUM. We believe it will deserve the attention of all architects, builders and everyone else whose livelihood is Building. For significant and interpretive coverage of defense and non-defense building, for constructive thinking as well as accurate reporting, THE FORUM will prove more valuable than ever to building professionals in these momentous times.

THE ARCHITECTURAL FORUM published by Time Inc. Time & Life Building Rockefeller Center New York, N. Y. to varying climatic conditions, in provision for the use of various materials with a given design, in more, rather than less, variation between the houses on a given street. And real standardization of house design would certainly require more, rather than less, work on the part of the architect: time for a thoroughgoing analysis of all of the factors entering into a given design, development of all of the appropriate variations of a given scheme to fill varying needs and situations, active participation in the design of most of the houses built for every income bracket rather than a field confined to a tiny fraction of those housed. ⁷

Discussion of standardized design in these terms may seem academic, if not Utopian. There is plenty of evidence, however, that such a process is actually going on. Consciously or unconsciously, many a leading architect works in exactly this way, developing and discarding new standard elements which are combined in different ways to meet differing needs, and unhesitatingly repeating those solutions which have proved their value. In fact, it is only through such repetition that the work of a particular architect acquires recognizable style, and only by agreement between the work of a whole school of designers that generalized styles—which are actually standards—are developed. In this sense the ideal of a modern American style (or set of regional styles) *is part and parcel of the need for standardization*.

But the practical, down-to-earth needs of the building industry demand a considerably more conscious and conscientious application of this principle. In their revolt against the excesses of the eclectic period-a revolt which has involved modernists and traditionalists alike-our architects have yet to throw off its major sin: pointless variation. In place of the breath-taking excursions through time and space which were the dearest vice of the designer who could work equally well in Byzantine and Baroque, the modern architect has acquired a tendency toward individualism that is frequently just as fickle and aimless. The only curb which can possibly be put on such a tendency is the will of the designer himself; what is needed is a more deliberate striving for continuity, a more rigorous testing of new ideas before they are put into practice. Such self-discipline, far from restricting design development, can do much to channelize change and give it meaning-instead of moving rapidly in a circle, it can then go forward more slowly but infinitely more surely toward a well-defined goal.

Another way in which architects can benefit from standardization is through a planned program for the development of carefully-studied design elements, carried on both individually and collectively. ⁸ There may be good reason why more than one bathroom layout should be used in the small house field, for example, but there is certainly no justification for more than four or five such arrangements in a given class of construc1. "Architecture must recognize the changes which are taking place and revamp its approach to the problems which it faces today. The war has brought a challenge and the profession has had to rise to defend its right to participate in defense. There has developed a 'smugness' in many quarters which has resulted in stagnation. The general public does not recognize nor respect the value of the architect in the present emergency.

"In the field of houses the profession must realize that large group planning and design and development of economical types present the greatest opportunity. During the past few years the architect has begun to take an interest in the small house and through the insistence by FHA that plans be developed, a better small house has evolved.

"There can be no doubt that competition of ideas will result in various designs. This has been true in every field of industrial standardization. The building industry with its many materials and varied climatic requirements demands various designs. The architect must design for mass instead of for detail."

BURNS ROENSCH, Architect Detroit, Mich.

8. "There has been, and no doubt still is, a feeling on the part of architects, as well as others, that standardization if carried too far will result in regimentation, but I believe this theory is based on false assumption. "Manufacturers have been the most progressive in developing standard units, due no doubt to economic reasons and architects have unfortunately been lagging in assuming the leadership in this development for the reasons stated above.

"During slack periods in the office we have developed a series of stock details of such items as cabinets, trim, window details, etc., and while these details have in no way interfered with freedom of design they have in fact allowed more study on essential items, planning and design."

M. H. FURBRINGER Furbringer & Ehrman, Architects Memphis, Tenn. 9. "My observation is that the currently active member of the architectural profession is happy to have the cooperation of improved standards developed by manufacturers."

PAUL GERHARDT, JR. City Architect, Dept. of Public Works Chicago, Ill.

10. "Perhaps it is heresy for me to say this but I have found most architects that I have talked to always feel that they are privileged to have something special in anything they design. I suppose it all stems from the fact that decoration has always been the architect's prerogative, and the more statuary and carved glass he could get on a building the better he thought it was."

HENRY DREYFUSS,

Industrial Designer New York, N. Y.

11. "I am surprised to note that in an article devoted to the basic consideration of standards, no mention is made of the possibility of adopting the metric system in place of our cumbersome system of weights and measures. It would seem to me desirable that we should adopt the metric system soon after the conclusion of the war for the following reasons. "1. The metric system has always appeared to me to be much more convenient to use and our present system can only be justified by the cost and inconvenience of making the change. "2. It would seem that the cost and inconvenience of making the change would be least burdensome if made in the early post-war period. If necessary part of the cost could be met by subsidy by the Federal Government in lieu of some of the "made work" which will undoubtedly be necessary.

"3. It is to be hoped that foreign trade will be expanded as a result of the peace. If arrangements could be made with the British Empire for a simultaneous change to the metric system, practically the entire world would be on the same system of weights and measures and this would greatly facilitate the mass production of articles for world markets."

LOUIS JUSTEMENT, Architect Washington, D. C. tion. These could easily be developed in considerably greater detail than is normally possible, improved wherever improvement suggests itself, and then used over and over again to the advantage of architect and client alike. Somewhat the same process is applicable to kitchens; certainly particular kitchen details can be perfected in this manner. And, if a sufficient number of architects are able to agree on what constitutes an ideal series of bathrooms or kitchens, manufacturers should be only too willing to furnish special items of equipment (such as tailored counter tops) at the price usually charged for stock items.

Easiest of all, architects can further the idea of standardization by simply indicating their willingness to entertain it—and by contributing their advice to the development of new standards. There is a widely held impression, especially among building material manufacturers, that architects are unable to adapt their designs to anything which cannot be hacked out with an axe, like a floor beam, at the site of the building. Despite resources which far exceed any at the command of the individual architect, manufacturers are reluctant to develop new standards that smack of design, for fear that architects may resent such proposals. As a result, many a good idea remains locked in corporate files for lack of an encouraging word from the profession. 9, 10

That the use of such standardized design elements would not result in identical buildings has been proved many times over by all of the classical styles of architecture. To those who feel that it would restrict creative ability, proponents of standardization have a stock answer, but a good one: the symphony orchestra. Symphonic music requires the coordinated teamwork of hundreds of specialists, timed to the split fraction of a second. Acceptance of a standard pitch and standard score does not prevent individual virtuosity, and a Toscanini is always free to superimpose his own conception of the music as still another type of standard. So with any standardization of basic elements: to the extent that they are made interchangeable, they can more easily be rearranged or revamped to form new design patterns wherever and whenever desired.

Thus while uniformity is an earmark of standardization, standardization does not aim at uniformity for its own sake. It seeks to establish uniformity only in the connections between cooperating units or groups. The creative designer is thereby offered increased flexibility and freedom in his own range of work. Through coordinated teamplay he is able to achieve goals that could never be attained by himself alone. And, instead of a world of look-alike and act-alike sterility, he is offered the tempting prospect of an industrially cooperative society where change is kaleidoscopically continuous and forms tend to become infinite in variety as performance standards become ever more specialized and exacting.

DIMENSIONAL COORDINATION

Far and away the greatest single contribution which the architect can make to the cause of building standardization is by the implementation of dimensional coordination. So long as the building process involves the assembly of the many and diverse products, not only of different manufacturers, but of different industries, the problem of their interrelationships will remain vexing and complex. And, while the interrelationships between these elements always involve structural and functional requirements, the key factor in their successful combination is the matter of size.

Coordination of all these various parts into attractive, usable, economical buildings is the architect's main function. If the bricks surrounding a particular window, or the acoustical tile surrounding a ventilating grille, or the marble slabs surrounding a monumental doorway fail to add up to the required dimensions of the opening, it is up to him somehow to adjust the difference either by cutting the brick, tile, or marble into fractional units, or by devising some sort of border or surround which will enlarge the opening to the required dimensions, or by changing the size of the window or grille or doorway to conform to one or another multiple of the basic size unit of the surrounding material.

The idea of a unit system, or "module," or "dimensional increment" for building design is not an abstraction which has been artificially introduced from outside the building industry; it is inherent in the building process itself. It is embodied in every combination of repetitive units to create a larger lineal dimension (as in the use of clapboards on a vertical surface), a larger area (as when tile are used to pave a floor), or a larger mass (as in the cubical units employed in masonry). It is as true of ornament as it is of structural elements, as true of, as it is of small.

Nor is the coordination of such units a new or visionary idea; it has always been attempted as a matter of common sense. It is important insofar as the exact relationship between such units is important from the standpoint of economy or appearance or usefulness, insofar as the size of the various units used in combination is fixed or hard to change, insofar as it makes good design a simpler, easier, process. With the development of more and more standardized building parts, with increased emphasis on franker, simpler methods of Joining these parts together, and with the use of larger units of material, especially finishing materials, the importance of such coordination is constantly increasing.

One way in which such dimensional coordination can be effected is through a painstaking analysis of individual design problems in which advantage is taken of accidental mathematical relationships between different stock items (thus two 15 in. cupboard doors can be equated to five 6 in. wall tile; four 3 ft. windows to three 4 ft. panels of wallboard). Another way is to take advantage of the presence of "modularity," or a common denominator wherever it happens to exist (as with recessed lighting troffers, which are commonly made 1 ft. wide and 4 ft. long, and work well with most acoustical tile, which are usually 1 ft. square).

Both of these methods, however, have the disadvantage that they can only be applied to a limited number of materials in a limited number of ways. If such coordination is to be generally applicable it is necessary that a universal integer, or module, be agreed upon and applied. Such a unit must be large effect maximum coordination, enough to small enough, to maintain design flexibility. It must be applied not to actual overall sizes, but to the centerlines of the junctions between repeating units and units of other materials. To attain real universality, the same unit must be applied to width, depth, and height.

These principles were first accurately formulated and widely publicized by Albert Far-

well Bemis, in the book The Evolving House, published in 1936. They have since achieved official A.S.A. recognition (thanks to the persistent support of the Modular Service Association, a non-profit organization founded by Mr. Bemis' heirs) and for the last two years have been the subject of investigation by a committee known as Project A62, sponsored jointly by the A.I.A. and Producers' Council, Inc., and representing more than 400 different trade associations, engineering societies, and other interested building organizations. Already this study has resulted in an approved system of simplified brickwork which uses the 4 in. module to good advantage in solving the problems of structural fit with other masonry materials, like back-up tile and concrete block, and with existing stock sizes of fram. ing lumber, wood windows, and doors (ARCH. FORUM, July 1941, pp. 31-34). The virtues of the 4 in. module in traditional planning and construction can hardly be denied. Its multiples neatly encompass bricks and 2x4's, 16 in. stud spacings and 4 ft. wallboard widths. It is a small enough size increment for doors and windows, yet large enough to eliminate unneeded variety. Together with standardized assembly details, which Project A62 is rapidly developing, it offers much in convenience to the designer, economy to the builder, and systematic standardization to the materials manufacturer. But like all standards, it is not universal in scope. Complete dimensional coordination as practiced by the modern designer must also take into account larger units where these are important from the design standpoint, must allow for new design developments (Project recommendations, for example, so far make no adequate provision for such items as window mullions which are also part of an articulated frame, for panel construction, for curvilinear forms). Nor must the 4 in. module be regarded as an eternally fixed end product; rather, it must be considered simply a good beginning and foundation for further progress as time goes on. 12

STANDARDIZED PARTS

Closely tied up with the question of design standardization is the problem of standardized parts and standardized assembly or construction. In one sense, most modern building materials and items of equipment are already standardized as to size, many as to quality and performance. But, especially as regards size, this uniformity can hardly be considered complete standardization. While considerable progress has been made in this direction in the past few years, it has been one-sided progress — there has not been a corresponding development of primary standards (performance requirements, codes), design standardization, and dimensional coordination to provide a firm basis for true standardization of building parts. Moreover, as has already been mentioned, manufacturers have actually avoided further standardization because of a feeling that Building is not prepared to absorb thoroughly integrated products. As a result, product standardization has had to mark time while waiting for the rest of the building parade.

Nevertheless, it is in this field that standardization has made its widest gains — gains which point the way for Building both by showing what

12. "The virtues of a four-inch module lie not in its neat inclusion of bricks. 2x4's, etc., but as you later suggest in its convenient size and chances for universal acceptance. "As standardization grows, the particular unit chosen for its modular basis becomes as significant as our standard gauge for railways. Its change at a later date would be chaotic. Unlike a railway gauge, however, it serves more as a control to design than as a restriction. It is a size increment, not a fixed gauge. Large units as well as small, wall panels and trim strips, all may come within its control, the larger units being simply multiples of the basic measure. Standards themselves may always be improved and developed, but their basis is being laid now in as permanent a form as the roadbed of a railway."

ALAN C. BEMIS

Cambridge, Mass.

13. "Irrespective of its stride, standardization would be greatly implemented today if there were more order in the presentation of material jacts. The devious channels that now lead to sources of information only beset the architect with despairing indecision. Meanwhile, office production costs go on merrily, awaiting the time when data will be more intelligently compiled and distributed.

"How much better it would be if the present process of trial and error could be avoided by more cordial cooperation within the profession, remembering always that the occasional unfamiliar job is harder to perform than the accustomed one; also that a job of little moment to the experienced architect appears like a mountain to the younger one.

"This dilemma might be eased a great deal if centers were to be established at principal points where architects are gathered, to serve as research and information posts on architectural matters.

"There appears to be no limit in the possibilities that might be developed in such centers and, doubtless, these could be organized in such a way that much good to the profession would arise from them."

JAMES H. MITCHELL, Architect San Francisco, Calif.

14. "In my opinion, our greatest difficulty and therefore the point that should be emphasized in our attack lies in the standardization of building procedure. This is particularly marked in our rural and small town areas . . . Every governmental agency, state department, and political subdivision of these, demands that men providing building commodities or services shall not be selected on their ability to meet the needs but on their willingness to bid low. Hence, the people of our industry are not encouraged to improve their procedure standards, for they are selected and rewarded upon a basis that tends to discourage such improvement."

EMIEL J. CHRISTENSEN, Architect Columbus, Nebr. standardization can accomplish and how it is achieved. Almost any building product that is produced and marketed on a national scale is a sure bet as to constancy of dimensions, color, weight, finishes, and other structural or mechanical characteristics. In terms of value, such products are measured against an entirely different scale than Building's hit-ormiss site assemblies, and are a prime demonstration of standardization's economy. And from the standpoint of variety and quality of design, few would deny that they represent enormous progress beyond corresponding products of the handicraft era.

Such standardized building parts have rendered the job of the specification writer a great deal easier, while at the same time increasing his range of choice and enabling him to specify and attain a higher standard of quality. Whole industries have set up standards under regular A.S.A. procedure, with excellent results. Outstanding examples (among many others) are the regulations governing the manufacture and grading of Douglas Fir Plywood, and those controlling test procedure and performance established by the Oil Burner Institute. Considerable progress has also been made in the use of certificates and labels. Shingles, lumber, Portland cement, gypsum, lime, paint, paper, linoleum, piping, wallboards and numerous other products are sold on the guarantee-label plan.

STANDARDIZED PROCEDURES

The application of standardization is not limited to physical things; it can be applied with equal facility and equal benefit to ways of doing things, to procedures. ^{13, 14} Neither in the past nor in the present has building been slow to see the advantage of standardization of this type. The official "documents" of the American Institute of Architects, defining the relationship of architect to client, client to builder, and architect to builder in uniform contract form are excellent examples of procedure standards set up many years ago. Similarly, architects' registration laws are standards of professional training and competence, the professional code of ethics a standard of professional behavior.

Unfortunately, this clarity of function and definition of responsibility does not hold true to the same extent in the case of others of Building's personnel, whose contact with the public is more frequent and general than is the architect's. Result is that the prospective home builder or home buyer, the business man who wants to put up a store or a factory, the building committee representing a church or fraternal organization is confronted by a confusing, and often bewildering situation. ¹⁵ And architects have not helped matters much by their seeming effort to surround their profession with an air almost of mystery, and by professional standards so impossibly high that they can be met only by a tiny fraction of the population.

Recent trends, such as the various home builders' "clinics," are in the right direction, but they have by no means gone far enough. What is needed is general agreement by all of the factors within the industry on the procedures appropriate to each class of construction and then adherence by all concerned to the standards so established. Standardization in this instance should be made the means to enable the industry to present a united front toward the customers of Building. As in other types of standardization the inevitable corollary would be the improvement of the services provided and a reduction of their cost.

FORMULATION OF STANDARDS

As a dynamic process, standardization implies that new standards must continually be set up in line with the changing needs of man and society. This task itself is creative design on a vastly enlarged scale. To tackle it is Building's immediate obligation if Building is to be prepared to meet the needs of a post-war world—the demand for better housing and community facilities which the cessation of armaments production is bound to produce.

But how are such standards to be established? ¹⁶ Who is to say which are the right and which the wrong ways of building, just how good is good enough? Who is to integrate these findings into a harmonious whole? ¹¹ Part of the answer to these questions is to be found in the work of the American Standards Association, in cooperation with the U. S. Department of Commerce, which has already established so many good and workable standards within and without the building field. Characteristically, the A.S.A. has not tackled this problem in a hit-or-miss fashion; it has standardized the procedure of establishing new standards and keeping them up-to-date.

First and foremost, this procedure is an eminently democratic one. It allows, nay seeks, full expression of opinion by all interested individuals and groups. Work on new standards is carried on by a broadly representative committee which includes users as well as producers of the product or service involved, as well as others whose interests may be affected by the establishment of the proposed standard. Proposals of the committee are distributed broadside to all those who may conceivably be interested, and their comments solicited on standard forms provided for this purpose. Adoption of the proposed standard hinges on written acceptances by a majority of the producers and other groups involved.

Secondly, the procedure avoids the evil of bureaucracy by requiring that the initial impetus and much of the leg work required to establish such a standard come from industry itself, rather than from within the Department of Commerce or the A.S.A. Self-impelled, the standards formulated in this way are always evidence of a real need for such regulation and codification rather than the zeal of government officials or abstract theoreticians.

Thirdly, the procedure depends for the enforcement of standards so established upon the authority generated by the standard's general **15.** "What about quantity surveys to eliminate guess work on costs? Could the owners be educated to stand the expenditure and save red faces when final figures soar into the blue?"

ELY JACQUES KAHN, Architect New York, N. Y.

16. "It seems to me that one way successful standardization will arrive is by standardizing an assembled unit like an automobile. After all the consumer—the public—is the final test of standardization and he is only interested in an assembled usable product like a sewing machine, a refrigerator or an autombile. The modules and the other items are interesting to us in the profession and in the industry, but not to the public.

"Progress will be made by the trial and error theory presumably and the combination of volume, skill and design will very likely maintain as in the automobile industry. The new element in mass production of houses, which does not affect the motor industry, will be the placing of them. The architect's skill as a site planner would be constantly tapped and demanded; otherwise the best units badly placed can produce a failure."

ALFRED SHAW, Architect Chicago, Ill.

11. "Better organization is needed rather than more organizations. Extensions of the Building Congress idea would be more worthwhile than the development of any new agency. It would have the same cross-section of the industry but it would have added strength (and more continuity) from diversity of objectives, as well as of interests represented.

"Existing agencies or organizations could be persuaded to expand and to assume new functions much more readily than a new set-up could be effected—and it might be an interesting experiment if the various technical publications of the building industry would take the initiative and test the power of the press by promoting such a program."

HORACE W. PEASLEE, Secretary Central Housing Committee Washington, D. C. 18. "Although 1 acknowledge the many excellent features of the ASA method 1 believe that some means of speeding it up would be essential to its effective use on such a comprehensive scale as you outline. Some means of providing continuity of staff work, and a greater amount of laboratory research are badly needed.

"I also have some reservations about your proposed Institute of Building Standards. Composed, as it is outlined, of representatives of the various special interests in the field, the probability is that each would be more concerned with preserving his own independent status than with the major objectives. 1 feel it unlikely that much progress will be made until some of these special groups have been merged, and submerged, into larger organizations whose comprehensive outlook would permit them to put an interest in the ultimate product before their concern with the exclusive jurisdiction over a part of the process."

MILES L. COLEAN, Research Director Twentieth Century Fund New York, N.Y. acceptance, rather than the force of law. Manufacturers conforming to the standard, and who agree to submit to suitable periodic tests establishing their conformity are permitted to so designate or label their products; those who do not wish to are free to so elect.

Such is the pattern, worked out in minute detail and already successfully applied to a wide variety of building products and procedures, which stands at Building's disposal for the establishment of future individual standards of every type. It answers the question of Who and How, but not the question of What is to start the ball rolling and integrate the final results.

The second part of the answer is perhaps provided by a special Institute of Building Standards, established in recognition of Building's special need for coordination, and representing all of its groups architects, engineers, contractors, builders, product manufacturers, dealers, real estate men, lending institutions, building managers, and property owners alike. ¹⁸ Such an institute designed to work in close collaboration with the American Standards Association and the Bureau of Standards might well be brought into being and organized by a Congress on Building Standardization, which could appropriately be convoked by the various professional societies in the building field. Whether this step or some other is taken, Building is clearly in line for further standardization from top to bottom. The result, if standardization is properly applied, should be beneficial to all factors within the industry and, most of all, to Building's customers.

SUMMATION:

12 POINTS TO REMEMBER

The object of standardization is the better and more economical satisfaction of human needs-

- 1. better products and services
- 2. more easily combined with one another
- 3. easier to distribute
- 4. easier to duplicate, repair, or replace
- 5. suited to a wider variety of applications
- 6. designed to satisfy pre-determined needs.

True standardization results in-

- 7. greater, rather than less variety
- 8. acceleration, rather than cessation of design development
- 9. increased, rather than lowered quality.

Building needs standardization more than any other industry because of its complexity and in order to achieve-

- 10. economy with a simultaneous improvement in performance
- 11. better design and the development of new regional styles
- 12. a clearer and broader understanding of industry-objectives and how they can be attained.

OFFICE BUILDING FOR UNITED BENEFIT LIFE INSURANCE COMPANY MUTUAL BENEFIT HEALTH AND ACCIDENT ASSOCIATION, OMAHA, NEBR.



All photos, Hedrich-Blessing

TINSLEY, MCBROOM & HIGGINS, ARCHITECTS

One great advantage enjoyed by an insurance company, as compared with the majority of commercial enterprises, is that the nature of its business does not force its offices into congested downtown districts. Good use was made of this circumstance when United Benefit Life put up its new building, for the semi-residential location chosen has ample room for lawn, trees and future extensions should they be needed.

The completed structure does not differ markedly in appearance from the type generally adopted by such institutions: a monumental mass with elevations whose pilaster treatment suggests classical precedents. This theme is carried through consistently, at the rear where it is expressed in brick instead of OFFICE BUILDING, OMAHA, NEBR.



stone, and in the main public interiors. To appreciate the high degree of efficiency attained in the building, it is necessary to turn to the plans and the large work areas. Services are grouped to form a compact interior core; elevators are set in an alcove so that waiting employes do not block other traffic. Another interesting device for reducing congestion is the disposition of the wardrobes, which are not concentrated in a single cloakroom, but are spread around the periphery of the service core of each floor. All private offices are located at the front of the building, and the large general work areas occupy the rear; there is a nice balance here between separation and ease of communication, with circulation through the center of the core as well as around the ends. The rear office spaces are entirely free of columns, allowing complete flexibility in the placing of desks and other equipment. Planning was based on careful study of company growth records, and it is believed that the present building, with the possible addition of two future wings in back, will take care of all space demands during the natural lifetime of the building.

LOBBY



REAR ELEVATION





ELEVATOR LOBBY





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OFFICE BUILDING, OMAHA, NEBR.

TINSLEY, McBROOM & HIGGINS, ARCHITECTS





TYPICAL WORK SPACE

EMPLOYES' LOUNGE



TINSLEY, MeBROOM & HIGGINS, ARCHITECTS



DIRECTORS' ROOM



Mechanical Engineer for Heating and Air Conditioning: CHAS. S. LEOPOLD

Mechanical Engineer for Plumbing and Electrical Wiring: B. E. LANDES

General Contractor: PETER KIEWIT SONS' CO.

CONSTRUCTION OUTLINE

FOUNDATIONS: Reenforced concrete. Waterproofing—Pozzolith, The Master's Builders Co., and membrane.

STRUCTURE: Exterior walls—Kasota stone, Breen Stone & Marble Co., 8 in. clay tile backup, air space; inside—4 in. clay tile, gypsum plaster and E. F. Hauserman Co. movable partitions. Columns—structural steel fireproofed with clay tile. Metal lath by Geco Steel Products Corp. Floor construction clay tile arches with Zonolite concrete fill, Universal Zonolite Insulation Co., and cement topping. Ceilings—Perfavent and Acoustone, U. S. Gypsum Co.

ROOF: Structural steel, clay tile arches, Zonolite insulating concrete fill, Universal Zonolite Insulation Co., pitch and gravel, Barrett Type AA, The Barrett Co. SHEET METAL WORK: Flashing—sheet

SHEET METAL WORK: Flashing—sheet copper. Ducts—copper bearing steel, galvanized.

INSULATION: Roof and boiler room-cork, Armstrong Cork Co.

WINDOWS: Sash—alumilited aluminum, double hung, The Kawneer Co. Glass—flat drawn, double strength, quality A, Libbey-Owens-Ford Glass Co.

STAIRS AND ELEVATORS: Stairs—steel, terrazzo treads and landings. Elevators—two passenger, one freight, Haughton Elevator Co.

FLOOR COVERINGS: Lobbies and corridors —greenstone, Virginia Greenstone Co. Toilets, service rooms, etc.—terrazzo. Work areas rubber tile, Goodyear Tire & Rubber Co.; asphalt tile in basement. Offices—carpet, Bigelow-Sanford Carpet Co., Inc. WALL COVERINGS: Lobbies—Montana

WALL COVERINGS: Lobbies—Montana Travertine, Northwestern Improvement Co. Corridors, etc.—sheet rubber wainscot, Goodyear Tire & Rubber Co. Toilets—glazed brick, Arketex, Fredenburg & Lounsbury. Office and directors' room—wood paneled. METAL TRIM: Doors—Trussbilt, Inc. and

METAL TRIM: Doors—Trussbilt, Inc. and Herzog Iron Works. Metal stools—Art Metal Products Co. Garage doors—Overhead Door Co.

HARDWARE: By P. & F. Corbin, Stanley Works and Von Duprin Co. ELECTRICAL INSTALLATION: Wiring

ELECTRICAL INSTALLATION: Wiring (lighting)—3 phase, 4 wire, 120-208 volt; (power)—3 phase, 3 wire, 208 volt. Switches tumbler. Fixtures—Art Metal Products Co. and Edwin F. Guth Co. Switchboard and distribution panels—Wm. Wurdack Electric Mfg. Co. Clock system—International Business Machines Corp. Vertical conveyor—The Lamson Co.

PLUMBING: Soil, waste and vent pipes—cast iron and galvanized steel. Hot and cold water pipes—copper. Water softener tanks— Permutit Co. Fire protection system—W. D. Allen Mfg. Co. Toilet fixtures—American Radiator-Standard Sanitary Corp.

Radiator-Standard Sanitary Corp. HEATING AND AIR CONDITIONING: Combination steam and forced circulation hot water system. Air conditioning—central station type, designed by Charles S. Leopold, apparatus by York Ice Machinery Corp. and Clarage Fan Co. Boilers—Kewanee Boiler Corp. Oil burners—S. T. Johnson Co. Radiators—Trane Co. Grilles—Tuttle & Bailey. Temperature control system—Powers Regulator Co. Water heater—Whitlock Coil Pipe Co. Pumps—Nash Condensate Pump and Dayton-Dowd Co.

SHOW ROOM

NEW YORK CITY

VINICIO PALADINI LEON BARMACHE, DESIGNERS





ENTRANCE LOBBY





VIEW 1.

Planning the average wholesale showroom offers comparatively few problems. In general the requirements include a reception room (here the elevator corridor), a large selling area, dressing rooms for models, and storage cabinets. The essential problem is one of creating as pleasant an atmosphere as possible, with provision for integrating the needed selling equipment with the room as a whole. Here the designers have been most successful. The difficult reception room shape has been given interest and variety with built-in furniture, recessed display cases and a well-lighted mural indicating the manufacturing process. In the main showroom there is a series of attractive booths separated by unobtrusive partitions of translucent glass. Most interesting is the manner in which all the details, from dress racks and lettering to furniture and backgrounds, have been coordinated to produce a hand-some, restful interior.



NAGERS

OFFICE
VINICIO PALADINI, LEON BARMACHE, DESIGNERS





VIEW 3.



VIEW 4.



COLOR SCHEME. Reception room: walls, light gray; ceiling, dusty neutral blue; floor, light blue; wall between the general office and entrance, burgundy; lettering, white. Showroom: walls, shell gray; ceiling, dusty neutral blue; carpet, dusty pastel blue; woodwork, natural oak.

FINISHES AND EQUIPMENT, WOODWORK AND FURNITURE—A. J. Passman. FLOOR COVERINGS: Carpet — Alexander Carpet Co. Rubber tile—Armstrong Cork Co. WALL COVERINGS—Fabrikona burlap, H. B. Wiggin's Sons Co. HERCULITE GLASS DOORS—made by Penn Brass & Bronze Works. VENETIAN BLINDS—Bakelite translucent, Rex Co. ELECTRICAL EQUIPMENT—Century Lighting, Inc. WINDOW DISPLAY—Bliss Display Corp. LEATHERETTE —E. I. Du Pont de Nemours, Inc.

RESTAURANT CHARLES A. STEVENS DEPARTMENT STORE, CHICAGO, ILL.



All photos, Vories Fisher



Located in a Chicago department store, the Circle Restaurant was designed as a convenience for shoppers and as an aid to merchandising. Its 100 chairs can serve about 300 meals per hour. Smart simplicity was the effect desired in the interior, which had to be arranged to conform with an existing structure. This effect was very definitely achieved. The plan shows a most interesting scheme for service: units are grouped at the three columns, providing a type of rotary circulation for the waitresses and pastry wagons which seems very efficient. The illumination, an important part of the design, is furnished by three sources: a large fixed window of translucent glass, a fluorescent trough for the decorative mural by Rainey Bennett, and direct ceiling fixtures. A special type of chair was designed for the restaurant, and is described in detail on p. 376.

The general color scheme is pink, gray and white. One wall is entirely covered by a mural, also in pink and gray, which develops its theme from the circle. At two points in the room the translucent quality of the window is echoed by white gauze curtains. Their transparency not only accentuates the feminine quality of the decoration, but defines the spaces allocated to the waitresses as well. The three large columns are painted clear coral pink, with screens at their bases in natural white birch. The floor covering is a light gray rubber tile, cross striped at intervals with white.

SKIDMORE, OWINGS & MERRILL, ARCHITECTS









SERVICE UNIT





All equipment for the restaurant shows a high standard of efficiency and design. The standard chair which was developed is a comfortably upholstered unit of tubular metal, with an attached shelf and a purse-holder. The eating surface is a tray, easily removed and replaced by the waitress. The trays are stored in the cabinet shown directly above. Provision has also been made for putting two chairs together, giving the convenience of a table for two.

FINISHES AND EQUIPMENT_INTERIOR PARTI-TIONS: Plaster on U. S. Gypsum Co. Pyrobar. FLOORS: Rubber tile, Wright Rubber Products Co., over magnesite bed. SOUND INSULA-TION: Kalite acoustical plaster, Certain-teed Products Corp. GLASS SCREEN: Double strength, Themolux, Libbey-Owens-Ford Glass Co. DUMBWAITER: D. A. Matot. FURNISH-Co. DUMBWAITER: D. A. Matot. FURNISH-INGS: Designed by Skidmore, Owings & Merrill; chairs by Garland Furniture Co. WOODWORK: Trim and doors—birch. HARDWARE: Yale & Towne Mfg. Co. MURAL: By Rainey Bennett. ELECTRICAL FIXTURES: Architectural Light. ing Co. KITCHEN EQUIPMENT: Albert Pick & Co. AIR CONDITIONING: Carrier Corp.



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ing in their neighbors to show it off!

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PRIORITIES

(Continued from page 4)

in good faith. If the house were offered for rent without success, Government would not object to its sale.

A builder will not be penalized if the estimated cost of his houses, as shown on the priority application, is exceeded and the house must be sold above the 6,000 maximum to make a fair profit.

REASONING

The reason behind building priorities and the implied curb on many types of projects is obvious and twofold: 1) to ensure delivery of critical materials to essential defense construction projects many of which have been stalled or delayed for lack of them and 2) to conserve for more essential defense industrial production those critical materials which would otherwise go into non-defense construction projects. Said SPAB'S Executive Director Donald M. Nelson of his last month's ban on nonessential building: "That was a drastic thing to do; a hard thing to do. Yet it simply had to be done." For evidence he pointed to the increasingly acute situation in copper-the most critical of all critical materials. During October, Army, Navy, Lend-Lease and other primary defense agency demands for this metal amounted to 144,430 short tons, while total production for the month (domestic, imports and scrap) came to only 138,700 tons.

One house does not require much copper (FHA says about 185 lbs. on the average), but last year's 540,000 non-farm dwelling units probably required close to 50,000 tons. Including non-residential building, the industry probably consumed more than a month's production of copper during 1940. The 1,000 tons of copper that go into 10,800 houses-only one-fiftieth of last year's crop of dwelling units-would help add another modern battleship to the two-ocean navy, put a whole squadron of bombers in the air (the largest bomber requires seven miles of copper wire and cable) or build acres of arsenals (an aircraft plant recently completed on the east coast required 378 miles of copper wire from only one of several manufacturers.)

Similar and equally convincing analogies could be offered in the case of iron and steel (Building normally consumes about one-sixth of it) which, along with copper, are the bases for practically all of the critical building materials now available only for defense and essential nondefense construction.

SIGNIFICANCE

The priority system will help part of the building industry at the expense of the other part. "For the duration"—at least after current inventories are depleted and unless the critical materials supply situation improves with time—no more \$6,000and-up houses will be built anywhere, and *(Continued on page 36)*

VITAL QUESTIONS & ANSWERS ON FLUORESCENT LIGHTING.

by **HYGRADE**

Q. How can you, in planning fluorescent lighting installations, select a manufacturer *thoroughly* qualified to handle the *entire* job?

A. Look at the record. It shows three things: first, HYGRADE <u>pioneered</u> in the fluorescent fixture business; second, HYGRADE has paced the field, has introduced the best things first, and in cases where available parts and accessories failed to meet exacting standards, has <u>actually designed and made</u> <u>these parts</u>: third, HYGRADE supplies everything in fluorescent at its finest for every kind of installation ! **Q.** How can you be sure of securing top <u>fluorescent light output</u> and <u>efficiency</u> at all times?

A. The answer to this is indicated in exclusive HYGRADE patents filed in Washington. These patents describe the superior coating used in HYGRADE Fluorescent Lamps — assuring you even distribution of light along the entire length of each lamp — more pleasing appearance — standardized colors — finer all-round performance!

Q. How can you be sure of specifying fluorescent lighting equipment that will <u>stand</u> <u>up</u>?

A. Find out how far various manufacturers go in backing it up. HYGRADE goes all the way—designs, engineers, makes, assembles, sells, ships, and GUARANTEES every unit!

Q. How can you be sure that installations will be completed <u>swiftly and</u> <u>inexpensively</u>?

A. Check with anyone who has specified HYGRADE. He will tell you that HYGRADE's policy of making, assembling, and shipping fixtures complete <u>cuts breakage in transit — speeds in-</u> <u>stallation — insures a better job</u>!

Q. How can you get complete information on HYGRADE Fluorescent Lighting equipment in a quick-reading easy-reference form?

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Figured in terms of cost per year allheart Redwood is one of the lowest cost materials known for both siding and exterior trim. It is described as "virtually everlasting" by a U. S. Government Bulletin—based on its proved resistance to weather, insects, decay, fire. In addition Redwood has minimum shrinkage and high insulation value, which contribute to low home maintenance costs.

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PRIORITIES

(Continued from page 34)

no more houses at any price will go up in non-defense areas. Fortunately, this truth is not as gloomy as it sounds: the 275 officially designated defense areas blanket a large part of the country with respect to population and the fields of normal building activity. Moreover, OPM has hopefully earmarked critical materials for the construction of 200,000 privately financed dwelling units (in addition to 100,000 publicly financed units) during the six months prior to April, 1942, has indicated that a similar allocation will be made for the following six-month period. Probability is that private builders will fall shy of their quota due to the temporary, risky nature of a large proportion of the defense housing demand, but, if they fill it, their production will about equal the healthy rate of 1940. Of course, the housing will be built by fewer and probably larger companies and will certainly be concentrated in fewer communities than heretofore

Non-residential builders capable of handling defense construction may still look forward to sizable markets. OPM officials predict that total 1942 construction expenditures will drop 25 per cent to \$8.5 billion (exclusive of maintenance, repair and remodeling operations) from this year's estimated \$11.2 billion. If so, 1942 will better prosperous 1940 by close to \$2 billion. But, defense construction of all types, which in 1940 accounted for only 15 per cent of total new construction expenditures, this year rose to about 45 per cent and will mount further to 75 per cent of the 1942 total.

In this connection, Chief John L. Havnes of the building materials and non-defense construction branch of OPM's Office of Civilian Supply at a Detroit board meeting of the Associated General Contractors of America last month commented: "In all probability in 1942, the construction fraternity . . . will get priority assistance for somewhere around 75 per cent of the dollar volume of 1941 . . . 75 per cent of 1941 is not a volume to bring complaint . . . I suggest that there may be many benefits (in the SPAB order) . . . There should be better deliveries, much better deliveries, to that large amount of construction work to be undertaken. With the mad scramble for materials curtailed, with some of the speculative builders out of the way, prices should be better and the dangers of ruinous inflationary tendencies lessened."

Like its employers, Building Labor will also be hit by the curb on non-essential construction. This year construction employment has averaged about 2.4 million, hitting a peak of 3.1 million last month. Defense construction is currently employing 1.2 million; non-defense, 1.5 million; (Continued on page 38)

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20, 30 and 40 years of continuous, daily, low-maintenance service are not at all unusual for Kinnear Rolling Doors!

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maintenance, repairs and remodeling, 400.000. SPAB's researchers estimate that next year's defense construction will require approximately the same payroll; so will the third classification. While employment on non-defense projects will drop markedly (probably more than 50 per cent), SPAB believes that the fall will be cushioned by the opening of employment opportunities in other fields and the fact that the drop will be from peak rather than normal levels. Thus, OPM's housing priorities expert, Sullivan Jones, last month noted that "when we started this defense construction program . . . everybody rushed into it-clammers and fishermen and farmers and butchers and musicians and car conductors. . . . Those are the fellows who are going to be squeezed out . . . But the old-line constructor, building mechanic, is still going to have his job. If he is going to be displaced in large numbers, I can give him the answer to that: go into ship building.'

COPPER CURB

As if to quell any doubts concerning the severity of the critical materials situation and OPM's determination to relieve it via building industry curbs, its Priorities Division fortnight ago, "in the most far-reaching action of its kind yet taken," virtually forbade the use of copper in building materials and construction. Covering a long list of civilian products from fire engines to caskets, from pleasure craft to napkin rings and sundials, "Conservation Order No. M-9-c" exempts all articles (presumably including buildings) produced under contract for the Army and Navy and the use of copper as a conductor of electricity. Otherwise, no one may use copper in the manufacture of any building material or item of equipment and "no person may use or apply copper or copper base alloy sheet, strip or screening for any purpose in connection with building construction except for minor repairs or maintenance (but not replacement) on existing buildings . . ." Penalties for disobedience: OPM may deprive the copper user of all priorities assistance, may prohibit the delivery of all allocated materials to him, may even recommend him for prosecution under the Criminal Code.

In essence, the order says that henceforth no copper shall be used by Building except for wiring and for Army and Navy construction. And, like preceding OPM orders, it means just what it says.

MBA'S 28TH

To discuss primarily the effect of national defense on their home financing business, members of the Mortgage Bankers Assn. (Continued on page 40)

HOW J-M PERFORATED FELTS MINIMIZE BLISTERING

BUT THIS ROOFING

HOLES!

FELT IS FULL OF



The diagrams above illustrate the action of the J-M Perforated Asbestos Felt. Note how the air is first forced out through the perforations as the felt is laid, then how each tiny "vent" is completely sealed by the hot waterproofing asphalt when the felt is broomed in. IT CERTAINLY IS! These millions of tiny holes in new J-M Perforated Asbestos Felts actually make a better built-up roof

HARD TO BELIEVE? Maybe—but not when you know the facts. The holes punched in J-M Perforated Felts are the result of intensive research and testing. Here's how they operate:

As the felts are laid, the tiny perforations permit trapped air to escape. Result: No objectionable "air pockets" . . . blistering troubles practically eliminated! Yet when the waterproofing asphalt is applied, the holes are completely sealed. And because these holes add new flexibility, J-M Perforated Felts are more quickly broomed into place, adhere snugly to each other and to the roof deck!

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JM JOHNS-MANVILLE Smooth-Surfaced ASBESTOS BUILT-UP ROOFS When SPEED is Important

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1. DRIVE AN-CHORS eliminate need of post-holes, pouring concrete and waiting for it to set. They permit installation of fence in any weather and hold the Fence permanently in line in *any* type soil. These anchors, deep-driven to correct angles for maximum bracing and strength, keep the posts rigid despite

posts rigid despite frosts, thaws, stresses, strains. Permit the fence to be moved, too, without loss.

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MBA'S 28TH

(Continued from page 38)

of America flocked to their 28th annual convention in New York City last month. Attendance did not reflect the obvious gloom with which the MBAsters face the immediate future, for, while shy of an alltime high, the 775 registration included a record number of out-of-towners.

Habitually one of Building's best managed conventions, MBA's 28th ran true to form, and all its sessions were well attended despite such potent local side-shows as the Louis-Nova fight and the Yankees-Dodgers World Series. Reason: MBA's convention committee put many an important speaker on the Hotel Roosevelt rostrum:

► Defense Housing Coordinator Charles F. Palmer, referring to Government's priority promise for privately financed defense houses, heartened the bankers with these words, "The defense program is not going to put you out of business," but warned them that they "face sacrifices. . . . The mortgage business is going to be curtailed." Having noted that bankers were generally known to be pessimists, Palmer forthwith earned for himself the reputation of an optimist by predicting a postwar need for 1.6 million dwelling units a year for ten years and by adding, "I think that they will be built." Reaction from the floor to this prediction was one of audible skepticism; the assembled mortgage bankers apparently recalled that only 937,000 dwelling units were produced during the peak prosperity year of 1925.

► Assistant FHAdministrator Earle S. Draper detailed the operations of the Government's priorities program in the Convention's most significant session (see p. 4, col. 3), advised the financiers that he considered it safe to make loans on private non-defense houses provided that they were already under construction.

Director Curt Mack of FHA's Underwriting Division answered a question which has bothered builders the country over ever since costs began to rise: FHA has ignored and will continue to ignore the current rise in building costs in its calculations of appraised values until the cost trend has become established. Needless to say. FHA will not consider the trend stabilized until after it has leveled off-either after the current rise or after the drop which may follow. Underwriter Mack admitted that this FHA policy tends to curtail private enterprise housing, for the increasing differential between costs and appraised values means larger down payments, a smaller market.

► New president of MBA is Frederick P. Champ, the first "farm man" to head the organization in two decades, despite the fact that MBA was organized in 1914 primarily for farm mortgage bankers. A native and resident of Utah, Harvard-educated "Farmer" Champ is a prominent local banker and an active conservationist.



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The Lindenwold Shingle (above) was reproduced directly from a full-size shingle reduced 6 times in size. The statches show the eight other colors in the same reduction. Notice the beautiful graining.







K RUST







HEATHER



LEAF TAN



How Stainless Steel serves in Restaurants and Cafeterias

W ITH stainless steel, restaurants and cafeterias achieve a cheerful atmosphere that attracts . . . and helps to hold . . . patronage. This lustrous metal assures the utmost cleanliness and purity because its bright surface does not rust, tarnish, chip, or peel and will not contaminate food that comes in contact with it. Maintenance is minimized, too, because it can be washed as easily as glass. It is available in a variety of forms and can easily be fabricated by welding and other methods.

Although we do not make steel, we have for over 35 years produced "Electromet" ferro-alloys and metals used in making steel. With the knowledge accumulated from this experience, we are in a position to give impartial assistance to architects, engineers, designers, and others who work with steel. If you are interested in the manufacture, fabrication, or use of steel of any kind for a specific purpose, consult us without obligation.

ELECTRO METALLURGICAL COMPANY

Unit of Union Carbide and Carbon Corporation 30 East 42nd Street III New York, N. Y. In Canada: Electro Metallurgical Company of Canada, Limited, Welland, Ontario



Observe how the bright luster of stainless steel enhances the attractive design of this modern water fountain.

The neat and distinctive appearance which stainless steel gives to the exterior of this restaurant attracts customers.



Above: Stainless steel counters and serving equipment make this cafeteria attractive as well as sanitary.

Below: Maximum permanence and cleanliness is obtained through use of stainless steel in this dish washer.



Electromet Ferro-Alloys & Metals

MORE THAN JUST NOISE REDUCTION -ACOUSTICAL CORRECTION TOO



Ideal acoustical effects for good broadcasting have been achieved in Radio Station WHLD, Niagara Falls, by spraying "Limpet" on three walls and the ceiling of this studio. In addition "Limpet" is used in another studio, the control room, offices, corridor and reception room.

K&M Sprayed "Limpet" Asbestos



CHOOSING an acoustical material for broadcasting studios offers the architect a more difficult problem than when noise reduction is the sole consideration. In studios, concert halls and theatres the material must be acoustically correct, that is, it must have about the same absorbing power at all sound frequencies, or pitches, in the musical range.

Keasbey & Mattison Sprayed "Limpet" Asbestos was selected for station WHLD because of its flat curve, that is, its unusually uniform sound absorbing power at different frequencies. A unique advantage, impossible with ordinary acoustical materials, in that it can be sprayed on to varying thicknesses, as conditions require.

The station manager, Mr. E. C. Hull, who has built a number of studios, is highly pleased with this "Limpet" installation. Not only does it have high acoustical efficiency, but it is unobtrusive, allowing full scope for artistic decorative treatment. In addition, its insulating properties increase the efficiency of the air conditioning system and save loss of heat through the outside walls.

The listening public enjoys the faithful reproduction of instruments and voices, without reverberations or noises from the studio audience.

K&M Sprayed "Limpet" Asbestos is a miracle in the acoustical field. Its noise reduction coefficient is .70 for a coating $\frac{3}{4}$ inch thick; any practical degree of sound absorption can be obtained by applying the proper thickness. Its efficiency as a heat insulator is shown by a thermal conductivity of only .31 at 75 degrees F.

"Limpet" resists fire. It sticks permanently tight to any clean surface, regardless of shape or composition. Even ten coats of paint will not noticeably affect its acoustical properties. It is unequalled by any other sound absorbing material.

Nature made asbestos; Keasbey & Mattison has made it serve mankind—since 1873.





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Today, GUTH Fluorescent Luminaires are built with the designing knowledge and manufacturing facilities developed through 39 years of successful experience. Each GUTH Product is engineered to produce more light and better light at lower Cost and to distribute that light with scientific control. Write us today for important, helpful facts about modern Fluorescent Lighting.

Typical GUTH Luminaires for Offices, Stores, Factories



HOUSES FOR DEFENSE

(Continued from page 326)

pass conventionally designed, conventionally built houses of comparable size. For their important parts in the development of this forward-looking house many a housing expert today is tossing bouquets at Client Glenn L. Martin, Contractor Jan Porel, Housing Research Director Robert L. Davison of the John B. Pierce Foundation, Celotex's George Swenson, inventor of the club sandwich wall board, and Architects Skidmore, Owings, Merrill.

Theirs is unquestionably one of the most significant small houses of the year-if for no other reason than its use of a new wall material which closely conforms to the paraphrased definition by the Temporary National Economic Committee of one of Building's most urgently needed developments: "The ideal material for greatest efficiency in the building of houses . . . should be light in weight, structurally strong, durable, fire-resistant, moisture-, weather- and sound-proof, produced in large panels or sections, easily bonded together to present either a smooth or broken finish, complete with permanent exterior and interior finishes molded into the units as integral parts of the material, adaptable to assembly in either traditional or modern design and inexpensive to produce in large quantities throughout the country." The 13/4 in. club sandwich comprising the walls of the Martin houses weighs 4.9 lbs. per sq. ft., sells for 25 cents per sq. ft. f.o.b. the factory. Production is 90,000 sq. ft. per day-enough walls and partitions for 60 Martin houses.

MATERIALS & EQUIPMENT

GRADE BEAMS-Reenforced precast concrete, Marietta Concrete Corp. TERMITE SHIELD-Copper-coated Sisalcraft, Sisalcraft Co. BUILDING PAPER-(between flooring and Joists) Sisalcraft, Sisalcraft Co. WALLS-134 in. Celotex Cemesto Board, Celotex Corp. COVER STRIPS-Asbestos battens at wall Joints, Keasbey and Mattison Co. PARTITIONS-11/4 in. Celotex Cemesto Board, Celotex Corp. CEILING-Celotex Key Joint Units, Celotex Corn. TRUSS CLIPS-Hurricane Braces, Structural Specialties Co. ROOF-Celo-Roof shingles, Celotex Corp. Irwin, Stanley HARDWARE-Russell & Works, Vincent Whitney Co. LINOLEUM-Congoleum-Nairn, Inc. FURNACE-oil-fired warm air floor furnace, The Coleman Lamp & Stove Co. FLUE-Porcelain enameled steel, The Baltimore Novelty & Enameling Co. FLUE COLLARS-asbestos, Ruberoid Co. WATER PIPES-copper tubing, Chase Brass & Copper Co. and Revere Copper & Brass Co. PLUMBING FIXTURES-Briggs Mfg. Co.

ELECTRICAL APPLIANCES—Range, refrigerator, water heater, Westinghouse Electric & Mfg. Co.

PAINTS-Davis Manufacturing Co.



Kitchen Engineering Service for the Architect

GOOD ENGINEERING is the very foundation of the kitchen. Kitchen equipment handles the most delicate and perishable of all commodities food. It is therefore essential that the equipment be designed, built and arranged for sanitation, performance and permanence.

This is a responsibility for the specialist. For more than half a century the John Van Range Company has maintained a staff of kitchen engineers whose only function is to render specialized assistance to architects responsible for planning modern facilities for the preparation and serving of food for schools, colleges and public institutions.

The kitchen at Hanover College, illustrated above, was planned, designed and equipped by the John Van Range Company, working in cooperation with the college architects and administrative authorities. Similar installations by Van engineers are to be found in scores of leading universities, colleges, schools and hospitals.

The services of John Van kitchen engineers are available, without charge or obligation, to all architects having food service problems on their boards. Have you such a problem?



Branches in Principal Cities





Add years of care-free service to roofs — gutters — downspouts with these improved steels

U·S·S PAINTBOND is a new galvanized sheet, Bonderized so that paint grips the surface tightly does not flake off. This treatment prevents the harmful chemical action between zinc and paint and adds considerably to service life. Roofs, downspouts, gutters and other galvanized work can be painted immediately, saving messy acid etches and costly return trips.

Painted samples exposed to both salt air and industrial atmosphere showed that rust was considerably reduced. Paint offers better protection to the metal because of tighter adherence.

In the South and in the West, a specially treated sheet for immediate painting is produced. It is called $U \cdot S \cdot S$ Dul-Kote and enjoys a wide popularity for home and industrial use.

With these improved steel products, you can assure a high quality, long lasting job at low cost. Write for complete information.



COPPER STEEL FURNACE built with firebox of U·S·S Copper-Steel boiler plate, combining strength and resiliency with life-time, crack-proof, rust-resisting durability.



METALLATH for elimination of plaster cracks, greater fire resistance. Partitions can be built of 2-inch thickness, saving space and considerable money on big jobs.



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CARNEGIE-ILLINOIS STEEL CORPORATION, Pittsburgh and Chicago COLUMBIA STEEL COMPANY, San Francisco TENNESSEE COAL, IRON & RAILROAD COMPANY, Birmingham Seully Steel Products Company, Chicago, Warehouse Distributors United States Steel Export Company, New York



RECORDS of the National Board of Fire Underwriters prove that lightning is a very real hazard. Yet West Dodd provides a thoroughly reliable defense for residences, industrial plants, and public buildings at relatively modest cost.

West Dodd is the oldest and largest manufacturer of lightning protection equipment. Its materials and methods of installation are approved by Underwriters' Laboratories, the American Institute of Electrical Engineers, and other recognized authorities.

ON DEFENSE PROJECTS

West Dodd lightning protection and static control equipment is being widely used on defense projects such as ammunition loading lines, ordnance plants, magazines and powder plants.

Investigate the protection West Dodd can give your building against loss or damage due to lightning. See Sweet's Catalog File, or write:



LIGATURE LABORATORY

(Continued from page 334)

terrazzo on the floor, structural glass on the walls (powder blue wainscoting, peach above).

The third bay is actually a building within a building in which the sterilization of the ligatures and the sealing of the glass tubes take place. It is entered via an air-locked dressing room where the employes shower themselves and don overalls, turbans, gloves and canvas boots. To facilitate the cleaning of the sterilizing and sealing rooms and to minimize the possibility of lodgment of germs and bacteria on their surfaces, the polished terrazzo floor is carried up to form a cove which is finished flush with the structural glass wall covering, which, in turn, runs flush into the cove of the hard, smooth, non-absorbent cement ceiling finish. Since continual washing of floors might attack the metal strips usually laid in terrazzo floors, they were replaced in these rooms with a plastic material. Following detailed drawings covering every sheet of structural glass, the manufacturer carefully trued the edges and corners of each sheet and applied them to the walls with cracks of only 1/64 in. between them. And, these cracks were then filled with plastic and finished flush. To the same end, the recessed fluorescent lighting fixtures are covered with sealed lenses and nonremovable covers-the replacing of tubes is done from the crawl space above the ceiling. In addition to being air conditioned like the balance of the plant, these two rooms enjoy air filtering by electricity. Operations in this section of the plant may be inspected through long plate glass windows in the winding room partition which are similar in design to the "onepiece" exterior wall windows.

The two rear bays of the plant are combined into one large room where the packed ligature tubes are stored in lockers pending their release after a sample of each lot has been inspected and tested by J & J's central control laboratory. Like the balance of the plant, it is fluorescent lighted, but its floor is cement finished and its plaster walls are merely painted to match the colors of the structural glass in the other areas.

Construction of the Ligature Laboratory is of the conventional steel skeleton type, but features one noteworthy innovation: The terrazzo floor is laid atop structural terra cotta tile separated by concrete T-beams and supported by layers of sand and cinders. Purpose of this construction technique is to permit the running of utility lines (compressed air, electricity, water, chemicals, gas, waste liquids, etc.) from a transverse tunnel through the ducts formed by the hollow tile to any part of the plant. While it is easy to drill through the floor into these ducts, thus obviating the necessity for tearing up the floor, the unique construction is amply strong. Tests conducted for the architects proved that the 4 in. thick tile laid in the unorthodox horizontal position would withstand a pressure of 825 lbs. per sq. ft.

Credit for the interesting design of the Ligature Laboratory as well as of its two predecessor factories, goes not only to the architects but to J & J's Chairman Robert W. Johnson who has showed uncommon interest in the appearance, layout and appointments of his three new buildings, including such newsworthy details as the disappearing window joints and the concealed supporting columns. Comments Architect Russell G. Cory: "The conception of this laboratory presented a fascinating experience for the architect. He was permitted the unique liberty of allowing his imagination complete license and furthermore was aided and abetted in straying from conventional paths by none other than the owner! ... It is true, of course, that certain highly scientific specialized processes in the manufacture of ligatures, requiring a fine degree of sterility, were somewhat limiting factors in determining materials. However, thanks to the discarding of all preconceived ideas of a factory, a building has been produced which is far removed from the most advanced conception of what constitutes even an ultra modern factory."

CONSTRUCTION OUTLINE — Ligature Laboratory

FOUNDATIONS: Concrete footings under columns; grade beams between. Basement waterproofed with Antihydro—Antihydro Waterproofing Co..

STRUCTURE: Exterior walls—11/4 in. Vermont marble—Green Mountain Marble Corp. and Vermont Marble Co.; air space; 8 in. terra cotta tile—Federal Seaboard Terra Cotta Corp., covered both sides with waterproofed cement plaster; air space; 1/4 in. Vitrolite structural glass — Libbey-Owens-Ford Glass Co. Floors—Terrazzo atop terra cotta tile atop sand and cinders. Roof structural steel covered with precast concrete slabs by Federal-American Cement Tile Co., covered with built-up roofing by The Barrett Co. and insulated with 4 in. of glass wool by Owens-Corning Fiberglas Corp. WINDOWS: Glass—1/4 in. Solex by Pittsburgh Plate Glass Co. Settings—bronze by

burgh Plate Glass Co. Settings—bronze by American Bronze Co. and Kawneer Co. FLOOR COVERINGS: Reception room —

marble (see above). Service areas—Asphalt tile by Tile-Tex Co. Manufacturing area— Terrazzo.

HARDWARE: Brass, by P. & F. Corbin. LIGHTING EQUIPMENT: Fluorescent fixtures by General Electric Supply Corp. and Miller Mfg. Co. Transformers by Allis Chalmers Mfg. Co.

PLUMBING FIXTURES: Standard Sanitary Mfg. Co.

ELEVATOR EQUIPMENT: Sidewalk lift by John W. Kiesling & Sons, Inc. Doors by Peelle Elevator Door Co.

HEATING EQUIPMENT: Low pressure forced water system. Boiler—National Steel Boiler Co. Oil burner—Petroleum Heat and Power Co. Controls—Minneapolis-Honeywell Regulator Co.

GOLD BOND FLOATING WALL SYSTEM SOLVES PITTSBURGH BUILDER'S PROBLEM



LICKING sound transmission be-tween apartment floors used to worry Pittsburgh builder Stephen E. Kovach, Jr. . . . until he used the new Gold Bond Floating Wall System for ceilings in smart Brentshire Village apartments, 100 families waiting for vacancies at Brentshire Village is proof that tenants appreciate quieter apartments . . . and that Mr. Kovach has found the right answer to his problem.

The Gold Bond Floating Wall System does a lot more than reduce room-to-room noise. It provides a one-hour fire rating, and eliminates nine-tenths of the causes for plaster cracks-thanks to the patented Floating Wall nail. Yet the Floating Wall System costs so little it can

AT BRENTSHIRE VILLAGE APARTMENTS IN PITTSBURGH, the Gold Bond Floating Wall

System has given Builder Kovach insurance against plaster cracks plus a fireproof barrier that reduces noise transmission between floors. As shown at left, any lather can easily apply the patented nails between panels of gypsum lath, and plastering is done in the usual manner. With all these advantages, the only extra cost is the price of the nails.

be used for defense housing and other low cost building projects.

Another Gold Bond "First"

This outstanding development is only one example of getting the best things first from Gold Bond. National Gypsum Company's busy re-

search laboratories have developed more than 150 better Gold Bond products ... including plaster, wallboard, lime, sheathing, gypsum and metal lath, wall paint, insulation and sound control materials. 300 trained Gold Bond representatives are ready and able to help you select the best material for your job - and when you specify Gold Bond exclusively, you get the extra protection of having the responsibility

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Helping to create tomorrow's larger markets...

As the various Government housing programs gather impetus, a new future is opening up for the building industry. Under the stress of emergency procedures, old taboos are being broken, and new standards are being created. And these new standards suggest that no matter what form tomorrow's building may take, the part of the builder, the building supply dealer, the realtor, the financier, the manufacturer, will be even more important than before.

Even such a revolutionary concept as that of Paul Nelson, demonstrates clearly how essential a part all the factors in the building industry will play, if the long hoped-for mass production is around the corner.



For the Architect and Contractor:

"... the exterior structure could be hand-built with our present methods, materials and labor. This would avoid standardization by permitting the individual to select his own style of house."

Mr. Nelson here suggests how advantage can be taken of mass production methods without limiting the scope of individual expression and without eliminating the services of the local builder. In the Nelson house, certain functional rooms would be prefabricated, but the exterior structure would not.



For the Dealer:

"The functional rooms ... mass produced as complete units ... could be delivered from regional plants to 'dealers everywhere', just as automobiles are ... It would not only be possible to trade in old rooms for better ones, but you could also add or remove rooms as the family's needs or tastes changed."

The dealer, in addition to his present functions, would be afforded the opportunity to sell entire prefabricated rooms, new or used, and in this way to benefit from a replacement market such as never has previously existed in the building field.



For the Realtor and Financier:

"Present-day houses ... rapidly become obsolete and decrease in value. Whole communities become run-down. But mass produced rooms, by permitting continual modernization, would protect the value of both the exterior house and the real estate it stood on."

Here is a conception where, by continually modernizing the interior of the house, it would be possible to maintain its value and that of the surrounding community.



For the Manufacturer:

"This is not an idle dream. To realize it we need only apply automobile mass production technique to the problem of building homes for America . . Already we have unit kitchens and bathrooms, American industrial genius which created the automobile is on the verge of creating the modern American home."

Mass produced rooms such as Mr. Nelson proposes would provide for ease of replacement, and the possibility of development from present standards to better ones through the production of newer and improved models. These are precisely the principles on which the success of the American automobile industry has been based.

In presenting these various concepts by leading architects and designers, Revere Copper and Brass Incorporated seeks only to stimulate public interest in better housing, confident in the knowledge that the use of copper and brass makes any house better to live in, better to own, better to rent or sell. The Revere Technical Advisors are always ready to help you with your problems.

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FOR MODERN WOOD TREATMENT



Orientalwood Flexwood treatment, Lobby of Today Theatre, Chicago, Loewenberg & Loewenberg, Architects; David Chapman, Designer. Photo: Hedrich

Orientalwood Flexwood varying from brown to grey, with an overall salmon tone, resulting from the lighter colored streaks, applied horizontally, supplies vivacity and movement to the lobby of Today Theatre. Curved soffits and jambs, columns and flower box carry out the continuous Flexwood treatment. Rare and exotic woods enable designers and architects to create effects and backgrounds to suit every mood. Flexwood, because of the ease and speed with which it is applied, is a logical choice when the luxury, beauty and color of *real* wood is desired.

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ls a public seating problem worrying you?

No architect need hesitate to call for help when it comes to solving seating problems. For public seating is a study in itself.

In the seating of churches, theatres, schools, auditoriums—each presents its own special problems. And they're usually tough ones—with churches, for instance, such things as ecclesiastic symbolism, design harmony in pewing, furniture and woodwork. With theatres—floor slope and sight lines. But you can depend upon the American Seating Company for the right answers to all those problems. You'll be getting the facts straight from public seating headquarters—the place where the greatest public seating experience in the world has been accumulating for many, many years. There's not the slightest obligation on your part. So, whenever a public seating problem worries you, let's work it out together. We'd like to be of help.

LET'S WORK IT OUT TOGETHER

American Seating Company

GRAND RAPIDS, MICHIGAN World's leader in public seating. Manufacturers of Theatre, School, Church, Auditorium, Stadium and Transportation Seating. Branch Offices and Distributors in 73 Principal Cities.



(Continued from page 26)

find many skeptics among the public and your advisers as well.

You are doing a good job so good luck to you and keep on pumping.

MARCEL VILLANUEVA, Secretary New Jersey Federation of Official Planning Boards East Orange, N. J.

NOT SO BIG

Forum:

Congratulations are due on the beautiful Thomas Jefferson Memorial! However, will not the Jefferson figure—with base not over 28 ft. high—be dwarfed in the large rotunda? This space is 80 ft. in diameter and 120 ft. to the dome. Many justly fear that either the statue or the background will be disproportionate. The Lincoln Memorial chamber is only half this height.

The Lincoln statue had to be made twice the size first planned. In the new Benjamin Franklin Memorial in Philadelphia, their massive Benjamin Franklin marble is somewhat overshadowed by the size of its hall. Sculptor James Earle Fraser shares this view.

Would not a suitable site be the portico out in front?—a natural setting. They might put the capital's Jefferson there temporarily. In the main part could later



be, for instance, a group composition of the Drafting or the Signing of the Declaration of Independence — a document of which Jefferson was the principal author.

Or how about a huge Liberty Bell, selfilluminated at night?—symbolically guarded, as on flag poles, by an American eagle with outstretched wings. This, too, would help make the Memorial even more a Shrine of Liberty.

I am an admirer of Thomas Jefferson one of our great patriots. We should not do anything to "dwarf his stature." The Memorial is built primarily for future generations. The regrettable impression should not be created that "The Sage of Monticello" is not so big as his Memorial!

Yours for Patriotism,

J. HENRY SMYTHE, JR. New York, N. Y.

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Forum:

My attention has been called by a reader of my booklet "Thirty Million Jobs" that you quote a sentence from "Thirty Million Jobs" without putting it in quotes or giving credit. The passage in question is "In time of war prepare for peace." This is a copyrighted slogan. . . .

ARTHUR DUNN

New York, N. Y.

5,000 FREE LOTS

Forum:

Norfolk, Va., our fair city is getting a lot of unfavorable publicity because of the acute house shortage here.

The local builders have built 2,900 houses in the last year trying to help house the influx of defense workers to Norfolk but it is out of the question for local builders and developers to build them fast enough to keep up as Norfolk's population has increased from 119,000 to 222,000 in two years.

A few wealthy patriotic public-spirited citizens have purchased 5,000 lots to give to any out of town builders that will build in groups of 50 or more homes at a time and help Norfolk get the 10,000 new homes we have promised the Navy Department we would build during the next six months. We figure that local builders can build 5,000 and by giving absolutely free 5,000 lots to out of town builders that we can get enough out of town builders to build the other 5,000 so we can keep our word to the Navy and get the 10,000 new homes to house the defense workers and stop the unfavorable publicity Norfolk is now getting.

When the Navy recently started building two new shipyards we promised the 10,000 new homes with the aid of FHA and we want the public to know that Norfolk is doing everything possible to keep our word.

W. B. SHAFER, JR., Chairman Emergency Housing Committee Norfolk, Va.



• Based on over 20 years of engineering research, Fenestra's Steel Window Systems give assurance that your new plant buildings will have ample natural light and ventilation *before they are erected*. You no longer need guess about airation and daylight. Both are predetermined; both are provided at tremendous savings over other methods.

Save Time

Remarkable savings in Defense Plant Building Time can be made when the entire walls are ready-built windows. Weeks, even months, have been saved by the use of Prefabricated Fenestra Steel Windows delivered to the job, already fitted, assembled, prime-painted, COMPLETE.

Save Money

And Fenestra's Steel Window Systems effect important savings (1) in the cost of the building, (2) in the cost of equipment to supply light and air, (3) in the cost of plant operation, (4) in the cost of protection from air raids, and (5) in the cost of post-emergency conversion to peace-time production.

AND A DESIGNATION

For many years Fenestra products have met the exacting specifications of the U. S. Army and Navy. Built of steel, they cannot rot, warp, shrink, swell or splinter... They are perfectly interchangeable, providing almost 100% salvageability... Fenestra's top quality may be further protected, when desired, by the use of Fenestra's Bonderizing process, as licensed by the Parker Rust-Proof Company. Long life is assured.



"Blackout" for Defense

This drawing (much reduced) is one of several from "Industrial Defense Buildings," a bulletin issued recently by Fenestra's Engineering Research division. Bulletin shows a number of ways of blacking out Defense Plants of standard construction and with Fenestra Steel Window Systems. It is designed to help Defense Industries to provide economically for efficient production NOW, DUR-ING an emergency and AFTER the emergency has passed. The coupon will bring a free copy.

> Detroit Steel Products Company, Dept. AF-11, 2252 East Grand Blvd., Detroit, Mich.

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Industrial Defense Buildings Bulletin.

Name.

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A 32-square foot unit of Q-Floor can be laid in 30 seconds. It is placed directly on steel beams, masonry walls or precast concrete joists. On the latter it is welded to bearing angles. These units immediately become safe, solid platforms upon which all building trades, masons, plasterers, plumbers, electricians and others, can work. 20% to 30% building time can be saved by the use of Q-Floors. Quicker completion of the job and quicker occupancy are assured.



NOW QUICK-IN

CAN BE APPLIED TO A REINFORCED

SHOWING METHOD OF POURING CONCRETE FOR COLUMNS, GIRDERS, SPANDRELS AND



Here is a section of RK-type Q-Floor, showing the cellular steel construction which performs the double function of a structural sub-floor and a system of electrical wireways. The cross-over channel, with its handholes on multiples of six inches, permits easy installation of wiring in all wireways anywhere, at any time. The concrete fill over the top of the Q-Floor units and the suspended ceiling below are also shown. This construction has been given a four-hour fire rating by the Underwriters' Laboratories, Inc.

CONCRETE STRUCTURAL FRAME

QUICK-IN

- FLOORS

FLOOR FILL IN A SINGLE OPERATION



ROBERTSON

Through a new and unique method illustrated here, both the "quick installation" advantages and the "electrical availability" advantages of Q-Floors can be obtained with reinforced concrete structural frames. Q-Floors (UK-type shown at left) are laid as quickly on precast concrete joists as on steel beams and they immediately form safe and solid platforms upon which other trades can store materials, place scaffolding and carry on their work. Greater SPEED is the result!

By this method, all concrete used in the columns, girders, spandrels and floor fill can be poured in one operation. It is possible (1) to install the wood form work for columns and girders (2) place the precast concrete joists in position (3) install Q-Floor sections which provide for electrical underfloor wiring (4) install hangers for ceiling and mechanical systems (5) place the reinforcing steel . . . all before the concrete is poured. Shoring, except under poured beams and girders, is eliminated. This provides open areas in which various trades can work without obstruction. Fire hazards are reduced. More dry materials mean greater progress during unfavorable weather.

The PRECAST JOIST used is fabricated with two $1\frac{1}{2}$ " x $1\frac{1}{2}$ " x $\frac{3}{16}$ " angles, back to back, in the compression flange of the joist. Angles are welded to steel diagonal shear bars. By installing these two angles in the precast joist during the process of manufacturing, it is possible to secure a straight smooth bearing surface with these angles. Joists are in turn set into the wood or steel form work for the girders. Q-Floor sections are then laid on the compression angles and screwed or welded to them. See details in illustration at left.

Additional data with suggestions and estimates furnished on request.

H. H. ROBERTSON COMPANY FARMERS BANK BUILDING . PITTSBURGH, PA.

QUICK-CHANGE

-FLOORS

STANLEY BUTTS with new-type Non-Rising Pin

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The greatest forward step in hinge construction in 40 years! Two reasons why. It's easy to seat. No twisting or turning – no pliers. Just push the pin down and it snaps into place . . . It stays down, yet is easily removable.



How Stanley Non-Rising Pin Works

The pin is grooved – just below the head – to hold a split ring. When the pin is pushed into the butt, the split ring *snaps* into a pocket in the top knuckle. The pin can be removed easily. But ordinary door action cannot work it up. The ring exerts enough pressure against the inside of the knuckle to hold the pin down.

HANDY GUIDE TO HINGE SPECIFICATIONS

Details and specifications on the complete line of Stanley Building Hardware! That's what you'll find in Stanley Catalog No. 61. Indexed for quick reference when writing specifications. Write for copy! The Stanley Works, New Britain, Conn.





(Continued from page 22)

as dams and concrete bridges. Between 1924 and 1932 Mendelsohn built up a tremendous practice, with as many as forty men in his office-a figure with few equals in Europeand his executed work included a great variety of industrial, residential and commercial buildings, many so large in scope as to fall into the field of city planning. When the Nazis came in, Mendelsohn left for England, where he found a hospitable reception, a partner, Serge Chermayeff, and new commissions in both England and Palestine. During the brief period of this partnership, which was dissolved in 1936, the new firm carried out a number of projects, chief of which was the splendid seaside pavilion at Bexhill. With Palestine enjoying a boom, thanks largely to the rapid influx of capital from a number of European countries, Mendelsohn's commissions in this country increased rapidly, and he again changed residence to handle these jobs more conveniently. Some of the projects in the Near East approached his biggest earlier works in size, and again he enjoyed a period of great creative activity, and again it was cut short, this time by the war. Work of the Palestine period falls into a category by itself. It is of very different character from his work in Europe, and it is typical of Mendelsohn's architecture that despite its dynamic personal character, there is invariably evidence of the most careful consideration of site, climate and materials.

To recapitulate Mendelsohn's achievements, and to arrive at a just evaluation of them was the purpose of Mr. Whittick's book, and it is certainly a task beyond the scope of a review. Ignoring the question of whether or not Mendelsohn is the "most representative" of modern architects, the sum total of his building undeniably forms an important part of modern architecture. And while his work naturally shows a strong family resemblance to other contemporary design, it shows an intensely personal and dramatic quality of its own. It may be this personal quality that has been so disturbing to the purists. "Function with sensibility," Mendelsohn once remarked, "remains mere construction." His best buildings, the Schocken stores in Chemnitz and Stuttgart, the Universum Cinema in Berlin, the textile factory in Leningrad, all show this sensibility. To Mendelsohn-and this is by no means true of all his great contemporariesmaterials, structure and function are merely raw elements to be fused into architecture by the creative artist. The architect, in other words, is not a master builder or super-coordinator alone, but he is still an artist charged with the responsibility of expressing the essentials of life in his time. It was largely on the basis of this approach as expressed in Mendelsohn's work that the author made the statement quoted at the beginning of this review.

Considered by itself, the book merits only superlatives. Written with intelligence and sympathy, it is also beautifully printed and handsomely illustrated. It makes no pretense to being a complete pictorial record of Mendelsohn's work, but there is more than enough material on which to arrive at an understanding of his aims and his architecture. Unfortunately it is not completely up to date, but this is inevitable in any book on an architect still engaged in active practice. With Mendelsohn now in this country, and with an exhibition of his work opening late this month at the Museum of Modern Art, it would seem a very good time for an enterprising publisher to bring out an American edition, since copies from England are obtainable only with difficulty and at considerable expense.

Take a <u>second</u> look at the WORLD'S FIRST WINDOWLESS PLANT





BETTER THAN DAYLIGHT lighting is helping Simonds Saw and Steel Company set new production records. Two years of experience have proved to Simonds that buildings need not be designed with windows—that they're better *without* them. And modern fluorescent lighting is one of the reasons. In sunshine or rain, day or night, bright daylight is always available inside the plant. Heat radiation is reduced to a minimum, allowing greater economy in operation of the air conditioning system.



WEATHER THAT'S ALWAYS FAIR is supplied by four air conditioning units like the one above. They make possible a higher level of production, output and quality in the Simonds factory than ever before. Clean air, at proper temperature and humidity, supplies perfect ventilation—without the need for windows that let out expensive heat, let in distracting noise. In the Simonds plant, the reduction in winter heating costs offsets the additional costs in summer of both air conditioning and lighting.

INSIDE FACTS

about windowless buildings!

- * Lower Cost Heating, Maintenance and Repairs
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SOURCES OF SAVINGS and greater values in windowless buildings are listed above. Consider them carefully. Present conditions make a detailed evaluation of this modern construction more important than ever before.

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*"Freon" is Kinetic's registered trade-mark for its fluorine refrigerants.

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HERE'S another triumph in modern build-ing design; another addition to the fast growing list of the blue chip jobs in which ZONOLITE insulation has contributed much to construction economy and maintenance efficiency.

Beneath this classic exterior is the lasting charm of maximum economy! . . . because ZONOLITE Concrete roof and floor fill permit the dual savings from decreased dead-load weight, plus greatly increased thermal and sound insulation values.

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DEVOTION TO DUTY IS A TELEPHONE TRADITION High morale, devotion to duty, ingenuity in meeting new circumstances and the ability and will to work with each other and with the public are traditional characteristics of tele-

Times like these not only demand these phone employees. characteristics, they serve to create and

Now, more than ever, the creed of telephone workers is expressed in these wordsextend them. "We'll do our best to get your call through." BELL TELEPHONE SYSTEM

"THE TELEPHONE HOUR" is broadcast every Monday evening over the N. B. C. Red Network.



Monument to a Battle Won

T HIS monument was fore the victory it now commemorates. Only the passing years could write its dedication – to man's con-

quest of the elements. A simple homestead, built when the Nation was young, it has endured with America, become a monument to those who planned it so well and protected it with white lead paint.

Yes, Pure White Lead is the dependable ally of men who fight the weather. And Dutch Boy White Lead means paint which sturdily resists the onslaughts of rain and snow and sun... keeping homes and other buildings young in appearance and protected well. Paint which wears slowly, smoothly-instead of cracking and scaling - thus saving the expense of burning and scraping when it finally does become time to repaint.

And now the Dutch Boy offers architects pure white lead in two forms: The *Triple-Improved* Dutch Boy *Paste* White Lead better than ever in whiteness, body, hiding; and the new Dutch Boy *Ready-to-Brush* Pure White Lead *Paint*.

Both are worthy of your proudest work.

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NEW DUTCH BOY WHITE LEAD PAINT- READY FOR THE BRUSH!

Now, in addition to the paste form, the proven protection of pure white lead is available in ready-to-brush paint form.

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The new Dutch Boy comes in 2 forms -Exterior Primer and Outside White. Both are 100% pure white lead paints -specially designed to do a real white lead job on new or old wood in 2 coats. You have never specified a special primer easier to brush on or a 2coat embination that

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WOOD OF ALL KINDS ... millwork, sash, doors, floors, siding, trim, plywood, etc. . . . needs protection against Moisture and Decay.

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PLASTICS AWARDS



FORUM OF EVENTS

(Continued from page 14)

Prizewinners in the sixth annual MODERN PLASTICS competition were announced early this month, with 75 awards out of about 2,000 submissions. So wide have the uses of

plastics become that the number of categories now includes

eighteen, such as scientific, industrial, military, transport, etc. Among the winning designs are reflecting letters, hardware, plastic tile, a new wiring system, toasters and radios. Of particular interest to architects and builders are the two items illustrated. Above is shown the interior of the new Coty shop in New York City. Display units are of laminated plastic, with a hand painted flower pattern permanently protected by a transparent plastic layer. The treatment, known as "Plasdecor," opens up great possibilities for new



Robert Keen

developments in furniture and display. In the lower photograph are a series of new extruded plastics, whose light weight and integral color not only permit their use as metal substitutes, but offer advantages in decoration and practical use substantially greater than those of metal. The strips are now used for table and counter strips, cover molds, sink edging, and variety of other purposes. (Continued on page 64)

I. F. LAUCKS, Inc. Seattle – 911 Western Ave. Los Angeles – 859 E. 60th St. Portsmouth, Va. – Commerce and Broad Sts.

A Dominion Observatory Discovers AN ALL-STAR PERFORMER in TONCAN IRON SHEETS



Dominion Astrophysical Observatory, Victoria, British Columbia

OUT OF TODAY'S EMERGENCY

When a peacetime tomorrow arrives, we shall find that out of today's emergency have come *better* Republic Steels to improve our everyday life. The steels which enable us to build faster warplanes, stronger tanks, guns and battleships will mean finer automobiles, railroad trains and machinery-better washing machines, refrigerators and thousands of other products in which steel makes life more livable, more comfortable, more enjoyable.

And when that tomorrow comes, Republic will be ready with greater capacity for producing these steels than ever before.



Sixteen years after Toncan* Iron Sheets were installed in the double walls of the dome of this astrophysical observatory, the director reported: "No sign of rust or corrosion."

This year, after a quarter-century of service, came this news: "The dome is in excellent condition. No repairs have been necessary during the 25 years."

That's typical of Toncan Iron performance. This time-defying alloy of openhearth iron, copper and molybdenum has rust- and corrosion-resistance that's unequalled by any ferrous material in its price class. It has twice as much copper as the finest copper-bearing steel or copper-bearing iron.

Specify Toncan Iron for all sheet metal applications where rust and corrosion would cause early failure in less resistant materials and consequent high replacement cost. It will win prestigebuilding praise from your clients.

For details, get the new booklet "A Few Facts about Toncan Iron for Architects and Engineers," or see Sweet's 13/6. Consult Sweet's for data on Republic Pipe 27/3; Steel and Tubes 23/5; Berger 9/1, 21/3, 21/21, 24/1, 28/5; Truscon 15/20.

* Reg. U. S. Pat. Off.

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REPUBLIC TONCAN IRON

202

PRESIDENT

An alloy of refined open-hearth iron, copper and molybdenum—that grows old slowly

Now Every Home Can Afford This Protection for

30 YEARS PLUS



*

This is an Intentional Understatement1... Thousands of squares of the first J-M Asbestos Shingles are still going strong after 30 and more years of service.

Razes Building . . . Saves Roof Shingles!

Typical example of the lasting qualities of J-M Asbestos Shingles is this building at Meriden, Conn., shown below. The J-M Asbestos Shingles were applied in 1908. When the original building was razed and a new one erected, practically all the original shingles were salvaged and used on

JOHNS-MANVILL

Asbestos Shingles



the new building. That was in 1939. Today, the builder reports, these shingles are still in excellent condition...give no reason to suppose that they won't last another 33 years or more!

 Orders for the new Johns-Manville American Colonial Asbestos Shingle have reached unprecedented volume. In addition to the tremendous demand for private construction, defense housing and defense projects of all kinds have called for thousands and thousands of squares. As a result, delivery may be slower than during normal times. However, factory production is being speeded up... every step is being taken to assure the fastest possible delivery under the present national emergency,

JOHNS-MANVI	ILLE, Dept. AF-11
22 East 40th Stro Send me a cop on J-M American obligation, of co	eet, New York, N. Y. y of your new full-color brochur n Colonial Asbestos Shingles. No purse,
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New J-M American Colonial Shingle offers all the time-tested advantages of *asbestos* ... at a cost that compares with that of far less satisfactory roofing materials

Architects, builders, dealers, home owners all agree, "The new J-M American Colonial Shingle is exactly the roofing shingle we've been looking for!" An asbestos product, it can't burn or rot, needs no periodic upkeep. Yet it has all the eye-catching features of weathered wood . . . deep texture, staggered edge, clean-cut shadow lines. It comes in colorful blends as well as in gray and white. And with all its beauty, firesafety and permanent qualities, a roof of J-M American Colonial Shingles costs but little more than a roof of less lasting materials.

For Re-Roofing Work, Too-

The new J-M American Colonial Shingle is just as easily applied over old roofs as on new construction. Its self-spacing, fast-laying design saves time, cuts costs. And remember—its great durability means that the first roof is the last roof! For details, mail coupon for beautifully illustrated full-color brochure.

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Specify **PERMUTIT*** home water conditioning

There'll be more singing in the bathtub. There'll be broader smiles in the kitchen. There'll be joy in the laundry. Permutit softened water banishes "bathtub ring," protects

piping from scale and corrosion, effects important savings in soap, linen replacement, fuel, plumbing repairs. Why not give your clients this modern necessity? Permutit is

easy to own - can be financed along with the house, adding little to carrying charges.

NOVEMBER 1941

FREE ADVISORY SERVICE. Architects are invited to consult Permutit freely on any water problem. Samples analyzed without cost. Write for specifications, capacity tables and special slide rule for sizing of models. The Permutit Company, Dept. AF3, 330 West

SOFT WATER from every faucet automatically

HOW PERMUTIT WORKS Complete unit (two tanks) is directconnected to water lines-involves no structural change. It's fully automatic, requires no attention. Raw water enters at top, loses its hardness in passage through zeolite bed, continues to service zero-soft, Zeolite is regenerated automatically. Once used, Permutit softened water becomes a "must" for the wellequipped modern home. PERMUTET WATER CONDITIONING HEADQUARTERS

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THE "CZC" treated sleepers in these buildings total only 7500 linear feet. They cost little but protect flooring worth thousands of dollars. By resisting decay and termite attack these sleepers will eliminate the possibility of a costly reflooring job.

"CZC" treated lumber also has other important advantages which make it a first choice for wood construction wherever durability and "clean" lumber is required.

Write for your copy of the new bulletin "Facts about CZC." E. I. du Pont de Nemours & Co. (Inc.) Grasselli Chemicals Department, Wilmington, Del.



FORUM OF EVENTS

(Continued from page 60)

CHILDREN'S MUSEUM

Last month New York City's Metropolitan Museum of Art took a tremendous step toward a new lease on life when it opened its "Junior Museum", a section of the building



Courtesy, Museum of Modern Art

devoted entirely to children. With five large rooms and a special staff of its own, the new museum has a program that includes movies, exhibitions, and instructive entertainment for individual children, school groups and junior hobby clubs. The museum features not only exhibits for children, but exhibits by children, the current attraction being a reconstruction of a newspaper of the early 1700's, with news items, editorials and advertisements written by children in one of the city's public schools. In the photograph above, visitors are studying an exhibition of Greek athletics. Adults are also admitted—if accompanied by children.

PERSONALS

ADOLPH MERTIN, architect, announces the removal of his office to 101 Park Avenue, New York City.

EWALD R. FROESE, architect, announces the removal of his office to 5850 Lotus Avenue, St. Louis, Mo. and the dissolution of the firm of Baum and Froese, as of November 1, 1941.

The editors of TASK, new student publication, wish to publish work from technical schools all over the country. They invite volunteer student agents to write to them, care of TASK, Robinson Hall, Cambridge, Mass.

ERRATA

The construction data published on the Washington National Airport (ARCH. FORUM September, page 176) omitted credit to the Libbey-Owens-Ford Glass Co., manufacturers of all the window glass used in the Airport, with the exception of that in the control tower, and the glass used in doors, railings, etc. In the same construction outline, the name of The Dextone Co., fabricators of the precast concrete used in the building, was misspelled.

In the September FORUM, page 72, credit for the plans of the Mount Evans Crest House should have read, Edwin A. Francis, Architect, in cooperation with the Forest Service Regional Office, Denver, Department of Agriculture, and W. Ellis Groben, Consulting Architect.
IT'S GOT TO STAND UP UNDER 30,000 FEET



CARPET FOR THE COFFMAN MEMORIAL UNION by BIGELOW WEAVERS

15,000 young people at the University of Minnesota make the beautiful Coffman Memorial Union headquarters for undergraduate social life. Every day of the college year they swarm in and out of its doors in a never ending stream of traffic... traffic that represents the hardest kind of wear for carpet.

Marshall Field of Chicago, contractor for the floor-covering installation on this important job, brought Bigelow Carpet Counsel the problem of supplying carpet for stairways, lounges, main lobby and many other rooms that would withstand the concentrated wear.

The success of Bigelow Carpet at the Coffman Memorial Union and hundreds of other installations proves that the advice of Bigelow contract experts can help you choose the *right* carpet for the right *spaces* at no extra cost per yard. Be sure to consult Carpet Counsel on your next carpeting problem . . . it will save you time and money. Bigelow-Sanford Carpet Co., Inc., 140 Madison Ave., New York, N. Y.

BIGELOW WEAVERS



Ceco announces the Improved



STEEL BASEMENT WINDOW

SEVENTH of a series of advertisements on How to Design and Build Homes That Sell!



Teature of the Ceco Ezee-Action Steel Basement Window. For indirect ventilation (as shown) or full ventilation — pull the easy-to-reach rod.



2—TAKE IT CLEAR OUT by slightly pressing the two side-arms. Many owners like this Ezee-Action feature for easier delivery of coal or materials.

4—INTERCHANGEABLE SCREENS AND STORM WINDOWS are available for all Ezee-Action Windows. Easy to put on and change, with no loose parts for the owner to misplace.



THIS "BEAUTIFUL WINDOWS" BOOKLET -FREE!

You'll find window treatment ideas for all types of rooms in this attractive booklet. Show it to your customers . . . help them visualize their homes. Ask for the ''BEAUTIFUL WIN-DOWS'' booklet — it's free!



• Name the feature you like best in basement windows and the Ezee-Action has it. Never were so many desirable features combined in one basement window unit. BONDERIZING and baked-on paint add long, rust-free service. Try Ezee-Actions in the next home you design or build. Your customer's satisfaction and enthusiasm will bring you back for another set of them!

CECO STEEL PRODUCTS CORPORATION Manufacturing Division: 5701 W. 26th St., Chicago, Illinois.

Ceco Steel Windows



_____ SPECIFY "PENNVERNON"-. NOT JUST "WINDOW GLASS"

• A good window glass should be clear, brilliantly finished on both sides of the sheet, as free as a sheet glass can be of imperfections and distortions, and dependably capable of permitting satisfactory vision through it. To an exceptionally high degree, Pennvernon Window Glass meets these requirements. The Pennvernon label is a reliable guide to window glass of genuine quality. It also identifies a glass readily and promptly available anywhere in the land through our many branches and thousands of dealers. Pittsburgh Plate Glass Company, Grant Building, Pittsburgh, Pennsylvania.

PENNVERNON WINDOW GLASS PITTSBURGH PLATE GLASS COMPANY "PITTSBURGH" stands for Quality Glass and Paint





PREFABRICATION

with complete flexibility of design

FOR ONE HOME OR THOUSANDS



Defense Housing throughout the country gives a clear picture of tomorrow's homes. Today's defense worker—both military and civilian—lives in a comfortable . . . attractive . . . completely *livable* home—a home constructed by *prefabrication*. People all over the country, witnessing this forward stride in building procedure, are becoming familiar with prefabrication, and recognize it as the ideal building method.

Precision-Built Construction-acknowledged leader in the field of prefabrication, because of its speed economy ... quality and permanence -was pioneered in 1935 by Homasote Company, and features the use of Homasote. Homasote-oldest and strongest insulating board on the market-comes in large sheets (up to 8' x 14') eliminating ugly wall joints and batten strips . . . forming a perfect base for paint or paper. Experience proves that these 8' widths are essential to satisfactory prefabrication. \$6,000,000 of architect-designed private homes have already been erected by Precision-Built Construction.

Precision-Built Construction allows the architect complete freedom of design... reduces his planning and supervisory time, so that he handles even small homes *profitably*. Any home regardless of size or style can be built by Precision-Built Construction—and completed in from 6 to 30 days.

With the completion of the Defense Housing Program, 67 fabricating plants, located strategically throughout the country, will supply architects and builders with Precision-Built Construction for private homes. Improvements made during this emergency period will have been incorporated, and passed on with other benefits to architects. Thus, Precision-Built Construction will continue to open broad, new markets for the architect—markets which mean more frequent and profitable demand for his services.

Although our capacity is exceeded at present by emergency orders for Precision-Built Construction, we are rapidly increasing our facilities to cope with the situation. Homasote wholesalers and retailers are cheerfully cooperating—at personal sacrifice—in the interest of National Defense. HOMASOTE COMPANY, Trenton, N. J.



MODERN POWDER ROOMS like this express the hospitality of thoughtful hostesses. Sleek Black Vitrolite wainscoting and black inlaid flooring lend a tone of elegance. A mirror of L · O · F polished plate glass

gives true reflection of the feminine charm which lingers before it. Yellow painted walls and the gold of the draperies are matched by the yellow colored jointing in the Vitrolite wainscoting.

A LITTLE GLASS in a doorway often is sufficient to overcome the severe appearance which might be caused by complete wood construction. Give your residential doorways the gay and cheerful touch bestowed by L-O-F Quality Glass. NOW YOU SEE a miniature beverage bar, one of the many pleasing and different suggestions put before your clients in the L·O·F Glass Designed for Happiness promotion. The mirror background creates the illusion of added depth.

NOW YOU DON'T see the beverage bar. It has been converted into a handy powder station for the ladies. The clear, true-reflection mirror of L-O-F Polished Plate Glass expresses a warm welcome to guests who want to keep looking their best.

"WELCOME!"

WHERE A HOME SAYS ...

FOR PLACES

• Those couples who take pride in playing hospitable host and hostess may be among your next clients. May we suggest, then, that you let Libbey. Owens.Ford glass help you provide the spots which must say "welcome" to their guests?

Already, these families have been admiring the unusual Glass Designed for Happiness suggestions presented through Libbey Owens · Ford advertising in their favorite magazines. They are pre-sold on the beauty and sparkling welcome which quality glass will give their home. They are ready to approve your plan which includes modern glass arrangements.

Nearly thirty million full color printed messages have told the story of Libbey Owens Ford Glass Designed for Happiness. Told it to sixty-five million readers—in the income class you serve. Libbey Owens Ford Glass Company, Dept. AF1141, Nicholas Building, Toledo, Ohio.

LIBBEY · OWENS · FORD F flass Designed for Happiness Don't Give a Jailbird a Break!



SPECIFY VAN DORN PRISON EQUIPMENT-

• Modern prisons demand special safeguards against escape. But they're easy for you to provide. Just call Van Dorn.

Van Dorn has all the specialized research, design, engineering and manufacturing experience you need to plan modern prison structures. It has been our job to keep crime locked up behind a network of steel for 63 years. We have produced universally desired construction features that have made us the largest manufacturer of prison equipment in the country.

These Van Dorn resources are yours. Our engineers will gladly work with you in developing details of construction, arrangement, segregation, accommodation—in preparing layouts, estimates, complete specifications — in supplying our specialized construction service. Or they'll be pleased to come and discuss the features of our service at your convenience with you.

But you need these Van Dorn facilities at your finger-tips now. You'll need them more during the boom times of public works in post-war years. Get all the facts. Write, wire or phone, now.





Many architects, builders and maintenance men

have found a simple way to end painting worries. Their paint specification for all properties is the same—Eagle White Lead mixed with linseed oil.

This pure white lead paint has been preserving the beauty of American homes since 1843. It is economical. Its performance is uniform, dependable. Time between paintings is lengthened. And because Eagle White Lead doesn't crack or scale, a perfect surface is left for repainting.





WOOD CONSTRUCTION SPEEDS DEFENSE BUILDING... WOLMANIZED LUMBER* MAKES IT Promoment



Tremendous quantities of lumber are being employed in this country's drive for Defense. The ease with which wood can be worked and erected simplifies and speeds construction. And where permanent construction is called for, Wolmanized Lumber is on the job.

Already, the total footage of Wolmanized Lumber used in Defense construction is more than this company's entire output in 1938!

Wolmanized Lumber offers all of the advantages of ordinary wood, with this plus—ability to withstand decay and termite attack. It is clean, odorless and paintable. Wolman Salts* preservative, driven deep into the cells of the wood by the vacuum-pressure system of impregnation, gives Wolmanized Lumber its plus value. "Fibre fixation" prevents washing-out or leaching.

Wolmanized Lumber is distributed nationally by retail Lumber dealers. AMERICAN LUMBER & TREATING COMPANY, 1647 McCormick Building, Chicago, Illinois.

*Registered Trade-Mark



FOR HARDWOOD FLOORS That are "RIGHT" Every Time



Specify Factory-Finished BRUCE STREAMLINE FLOORING

There's no guesswork when you specify Factory-Finished Bruce Streamline Flooring. Every square inch has been uniformly finished at the Bruce Plant on special machines. Nothing more to do—ready for use as soon as laid.

The finish penetrates the pores of the wood-stubbornly resists scratches, chipping and peeling. Stays beautiful for years without the need of refinishing.

Streamline comes in Oak, Maple and Beech. Three sizes: $25/32'' \ge 31/4''$, $1/2'' \ge 21/2''$, or $3/4''' \ge 21/2''$. Easy to install—laid just like regular strip flooring. Usually costs *less* than ordinary flooring finished on the job. Nationally advertised. Mail coupon for full details.



This is one of your clients resting on *Koyalon*



Noyalon is the modern material that replaces complex upholstery parts with one molded piece. Above you see how sensitively this springy-soft latex foam responds to weight and shape. In this case the weights are bowling balls. But Koyalon adjusts itself just as perfectly to the various weights and shapes of the human body. Which means Koyalon supports more evenly and completely, therefore more restfully.



Simplifies built-in seating

Koyalon provides both softness and springiness in a single material—preshaped, ready to apply to any base. Does a more beautiful job because it comes already molded to perfect form for the upholsterer. The beauty and comfort last longer, too —Koyalon contains no metal parts to sag or padding to pack out of shape.

Springy—yet softer than a baby...

Note how Koyalon shapes itself, instead of shaping the baby. Alive with the resiliency of millions of tiny latex springs, yet softer than a baby, Koyalon never compresses muscles fatiguingly. Another reason why, in modern seating, Koyalon means comfort.



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UNITED STATES RUBBER COMPANY 1230 Sixth Avenue · New York

USE THE MARGIN BELOW FOR YOUR NAME AND ADDRESS



DOORS, FRAMES AND WINDOWS . . . Modern manufacturing methods make stock

items in doors, frames and windows of *Ponderosa Pine* to help you assure true architectural beauty in any style, size or price of home. For both quality and low price are the benefits of mass production.

Today, stock *items* of *Ponderosa Pine* can be used to solve almost any door, frame and window problem. Stock doors, for example, are available to suit every architectural style. When they are used, costs are kept down.

And *Ponderosa Pine* is well adapted to modern production methods. Its characteristics have made Ponderosa Pine the *preferred* wood for woodwork for more than 40 years. It takes and holds paint, enamel or other finish well; its uniform grain resists "raising"; it takes nails and screws without splitting; it can be worked by hand or machine; takes any architectural design readily. Add to these proved features the *abundance* of *Ponderosa Pine* and it is easy to see why this wood is so well suited to today's requirements.

PEOPLE WANT BETTER DOOR AND WINDOW ARRANGEMENT

Extensive surveys show that people want more window area for more light and air; want more efficient door arrangement for greater convenience and privacy. The trend to functional design and better use of space is a public demand in today's home.

Ponderosa Pine Woodwork's national advertising campaign is taking full advantage of that trend for you. A 32-page idea book called "Open House," offered free in our advertising, is telling people how to use stock doors, frames and windows of *Ponderosa Pine* to get the features they want, *plus* lasting value in all woodwork.

Watch this program. See how it is helping you save home builders money. You'll want to see "Open House." Let us send you a free copy.

PONDEROSA PINE WOODWORK



Additional copies of "Open House," which you may want for your clients, are available at 10c each. The Most Important Room in the House (and until recently the most neglected) Comes into Its Own with YPS KITCHENS



Almost invariably, even the most charming houses built ten years, or more, ago have "perfectly awful" kitchens.

These kitchens can be transformed easily and inexpensively — into modern, beautiful and convenient rooms by installing YPS kitchen cabinets and cabinet sink.

The resale price of the home is materially increased, for the modern housewife wants these YPS Features—

> All-steel * Permanent * No dark corners * Sanitary * Fits any size kitchen * Insulated for quiet operation.

Youngstown Pressed Steel D Mullins Manufacturing Corp Please send me the Fall Edition	ivision, Dept. 79-8 oration, Warren, Ohio. on of YPS Kitchen Catalog.	
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Left—A new building, Dormitory No. 10. Leonard Mauldin, architect; Templeton & Cannon, contractors.

Large view—Dormitory No. 11, one of the newest buildings. Phelps & Dewees, architects; Will O'Connell, contractor.



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