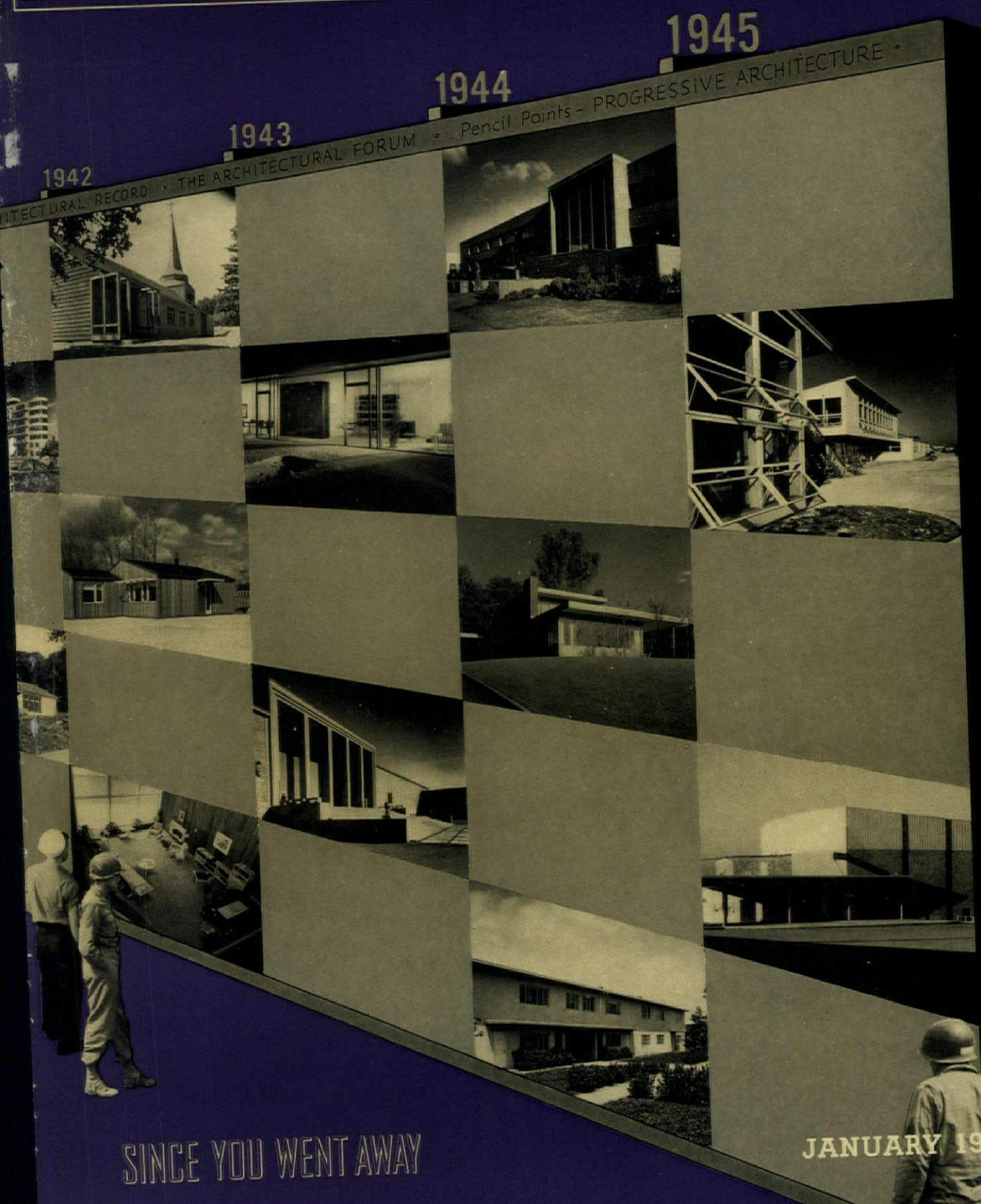
PROGRESSIVE ARCHITECTURE

PENCIL POINTS



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PROGRESSIVE
ARCHITECTURE
PENCIL POINTS

BASIS FOR ADVANCE

1946 will be a year of reorganization of the building industry and of the field of architecture. Before its end, most of the architectural men who have been in war service or in some civilian war activity will have either re-established themselves or (in a few cases) decided to leave the profession for good.

Right now there are many who have yet to shed uniforms or return home to resume where they left off when they were called away. It is a fit time, therefore, for them and for us to take a quick critical look at the state of architecture during the last four years—preparatory to stepping out, boldly, we hope, on a new period of advance.

We have chosen to make this survey by means of a review of the architectural press between the time of Pearl Harbor and V-J Day—December 1941 through August 1945. To do this with an objectivity that would be difficult for us to maintain as editors under examination ourselves, we engaged Thomas Creighton (architect and author of that excellent recent book "Planning to Build") to comb through the material published during the war years in the three national architectural magazines, to select the significant examples, and to draw his conclusions as to the trends indicated.

We feel that he has done a job in the following pages that will be helpful not only for the returning veterans (to whom the presentation is particularly addressed) but also to architectural men in general who are face to face with a challenging new opportunity and can profit by having a clear picture of progress to date.

Incidentally, the making of such a survey reinforces our belief (which we voice at the risk of seeming to take undue pride in our own accomplishments) that the architectural press as a whole furnishes a pretty vital service to the profession, recording and interpreting month by month the better works of architecture being done in all parts of the country and the world. Without the architectural magazines, there are few architects who would be able to keep abreast of what their contemporaries were doing and what new techniques of design and building were being developed in widely separated places.

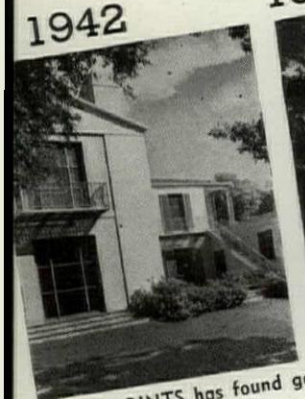
The results of the survey are heartening to us as indicating that from now on we can expect to see increasing self-confidence in American designers who are quite obviously well started on the right track. Unless we are greatly mistaken (and we are hardly ever mistaken), American architecture is coming of age during this next period of building and we will see in the next ten years an increasing proportion of intelligently designed structures, truly representative of the civilization that produces them.

Kenneth Reid

PEARL HARBOR TO

A REVIEW OF ARCHITECTURAL PROGRESS

By THOMAS H. CREIGHTON, A.I.A.



1942

PENCIL POINTS has found good reasons for devoting its pages to PROGRESSIVE ARCHITECTURE.

1945

1941

THE ARCHITECTURAL FORUM has noticeably extended

194

Photographs: left to right

Residence, Whiterock Lake, near Dallas, Tex. John F. Staub, Architect. Photo: Sigurd Fischer. Pencil Points, Jun. 1942.

House, Northern California. John B. Yeon, Designer. Photo: Roger Sturtevant. Pencil Points-Progressive Architecture, Sept. 1945.

House, Klamath Falls, Ore. Howard R. Perrin, Architect. Photo: Erven Jourdan. The Architectural Forum, Dec. 1941.

House, Redwood City, Calif. W. W. Wurster, Architect. Photo: Roger Sturtevant. The Architectural Forum, Aug. 1945.

Cornwall Elementary School, Cornwall, Conn. Adams & Prentice, Architects. Photo: George H. Van Anda. Architectural Record, Dec. 1941.

Jackson School, Wayne County, Mich. O'Dell, Hewlett & Luckenbach, Architects. Photo: Elmer L. Astleford. Architectural Record, July 1945.

SINCE YOU WENT AWAY

The four years from the winter of 1941 to the winter of 1945 have marked a certain maturing of architectural design in the United States, despite the fact that this was a time of limited building. By very necessity there seems to have developed a more careful use of materials, a more rigid analysis of plan, a more direct and honest projection of the plan into a building. New names have appeared in the profession; the older firms are producing a new sort of work. There is a popular wave of at least curiosity about modern design. The architectural magazines have a new appearance and a new attitude. Something seems to have happened to architecture at home while victories were being toughly won abroad.

There has been, as a matter of fact, a lot of building construction in the United States during the war. The three architectural magazines of national scope have published as much of this material as they were allowed to—when they considered it good. They have also published during the war a number of buildings that were designed and constructed just prior to 1942.

It is possible that you haven't seen any of the architectural magazines for the years 1942, 1943, 1944, or

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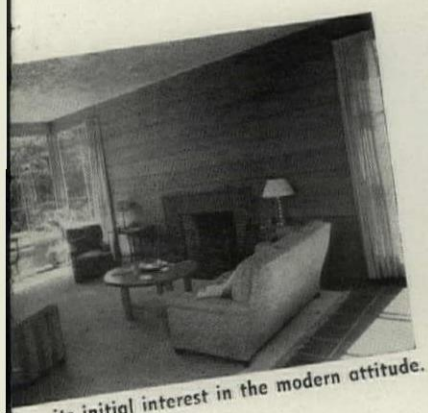
DURING THE WAR YEARS



its initial interest in the modern attitude.

1941

1945

The ARCHITECTURAL RECORD indicates an increasing concern with contemporary design solutions.

THERE HAS BEEN A CHANGE

1945. Perhaps you were in the service, abroad, or in the States, doing non-architectural work. Perhaps your practice folded up and you went into one of the many kinds of defense jobs. If you've missed the gradual change in the magazines you'll be brought up short when you turn to them now. There has been a change.

In December, 1941, all three of the magazines were complaining about the recent priorities order limiting construction to essential work. In *Pencil Points*, Talbot Hamlin wondered: "What is the essential reason for this extraordinary order?" The *Architectural Record* put on a brave front and decided that practically everything was essential, from public comfort stations to skating rinks. *The Architectural Forum* tore apart an "over $6,000 house"—a nice Colonial design at that—to prove that it could be built with non-critical materials. Only *Pencil Points* caught the boat, paradoxically because it was late that month; Ken Reid had time to insert a post Pearl Harbor editorial, "It is War Now—Total War."

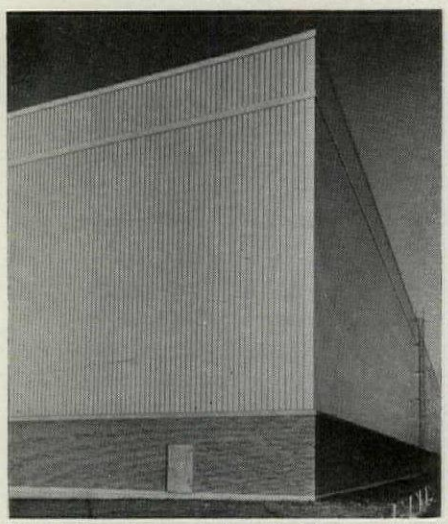
And the material published? There were modernized Gothic schools, modern FSA hospitals, Georgian schools, modernistic recreation buildings, modern houses, rambling Cape Cod houses—you had paid your money and could take your choice.

In the August 1945 issues of the same magazines not a single building was illustrated which was not designed in a contemporary, non-traditional manner. Both *Pencil Points—Progressive Architecture* and *Architectural Record* concerned themselves with hospitals, the first publishing Alden Dow's Midland Hospital, and the *Record* concentrating on the USPHS standard designs. The *Forum* printed a proposed United Nations' Center (which *Pencil Points* had presented in July) and three proposed "living memorials"—recreation centers. The *Record* had some experimental prefab houses. The *Forum* published the Toledo plan. *Pencil Points* scotched the rumor about fluorescent lighting and eye trouble.

Thus the content and the attitude of the Pearl Harbor and the V-J numbers were widely different. It may be worth while to go back over the issues in between, watch that change occur, and try to find out what it means.

SINCE YOU WENT AWAY THERE HAS BEEN **A CHANGE**

Buildings such as this presented design problems which demanded changes in methods.
Reception Building, Great Lakes Naval Training Station, Ill. Skidmore, Owings & Merrill, Architects. Photo: Hedrich-Blessing. The Architectural Forum, Aug. 1942.



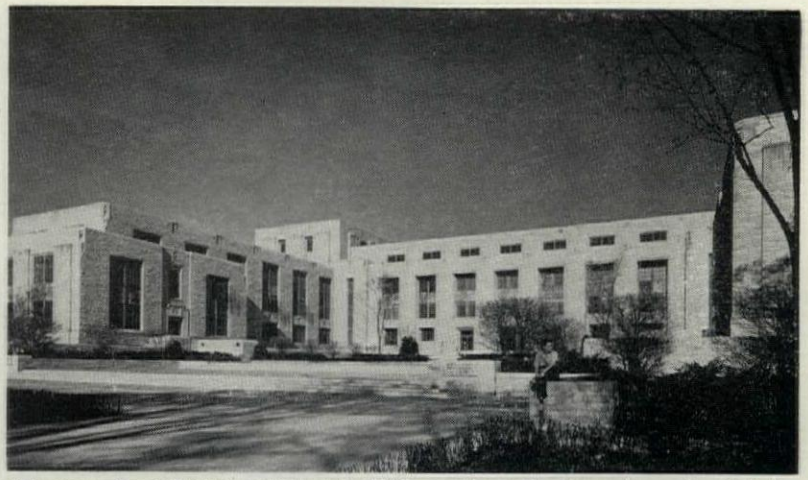
The design of war plants called for speed and plenty of ingenuity as scarcities developed.
Windowless bomber plant, built under direction of U. S. Corps of Engineers. The Austin Company, Engineers and Builders. Photo: Courtesy The Austin Co. Pencil Points, Feb. 1942.

READJUSTMENT IN 1942

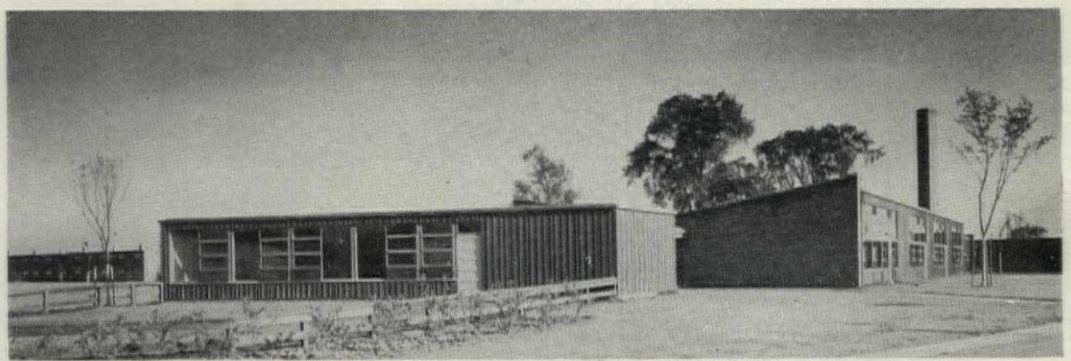
During 1942 all three of the magazines were adapting themselves to the war situation—the complete stoppage of all but defense work. For a time they could not get their hands on publishable war material and "defense housing" made pretty poor pickings. Industrial plants, however, appeared frequently that year, and the Austin Company scored twice, with a bomber plant (*Forum*, February) and one of the windowless factories (*Pencil Points*, February) that the glass and metal sash companies and many psychologists consider inhuman. The Albert Kahn organization had a good deal of material published, until the obvious fact that unornamented, straightforward industrial design could also be good looking was well rubbed in by all three magazines.

In housing, even the Saarinens' Center Line project (*Forum*, May) was a barren photographic subject, well planned as it was. Only Hugh Stubbins, Jr.'s, Windsor Locks, Conn., FWA housing (*Forum*, May) was exciting in appearance, as it took advantage of the striated effect of vertical redwood siding on carefully studied elevations, to gain pleasant honesty rather than forced effect or apparent poverty.

Understanding the needs, some architects found clean progressive solutions for emergency housing.
FWA Housing, Windsor Locks, Conn. Hugh Stubbins, Jr., Architect. Photo: Paul Davis. The Architectural Forum, May 1942.



Ably streamlined Gothic, published in 1942, would not be deemed significant today.
Technological Institute, Northwestern U., Evanston, Ill. Holabird & Root, Architects; McKim, Mead & White, Consulting Architects. Photo: Hedrich-Blessing. Architectural Record, Aug. 1942.



Any traditional props would obviously have been meaningless in the design of schools for defense communities.
Kindergarten Unit, Center Line School, Center Line, Mich. Eliel & Eero Saarinen, J. Robert F. Swanson, Architects. Photo: Coburn. Pencil Points, Nov. 1942.

In August, the *Forum* displayed Skidmore, Owings & Merrill's Reception Building at the Great Lakes Naval Training Station. In the same month, the *Record* published the just-prewar Technological Institute of Northwestern University, by Holabird & Root, with McKim, Mead & White as consultants—a modernized collegiate Gothic which all that talent managed to make a near miss. A striking comparison was provided by *Pencil Points* (November), which pointed an approving finger at the one part of the Center Line project that was significant—the school.

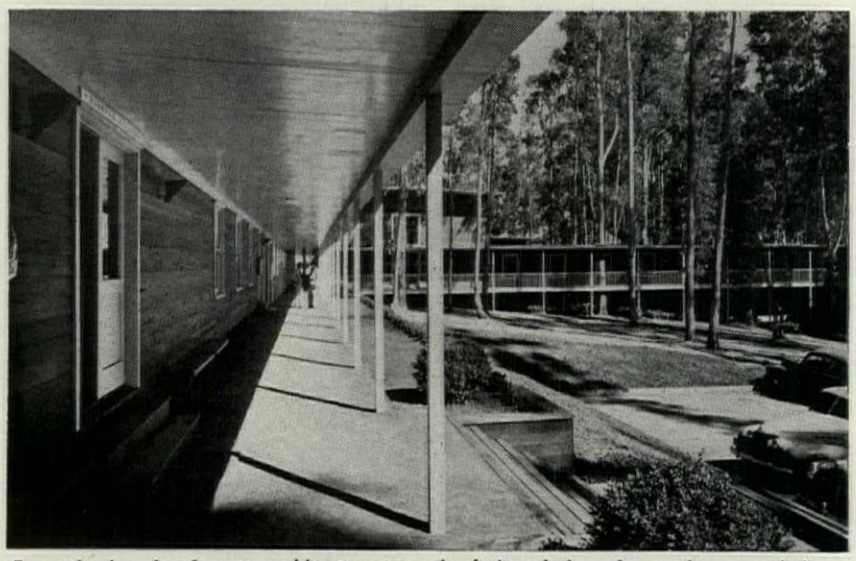
The *Forum* in March gave a number of pages to St. John the Divine, "the largest Gothic cathedral in the world," and atoned by later publishing two unusual churches—Barry Byrne's Sts. Peter and Paul (June) and the Tabernacle Church of Christ by the Saarinens and Pierre & Wright (October). In July, *Pencil Points* had presented Pietro Belluschi's St. Thomas More Chapel.

Houses of all sorts were published. The change in *Pencil Points* can be plotted simply: in February "The Architect and the House" series was concerned with the good taste of John F. Staub's southern Colonial; in May, the exuberance of Alden B. Dow's Frank Lloyd Wright period; and in July, the originality of Pietro Belluschi. Late in the year, the *Forum* was still printing traditional designs if the plan was good. The *Record* continued a middle-of-the-road policy, taking in everything from Royal Barry Wills to George Fred Keck.

While the *Record* made no stated change in policy, *Pencil Points*, in June, became *THE NEW Pencil Points*. More important than the change to a modern format, which is what caused comment in professional circles, was its stated intention "to explore . . . to crusade." The *Forum* began in September its 194X series, with The New House ("assuming prefabrication").

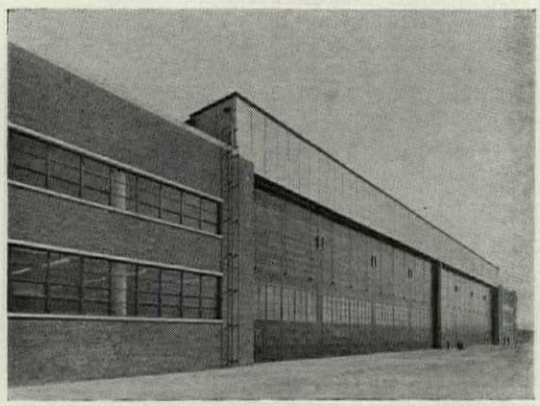
Thus 1942 was a poor year for material, but a year of noticeable change in the magazines. A spirit of arguing for what seemed good design and construction appeared, and a looking around to see if something better than the best prewar designs couldn't be found in the present or in 194X.

SINCE YOU WENT AWAY THERE HAS BEEN **A CHANGE**



From the boards of some architects came stimulating designs for sombre commissions.
Maritime School, Calif. Gardner Dailey, Architect. Photo: Roger Sturtevant. The Architectural Forum, Sept. 1943.

Houses published during the war years attested fairly the changing standards of the magazines.
House, Cambridge, Mass. Philip Johnson, Architect; S. Clements Horsley, Associate. Photo: Ezra Stoller. The Architectural Forum, Dec. 1943.



Industrial war work continued to require straightforward expression of both architectural design and construction.
Plant for Curtiss-Wright Corp., Louisville, Ky. Albert Kahn Associated Architects and Engineers, Inc. Photo: Hedrich-Blessing. Architectural Record, Nov. 1943.

TAKING STOCK IN 1943

In 1943 the pinch in good material began to be felt in earnest. Except for an unusual number of interesting houses (almost all of them built before the war) and the slow emergence of well-designed war projects, there was not a great deal of real significance published during the year.

In the war-building category both *Forum* and *Record*, in January, displayed the Pentagon Building. The *Forum* followed up Skidmore, Owings & Merrill's work at Great Lakes by printing the Welfare Building in March. War housing began to show a more facile use of transient materials and in August *The New Pencil Points* reproduced Roi L. Morin's McLaughlin Heights design. For September the same magazine found a wood laminated arch hangar designed by Albert Kahn Associates.

There was a digging back into the period before the war, and several notable projects were turned up, ranging from Hornbostel & Bennett's Library and Science Building at Wheaton College (*Forum*, January) to the Saarinens' quite different Library and Museum at Cranbrook (*Pencil Points*, December). In June the *Forum* gave the swank Statler Hotel a show, and in August the *Record* presented William Gehron's Queens Borough Hall.

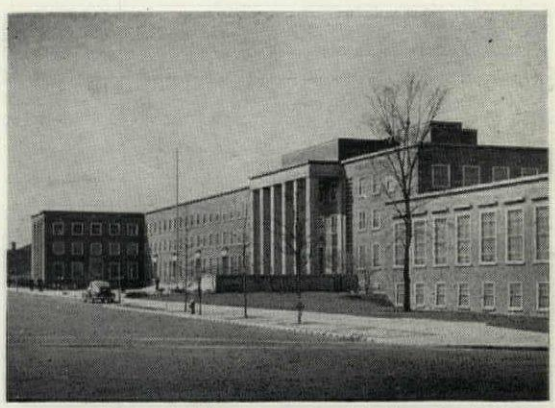
Fewer traditional designs appeared among the houses illustrated. The *Record*, in May, welcomed both Neutra and Wills. In June the *Forum* had a William Wilson Wurster portfolio and in December published the completely naked Johnson-Horsley house. *The New Pencil Points* during the year found merit in the solar yearnings of Keck and the open

Saarinen's masterful prewar grouping brought a wisp of nostalgia to a year mostly devoted to war business.
Museum and Library, Cranbrook, Bloomfield Hills, Mich. Eliel Saarinen, Architect. Photo: Hedrich-Blessing. Pencil Points, Dec. 1943.

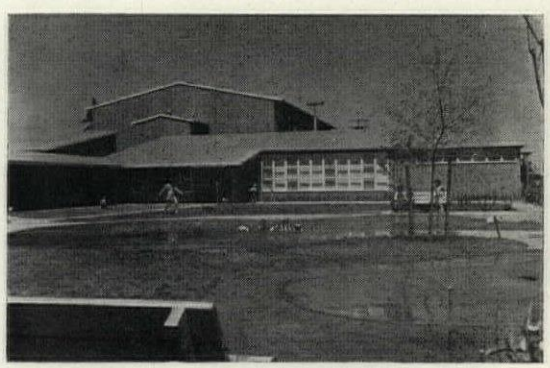
planning of Koch. In the selections of all three magazines there was evident an interest in technological progress as well as appearance. Methods of construction—in particular, prefabrication—and such conceptions as radiant heating were discussed, not as isolated phenomena, but as integral parts of the design.

Again, what was photographed and published was not so significant as what was written and published. *Pencil Points* concentrated on education of the architects rather than the public, and began in March a series of articles on urbanism, which it supplemented by some excellent critiques by Talbot Hamlin and analytical material on city planning. The *Forum*, in August, launched its "Planning With You" campaign, attempting to do something about the growing realization that no full planning is possible without public understanding and support. The *Record* continued its Time Saver series with a marked change toward progress and exploration rather than draftsman's data. (From Typical Curb Sections, in January, to a precast concrete railroad station canopy "to conserve materials and reduce profiles," in December.)

It was a year for taking stock and cleaning out the old merchandise. What material was published was apparently selected with a new set of standards in mind, although there was not much attempt to define them. There appeared a marked interest in techniques, in the broader aspects of planning, and in education—self-education and customer-education.

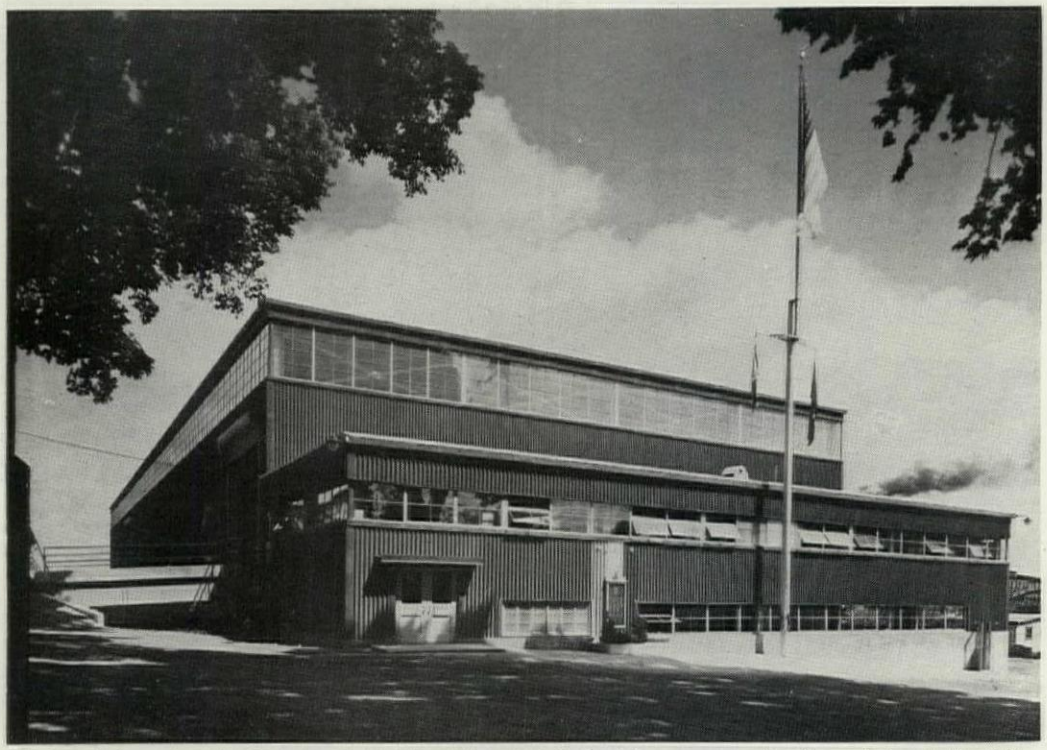


Other significant buildings completed before Pearl Harbor were found and published during 1943 by the magazines.
Borough Hall, Queens, New York City. William Gehron, Architect; Andrew J. Thomas, Associate. Photo: Sigurd Fischer. Architectural Record, Aug. 1943.



The frank use of available materials to form useful buildings indicated the change taking place in our philosophy.
Administrative Center, McLaughlin Heights, Vancouver, Wash. Roi L. Morin, Architect. Photo: Erven Jourdan. Pencil Points, Aug. 1943.

SINCE YOU WENT AWAY THERE HAS BEEN **A CHANGE**



Harriman's honest and crisp use of curtain wall materials furnishes an example of war-induced simplicity.
Machine Shop and Assembly Building, Maine. Alonzo J. Harriman, Architect-Engineer. Photo: Ezra Stoller. Pencil Points, Mar. 1944.

The need for getting down to essentials caused a change but did not preclude the production of excellent design.
Vallejo Community Hospital, Vallejo, Calif. Douglas Dacre Stone, Lou B. Mulloy, Architects. Photo: Gabriel Moulin. Architectural Record, Aug. 1944.

Planning for the armed services themselves sometimes produced unusually clever uses of forms and materials.
Officers' Recreation Building, Roosevelt Naval Base, Terminal Island, Calif. Allied Engineers, Inc., Architects and Engineers. Photo: Maynard L. Parker. Architectural Record, May 1944.

DOWN TO ESSENTIALS IN

During 1944 two trends in the magazines were apparent. In the first place, there was increasing evidence that restrictions on materials and planning for emergency use were producing an unexpected result—good architecture. Imagination and ingenuity had been called for on the part of the practicing architects, not as intellectual exercises, but as war necessities. Ostentation, falseness had to go, and after the somewhat barren start virtue began to be found in the necessity. In purely war structures (Roosevelt Naval Base, *Record*, May; Postal Concentration Center, *Forum*, December); in housing projects by Thomsen and Wurster (*Pencil Points*, January), by Neutra (*Forum*, March), by Gropius and Breuer (*Forum*, July), and by Johnson, Wilson, Merrill, Alexander, and Stein (*Pencil Points*, September), as well as in several photogenic Lanham Act hospitals and a quantity of industrial construction, the year produced designs which would have been notable in any year.

The second tendency was a conscious attempt. on the part of all three magazines, to integrate the archi-

Washington visitors in 1944 gaped admiringly at the brick and transite housing on the Potomac instead of the cut stone monuments.
PBA dormitories for women, Washington, D. C. George Howe, Supervising Architect; Gilbert Stanley Underwood, Consulting Architect. Photo: Gottscho-Schleisher. The Architectural Forum, Jan. 1944.

Structure, lights, sprinklers, and vents make up this bank ceiling.
Branch Bank, Irving Trust Co., New York City. Voorhees, Walker, Foley & Smith, Architects. Photo: P. A. Dearborn. Pencil Points, Oct. 1944.

The houses published showed varied ways of planning for modern living.
House, Conn. Malcolm Graeme Duncan, Architect. Photo: P. A. Dearborn. The Architectural Forum, Jan. 1944.

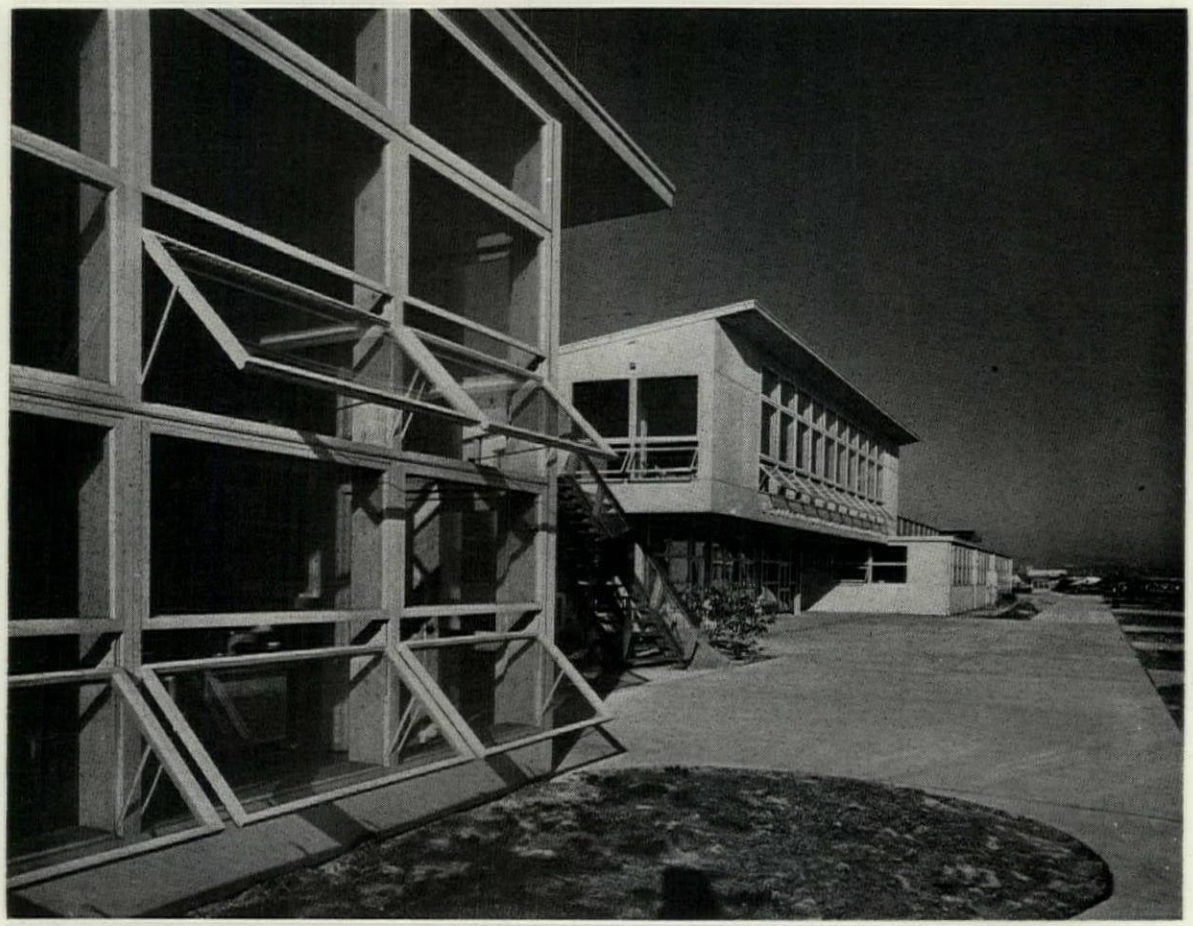
1944

tecture published with other aspects of building and with the society for which it was designed. In January the *Record* announced a series of collaborative numbers, published in conjunction with trade magazines representing possible client groups (*Hotel Management, Nation's Schools*, etc.). The *Forum* continued to push "Planning With You," continued to peer into 194X, and continued to document prefabrication possibilities. *Pencil Points* published exhaustive analytical critiques with its housing projects, looking particularly for over-all community planning. The *Forum* made a sincere reportorial effort to find out the tenant reaction to a functional housing design, and found the result encouraging. *Pencil Points* carried an article on integrated design (architect-engineer collaboration, correlation of structure, materials, equipment, appearance) in October. Several months earlier, in June, this magazine had "rededicated" itself to the cause of progressive architecture, coming right out and saying what it meant by that commodity—good planning (in fitness, strength, beauty, social purpose) of the individual unit, carried through to the same sort of good planning for the world.

Exciting designs from the prewar period continued to appear during the year, such as Ahlschlager's Mercantile Bank Building (*Record*, July), Freeman, French, Freeman's St. Mark's Church (*Forum*, July), Franklin & Kump's Fresno City Hall (*Forum*, June), and Martens and Son's United Carbon Building (*Pencil Points*, October). Several dozen excellent contemporary house designs were illustrated, not all of them by the well-known names. A rather discouraging exhibition of New York City's postwar building program, as designed to date, was treated critically.

The quality of the work published, although the choice was still limited, improved during the year, and at least in the cases of *Pencil Points* and the *Forum*, only buildings designed in twentieth century idioms were selected. In all three magazines the technical data was increasingly exploratory, and the definition of architecture, consciously or not, was broadened.

SINCE YOU WENT AWAY THERE HAS BEEN **A CHANGE**



This wartime design inspires hope that many projected airports will be handled by architects with similar skill and fitness.
Washington Port of Aerial Embarkation, Washington, D. C. Charles M. Goodman, Architect. Photo: Ben Schnall. The Architectural Forum, Mar. 1945.

VICTORY IN 1945

Through V-J Day, the 1945 issues of the magazines continued the search for good architecture and integrated planning in war building. The bulk of the emergency construction had been completed, but sensible and in some cases attractive housing projects and industrial plants continued to appear.

With the end of the war obviously coming, attention began to shift to the postwar possibilities. Many brave words had been written about the great opportunities at hand, and now we were about to be faced with the reality. Until the war came, we had been self-consciously striving for "a style," and then the impact of immediate need and the call for ingenious solutions had driven away, in large part, the self-consciousness. After the first drab barracks, we had seen some interesting designs appear. Had architecture in the United States found itself? Would it go on to a more mature contemporary expression in the postwar period? The magazines sought the answer in two ways—by going back prewar and digging up good work which had been missed, and by hypothesizing about the future.

In the first category the *Record* found merit in Walker & Gillette's Chemical Bank and Trust Company (January), and *Pencil Points—Progressive Architecture* gave due prominence to Franklin & Kump's Sill Building (March). To compose a photographic essay on "The Vertical Style," in August, the *Forum* collected a series of skyscraper close-ups, and found few of them honest expressions of the structure.

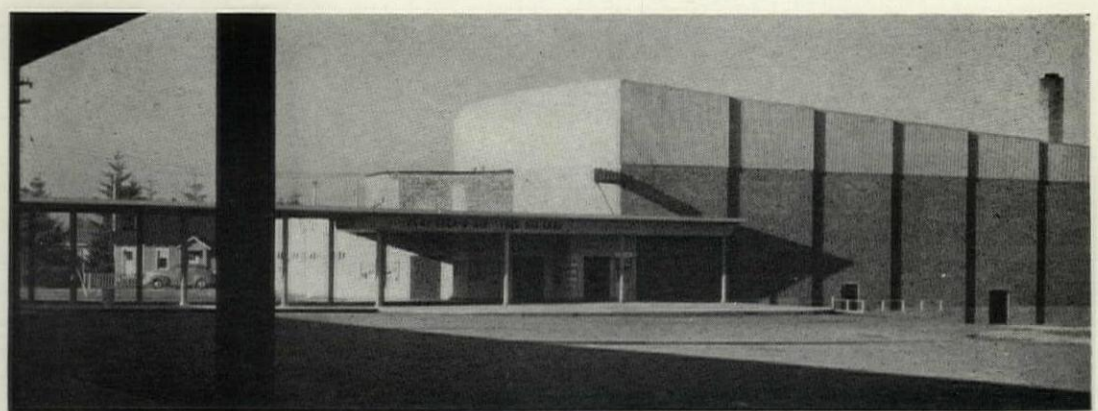
In the sphere of hypothesis, the *Forum*, in April, reviewed the biases of the consumer magazines and decided that the modern approach is becoming ac-

This school did not let war limitations stop a design which happily realizes many teachers' aims.

Rugen School, Glenview, Ill. Perkins, Wheeler & Will, Architects. Photo: Hedrich-Blessing. Pencil Points-Progressive Architecture, Apr. 1945.

From various parts of the country came designs which showed change.

Memorial High School, Bath, Maine. Alonzo J. Harriman, Architect-Engineer. Photo: Ezra Stoller. The Architectural Forum, June 1945.



War housing finally produced good buildings designed to meet community needs by making use of available materials.

Orchard Heights Housing, Seattle, Wash. Jones, Bouillon, Thiry & Sylliaasen, Architects; theater adapted from design by Pietro Belluschi, Architect. Photo: P. A. Dearborn. Pencil Points-Progressive Architecture, Jan. 1945.

ceptable. *Pencil Points—Progressive Architecture* voiced the same conclusion when it published, in September, some of the *Ladies' Home Journal* houses that had been exhibited by the Museum of Modern Art, but tempered its rejoicing with a well-documented warning that someone was kidding someone about prices. *Pencil Points—Progressive Architecture* published, in May, as the results of a competition, a number of houses to be built largely out of glass. The *Record* for May began speaking of the Post-Modern house and, in an article by Dean Hudnut, called for houses "built out of human hearts."

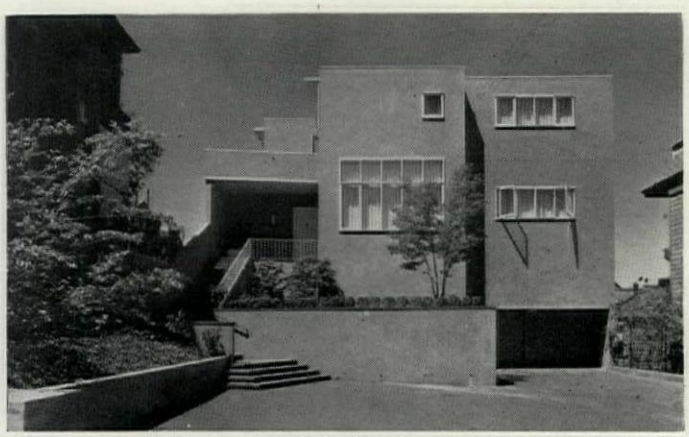
As 1945 drew to a close, a fairly consistent policy on the part of at least two of the magazines had been established. The *Forum* had long since stopped publishing anything frankly traditional in plan, form, or detail. *Pencil Points*, with a stated and restated policy of searching for Progressive Architecture, was naturally choosing contemporary designs, attempting to analyze and justify each choice. The *Record* alone would take all comers at the beginning of the year, but during the last half of 1945 it, too, seemed to be convinced that buildings designed by its Time Saver Standards with the use of its Building Type Studies should by now have a modern appearance.

There has unquestionably been a change in the magazines since Pearl Harbor, a change not only in the appearance of the buildings published but equally in the attitude of the three major publications toward technics, toward planning, and toward architecture's ultimate client—society.

The question remains, in the minds of some, whether that change has been all for the good.

SINCE YOU WENT AWAY THERE HAS BEEN

Prewar, many designs published were not modern minded.
House, Conn. Norris F. Prentice, Architect. Photo: Courtesy Hartford-Courant. The Architectural Forum, Nov. 1941.



Many others that were selected obeyed over-rigid modern formulas.
House, San Francisco, Calif. Gardner Dailey, Architect. Photo: Roger Sturtevant. Pencil Points, Dec. 1941.

CHANGE DOES NOT NECESSARILY MEAN PROGRESS

If you want to catch up with the developments in architecture between Pearl Harbor and now—for instance, if you are going to reopen your offices and you want to know what you've missed—you will want to know more than the mere fact that there's been a change. You will want to know the answers to several other questions:

Has the change that we have seen taking place in the architectural magazines been in a progressive direction?

Is the change in the magazines indicative of a change in the profession, or is it just smart editorial policy? In other words, have the magazines lost touch with the bulk of the profession, or are we all moving on together?

Is the change accompanied by a corresponding development in the public's attitude? That is, is there an increased consumer acceptance of progressive design, based on understanding, or is the change simply an intellectual or technological one?

Finally, where do we go from here? Is there any indication of continuing progress—if progress it is—or has the movement from traditionalism and eclecticism been a sterile one?

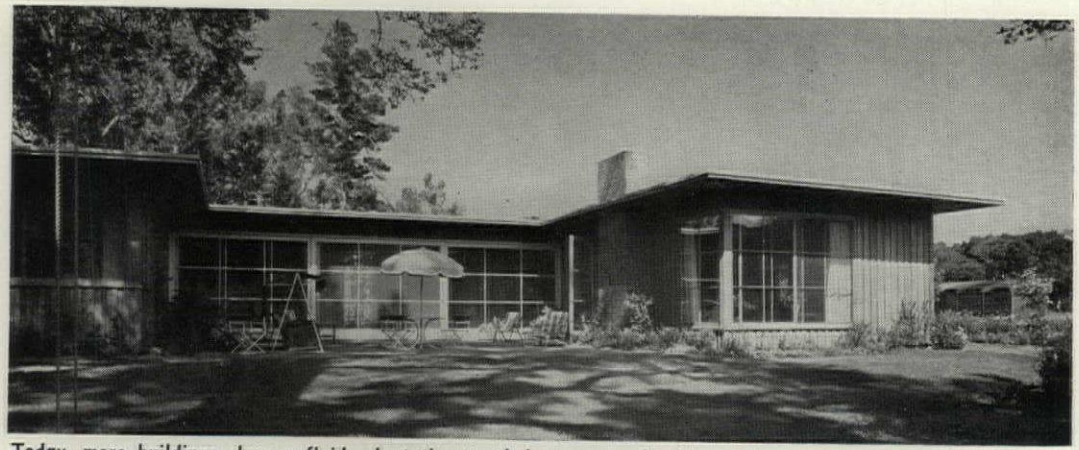
Even to pose the first question may seem foolish to a great many architects. Some would unhesitatingly answer *yes*, and a few would say *no* with equal conviction. The great majority of us, I think, are inclined to assume that any change is progress. Unfortunately that is not so. To take an outstanding example, fascism was a change that sounded like progress if its principles were stated quickly, but it turned out to be black reaction. Let's be sure that our turning from the straight and safe path of tastefully designed Georgian houses and Gothic churches is in a good direction—a progressive direction—before we applaud it. We might have to go back to the turning point and start over again in another direction, and that would waste time.

The preceding pages have been a quick chronological survey of the war-years' magazines—to find change. Now for a few pages it may pay to pick apart some of the material that has been published and hunt for progress. In order to do that there must be some criteria; there must be some definition of progress, so that we know what we seek.

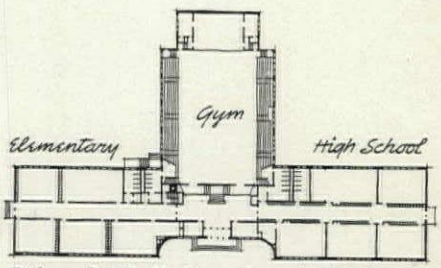
It would seem best to choose the simplest, commonly accepted standards for good architecture: fitness, strength, beauty, purpose. If it can be proved that architecture published during the war years shows an improvement over architecture published during the prewar decade in fitness of plan, use of materials, construction methods, appearance, and social usefulness, then the change may be called progress.

Actually this is a severe test. Planning for war itself is certainly the most socially useless task one could imagine. If progress crept through in the schools and the hospitals and the housing projects built during the war, and if prewar progressive architecture was found and belatedly published during those years, it is something worth marking.

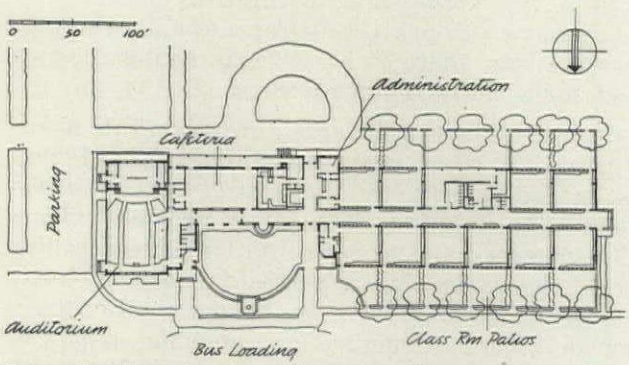
PROGRESS



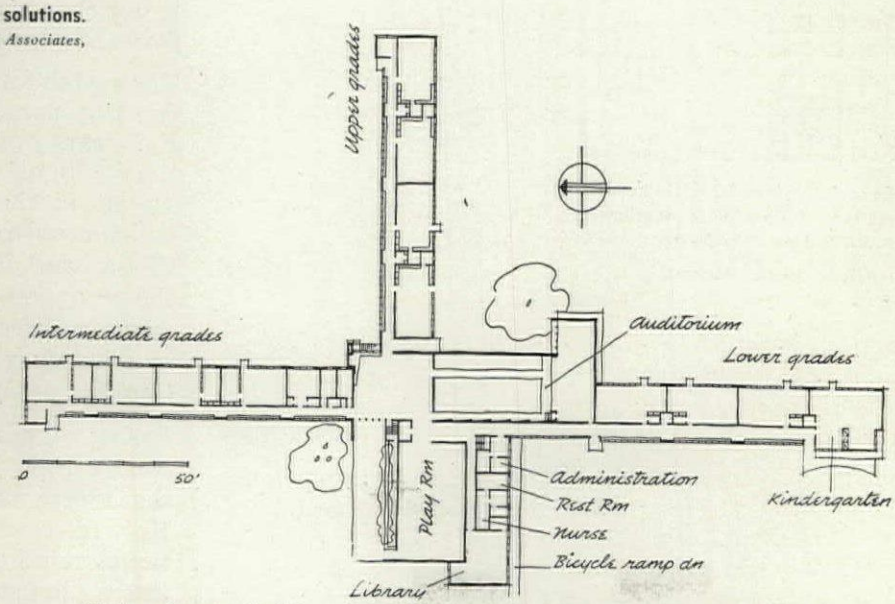
Today, more buildings show a fluid adaptation to their purpose. Is this genuine progress as well as change?
House, Redwood City, Calif. W. W. Wurster of Wurster & Bernardi, Architects. Photo: Roger Sturtevant. The Architectural Forum, Aug. 1945.



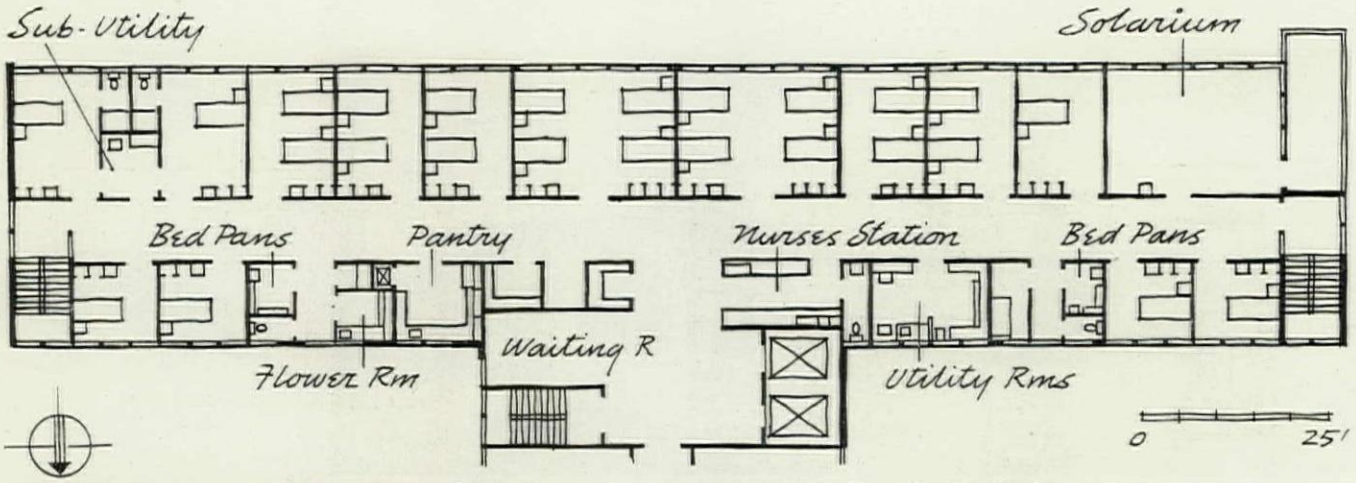
Before Pearl Harbor, the plans of published structures were often stereotyped.
Crescent School, Klamath County, Ore. Howard R. Perrin, Architect. Architectural Record, Dec. 1941.



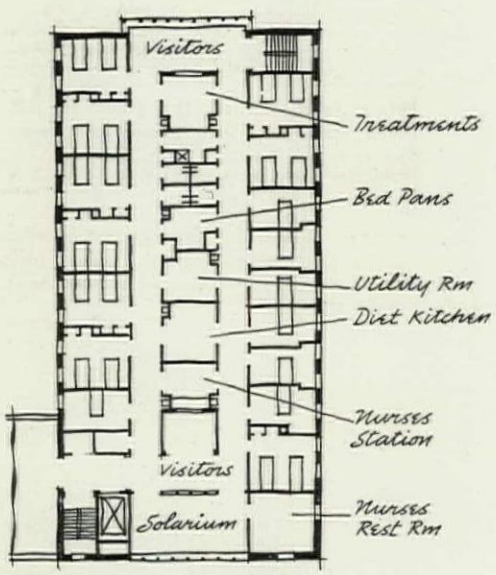
Change is shown by plans which seek different solutions.
Lakeside Union Elementary School, Calif. Frank Wynkoop and Associates, Architects and Engineers. Architectural Record, July 1945.



Today, plans are flexible, open, and intimate. Is this progress as well as change?
Rugen School, Glenview, Ill. Perkins, Wheeler & Will, Architects. Pencil Points, Sept. 1943.



In hospitals, as elsewhere, architects have found that freedom from formal restrictions allows planning fitted to modern needs.
Nursing Unit. Hospital Facilities Section, USPHS; Marshall Shaffer, Chief Architect. Architectural Record, Aug. 1945.



Some free plans forgot to consider matters of orientation, ventilation.
Double-Pavilion Hospital Plan. Charles F. Neergaard, Hospital Consultant. Architectural Record, Mar. 1942.

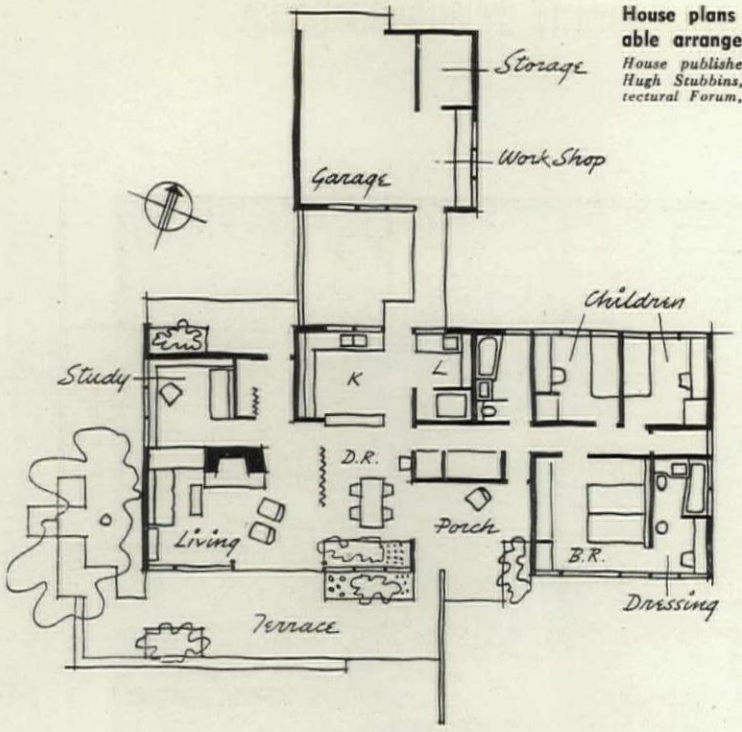
IN THE FITNESS OF THE PLAN

Even though the principles of functional planning had been thoroughly and intelligently discussed—and in many cases practiced—for a number of years before the war, there was yet room during the war period for a marked improvement.

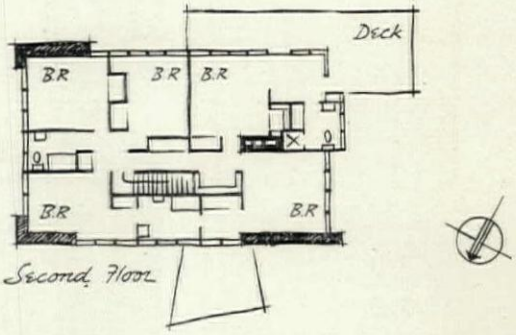
Very few architects still force a program into a *formal* plan, but there are restrictions imposed, perhaps subconsciously, by the search for an *architectural* plan solution to a given problem. Thus, while symmetry and axes are no longer compelling factors, there remains a desire for arrangement. Obviously there could be several functionally correct plans for a given structure, one of which might be better than the others in the sense of neat, straightforward, three-dimensional arrangement.

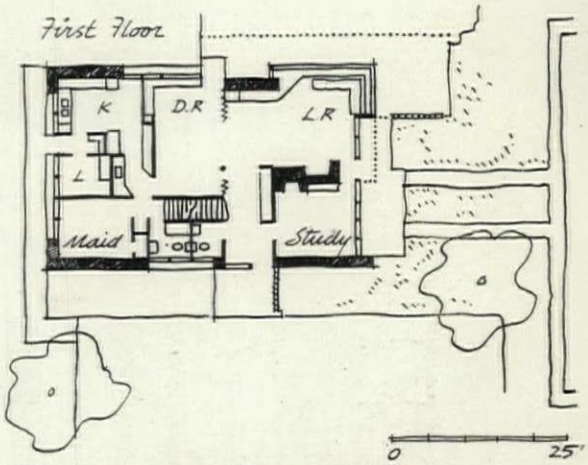
The search for this sort of plan, which denies neither function nor order, made progress during the war. For years architects had *talked* of arranging functions (items in the program) rather than spaces (items in the solution). This was a nice theory, which could rationalize almost any sort of plan, until the war came. First in industrial work, where the arrangement of *processes* is everything, then in war structures such as training camps, and finally in emergency housing, schools, hospitals, this functional approach became necessary.

Perhaps the importance of speed was a virtue; there wasn't time for self-conscious striving. Certainly there were many instances like the USPHS Nursing Unit (*Record*, August 1945) where a chart of functional relationships was translated almost literally into a plan solution with a minimum of pulling and pushing, and with the result orderly, pleasing, archi-



House plans increasingly show a livable arrangement of their functions.
House published in Ladies' Home Journal. *Hugh Stubbins, Jr., Architect. The Architectural Forum, Apr. 1945.*





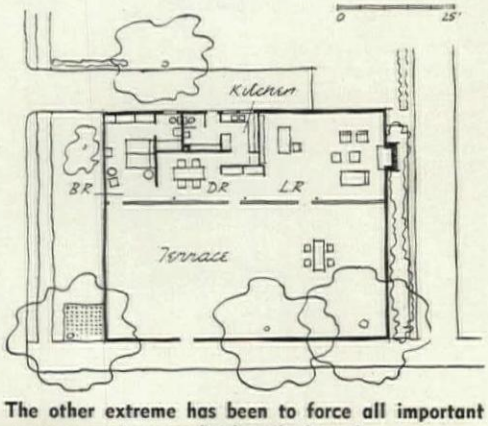
The first moves toward fit planning merely eliminated partitions and opened up the dividing walls.
House, Torresdale, Pa. Oscar Stonorov, Edmond Bacon, Architects. The Architectural Forum, Nov. 1943.

OF BUILDINGS

tectural. It must be admitted that the need for designing, in most cases, one-story structures, made a free arrangement of spaces easier. The sprawling pavilion-type Lanham Act hospitals, for example, were not restricted by the zoning regulations which bedevil the designer of a multi-story urban unit. Nevertheless, there is more true design ability involved in the standard plans of the USPHS than ever had to be exercised in the formal hospital arrangements of the '20s and, yes, the '30s. This sort of ability got a great impetus during the war.

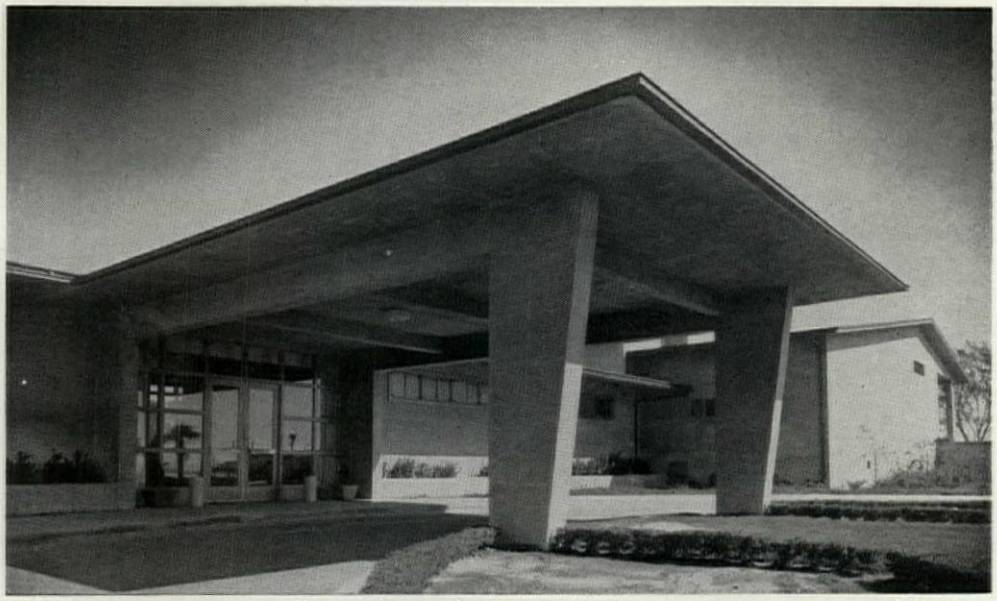
The purely technical aspects of planning in a fit manner also progressed under war requirements. The current interest in modular planning is not accidental. In designing emergency structures the value of small modules (to simplify the design of concrete block piers, for example) and of large modules (to allow repetitive structural design for both speed and economy), became so obvious that there is a natural desire to carry the system over, with increased coordination, into postwar planning.

The greatest general improvement in planning before the war had been in the residential field. With no house building to speak of, except for minima, we have had lots of time to think about this subject for five years. The magazines have had a chance to choose what they considered best out of the prewar work which had not yet been published. Increasingly they have considered best those plans that demonstrated economy, separation yet integration of functions, flexibility, construction correlation. So much critical analysis and realistic data have been published during the war that there is no longer any excuse for a bad house plan.

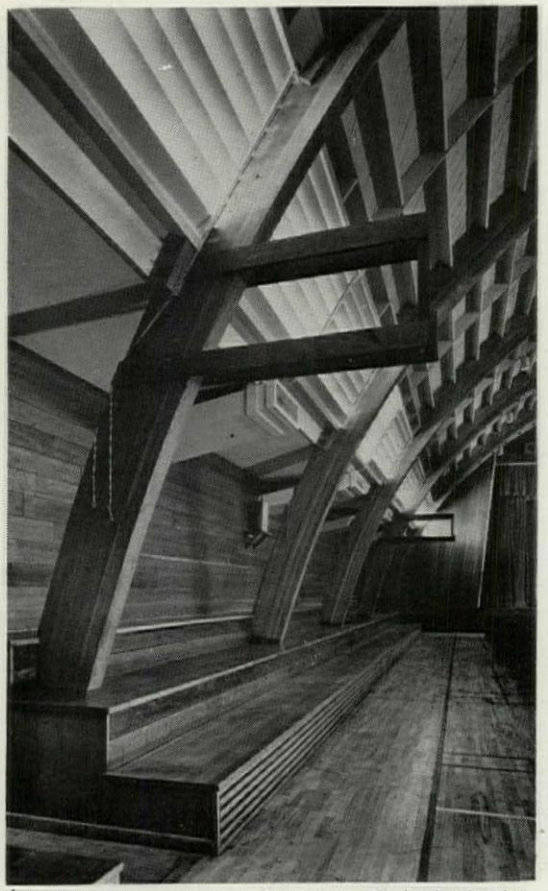


The other extreme has been to force all important rooms toward a completely naked southern exposure.
House, Cambridge, Mass. Philip Johnson, Architect; S. Clements Horsley, Associate. The Architectural Forum, Dec. 1943.

SINCE YOU WENT AWAY THERE HAS BEEN **PROGRESS**



In war design concrete was rediscovered as a plastic material allowing a fresh new structural freedom.
Officers' Recreation Building, Roosevelt Naval Base, Terminal Island, Calif. Allied Engineers, Inc., Architects and Engineers. Photo: Maynard L. Parker. Architectural Record, May 1944.

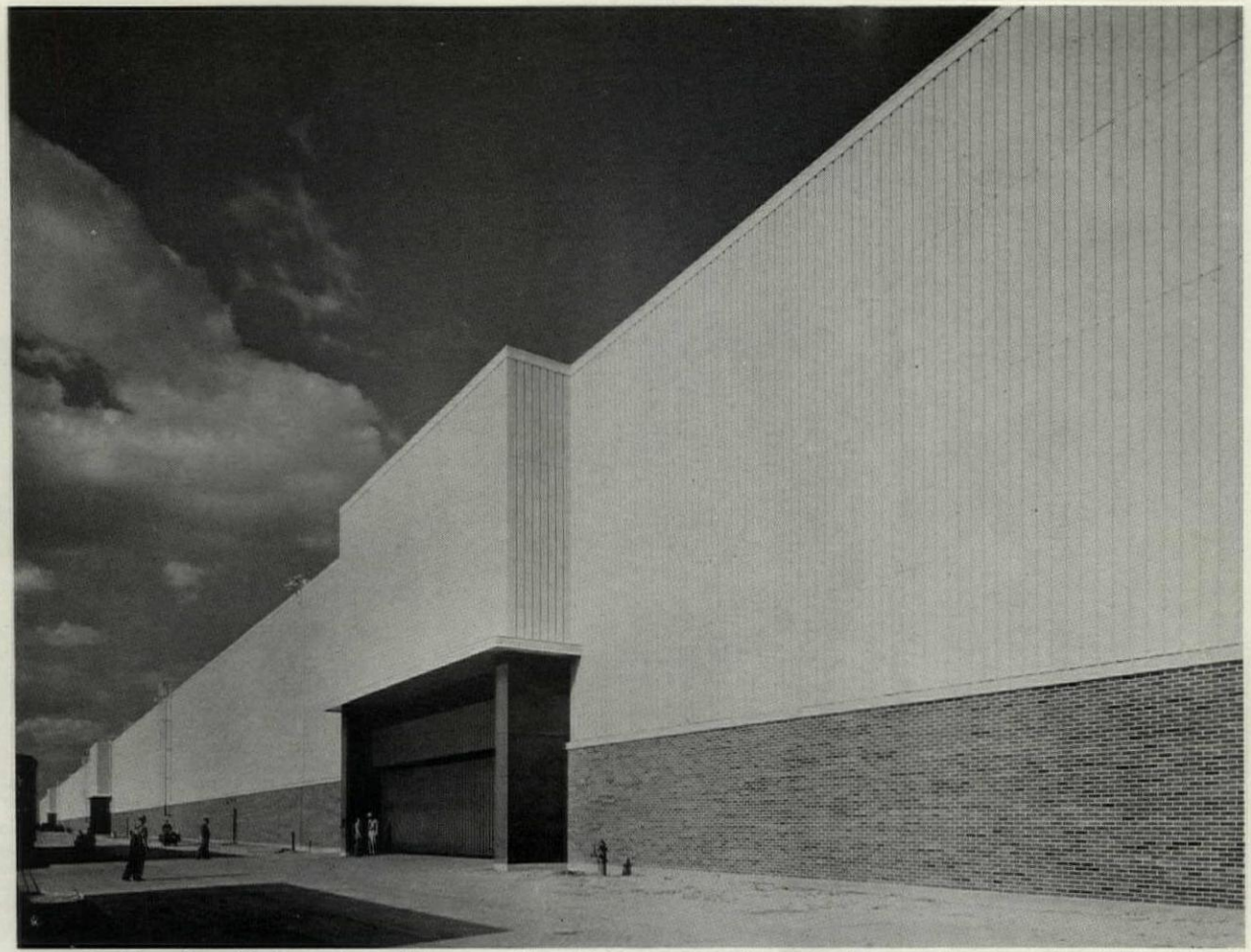


Wood found new uses, gained strength in lamination.
Recreation Center for War Workers, Vallejo, Calif. Bernardi, Wickenden, Langhorst & Funk, Associated Architects. Photo: Roger Sturtevant. Pencil Points-Progressive Architecture, June 1945.

IN THE USE OF MATERIALS ANI

The war forced appreciation of the full value of materials. True enough, what war-time design called for was not the most *fit* material, but rather the fullest possible use of the material that was available. This was good discipline. The result was complete evaluation, often for the first time, of many materials which had been used extravagantly and thoughtlessly before the war.

Under the stress of war needs, many old stand-bys were brought into flattering new use (concrete masonry units, for example) and some new materials were invented or further developed (flooring surfaces, hollow concrete pre-cast planks, plastic oddments). New, more economical and sometimes more pleasing designs in wood construction were developed; laminated arches got a chance to prove themselves, and unusual truss and girder designs appeared. Concrete as a material of both structure and finish was found to have unsuspected possibilities (in economical use of labor and materials, in plastic adaptation to new design techniques) and limitations (in appearance, in erection speed).



New materials and combinations of materials were well used in war construction, as in this example of a steel and Fiberglas wall. *Parts Plant, Consolidated-Vultee, Fort Worth, Tex. The Austin Company, Engineers and Builders. Photo: Courtesy The Austin Co. The Architectural Forum, Jan. 1945.*

CONSTRUCTION METHODS

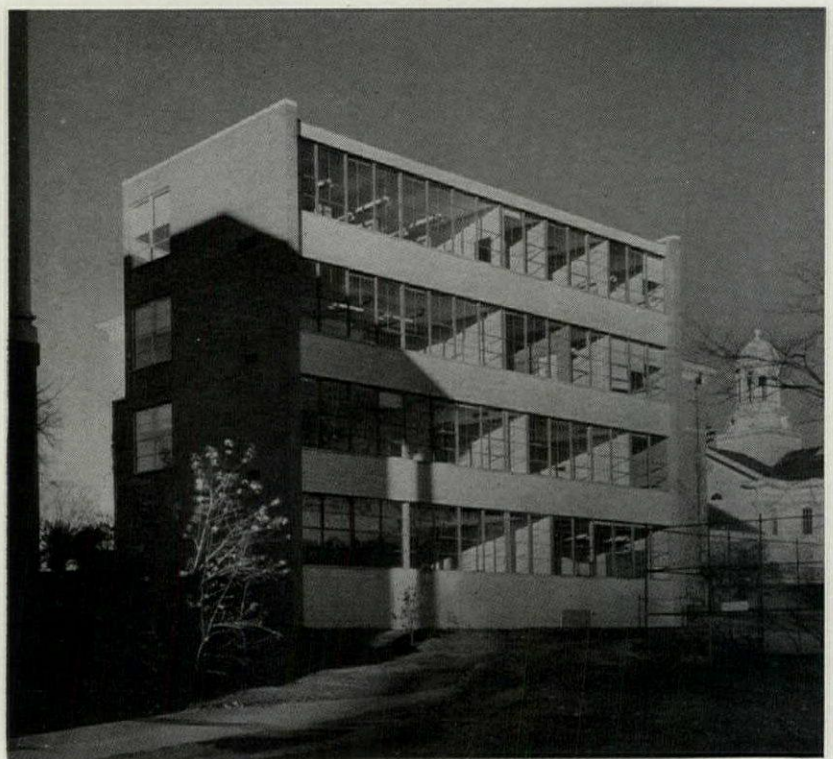
The magazines have reflected this increasing desire to evaluate and understand materials. One of the most encouraging notes of progress in the change within the magazines has been the move from data sheets which were information on sizes to mature analyses such as the new Materials and Methods section of *Pencil Points—Progressive Architecture* and the *Forum's* Design Analysis series.

Progress in construction methods during the war must be measured in the same way the use of materials should be assessed—by the increase in investigation and analysis. War design called for methods of building which were speedy, and used available labor and materials. A great deal of ingenuity was devoted to integrating the architectural conception with specific construction requirements. The obvious example of this sort of coordination is the housing unit or the barracks or the training school designed for site prefabrication and crane erection of large panels. Another is the development of the cavity wall principle (*Pencil Points—Progressive Architecture*, April 1944) and its fancier relative, the breathing wall (*Forum*, January and August 1945). Here is the sort of thing which, astoundingly, happened again and again—under war stress, a principle already known, but long neglected, was carried to new, progressive fruition.

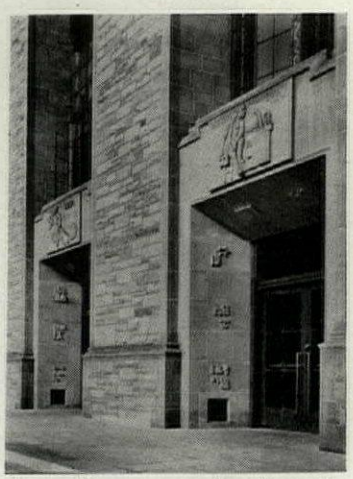
The use of the rigid frame analysis spread, with resulting economies, particularly in concrete design. The use of repetitive elements, large and small, brought the advantages of modular planning to the construction site as well as to the drafting board. Many structures were designed not only to accommodate wall-board sizes but to utilize a standard truss design over a large area or to permit the use of traveling forms for concrete pours. All of this has been well documented by the magazines.

Standard construction methods had become as frozen as any other aspect of traditional design, and the war years have apparently served to free our thinking in this respect. Buildings had to be designed to fit construction systems; it is only a step further to design construction systems to fit buildings.

SINCE YOU WENT AWAY THERE HAS BEEN **PROGRESS**



Much modern work built before the war had denied any fitness for specific purpose.
Science Building, Wheaton College, Norton, Mass. Hornbostel & Bennett, Associated Architects. Photo: Ezra Stoller. The Architectural Forum, Jan. 1943.



A reaction was overdue from the false fitness of associated style.
Technological Institute, Northwestern U., Evanston, Ill. Holabird & Root, Architects; McKim, Mead & White, Consulting Architects. Photo: Hedrich-Blessing. Architectural Record, Aug. 1942.

IN THE APPEARANCE OF OUR BUILDINGS

In the first place, the *fitness* of the appearance of construction during the war has undeniably improved. Forgetting for the moment the question of beauty, we are beginning to find out what makes a structure look fit for a certain given purpose.

It has taken us some time to distinguish between association and fitness. The greatest hold traditionalism has on the public and a large part of the architectural profession is the association a certain "style" has with a certain use. In order to deny the validity of this association of ideas, it seemed smart for a while to deny any requirement of fitness in appearance. For instance, to wrench away from collegiate Gothic, Hornbostel & Bennett's Library and Science Building at Wheaton is designed as an industrial laboratory or a commercial structure might be. This intertype phase of the modern trend proved to many observers that architecture cannot be non-objective; that the requirement of a fit plan is supplemented by the need for fit appearance.

During the war the magazines have published, as we shall see, heartening examples in many fields to prove that fit structures can be designed without unfairly calling on traditional associations. Examining the magazines, one finds an increasing emphasis in design and in editorial comment on fitness of appearance, and one finds that this involves fitting a structure to its terrain, to its locality, to its use, and to the people who are going to use it.

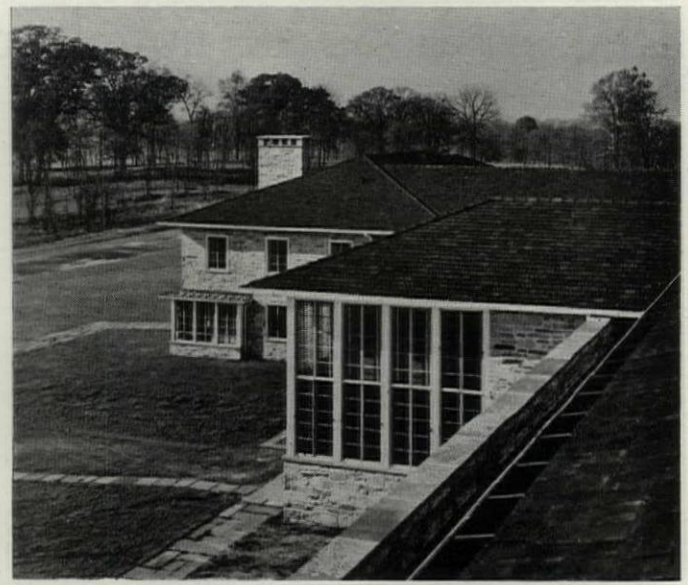
When architects begin talking about *beauty* there is a temptation either to get into the field of pure esthetics on the one hand, or, on the other, to judge only by the *fitness* we have been discussing across-page. Neither test is completely fair.

There have been many designs, good by the standards of esthetics, which have not resulted in beautiful structures, usually because they were not fit in some sense. On the other hand, there have been many functionally fit buildings which were not good

looking, because some other ingredient was missing.

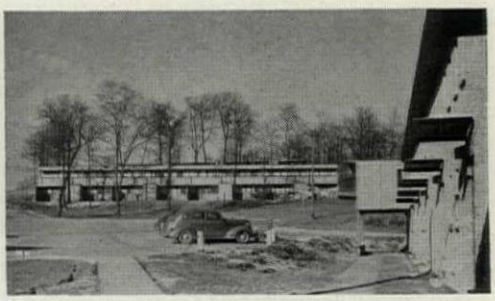
There are many standards to be met before an architect's product can be fairly called a handsome bit of architecture. Fitness is one. Pure, non-objective design is another. The technical excellence which comes with integration of plan, materials, construction methods, and appearance—with resultant sureness and lack of awkwardness—is a third.

Finally, if we admit that architecture is an art and not a trade, there is the intangible ingredient of pure inspiration in a fully successful structure, just as there is in a successful painting or piece of sculpture. And there the contemporary expression, playing with progressive construction techniques, has a great advantage over the restrictions of stylism. That is why bits of inspired design peep through even the handicaps of war design, appear even in that most drab of commissions—defense housing. Architecture has become more exciting, more inspiring.



Progress comes hard in fit appearance and beauty without tricks.
Mary Fisher Hall, Goucher College, Baltimore County, Md. Moore & Hutchins, Architects. Photo: Gottscho-Schleisner. Pencil Points, July 1943.

Despite difficulties of speed and cost, housing for war use showed substantial progress in appearance.
Packard Court, Niagara Falls, N. Y. Association of Licensed Architects. Photo: P. A. Dearborn. Pencil Points, Jan. 1944.



It became apparent in the early approach to the problem that fitness taken alone was not enough.
Aluminum City Terrace Housing, Pittsburgh, Pa. Walter Gropius, Marcel Breuer, Architects. Photo: Gottscho-Schleisner. The Architectural Forum, July 1944.

Projects designed by adroit architects proved also that studied design was not sufficient by itself.
Channel Heights Housing, near San Pedro, Calif. Richard J. Neutra, Architect. Photo: Julius Shulman. The Architectural Forum, Mar. 1944.

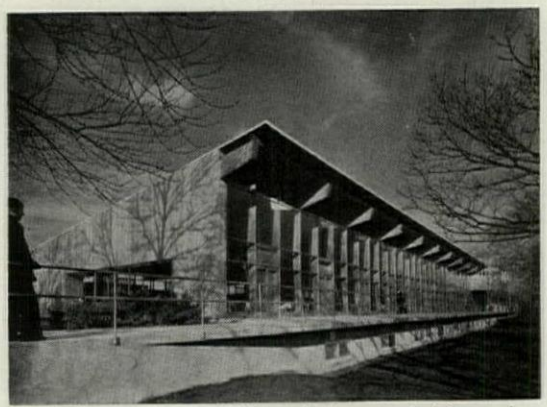
Before the war ended there were good looking examples of successfully combined ingredients.
Baldwin Hills Village, Los Angeles, Calif. Reginald D. Johnson, and Wilson, Merrill & Alexander, Associated Architects; Clarence S. Stein, Consulting Architect. Photo: Roger Sturtevant. Pencil Points, Sept. 1944.

AGAINST ODDS, IN BUILDING FOR THE ARMED SERVICES

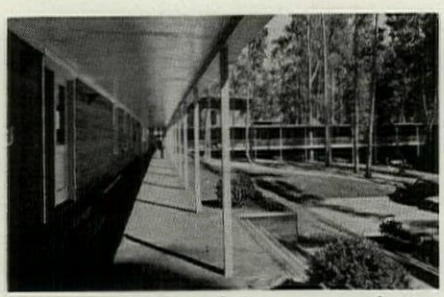
When assignments for design were first handed out by the Army, the Navy, the Coast Guard, and the Maritime Service, the requirements seemed to discourage any advance in architecture of this sort. The demand for speed, the need for using non-critical materials, and, in many cases, the existence of stock drawings which were completely stodgy and arbitrary solutions, were handicaps difficult to overcome. There was seldom encouragement or reward for the development of something better, and those architects deserve everlasting credit who took the pains to convince engineers in uniform that a fusion of fit materials and fit plan can be expressed handsomely with no extra cost in money or time.

As the war went on, a number of good designs appeared in the magazines. Undoubtedly there were many more, which the censorship imposed on this type of work has still hidden. The tradition which progressive architecture had to overcome here was not that of stylism or extraneous ornament; it was rather the lack of *creative* imagination inherent in the regular Army and Navy training. The word "barracks" had become synonomous with drab, undesigned, construction. There are enough living quarters now scattered around the country in various training centers, designed with imagination and a sense of appropriateness, to prove that this need not be.

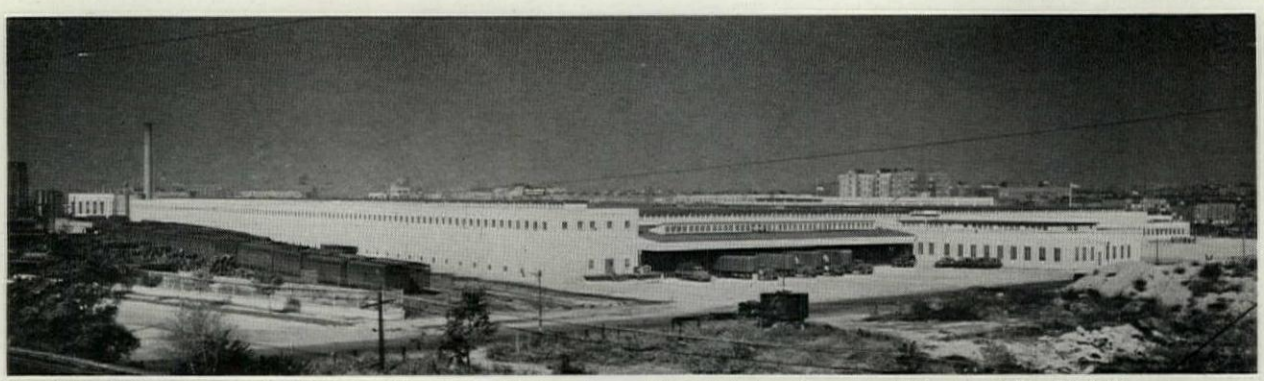
Commissions for war work were not handed out because of a practitioner's esthetic philosophy; the usual requirement was ability to organize large scale work quickly. That progress was made here in planning, use of materials and methods, integration of design, and even appearance is an encouraging thing.



One of the first war buildings which succeeded in proving wrong the official attitude of disinterest in good design.
Welfare Building, Great Lakes Naval Training Station, Ill. Skidmore, Owings & Merrill, Architects. Photo: Hedrich-Blessing. The Architectural Forum, Mar. 1943.



Another progressive solution to a purely war problem, fusing design and social purpose.
Maritime School, Calif. Gardner Dailey, Architect. Photo: Roger Sturtevant. The Architectural Forum, Sept. 1943.



The difficulties and urgency of construction demanded broad repetition of design elements, which materially aided the appearance.
Army Post Office, Long Island City, N. Y. Alfred Hopkins & Associates, Architects. Photo: Ben Schnall. The Architectural Forum, Dec. 1944.

The large variety of wartime industrial work tended to free this field from stultifying standardization.
Headquarters Building, Hershey Metal Products Co., Ansonia, Conn. Leo F. Caproni, Architect. Photo: Gottscho-Schleisner. The Architectural Forum, Aug. 1945.

IN INDUSTRIAL DESIGN

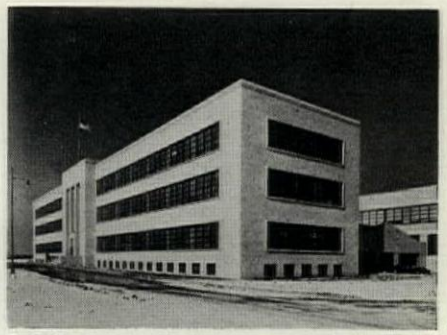
The design of industrial buildings has for years been more clean and uninhibited than commercial, institutional, or residential work. However, as the word "barracks" had come to have a derogatory architectural implication, so the word "factory" had come to mean a building which worked well but had no good looks.

Several designers, notably the Albert Kahn organization and the Austin Company, had self-consciously tried to remove this stigma. From the early days of the war on to the end, published examples illustrated cleverness in construction (Austin Co., *Forum*, October 1944), facile use of materials (Alonzo Harriman, *Pencil Points*, March 1944), a frank expression of the production unit (Kahn, *Record*, November 1943), but almost always a forced "architectural" emphasis at the administrative entrance (Kahn, *Pencil Points—Progressive Architecture*, December 1944).

Several buildings not strictly in the industrial class, which were prominently displayed in the magazines, must have had a salutary effect on designers who entered this field during the war. The Murray Hill Bell Laboratories of Voorhees, Walker, Foley & Smith (*Pencil Points*, August 1942) made good use of a module based on function rather than material, in this case a six-foot laboratory unit; the much discussed Municipal Asphalt Plant of Kahn & Jacobs (*Forum*, March 1944) proved that industrial usage sometimes calls for unusual forms, and continued publication of federal power projects (*Pencil Points*, September 1944) emphasized the design value of full engineer-architect-owner collaboration.

Toward the end of the war, clichés seemed to be giving way to a fresher approach. In its V-J month issue the *Forum* published an excellent example of the trend in Caproni's Headquarters Building for Hershey Metal Products. The plan is fresh, the appearance is imaginative and appropriate. There has been progress.

While restrictions on materials were a nuisance, they did induce fresh imagination in design.
Machine Shop and Assembly Building, Maine. Alonzo J. Harriman, Architect-Engineer. Photo: Ezra Stoller. Pencil Points, Mar. 1944.

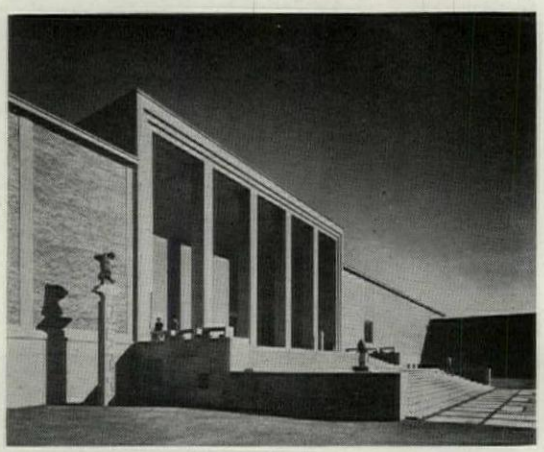


Satisfactory in all other respects, many plants had a false entrance feature forced on them.
Airplane Engine Plant, Middle West. Albert Kahn Associated Architects and Engineers, Inc. Photo: Hedrich-Blessing. The Architectural Forum, Mar. 1942.

Windowless walls made design and construction difficult.
Windowless bomber plant, built under direction of the U. S. Corps of Engineers. The Austin Company, Engineers and Builders. Photo: Courtesy The Austin Co. Pencil Points, Feb. 1942.

SINCE YOU WENT AWAY THERE HAS BEEN **PROGRESS**

This project comes as close as any school to a completely satisfactory fusion of progressive planning and all-round congenial appearance.
Rugen School, Glenview, Ill. Perkins, Wheeler & Will, Architects. Photo: Hedrich-Blessing. Pencil Points-Progressive Architecture, Apr. 1945.



Strongly personal design such as this may not have as much general influence as some of the wartime schools.
Museum and Library, Cranbrook, Bloomfield Hills, Mich. Eliel Saarinen, Architect. Photo: Hedrich-Blessing. Pencil Points, Dec. 1943.

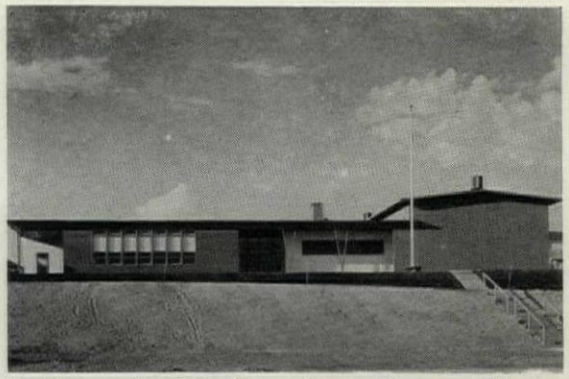
IN THE DESIGN OF SCHOOLS

Long before the war began many architects knew perfectly well that there was neither fitness nor beauty in the design of modern educational institutions masked in antique forms. In *Pencil Points* for June 1942, Talbot Hamlin wrote well on this matter, using as his bad example a cute Colonial farmhouse design. Even lay citizens shuddered at the Tudor monstrosities in which their city children had to spend their days. Harder to overcome has been the equal unfitness for character-forming education—the equal drabness—of pure functionalism designed solely to meet the needs of progressive teaching.

At first it seemed that the war construction program would not do much to help in progressive development. Lanham Act schools in the beginning were pretty miserable, from inexpensive imitations of Georgian, through modernistic misunderstandings of contemporary design, to just plain cheapness. It seemed as though the magazines would have to content themselves with finding dignified, if unexciting, designs such as Eggers & Higgins' Cardinal Hayes High School (*Forum*, December 1941) or frankly traditional numbers like Eric Kebbon's Benjamin

Recently published schools indicate that modern schoolhouses don't need to be pompous or barren.

Carmel High School, Carmel-by-the-Sea, Calif. Franklin & Kump and Associates, Architects. Photo: Roger Sturtevant. Pencil Points-Progressive Architecture, Apr. 1945.



The danger of making the modern medium as coldly forbidding as the classic is gradually being alleviated.

High Point School, Seattle, Wash. Stuart, Kirk & Durham, Architects. Photo: P. A. Dearborn. Pencil Points-Progressive Architecture, Apr. 1945.

War housing projects were often enlivened by a school that was exciting in plan and appearance.

School, Community Center, Center Line, Mich. Eliel & Eero Saarinen, J. Robert F. Swanson, Architects. Photo: Coburn. Pencil Points, Nov. 1942.

Franklin High School (*Record*, February 1943) or, at best, personalized bits of unusual designs such as the Saarinens' Cranbrook Library (*Pencil Points*, December, 1943).

Then suddenly a few progressive designs appeared in defense housing projects, and in case after case an uninspired project was highlighted by a school building which was exciting in plan; intelligent in its construction; and warm, appealing, and appropriate in appearance. By the end of the war, all three of the magazines were able to gather enough material for school issues (*Pencil Points*, April 1945; *Forum*, June 1945; *Record*, July 1945) which, together with miscellaneous designs scattered in previous numbers, indicate a long step forward.

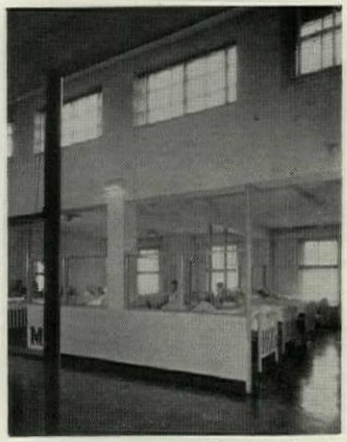
While a completely satisfactory fusion of progressive planning and congenial appearance has seldom appeared during the war (perhaps the Rugen School of Perkins, Wheeler & Wills, *Pencil Points*, September 1943 and April 1945, comes as close as any), the fact that spotty progress in one aspect or another has appeared under war conditions in a number of buildings, in various parts of the country, is sufficiently encouraging.

Progress in plan has come in a greater use of flexible classrooms (a practice often hampered by restrictive codes), in more commonly accepted correlation of indoor and outdoor areas, and in planning for community use of many of the school facilities. The magazines have published enough documentary material to prove the value of planning for better natural light by the height and size of the windows, by the slope of the ceiling, and by the use of clerestories. Cost analyses have been presented, indicating that modern planning, even of the open corridor type, can cost less than the traditional rigid use of space.

We knew, or suspected, these things before the war. Now there are more tangible statistics to bolster progress, and, surprisingly, more examples to prove that good planning can be good looking. There has been progress—progress that will help meet the coming demands for schools making greater use of new teaching techniques, such as audio-visual aids, and schools serving a greater community purpose.

SINCE YOU WENT AWAY THERE HAS BEEN **PROGRESS**

Prewar hospitals that functioned well often ignored simple urbanity.
Triboro Hospital for Tuberculosis, Queens, New York City. Eggers & Higgins, Architects. Photo: Samuel H. Gottscho. The Architectural Forum, Feb. 1941.



Wartime hospitals rediscovered materials, thus found new efficiency.
USPHS Hospital, Sheepshead Bay, N. Y. Alfred Hopkins & Associates, Architects. Photo: P. A. Dearborn. Pencil Points, Apr. 1944.

IN THE DESIGN OF HOSPITALS

Before the war there was a general realization among hospital administrators and those architects who took the planning of hospitals seriously that the hospital building, more than any other structure except the industrial plant, must be designed primarily to function well. Care of the patient and the processes of diagnosis and treatment cannot afford to break down or even be impeded by errors in planning or selection and placing of equipment. Hospitals that worked well, and hospitals that had abandoned traditional designs in order to work well were not uncommon in 1941.

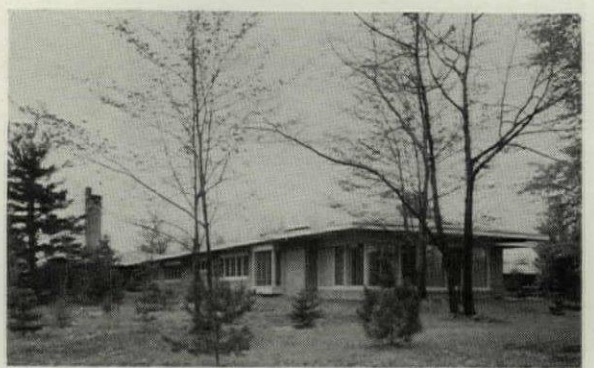
Still there has been progress during the war. First, and probably most important, were the plan suggestions (accepted as gospel by most designers of Lanham Act hospitals), distributed by the Hospitals Facilities Section of the U. S. Public Health Service. Standards had been published before (the *Record*, in 1941, publicized the standard rooms designed by the Department of Hospitals in New York City under Isadore Rosenfield) but what Marshall Shaffer's group did was correlate rooms into full or partial plans, based on usable modules, combining flexibility, openness, and studied function. Many successful and pleasant pavilion-type hospitals, such as that designed by Faulkner & Kingsbury at Bethesda, Maryland (*Pencil Points*, April 1944), were simply intelligent expressions of these standards.

Progress appeared in ways other than functional planning during the war. The critical appraisal of materials mentioned a few pages back should begin to pay dividends more quickly in hospital work than in any other categories. Hospitals have been notoriously expensive per cubic foot to build, partly because of an extravagant use of expensive materials. When a structure such as the Sheepshead Bay Hospital of Alfred Hopkins and Associates could be constructed during the war at a cheap cubic foot cost because it used painted concrete block and glazed wall bearing block as construction and finish, and could also please patients and administrators, progress has been made.

Fit appearance is a problem here, as it is in other institutional structures. Hospital people insist that their buildings must "look inviting," for obvious psychological reasons. Certainly a tour de force such as Skidmore, Owings & Merrill's Little Traverse Hospital (*Forum*, February 1945), brilliant as it is, is not the ultimate answer, any more than was Eggers & Higgins' heavy modernism of the Triboro (*Forum*, February 1941). Many of the one-story emergency units have been pleasantly inviting without the sacrifice of honesty and efficiency. Alden Dow's Midland Hospital (*Pencil Points—Progressive Architecture*, August 1945) achieves this aim by the use of large overhangs, pleasant wall surfaces, and inviting openness, and, on the interior, by a sparkling use of color.

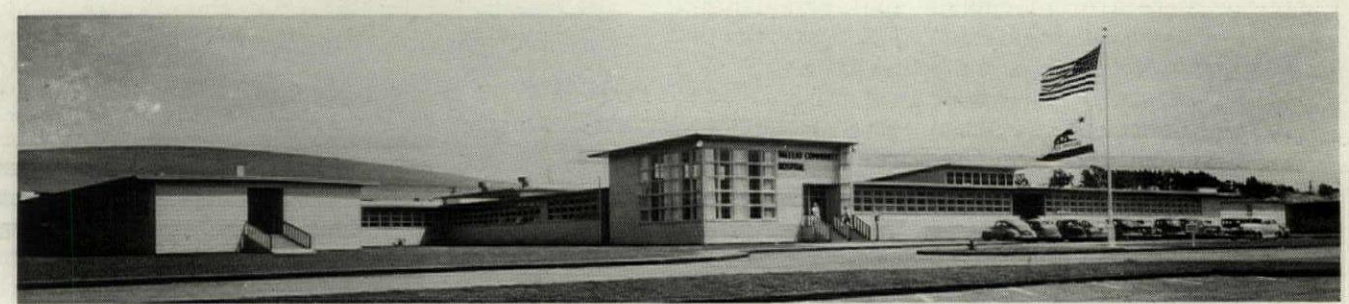
As the architects of the country face a staggering volume of hospital design, with its necessity well certified, they can certainly profit from the progress made during the war years. Sometimes it cannot be pointed to directly, in specific buildings, but it exists undeniably in a more sure understanding of the problems and a closer approach to the proper solution.

Improvements in pure design indicate sure progress away from outworn standards but do not solve the problem of inviting appearance.
Little Traverse Hospital, Petoskey, Mich. Skidmore, Owings & Merrill, Architects. Photo: Hedrich-Blessing. The Architectural Forum, Feb. 1945.



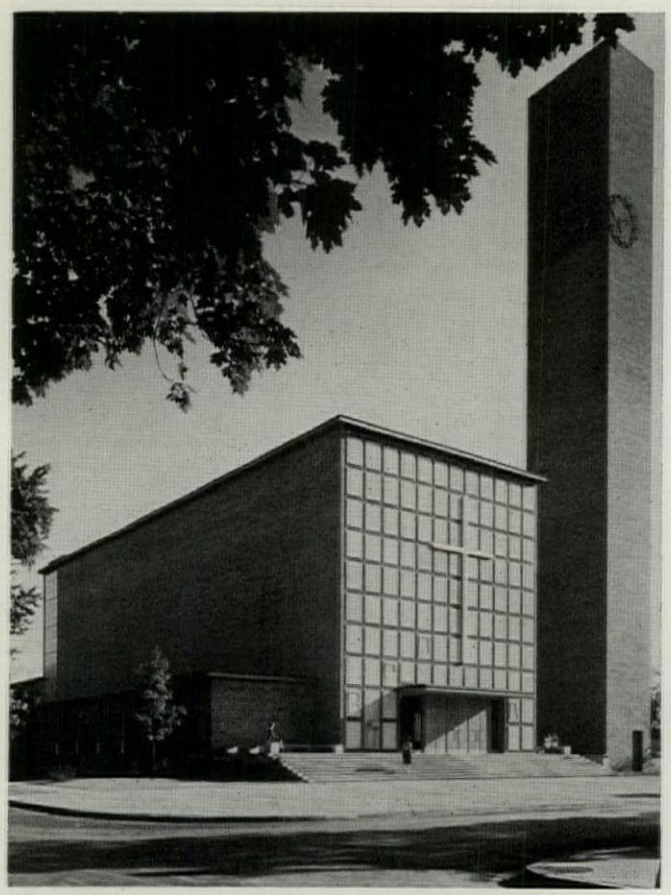
Open planning and wide overhangs cannot be forbidding.
Midland Hospital, Midland, Mich. Alden B. Dow, Architect. Photo: Elmer L. Astleford. Pencil Points-Progressive Architecture, Aug. 1945.

Sprawling wartime pavilion hospitals acquired natural informality.
Suburban Hospital, Bethesda, Md. Faulkner & Kingsbury, Architects; John W. Stenhouse, Associate; in collaboration with Hospital Facilities Section, USPHS. (Marshall Shaffer, Chief Architect); and Emergency Operations Section, PBA, FWA. Photo: Rodney McCay Morgan. Pencil Points, Apr. 1944.



War forced the use of simple materials and simple design, which should help do away with the extravagance common to prewar hospitals.
Vallejo Community Hospital, Vallejo, Calif. Douglas Dacre Stone and Lou B. Mulloy, Architects. Photo: Gabriel Moulin. Architectural Record, Aug. 1944.

SINCE YOU WENT AWAY THERE HAS BEEN **PROGRESS**



Recent designs prove worship doesn't need to have antique housing.
Tabernacle Church of Christ, Columbus, Ind. Eliel & Eero Saarinen, Architects; Pierre & Wright, Associate Architects. Photo: Hedrich-Blessing. The Architectural Forum, Oct. 1942.

There were fresh expressions of a church plan before the war broke.
St. Mark's Church, Burlington, Vt. Freeman, French, Freeman, Architects. Photo: Ezra Stoller. The Architectural Forum, July 1944.

Progress lies in such simply manifested dignity.
St. Thomas More Chapel, Portland, Ore. Designed by Pietro Belluschi of A. E. Doyle & Associate, Architects. Photo: Erven Jourdan. Pencil Points, July 1942.

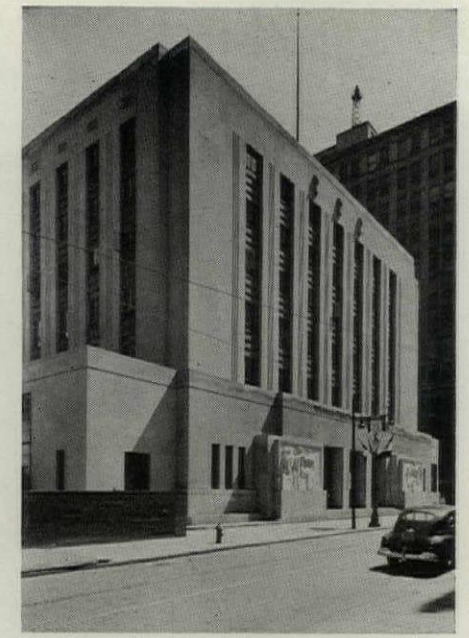
IN THE DESIGN OF CHURCHES

With the exception of chapels in the training camps, there have been few, if any, churches built during the war. Some of those very chapel designs have promised good things to come, but in the main we have to base our estimate of progress on the most recent prewar designs which the magazines have found and published during the war.

Certainly there are not enough good looking, well planned modern examples to justify saying that there is a *trend* toward a contemporary expression. The *Record* found it necessary, in September 1944, to illustrate with European examples an article on modern church architecture by Dean Hudnut.

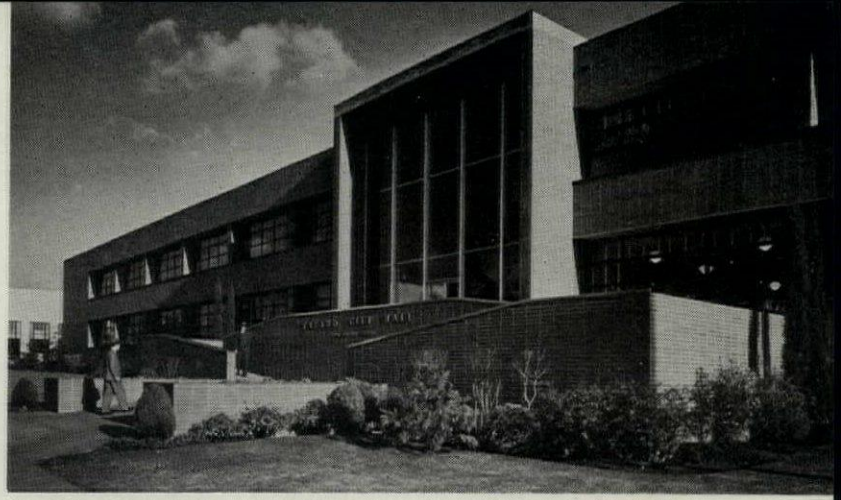
While several of the published churches broke away from traditional shapes, the continuing usefulness of the nave-transept-chancel plan for an unchanging ritual in most denominations seems to make drastic form variations unnecessary. A growing regard for the early liturgical plan with the altar more centrally located influenced some designs, such as Freeman, French, Freeman's St. Mark's. Startling as it seemed when it was published, the Pierre & Wright-Saarinen Tabernacle Church of Christ is simply a stark expression of a normal church plan, well integrated with the other activities. Both Alden Dow's church and Pietro Belluschi's chapel illustrated here are simple projections of ordinary plans—honest, pleasant, religious, without being otherwise unusual.

Although it is not possible to point to enough *wartime* designs, as it is in the case of hospitals and schools, to demonstrate an advance, and although the prewar examples we have been shown are few, apparently isolated, instances, it still seems fair to say that there has been progress. Even the eight or nine good contemporary designs published between Pearl Harbor and V-J Day, in a field which has been as doggedly traditional as this one, are encouraging.



Modern classicism marked public buildings in a period of predominantly sterile good taste.

U. S. Court House and Post Office, Philadelphia, Pa. The Ballinger Company and Harry Sternfeld, Architects. Photo: Samuel H. Gottscho. Pencil Points, Sept. 1941.



Examples of progressive plan and appearance are sadly rare in this field.

City Hall, Fresno, Calif. Franklin & Kump and Associates, Architects. Photo: Roger Sturtevant. The Architectural Forum, June 1944.

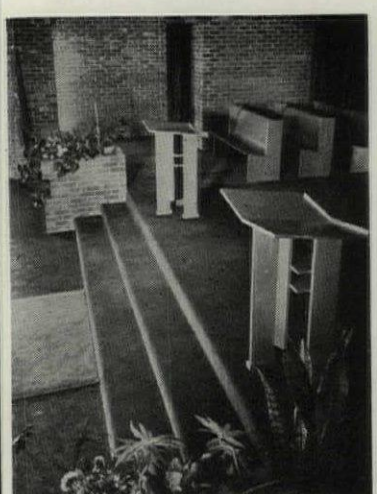
IN THE DESIGN OF PUBLIC BUILDINGS

Another category in which the standard of classical correctness has not been jolted by any violent change is that of public buildings. Obviously the clients for this sort of architecture—public officials—are by the very nature of their position slower to change than individual citizens. They represent, let us say, the mean of public opinion rather than the extreme, and they reflect changes in that mean slowly.

A growing distaste for blatant colonnades crystallized for a time in a sort of modernized Classic, of which Paul Cret's Folger Library is the prototype. Occasional instances of individual architectural inspiration rising above the average of this formalism have shown up, but in general the problem of monumentality seems to frighten the designers of "important" public buildings into creative banality. For instance, the Pentagon is notable only as a large building.

A few instances of good fresh design have appeared during the war, of which Franklin & Kump's Fresno City Hall is easily the outstanding example. With its wide open lobby and ramped corridors it flaunts and justifies a simple expression. Perhaps a more deep-rooted growth can be detected in the many community buildings which, with the schools, enlivened war housing projects which were otherwise stodgy. A possible extension of this sort of structure can be seen in the Evansville, Indiana, projected municipal airport and community center that *Pencil Points—Progressive Architecture* published in July 1945. Here the Albert Kahn organization proposes a lively design for public buildings of a new kind. Given enough of this sort of thing, the formalism of the typical city hall is going to be oppressive rather than impressive.

There are evidences of progress in this field, but we certainly have not yet arrived at a point which justifies any cheering.



Progress lies also in sincere propriety.

Reorganized Church of Jesus Christ of Latter Day Saints, Midland, Mich. Alden B. Dow, Architect. Photo: Elmer L. Astleford. Pencil Points-Progressive Architecture, Dec. 1944.

SINCE YOU WENT AWAY THERE HAS BEEN **PROGRESS**

IN THE DESIGN OF COMMERCIAL BUILDINGS

Despite the small volume of commercial work that could be designed during the war, several clues give us a hint of progress. In the hitherto unpublished prewar jobs, in the shop alterations, and in competition designs, there appears a fresh desire to study and solve the architectural problems involved.

Large stores and office buildings, we know now, don't need to strive self-consciously either to hide or to express their basic structures. The removal of lingering classical design concepts and the freedom gained through new techniques make the prewar conflict between "horizontal expression" and "vertical expression" somewhat academic at the present time. By presenting (March 1945) the completed Sill Building of Franklin & Kump and (October 1945) the proposed Schenley office building of Woodie Garber, *Pencil Points—Progressive Architecture* amply document this fact.

Through the early part of the war, when other material was scarce, the magazines found much small commercial work to illustrate. Better than typical was Ketchum and Gina's Artek-Pascoe Shop interior (*Forum*, August 1942), but there were others which demonstrated the same desire to find a well planned architectural solution to merchandising problems without sacrificing the freedom in use of form and material and the emphasis on advertising which this work demands.

As many communities attempt to clean up Main Street, there will be a continuing effort to design in a manner which is not cute, nor garish, nor yet purely tricky, but a contemporary architectural interpretation of merchandising and commerce.

Real progress in architectural translation of commercial needs first became evident in store design.

Artek-Pascoe Shop, New York City. Morris Ketchum & Francis X. Gina, Architects. Photo: Ezra Stoller. The Architectural Forum, Aug. 1942.

Prewar groping eliminated pomposity.

Mercantile National Bank Building, Dallas, Tex. Walter W. Ahlschlager, Architect. Photo: William Langley. Architectural Record, July 1944.

Fusion of plan, materials, structure, means progress.

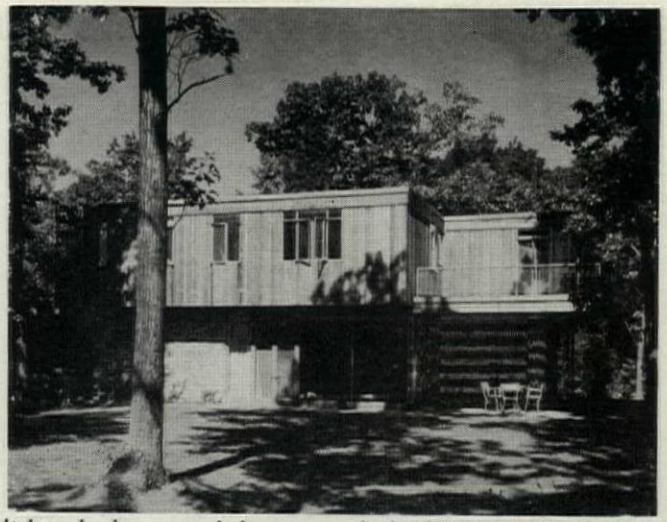
United Carbon Building, Charleston, W. Va. Martens and Son, Architects. Photo: Jean St. Thomas. Pencil Points, Oct. 1944.

New methods outmode old contentions.

Sill Building, Bakersfield, Calif. Franklin & Kump and Associates, Architects. Photo: Roger Sturtevant. Pencil Points-Progressive Architecture, Mar. 1945.

There has been proof that the dignity of home ownership need not suffer through modern honesty.

House, Winchester, Mass. Carol Fulkerson, Architect. Photo: R. W. St. Clair. Pencil Points, May 1944.



It has also been proved that our standards of design need not suffer.

House, Cos Cob, Conn. Pomerance & Breines, Architects. Photo: Ezra Stoller. The Architectural Forum, Aug. 1943.

IN THE DESIGN OF HOUSES

Progress in residential design was handicapped, for a long time, by the almost exclusive attention paid to the plan. It was so exciting to discover that the tiresomely standard room arrangement could be varied and improved for modern family needs that that seemed an end in itself. You could either mask the new plan with a traditional envelope or you could project it starkly, using a few new tricks, and thumb your nose at the neighbors.

New construction techniques demanding a design integration, the spread of the contemporary expression from the few places where it had first found favor, and the growing realization that modern planning only stated a problem in design and did not necessarily bring its ready-made solution, have unblocked the way to progress. Increasingly the magazines have found houses to publish which are honest and useful in plan, which use materials capably and ingeniously, and which have a character and an appeal not based on tradition, denial, or cuteness.

There has been ample demonstration in work published during the war that the sloughing off of traditionally associated styles need not mean the loss of any of the ingredients of good house design—non-objective composition in three dimensions, the dignity man's proudest possession calls for, the friendly pleasantness that family life in a community of kindred souls demands.

During a time of cooling our heels in residential work there was opportunity for the magazines to choose and for their readers to evaluate. Judged by rigid standards, enough work has been shown from various parts of the country to indicate progress and to justify optimism about the coming period.

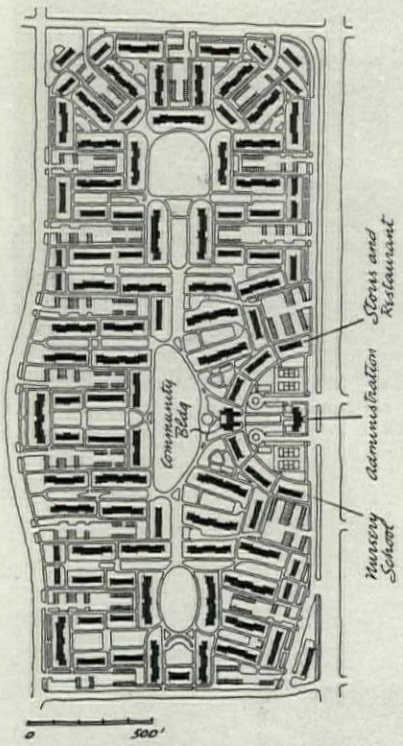
Prewar California work demonstrated that open planning tended to be romantic and friendly.

Nesbitt House, Calif. Richard J. Neutra, Architect. Photo: Julius Shulman. The Architectural Forum, Mar. 1943.

Published work marked progress towards a natural expression.

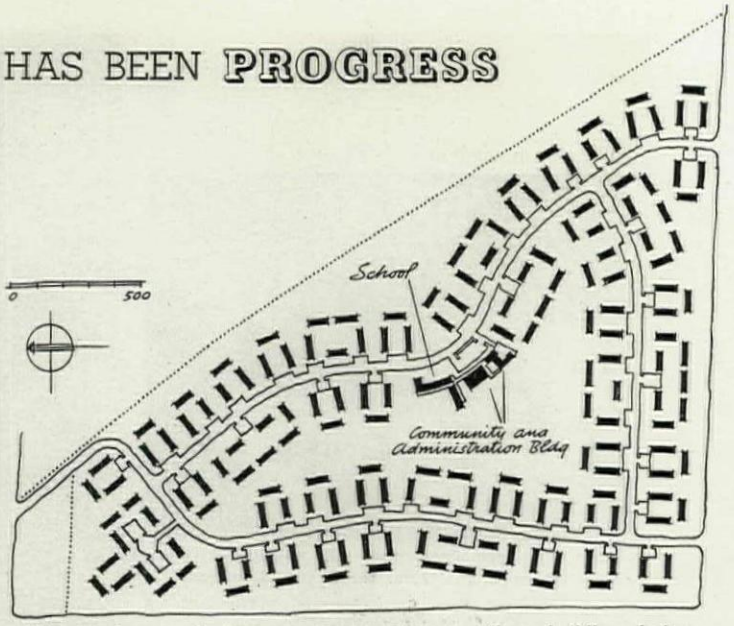
House, Woodside, Calif. Anshen & Allen, Architects. Photo: Dean Stone. Pencil Points, Oct. 1943.

SINCE YOU WENT AWAY THERE HAS BEEN **PROGRESS**



Social concern appears in control of things like traffic, density, recreation.

Baldwin Hills Village, Los Angeles, Calif. Reginald D. Johnson, and Wilson Merrill & Alexander, Associated Architects; Clarence S. Stein, Consulting Architect. Pencil Points, Sept. 1944.



War housing required group arrangement as well as building design.

Victory Park Housing, Compton, Calif. Adrian Wilson and Theodore Criley, Jr., Architects. Photo: Maynard L. Parker. Architectural Record, Jan. 1945.

An Iowa railroad station—progress has spread to include many types of buildings.

C. B. & Q. Station, Burlington, Iowa. Holabird & Root, Architects. Photo: Hedrich-Blessing. Architectural Record, Oct. 1944.

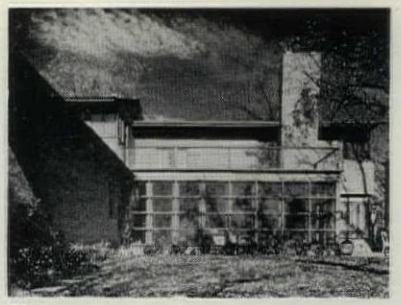
IN THE PROFESSION

Criticism of the profession of architecture, and of its individual professionals, was widespread before the war. The criticism on the part of the lay public had tangible expression in a bland ignoring of architectural services for a large part of the work built. Architects were considered fuddy-duddy artists (or long-haired theorists) and it was really no great surprise when the armed services began passing up architectural talent in their search for executive personnel in the early days of the war. Self-criticism began to change from complaints about being misunderstood to a realization that the profession had actually fallen down badly, in recent years, in two important respects—its responsibility, as a body of planners, in social planning, and its lack of progress, in a progressive age, in its job of designing buildings.

It seems strange that building for war, the most anti-social of purposes, should have helped the profession recover an interest in the broader social aspects of planning, but it did. In planning for war purposes no one building could be thought of as an isolated unit; it always had a relation to the broad strategy. In war housing, communities were planned as wholes, not as individual houses. Hospitals and schools built during the war had to justify themselves as necessary, and therefore had to be planned after surveys of community needs.

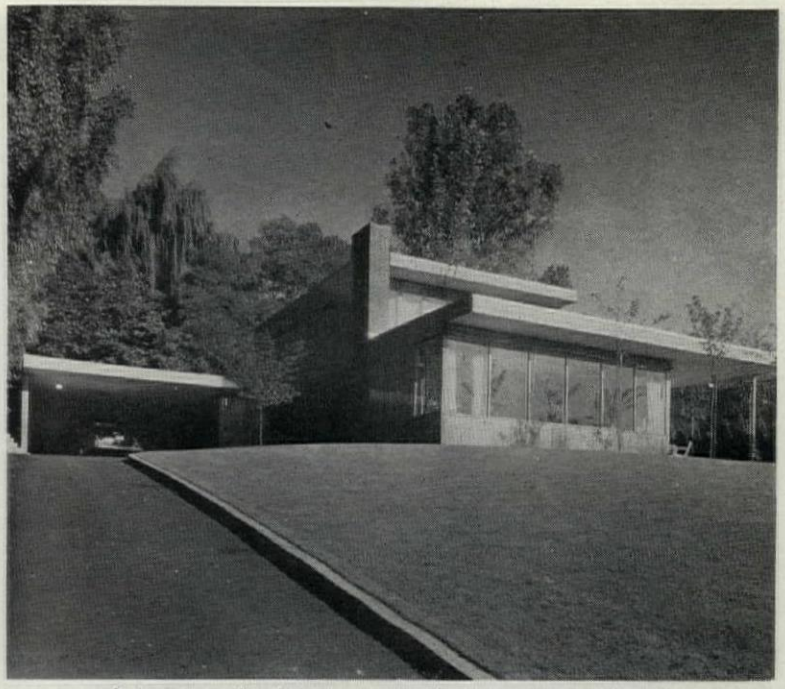
The *Forum* presented Planned Neighborhoods for 194X in October 1943 and April 1944. *Pencil Points* did a job on planned versus unplanned housing in June 1944. The *Record* emphasized coordinated regional planning in its August 1945 number. These isolated examples reflect an increased interest within the profession in planning not only for individual clients, but for society.

Any cause which can justify itself socially has its missionaries, and progressive architecture has been no exception. The signs of success in propagation are the accession of new adherents and, finally, general acceptance. In the movement for the better design of better buildings there is cause for rejoicing in the fact that new names, from various parts of the country, appear monthly in the magazines as authors of good contemporary designs. The names themselves are not always new; the fact that they are attached to non-traditional architecture often is.



The search for indigenous architecture is no longer limited to a few men. . . . . .

House, Dallas, Tex. Howard R. Meyer, Architect. Photo: Jean St. Thomas. Pencil Points-Progressive Architecture, Feb. 1945.



. . . . . It is noteworthy that progress in the profession appears in every state.

Residence, Portland, Ore. Van Evera Bailey, Architect. Photo: P. A. Dearborn. Architectural Record, Nov. 1944.

. attempts to break from tradition were lized; now progress may appear anywhere.

kson School, Wayne Co., Mich. O'Dell, Hewlett & kenbach, Architects. Photo: Elmer L. Astleford. Architural Record, July 1945.

Progressive architects are finding local appropriateness without resorting to the imitation of past local styles.

House, Bowmanstown, Pa. Paul Beidler, Architect. Photo: P. A. Dearborn. The Architectural Forum, June 1945.

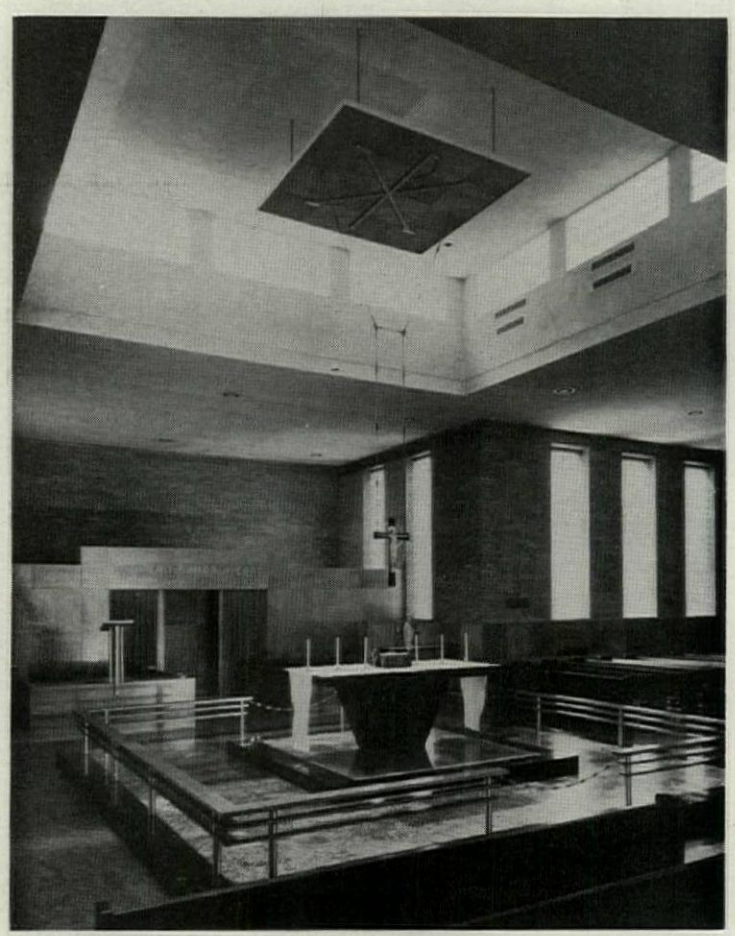
A few years ago it seemed to many of the missionaries that a new organization, outside the A.I.A., would have to be formed if the architects as a profession were going to take a stand for untrammeled planning and fit expression. While that body is not yet ready to bar from membership an architect who insists on living in the past, its recent pamphlet *Architecture, A Profession and A Career* allows William Lescaze to explain "Our Own Architecture" and William Wilson Wurster to define "The Twentieth Century Architect." Not all architects and designers of buildings are members of the A.I.A., but it is sufficiently representative so that any move in a progressive direction on its part indicates a definite trend in the practice of architecture.

An objective appraisal of progress within the profession could not fail to give credit to two of the magazines; the *Forum* for its early scouting and touting in the interest of contemporary design, and *Progressive Architecture—Pencil Points* for its current critical analysis and measurement against standards of the work it finds worth publishing. In these cases the magazines have led, rather than reflected, the profession, and credit is due.

Southern Colonial becomes pleasant history as the influence of professional leadership grows.

House, Charleston, W. Va. Martens and Son, Architects. Photo: Jean St. Thomas. Pencil Points-Progressive Architecture, Feb. 1945.

SINCE YOU WENT AWAY THERE HAS BEEN **PROGRESS**



Traditionally conservative Vermonters are proud of a frank modern church.
St. Mark's Church, Burlington, Vt. Freeman, French, Freeman, Architects. Photo: Ezra Stoller. The Architectural Forum, July 1944.

In the same realistic state the economy and usability of a simple school appears natural.
Bellows Free Academy, Fairfax, Vt. Freeman, French, Freeman, Architects. Photo: Ezra Stoller. Pencil Points-Progressive Architecture, Apr. 1945.

IN PUBLIC ACCEPTANCE OF PROGRESSIVE ARCHITECTURE

Undeniably the development of a fit native architectural expression was hampered before the war by public disinterest. Popular concern, and at least some popular understanding, are necessary to prevent architecture from becoming introspective, in the sense that the work of LeCorbusier and, to a lesser extent, that of Frank Lloyd Wright has become.

There is no lack of interest at the present time. With millions of citizens thinking about building, and with lots of time to think, general curiosity about the advantages of modern design has grown during the war. The popular lay magazines which have a home department have reflected this interest, and in a "House Omnibus" number (April 1945) the *Forum* reviewed the trend.

Better Homes and Gardens believes it must "act as a leavening influence . . . must choose a bit of both the best extreme and the finest traditional designs."

McCall's took a vote, found its readers preferred Royal Barry Wills Cape Cod to John Funk modern.

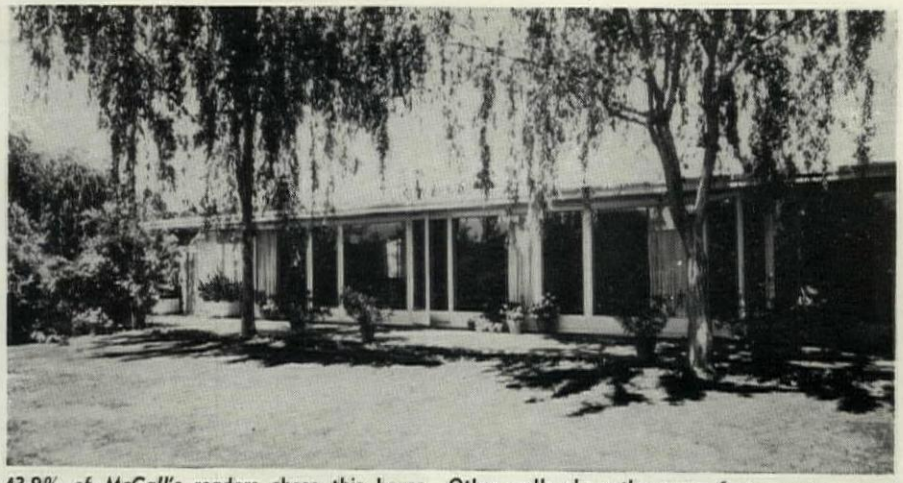
Ladies' Home Journal has "put the prewar house out to pasture."

House Beautiful finds its readers want "the function of modern architecture without the look of modern."

Parents' Magazine is interested in details of planning (for efficiency, comfort, fitness) and prefers not to debate "style."

Woman's Home Companion presents both contemporary and traditional houses.

Country Gentleman finds its readers interested in fitness and function rather than style.



43.9% of *McCall's* readers chose this house. Other polls show the same fast growing trend.
House, Modesto, Calif. John Funk, Architect. Photo: Roger Sturtevant. The Architectural Forum, Apr. 1945.

Patients and staff praise this contemporary small hospital design.
Midland Hospital, Midland, Mich. Alden B. Dow, Architect. Photo: Elmer L. Astleford. Pencil Points-Progressive Architecture, Aug. 1945.

56.1% in *McCall's* poll—no longer a landslide—preferred a well designed "Cape Cod" type house.
House. Royal Barry Wills, Architect. Photo: George H. Davis. The Architectural Forum, Apr. 1945.

There are two ways to read the present attitude of the popular magazines toward progressive architecture (assuming that those magazines are sufficiently sensitive to reader response to reflect the public attitude in the groups they reach, which seems to be the case). The discouraging way is to conclude that people still like Cape Cod cottages, and that's that. The other way is to cheer at the astonishing fact that 43.9% of *McCall's* readers would rather have an extreme, open, flat-roofed modern house than any other kind, and that many of the wide circulation magazines are presenting to interested readers, month after month, designs by Koch, De Mars, Stubbins, Dailey, Hornbostel.

There are interest, curiosity, and willing-to-be-convinced skepticism, which are all to the good. In September 1945 *Progressive Architecture—Pencil Points* analyzed popular response to the very solar group of house designs that the Museum of Modern Art displayed after they had been published in the *Ladies' Home Journal.* Thousands of letters had gone to the *Journal,* and over 1,500 people daily attended the show. Responses indicated avid interest ("was ecstatic," "carried away," "hurrahs," "handsprings") tempered with many technical doubts, some embarrassing and some easily answered, and, unfortunately, false hopes about costs.

Contemporary designs in commercial work no longer shock the public; the new design methods in institutional work are gaining wide acceptance. In homes, where the lag has been, the customers are undoubtedly interested. It would seem like a much more fertile field for the growth of progressive design than it was before the war.

SINCE YOU WENT AWAY THERE HAS BEEN

Change and progress during the war point away from prosy eclecticism.

Rosemont College Chapel, Rosemont, Pa. Henry D. Dagit & Sons, Architects. Photo: William Rittase. Architectural Record, Mar. 1943.

Preparation to abandon the rigid space alignments required by symmetry and faithful stylism appears in the war-year magazines.

Benjamin Franklin High School, New York City. Eric Kebbon, Architect. Photo: Courtesy N. Y. Board of Education. Architectural Record, Feb. 1943.

FOR FURTHER PROGRESS

There is a current quickening of what seemed a few years ago to be an architectural corpse; it is indicated by the activity in the offices, the growth of the A.I.A., the realism in the schools, the reformation of the magazines. These things are exciting not only because they indicate change, not only because that change has been demonstrably progressive, but most of all because there seems to be a real desire—almost a program—for continued progress. Although no one (almost no one) claims to have arrived at a satisfactory end, and very few seem to have arrived at the same point, there is a growing agreement as to where we are going, and why.

American architecture is prepared to abandon eclecticism.

Although there will be many buildings constructed in the next few decades that will try to express twentieth century needs by esthetic and structural forms derived from past ages, the designers as a group, and as divergent, capable, sometimes brilliant individuals, are continuing to move away from that sort of solution. The progress we have seen is a growing thing. The excitement that comes with freedom from old restraints is contagious.

There are, of course, reactionaries who are sincerely convinced that anything progressive is wrong, and there are honest architects whose training in formalism is so deep rooted that they cannot change. But there is an increasing tendency to apologize for eclectic designs ("In New England, you know, acceptance comes slower") and there are an increasing number of practitioners who would no more sell an anachronistic architectural design than they would put their names to an unsafe structural design.

FOR MORE THAN INTELLECTUAL REVOLT

In publishing the designs which the Museum of Modern Art selected in 1944 as the best of structures "built in the U. S. A., 1932-1942," the *Architectural Forum* editors commented on an obvious characteristic of much prewar modern design—"a habit of looking at architecture the way one looks at a painting . . . an approach which considers the building as a kind of abstraction which is supposed to conform in its appearance with certain preconceived ideas of form . . . frequently self-conscious in its striving for modernity." This rigid adherence to new, but fixed, esthetic standards, had been an admitted fault before the war. It threatened to freeze into a "style" the freedom from eclecticism, long before there had been sufficient experiment with the expression of modern needs in modern materials with modern techniques. War construction helped eliminate the self-consciousness (the design problems were real, and

PREPARATION

The work done by leaders in modernism was indispensable but it must not prevent making further progress.
House, San Francisco, Calif. Gardner Dailey, Architect. Photo: Roger Sturtevant. The Architectural Forum, Mar. 1945.

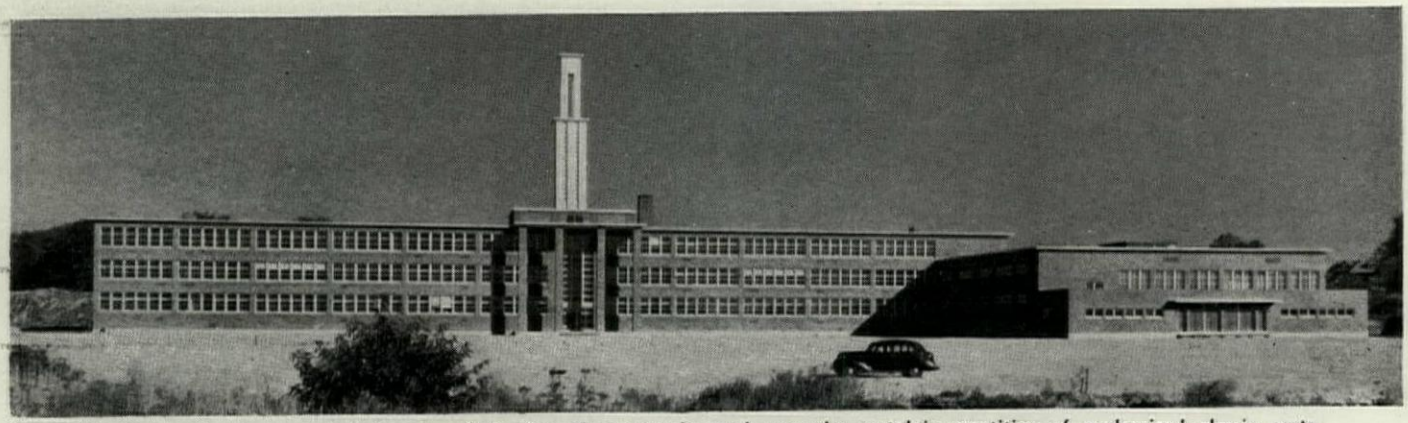
Sincerely progressive architects will have to guard against using modern stylistic trickery.
High Point School, Seattle, Wash. Stuart, Kirk & Durham, Architects. Photo: P. A. Dearborn. Pencil Points-Progressive Architecture, Apr. 1945.

The new freedom brings the real danger of self-conscious striving.
Parker Homes (FWA), Sacramento, Calif. W. W. Wurster, Architect; Charles F. Dean, Associate. Photo: Roger Sturtevant. Architectural Record, Jan. 1944.

pressing, and demanded a straightforward solution) and the magazines have had time to find work which is progressive without being smug.

There is willingness now to admit that a house can have a sloping roof, if there is reason for it, without marking itself as old-fashioned. There is realization now that the reasons for contemporary architecture, and the hopes for its acceptance, lie in sincere, understandable solutions, not sophisticated theories. The groundwork of the brave and clever designers who led the modern movement was indispensable; progress beyond their work is under way and continuing. It is smart—and easy—to condemn the present spirit of growth by pointing to flaws in its beginnings. Fortunately there are many indications that progressive architecture will outlive both the beginnings and the condemnation.

SINCE YOU WENT AWAY THERE HAS BEEN **PREPARATION**



Preparation for greater progress includes the elimination of compromise and even the nostalgic repetition of modernized classic parts.
Gloucester High School, Gloucester, Mass. Coolidge, Shepley, Bulfinch & Abbott, Architects. Photo: Haskell. The Architectural Forum, Mar. 1942.

FOR MORE THAN EVOLUTION

Whenever architects, bankers, or intrenched politicians want to prevent progress, they find their most successful slogan "evolution, not revolution." It is catchy and reassuring, and can't be called reactionary. It is based on the undeniable fact that the progress from monkey to man was marked by a period when the beasts looked partly like monkeys and partly like men.

In architecture, it justifies either modernizing a Cape Cod house by simplifying the detail, increasing the size of the windows, and improving the plan, or toning down a functional design by recalling some nostalgic element such as a colonnaded porch or a spire or a tower.

The fault in this thinking is that any such compromise hopelessly handicaps free planning and full technological advance, and, as many extant specimens prove, produces a hybrid rather than the missing link. The urgencies of architectural design during the war did not justify any such fusion of old and new. A training camp could not bother to recall an English manor house any more than a B-29 was concerned with its evolution from the horse and buggy. In current practice there is not much validity in the argument that a school designed to make use of television should evolve from a Roman temple.

An increasing number of architects and their clients realize today that an evolutionary development which considers the origin of the species to be the eclectic period we have just passed through is meaningless. In this period of growth we are prepared to look for ancestors more inspiring than that.

Vaguely classical feeling in the design of houses records hesitation.
House, Dobbs Ferry, N. Y. Julius Gregory, Architect. Photo: Maynard L. Parker. The Architectural Forum, Aug. 1945.

Compromise with traditionally correct styles can stifle rather than help to develop further progress.
Employers Mutual Insurance Co., Wausau, Wis. Childs & Smith, Architects. Photo: Hedrich-Blessing. Pencil Points, Jan. 1942.

There are many architects who find the means for continuing growth in using a true native medium.

House, Petaluma, Calif. Mario Corbett, Architect. Photo: Philip Fein. The Architectural Forum, May 1945.

As modern living changes without losing any graciousness, so will its housing inevitably progress.

House, Claremont, Calif. Millard Sheets, Designer; Benjamin H. Anderson, Associate. Photo: Roger Sturtevant. Pencil Points-Progressive Architecture, Feb. 1945.

The preparation through the war has been toward an architecture growing stronger in purpose, design, skill.

Baldwin Hills Village, Los Angeles, Calif. Reginald D. Johnson, and Wilson, Merrill & Alexander, Associated Architects; Clarence S. Stein, Consulting Architect. Photo: Margaret Lowe. Pencil Points, Sept. 1944.

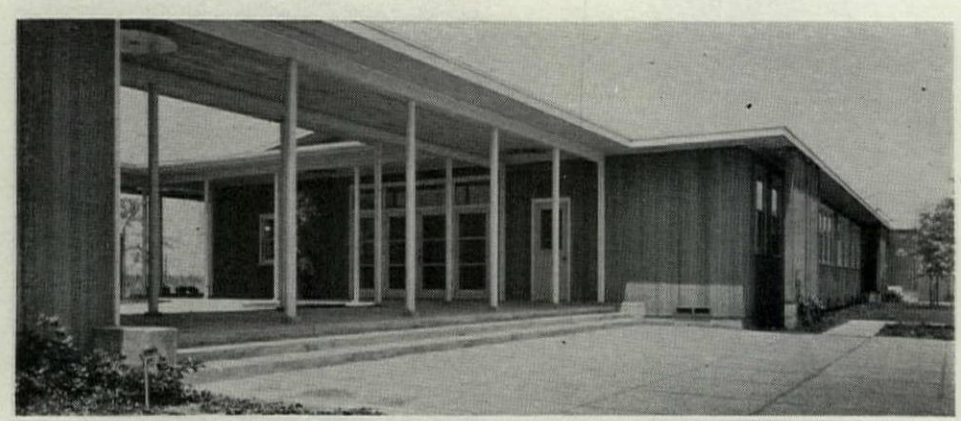
FOR GROWTH IN HONESTY AND CHARACTER

If eclecticism is outgrown, if the starkness of the International School has served its purpose, if compromise is in bad repute, and yet architecture in the United States is prepared to go on in further growth, there is indeed an interesting period ahead. There will be certain new standards of good design established, and there will be a firmer, more consistent, more mature expression of those standards which we already accept as criteria.

The architecture which has been published during the war indicates that the growth will be in the directions of greater honesty and developed character. We have a tradition in architecture in the United States, and it is not the architectural hash that filled most issues of most magazines in the '20s and into the '30s. Our tradition of honest building design lies in the early American structures that were among the most sincere architecture of the seventeenth century anywhere, in the Indiana log cabins and the California mud houses, in brick and stone buildings erected to fill honest needs where brick could be made and stone could be quarried.

The discouraging thing about architecture in the early part of the century was that most architects thought that the way to honor tradition was to copy results. The designs for war gave us final proof that that was absurd. The encouraging thing today is that many architects realize that our real tradition is honesty, character, planning for current needs, designing with available materials, utilizing developed techniques. With those aims, with the ground prepared, we should see a great period of growth.

SINCE YOU WENT AWAY THERE HAS BEEN **PREPARATION**



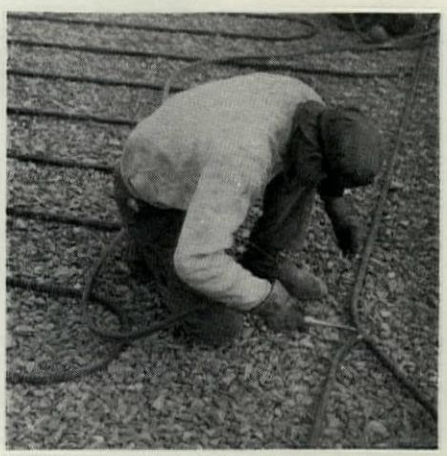
The profession grows in social understanding as new social purposes for building become evident.
Cabrillo Homes Community Building, Long Beach, Calif. Walter L. Reichardt, Architect. Photo: Julius Shulman. Pencil Points, Feb. 1944.

FOR GROWTH IN KNOWLEDGE

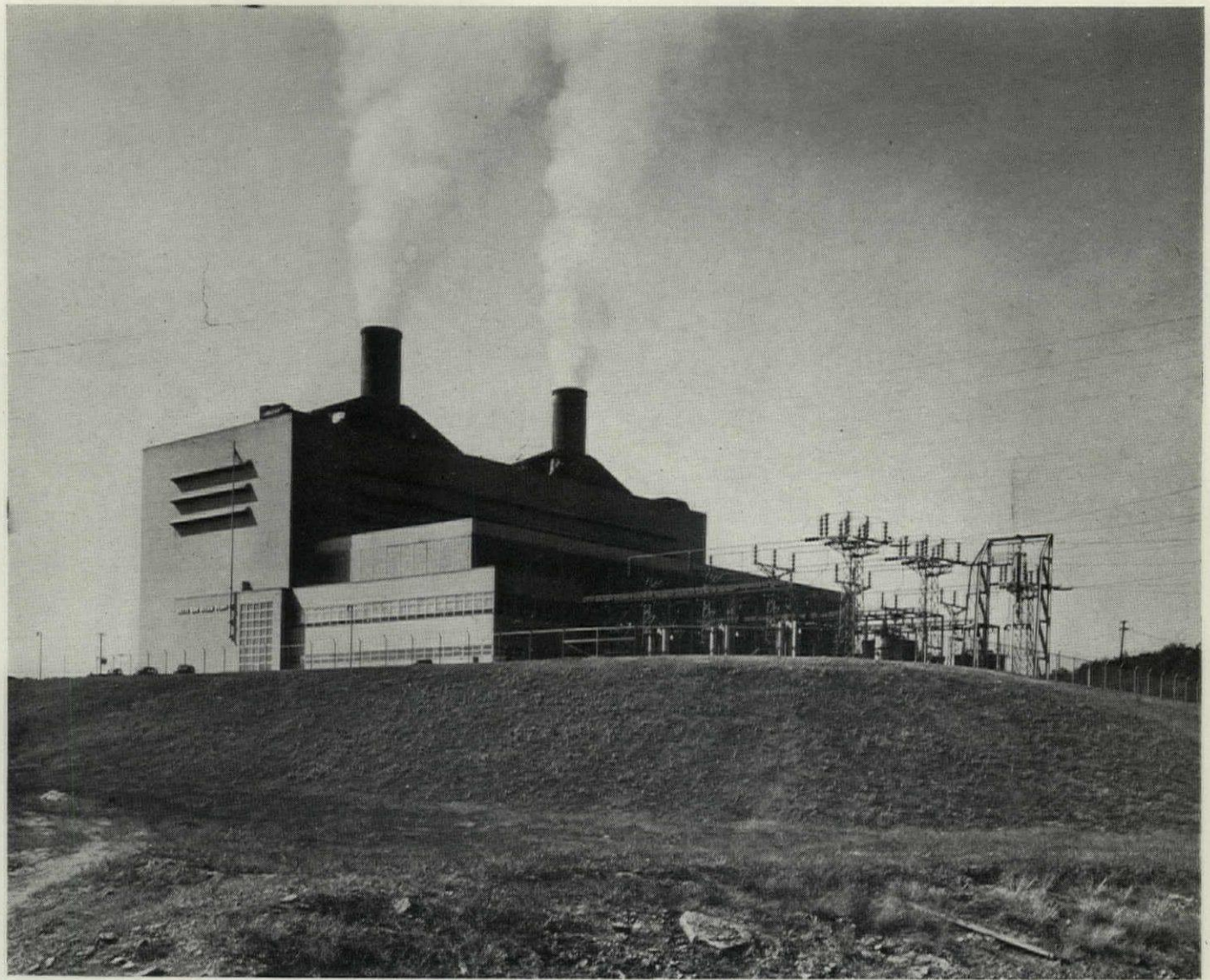
One reason architecture failed to progress through many decades in this country was the fact that the profession felt sure it had all the answers. When the steel framed, masonry walled skyscraper was developed, when the stud framed house veneered with wood or masonry had been built many times, there seemed no further progress either necessary or desirable. There were standard details, which merely had to be learned.

With the depression came questioning, but it expressed itself in complaint rather than investigation. Not until the period just before the war was there any real interest within the practicing body of architects about new methods and new uses of materials. It was an accepted fact for many generations that "designers" knew how to use Conté crayons but hadn't the slightest idea how to manipulate concrete.

The war spurred investigation and education within the architects' offices tremendously. The war-year magazines reflected this, and the recent issues indicate a desire to go on and increase the still meager technical information available to designers, specification writers, draftsmen—and their bosses. Most encouraging and most promising is the desire to make this information productive rather than purely informative. Launching its Materials and Methods section, *Pencil Points—Progressive Architecture* (July 1945) professed a desire that it should be "a clearing house of unbiased technical information, wherein the search will always be for better ways to build." Superficial knowledge is no longer enough; the way is prepared for a fully educated, constantly enquiring profession.



Fuller appreciation of materials and the ways to use them promises to bring further growth.
Welding wrought iron radiant-heating floor coil. Philip F. Hallock, Architect; R. V. Hall, Associate. Photo: Courtesy A. M. Byers Co. Pencil Points, Dec. 1943.



Through projects such as this people have been partly educated in the value of thoroughgoing collaboration by architect, engineer, builder, client. *Watts Bar Project, TVA. Photo: TVA. Architectural Forum, Sept. 1944.*

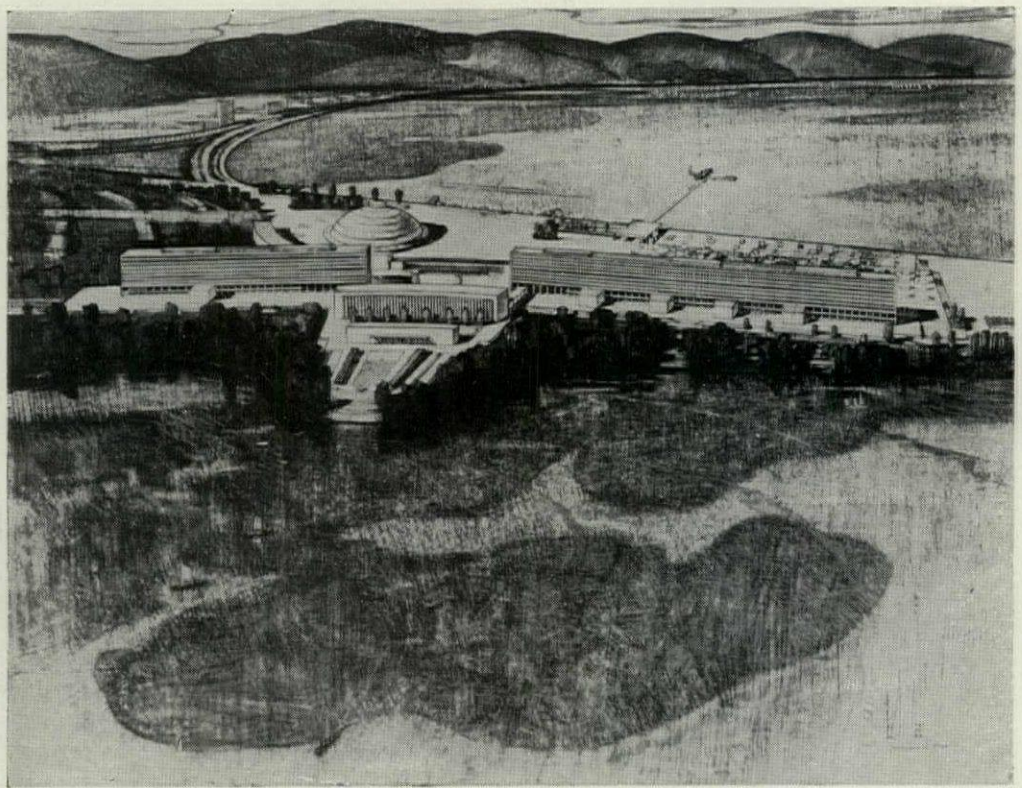
FOR GROWTH IN LEADERSHIP

While an architect's purpose is certainly not to impose his will, but rather to interpret the needs and the wishes of his client, that fact does not deny the responsibility for leadership, guidance, and counsel. Too often in the past the advice has included an admonition to leave all technical matters in the architect's hands. "School boards should not concern themselves with methods of construction," a prominent school architect wrote as late as 1942. That attitude is in process of changing. Progressive architects are anxious that their customers should know about materials and methods and the criteria of design—it is the only intelligent way to sell a good piece of contemporary architecture. Progressive clients are anxious that their architects should tell them the facts of life, and more and more school and hospital boards and potential home owners want to know about materials and methods rather than style.

It is an interesting sidelight on architectural progress that the profession is becoming articulate. A well stocked public library now carries on its shelves perhaps two books on architecture published before the war (Ruskin and Hamlin) and seven published within the last twelve months. Those seven are not about theory; they deal with concrete facts and specific examples of modern planning and building, and they have been borrowed many times.

It is an aspect of the progress we have made and the determination to continue growing that the public *must* now know what architecture is really about. There has been preparation to lead and instruct, not merely impress, the clients who ask for just that.

SINCE YOU WENT AWAY THERE HAS BEEN **PREPARATION**



Architects no longer wait to be invited to assist in the physical planning for achieving a united world.
Proposed United Nations Center, San Francisco Bay. W. W. Wurster, T. C. Bernardi, E. Born, Architects. Pencil Points-Progressive Architecture, July 1945.

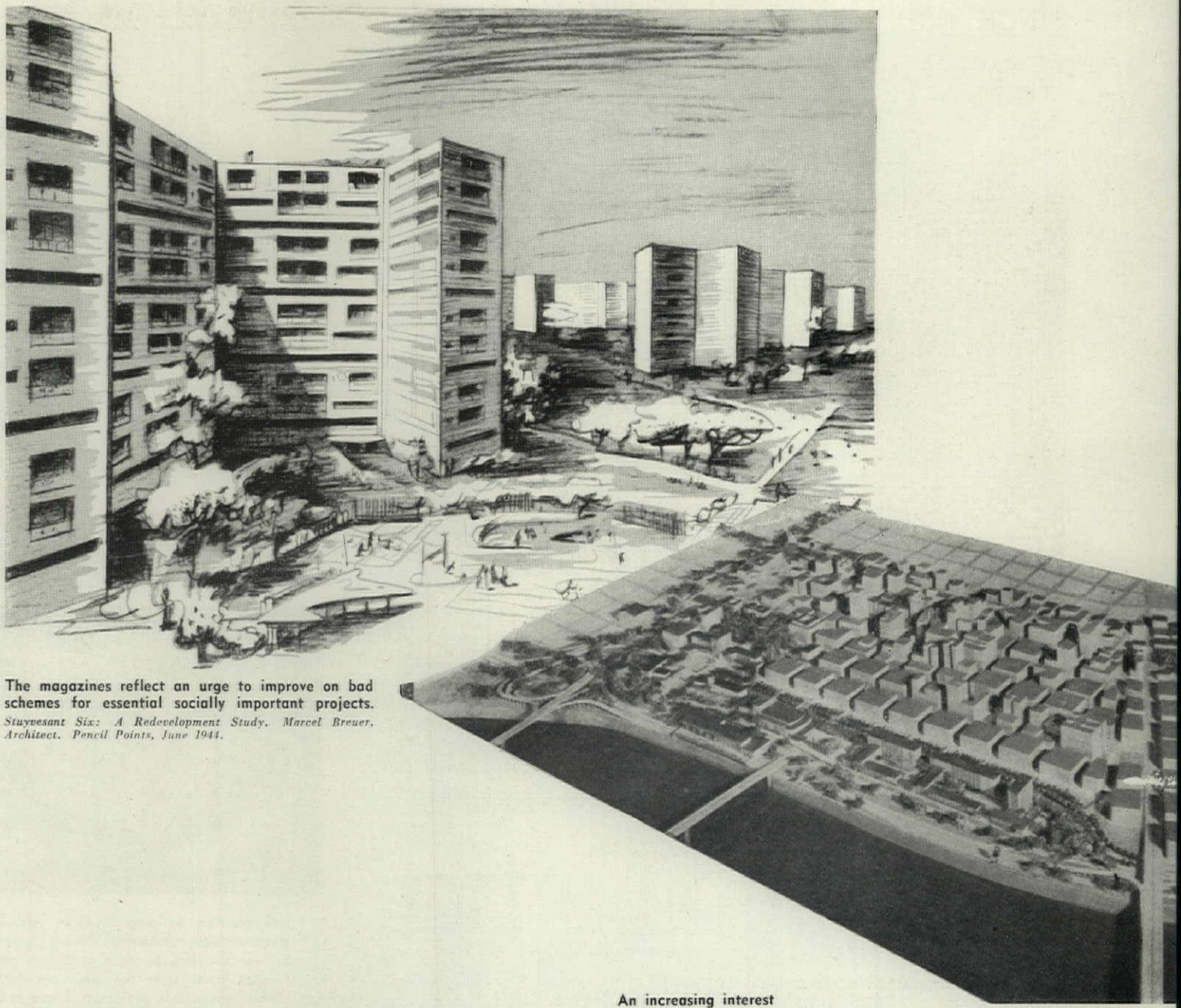
FOR LEADERSHIP IN DEMOCRATIC PLANNING

While there are still architects who consider support of measures for well planned living a matter of political persuasion or economic situation, the war period seems to have been a time of preparation for greater leadership in planning not only buildings, but units in an integrated whole, and for a desire, at least, to assist in the planning of that whole.

Perhaps the feeling of uselessness when the war began did it. We have seen that war design required in many cases a broad attitude of relationship; perhaps that helped. Perhaps two atomic bombs made unplanned living seem extremely dangerous. The fact that architects are consulted for reconstruction of a store front and ignored in the reconstruction of society rankles. Whatever the cause, there is apparent a desire for leadership and responsibility in over-all planning. It appears in the magazines, in conversations among architects, in meetings of the professional societies.

The desire is there; an increased experience and a greater knowledge of the factors are evident. Will the coming period be one of architectural growth in the sense of leadership in social planning? It can be. It can be if the architects join with the engineers and the scientists to protest the fact that no technical professionals advised the United States delegation to the United Nations conference. It can be if the profession works with the U. S. Public Health Service and the American Hospital Association in the development of integrated health service based on factual surveys, instead of quibbling about whether prequalification lists are dangerous. It can be if the profession as a whole, instead of a few individuals, takes an active part in *planning* for, not merely approving or disapproving after the fact, solutions to the problem of housing.

Before architects are taken seriously as social planners they will have to present themselves with slightly cleaner faces than they have had in the past. They must broaden the definition of architect to in-



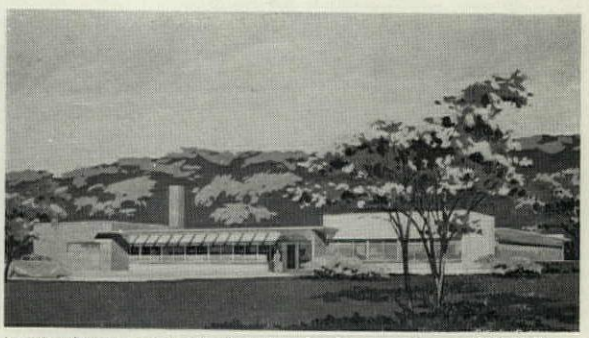
The magazines reflect an urge to improve on bad schemes for essential socially important projects.
Stuyvesant Six: A Redevelopment Study. Marcel Breuer, Architect. Pencil Points, June 1944.

An increasing interest in broad planning for good living shows a new desire to lead.
Proposed Civic Development, Portland, Ore. Photo: Courtesy Portland City Planning Commission. Pencil Points-Progressive Architecture, Dec. 1944.

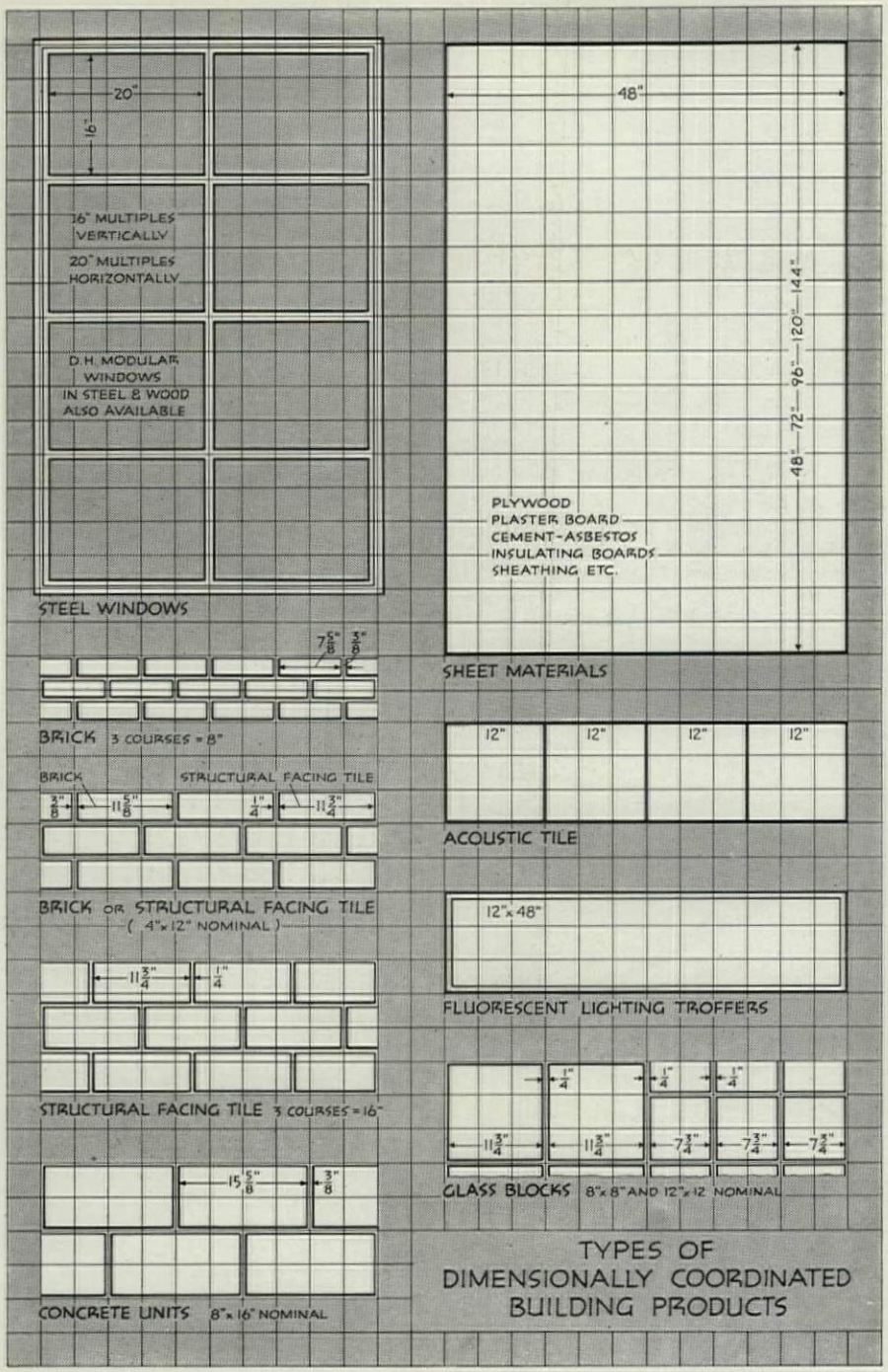
clude planners produced by changing conditions. They must find an answer to the architect-builder problem which does not ignore the question. They must arrange better the relationship of the private practitioner and the government-hired designer. They must discover a more satisfactory relationship with employees, with beginners, and with engineers than the present crude supply and demand arrangement.

If these things are done—if, with a house in order, the architectural profession translates desire to serve into a demonstration of serviceability—then architects may begin to replace politicians and handshakers in the councils of those neighborhoods, cities, states, and other government units where planning and designing of the most important sort are done.

We have seen a change take place. We have seen progress made. We have seen preparations accomplished for further growth in architecture. The limit of that growth is up to the architects themselves.



Leadership in over-all planning leads soon to good buildings.
Rural Health Center, Hospital Facilities Section, USPHS (Marshall Shaffer, Chief Architect). Stanley Reese, Delineator. Architectural Record, Aug. 1945.

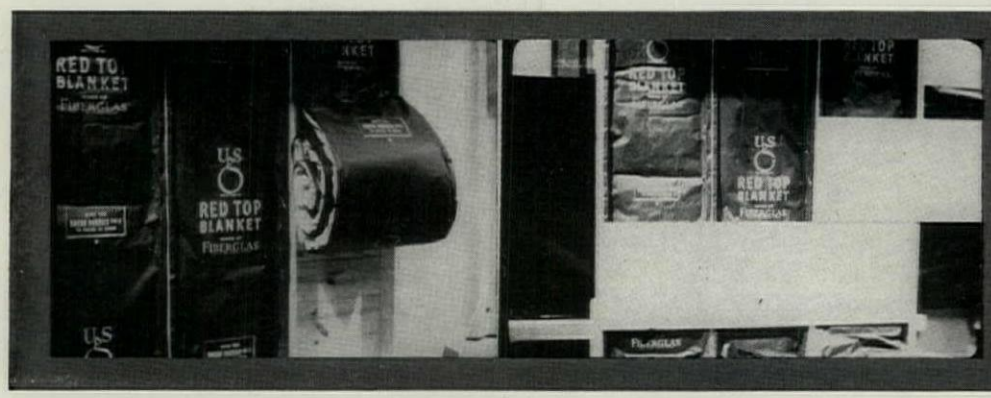


TYPES OF DIMENSIONALLY COORDINATED BUILDING PRODUCTS

A SCOTSMAN

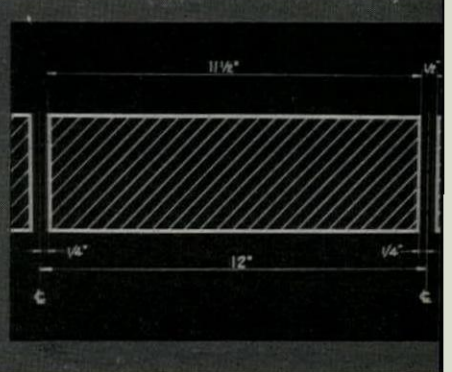
By A. GORDON LORIMER

Contemporary building designers (working wit materials and mechanical devices manufacture by new processes, as much as 90% of them pr finished away from the site) are faced wit almost insuperable problems of assembling an fitting products together. At LEFT are a fe products manufactured to "modular" sizes, practice which would eliminate much difficult



The picture's not wholly black. Some materials, for instance insulating blankets, are made to fit stud dimensions; the 16" module has come from standard wood framing.

And construction boards are made 4 ft. in one dimension by 16", 6 ft., 8 ft., 10 ft., and 12 ft. in the other. Such product sizes have been initiated by manufacturers.

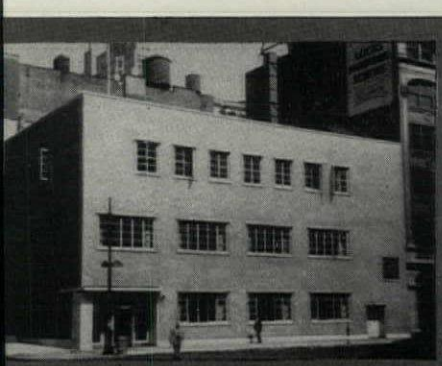


Here is a brick 12" long (including joint) us by Franklin and Kump in the Fresno, Calif., C Hall. The brick is laid up in increments exactly 12".

LOOKS AT **MODULAR COORDINATION**

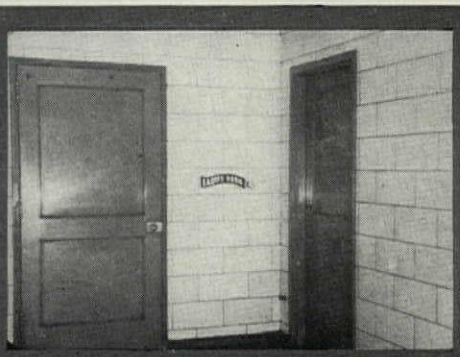
Chief, Bureau of Architecture, Department of Public Works, City of New York

During the late war scarcities of familiar materials and equipment necessitated use of the unfamiliar; cessation of normal building gave time for research; and gradually there developed a demand for building construction better than we used to have. We have added plastics to the list of basic building materials; equipment has changed size, shape, or detail; methods of use have improved. Gordon Lorimer's presentation below, briefed from a longer one he is currently making in support of A.S.A. Project A62, Modular Coordination, demonstrates the values of rational design. In subsequent pages there is space for description of only a fraction of the changes in architectural practice. Others will be discussed in later months.

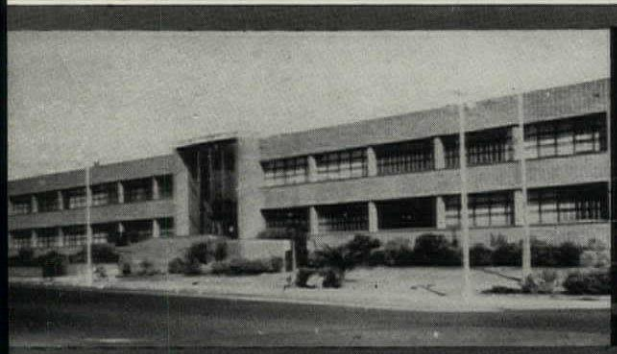


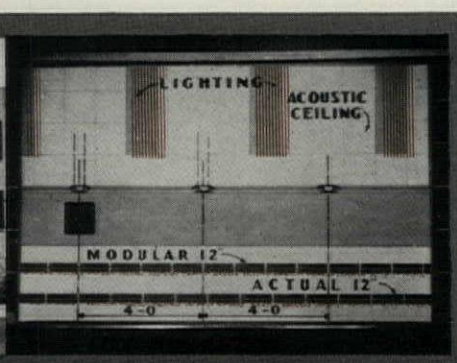
this quite clean, simple modern building there s been much expensive cutting of hard ma- nry materials surrounding the windows.

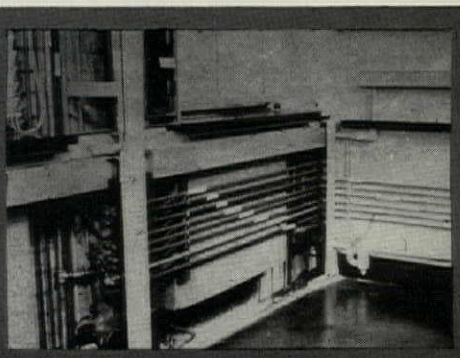
Specifically, note that brick had to be cut at every course for every window jamb—not only a difficult job, but a waste of time and material.



Tile had to be cut around interior doors in another building. Such unrelated sizes of building products pose a problem the architect alone cannot solve.



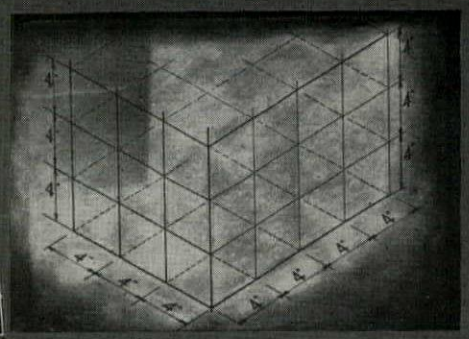




he even increment permits even column spacing which can be coordinated exactly with dimensions of windows nd other equipment. Here columns stand free of windows; and although the actual building has a plaster eiling, standard acoustic tile and standard 12" x 48" fluorescent troffers are drawn in to indicate possibilities. artitions can be located at any 4-ft. interval without disrupting equipment.

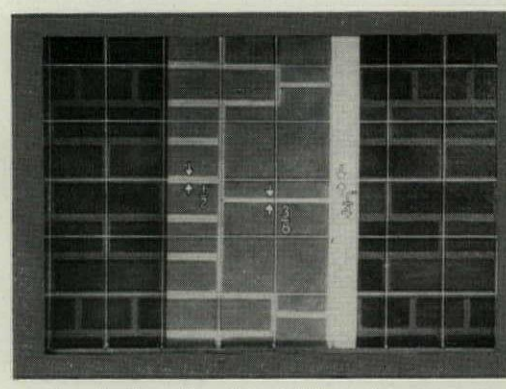
Bell Telephone Labs., Voorhees, Walker, Foley & Smith, Archs., employ a 6-ft. module (window plus pier) with which is coordinated lab. services providing labs 12, 18, or 24 ft. wide.

A fine office building (Tinsley, Mc Broome & Higgins, Architects) *without* benefit of dimensional coordination: entire interior of flush metal panels, which had to be custom-made after construction of the shell and individually routed through production, shipping, and installation because supposedly identical building dimensions varied substantially.

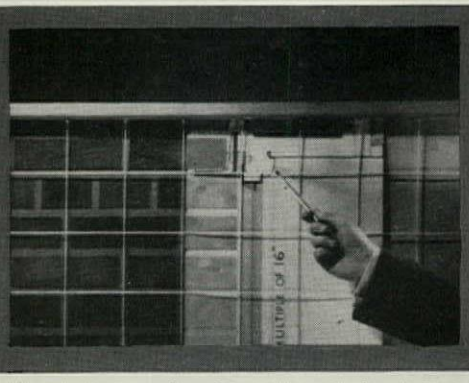


The four inch module, already a common denominator for many materials, is the base unit advocated by A.S.A. Committee 62. It is the basis of a uniform, 3-dimensional grid to which the building and its parts can be referred. The nominal 12" brick on the preceding page fits into the grid.

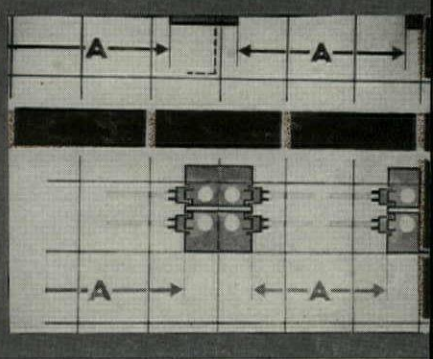
One side of this panel is built of modular bri the other of common, non-modular brick. C *you tell which is which?*



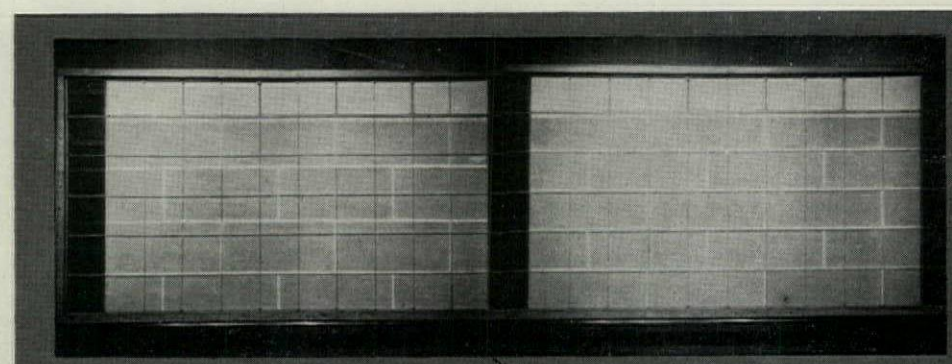
Coordination of modular brick, modular concrete block, and interior finish: varying joint thicknesses don't matter because *nominal* size, center-to-center of joint, is standardized rather than *actual* size without joints.



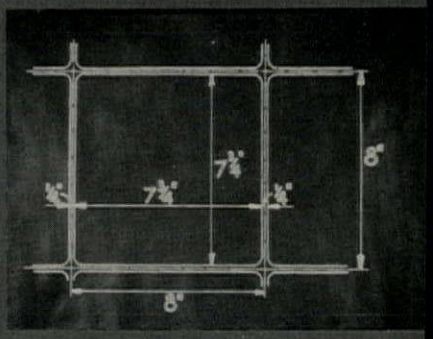
Manufacturers of solid-section steel windows (except residence casements) have adopted modular sizes, based on 16" multiples vertically, 20" horizontally. Result: thousands of types and sizes reduced to some 300 standard items, many of them interchangeable in standard openings (facilitating changes); all can be inserted in a completed opening, which means completion of building shell need not wait upon windows. Note also improved head detail.



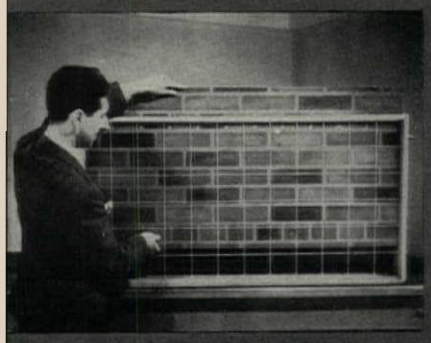
Metal double-hung windows give little trouble themselves; jambs can easily be ½ the mulli the total dimension for a double-hung wind bank is a simple multiple of the unit. But merly, you had either to use an uncoordina brick opening (upper part of drawing) or varying glass sizes. Modular windows coordin completely (lower half of drawing).



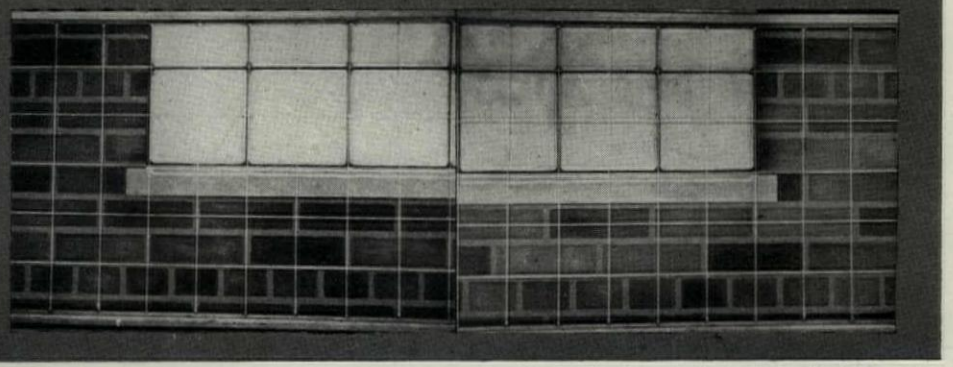
For interior finish, here is the former standard glazed tile, 5 - 1/3" x 12" (nominal), laid three courses vertically in 16". Set it in the grid; the difficulty of achieving complete modular coordination is apparent. Contrast the 4" x 12" nominal interior glazed tile, which coordinates with the modular grid, can be laid in 1/3 bond to coordinate completely, can be used in rhythm with brick and glass block.



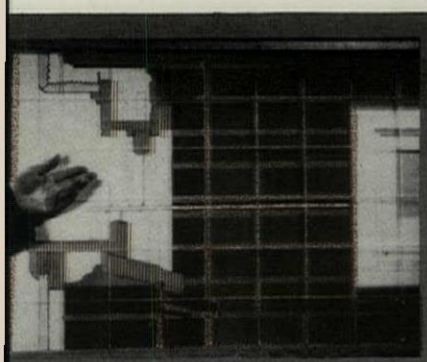
When glass blocks were being designed, bef their introduction into the building market, m lar sizes were decided upon: 8" x 8" and 12" 12", center-to-center of joints. No new sizes needed to fit the module.



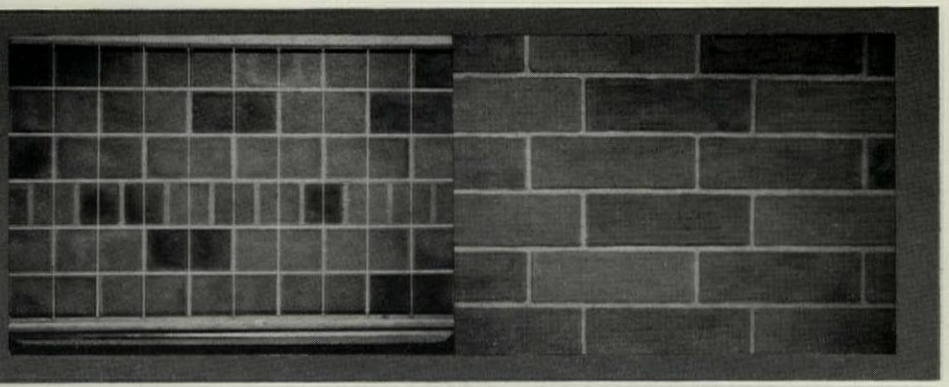
s is a grid box, into which a sample product be slipped to determine whether its dimen- s have been coordinated with those of other dular materials. The same grid is literally sent on an architect's scale and on a footrule.



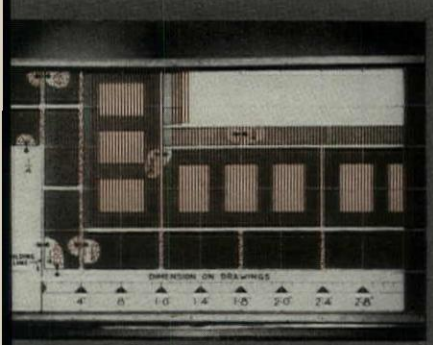
Here are brick panels with openings glazed with glass block. Panel at right is built of old-size 8" brick with ½" mortar joints. Joints do not coincide with grid lines; the discrepancy becomes progressively larger. Left-hand panel uses modular brick with ½" joints; joint dimension is allowed for by the manufacturer, so brick lay up 8" center-to-center of joints and coincide with the 4" module; 3 courses vertically equal two modules. The glass blocks coordinate perfectly.



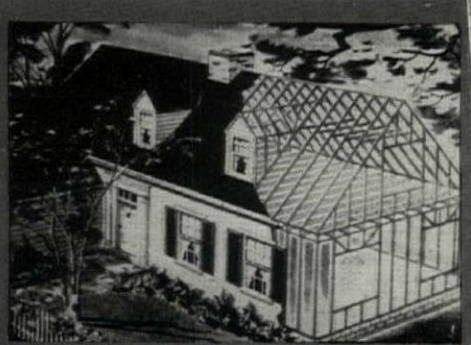
k double-hung wood windows have been like- coordinated by the National Door Mfrs. .; many sizes, based on 4" (horizontal and cal) increments, are available. This achieve- is remarkable considering that there used e ten different dimensional markets, whereas identically dimensioned units coordinated masonry and frame construction are na- lly available.



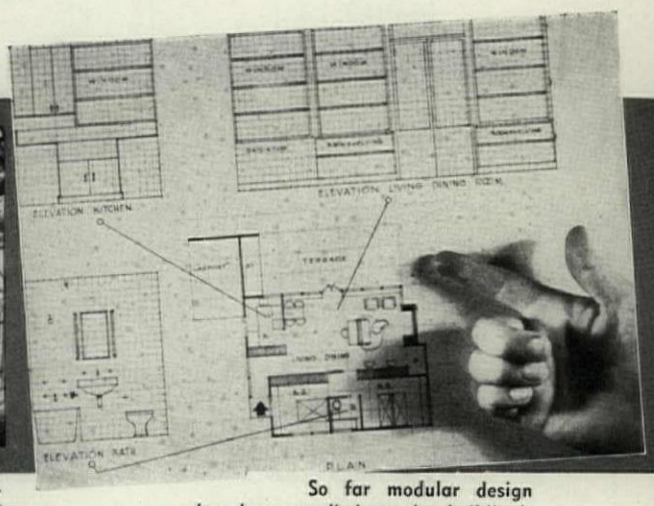
From the viewpoint of coordination, a new standard 4" x 4" x 8" brick works best, giving complete flexibility vertically or horizontally in 4" units. Any opening, sill height, or floor height becomes practical at any 4" interval; coordination with other modular products is perfect. The 4" x 4" x 8" brick can be laid in any bond: common, Flemish, etc. At right is another new modular size of brick, 4" x 4" x 12", which has been gaining favor, is economical to lay, and can be laid in 1/3 bond to preserve the module.



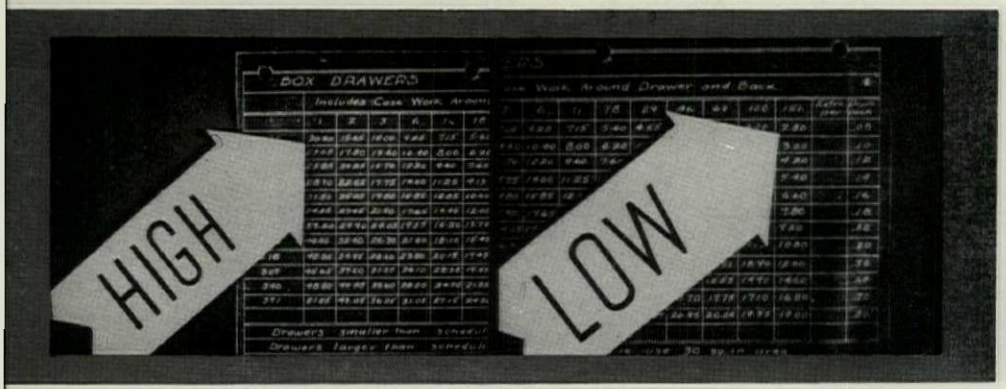
lular brick, modular concrete block, modular rior tile, laid up to show coordination even gh joint thicknesses vary. Outside module , ½ joint outside the walls, allows for joint ssary at reentrant corner.



Modular design makes it possible to build residences economically. Conventional 16" stud spacing was considered in selecting the 4" module. New types of steel framing, on 20" or 24" centers, also fit.



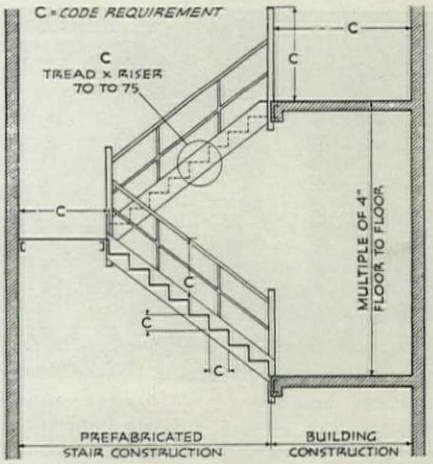
So far modular design has been applied to the building's exterior. Coordination does not stop there; *building equipment* can also be directly related to the modular grid.

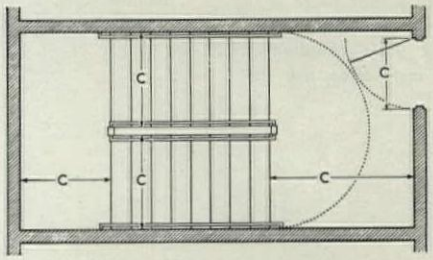


Price sheet of a well-known equipment manufacturer, showing costs of cabinet drawers. One, specially dimensioned, cost $20.20; in lots of 150 or more, cost dropped to $2.80 each. These are sheets from an actual job that required seemingly identical cabinets between columns on several floors. Variation in column size, thickness of fireproofing, etc., forced use of specially dimensioned units until it was decided to use repeated standard units plus a variable closure.

Automobiles are cheaper, better, more numerous today because they've been standardized for mass production.

Such great postwar projects as the proposed Civic Center for Brooklyn, N. Y.—only one of many—can be better and more cheaply built if the same principle—modular coordination—is applied.

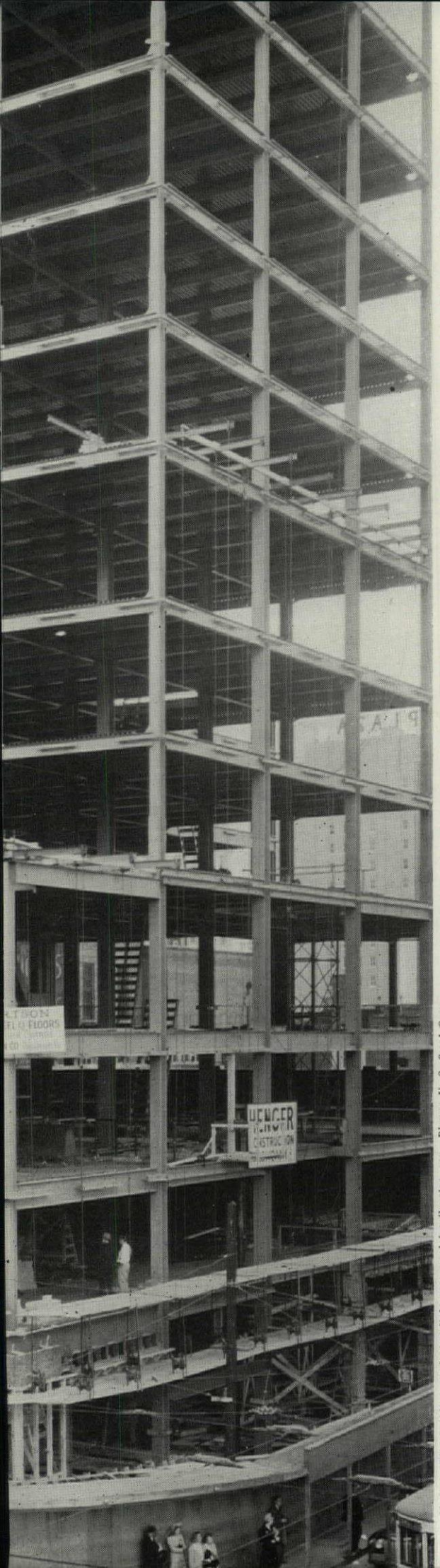




Stairs—another product which can be standardized for many buildings. Codes usually control all dimensions marked "C"; if floor heights are modular, stair units can be ordered by a standard designation which would insure compliance with all requirements, eliminate time wasted in detailing.

NEW DEVELOPMENTS: STEEL IN BUILDING CONSTRUCTION

By CARL F. BLOCK, Market Development Division, Carnegie-Illinois Steel Corporation, Pittsburgh, Pa.



Modern office building employing light-gage steel for flooring, etc. Photo: U. S. Steel Corp.

The properties of steel make it ideal for many uses in home construction. It is easily fabricated, readily available, adaptable to numerous methods of finishing and, finally, it is economical. These properties have led in the past to experimentation with steel houses, with varying degrees of success. Based on a study of the various experiments, the following four features stand out as being essential to the success of steel housing construction.

ESSENTIALS FOR STEEL HOUSE CONSTRUCTION

1. Public acceptance must be developed before any major changes can be made in housing design or in materials.

2. Infiltration of air must be prevented because of its effect on appearance, cost of maintenance, and cleanliness. This can be solved by good design and proper fabrication.

3. Heat conductivity (through exterior walls) is of vital importance. This loss of heat directly increases costs, and the effect of condensation on interior surfaces raises the cost of maintenance. This problem has been solved by interrupting the continuity of heat conductivity through the walls and by the use of insulation.

4. The direct replacement of several materials performing different functions by a steel unit performing these combined functions.

When this modern replacement practice is followed, for example, by using steel unit panel construction in place of the traditional stud, lath, and plaster wall, the following advantages are secured.

ADVANTAGES AVAILABLE

1. Proper and sufficient stud strength is assured by correct design.

2. Good insulation can be easily provided.

3. Condensation difficulties are overcome by the insertion of materials having low heat conductivity.

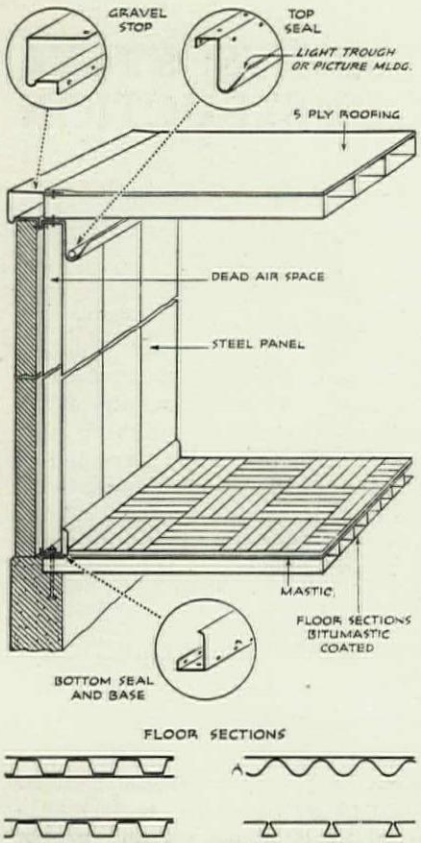
4. A steel panel provides a flat, true interior wall ready to receive any desired type of finish.

5. Since a steel surface does not "breathe," the walls remain clean and consequently are easy to maintain. Likewise, they hold paint well, and as a result, retain their good appearance with little attention.

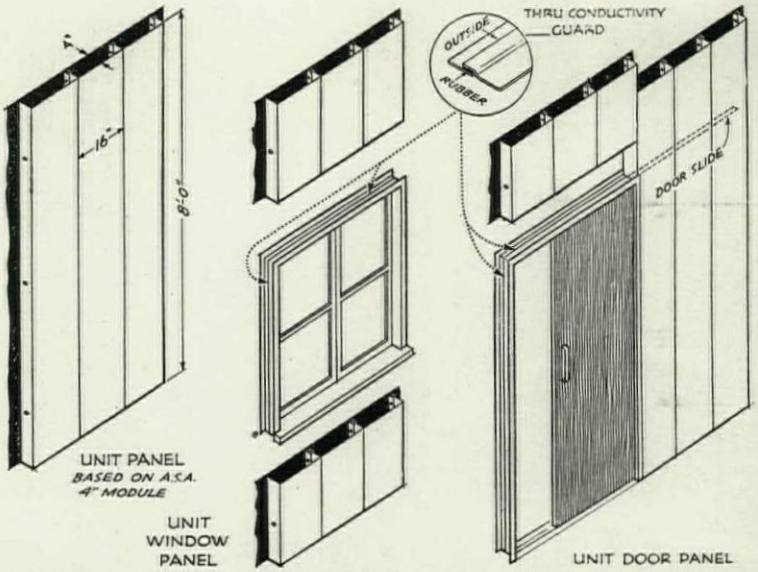
6. The speed of erection and completion of steel panel construction is a decided advantage.

7. The adaptability of panel or cellular wall and floor construction to radiant heating may prove an interesting feature in the future.

8. The flexibility of steel unit design results in great ease of building construction and simplifies building operations, storage and movement of material.



Lightweight cellular steel construction for houses; formed sections, hollow, provide raceways for concealing wiring, piping, etc.



Panel groups, 4 x 8 ft., made up of three standard 16" sections, is 4" thick, conforms to modular dimensions. Window and door panels are similar. Conductivity guards interrupt heat travel from one side to the other, assist in maintaining more even temperature of interior surfaces.

FLOOR AND WALL CONSTRUCTION

Modern steel construction is suitable for use in homes either with or without basements, so no unusual foundation problems are encountered. Steel floor units are fabricated from steel sheets formed into panels which can be bolted directly to the foundation. Over these smooth rigid panels a mastic top coating is applied and into this is set wood block flooring or linoleum. When a basement is not provided these floor panels are well insulated.

To the floor units can be attached vertical steel panels designed to provide the desired insulation and smooth wall surfaces and also the strength required to support the second floor or roof. These panels, room height and 16 inches wide, can be factory assembled into groups of three sections to give a 4-foot unit for easy erection. Other panel groups or modules contain window and door sections and modules with self-contained sliding doors may be available.

FINISHES AND BUILT-IN EQUIPMENT

The exterior of one of these modern houses can be of any desired material, such as brick, stone, or wood. Windows having steel sections and frames, with sills made of porcelain enamel on steel or other protected metal, with receptacles to collect any moisture produced by condensation, are now available. Interior wall panels for separating rooms, replacing conventional walls, can be designed to provide useful storage space.

A linen cabinet has been designed to replace a wall section and provide space for towels, cleaning tissue, toilet tissue, soaps and accessories, medicine storage, or clothes chute. A building using features of this new construction in River Forest, Illinois, has 281 apartments and has proved to be very economical.

Flat roofs can be of normal roof construction with gravel stops of colored porcelain enamel on steel. Gable roofs can also be constructed, if desired, of light steel framework or pan construction covered with porcelain-enameled steel shingles or enameled clapboard-type steel roofing sections.

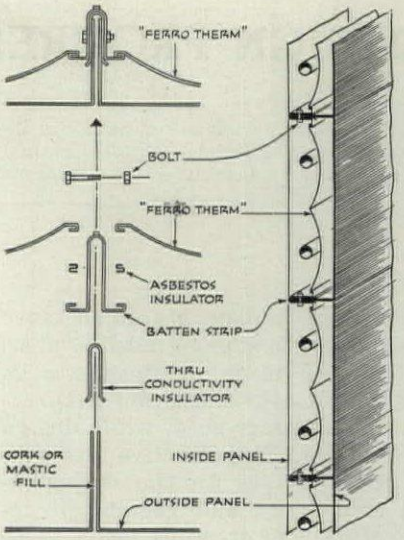
Steel stairs are now available for use in homes. Bedrooms in the new steel house would be designed as two adjoining rooms with a complete cabinet between instead of a space-wasting wall. The cabinet would be divided to serve each of the bedrooms and would extend from floor to ceiling, providing space for all types of storage including the usual clothes and drawer spaces. These clothes storage spaces would have doors on piano hinges or sliding doors. Being practically airtight, they would be ideal for moth-proof storage.

Bathrooms offer an opportunity for displaying the full range of colors and finishes on steel used in both walls and ceilings. Pressed steel bathtubs, lavatories, and shower stalls made of porcelain enamel on steel and furnished in colors to harmonize with the walls, are now available. Medicine cabinets of stainless steel or porcelain enamel are now on the market.

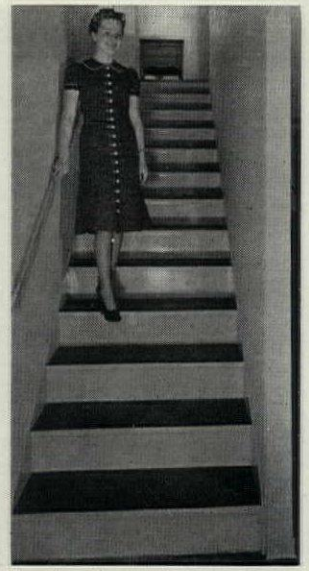
Kitchens. Cabinets will soon be available in new designs and finishes, as will pressed steel sinks with stainless or porcelain enamel finishes, with bowls, drainboards, and even wall tile, of the same material.

RADIANT HEATING AND STEEL CONSTRUCTION

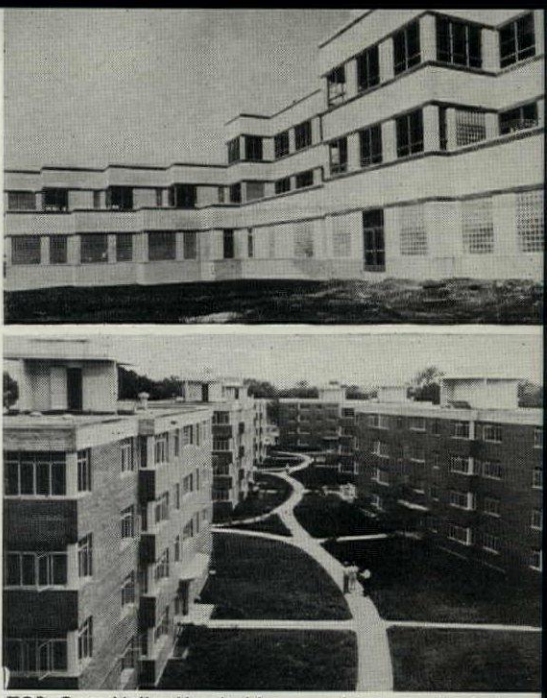
Radiant heat is also in prospect for the American home owner. Steel walls, floors, and ceilings provide the ideal medium for applications of this type. Hot air, electrical tube, steam, or hot water types of heating equipment are all equally adaptable for radiant heating. One system circulates air at 130° above a suspended ceiling. Other new systems have been developed



Radiant heating and reflective insulation combined with cellular steel construction; insulation reinforces the heating system. Note that assembly includes conductivity guards to reduce heat transfer.



Steel stairs, prefabricated, installed as a single unit.



U.S. Steel Corp. photos

TOP, Grass Valley Hospital has porcelain enamel exterior surfacing, steel floors, ceilings, walls. BOTTOM, 281-unit garden apartment, River Forest, Ill., has steel structure, floors, ceilings.

using steel baseboard or cornice panels of a room to circulate the heating medium. In England and France large panels have been placed on walls or suspended in rooms to provide radiant heating.

ADAPTABLE TO DIFFERENT TYPES OF BUILDINGS

Each application must be specially tailored for the job it has to do. Since steel is easily fabricated into identical sections, it lends itself readily to mass production. Straight line, one-story production structures offer industry economies and efficiency never realized before. These buildings have covered from ten to more than fifty acres, each constructed with steel frames, steel roofs, and steel sidewalls, many being windowless. Hospitals and all types of educational buildings lend themselves particularly well to the use of porcelain enamel on steel.

Interiors and equipment made of fire-resisting steel will not burn. Every pound of combustible material eliminated from buildings reduces the fire hazard, thus aiding the trend toward safer, more easily maintained schools and public buildings. Commercial buildings will also use much steel in the future, not only in the supporting structure but also in the interior and exterior as well. Large numbers of small commercial buildings, gas and service stations, small restaurants, roadside stands of various types, ticket offices, bus terminals, store fronts, theaters, and numerous other buildings have been constructed with exterior veneers of enameled steel, stainless steel, and porcelain enameled steel finished in every color of the rainbow. These buildings require a minimum of expense and effort to maintain in a clean, attractive condition.

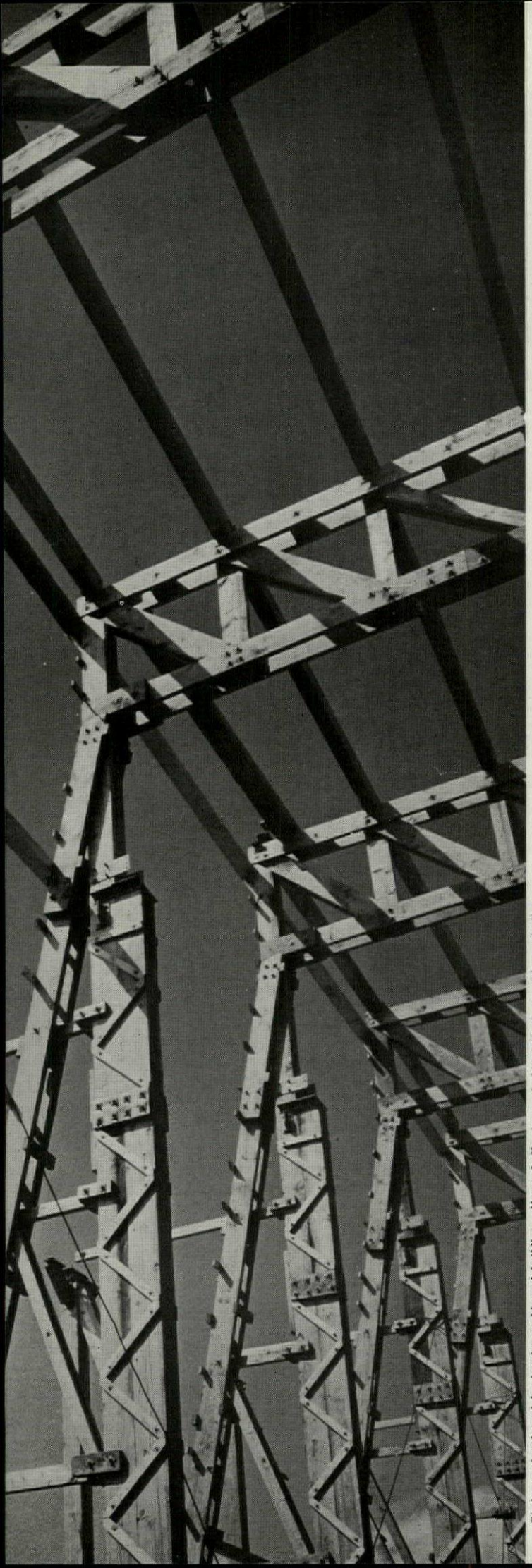
The larger types of commercial buildings offer interesting opportunities. Besides the basic skeleton requirements of multi-storied buildings, steel floors, ceilings, and sidewalls offer new as well as continued uses for steel. To keep commercial buildings modern and rentable requires sufficient conduit space for electric wiring for business machines, telephones, and communication systems. Unlimited facilities for these are provided in steel floors. Steel walls and ceilings can carry the heating, air-conditioning and utility systems for the building.

LIGHT-GAGE STEEL CONSTRUCTION

Lightweight steel applications include steel joists, steel windows, steel stairs, steel lath, mouldings, steel veneers, cold formed steel studs and shapes, steel floors, and many other products. The American Iron and Steel Institute sponsored a survey of types of lightweight building construction and engaged the Pittsburgh Testing Laboratory to make an inspection survey and report their findings on a considerable number of applications in buildings of various age groups from ten to thirty-five years of use. The report shows that the installations generally are in excellent condition and are structurally sound, and concludes that properly protected lightweight steel construction under normal conditions may be expected to retain its structural properties during the life of a building.

It is anticipated that a specification for the design of light-gage steel structural members will soon be issued by the committee on Building Codes of the American Iron and Steel Institute. Preliminary steps have already been taken leading to the development of a series of shapes which will be acceptable as standard by fabricators and designers. These advances will make it possible for engineers to design light-gage steel structures on sound engineering principles and for building code officials to check their safety without a load test.

Architects, building officials, and contractors should be constantly alert to improve methods and uses of materials to provide better, less expensive, more easily maintained residential housing, to provide better buildings for industrial and commercial enterprises, and to assure economical and properly maintained properties which will not become those eyesores or tax delinquents which eventually will contribute to the blight of our cities.



Timber replaced steel for framing a shipyard building. Alonzo J. Harriman, Architect-Engineer. Photo: Stoller.

TIMBER DESIGN PROGRESS

By ALBERT G. H. DIETZ, Assistant Professor of Structural Design and Materials, Department of Building Engineering and Construction, Massachusetts Institute of Technology, Cambridge, Massachusetts.

STRESS-GRADED LUMBER

A far-reaching development of fundamental importance to all engineering use of timber is stress-graded lumber. Wartime shortages of timber made it imperative to stretch the available supply to the limit. WPB Directive 29 increased allowable stresses 20%, while design loads were drastically reduced. The directive also contained comprehensive specifications for timber fastenings, glued laminated structures, and general procedures for design, fabrication, and erection.

In spite of increased design stresses, reduced design loads, hurried and poor designs, bad selection of materials, use of unseasoned timber, and slipshod fabrication often unavoidable under wartime pressures, generally dangerous structures do not appear to have resulted. Consequently the increased allowable stresses are recommended for normal peacetime design and loads by the National Lumber Manufacturers' Association in "National Design Specifications for Stress-Grade Lumber and its Fastenings."

Stress-grades are now established for white ash, beech, birch, chestnut, southern cypress, tidewater red cypress, coast region Douglas fir, inland empire Douglas fir, rock elm, soft elm, black and red gum, eastern hemlock, west coast hemlock, hickory, larch, hard maple, red and white oak, pecan, Norway pine, southern longleaf pine, southern shortleaf pine, yellow poplar, redwood, eastern spruce, and tupelo.

Based upon position and size of knots, splits, wane, slope of grain, and possibly the proportions of spring and summer wood (dense Douglas fir and southern pine), stress values are specified for tension, extreme fiber in bending, horizontal shear, compression perpendicular and parallel to the grain, and modulus of elasticity. Allowable stresses assume loads to be permanent and timber to be originally either green or dry but kept dry in use unless pressure-impregnated with an approved preservative by an approved process, or unless the timber is the heartwood of a durable species. Structural timbers are classified as beams and stringers (loads on narrow edges); joists, plank (loads on wide or narrow edges); or posts and timbers (end-loaded).

Intelligent, economical design in timber, employing the procedures recommended for stress-graded lumber, requires competent engineering talent and acquaintance with the behavior of wood under load to take full advantage of stress modifications allowable:

1. **Snow load** combined with dead load, 15% increase;

2. **Wind or earthquake load** combined with dead load, 50% increase;

3. **Impact stresses,** 100% increase if impact plus dead and other live loads does not exceed twice the permanent-load stresses;

4. **Final sizes of timbers,** not less than required for permanent loads alone;

5. **Modulus of elasticity,** unaffected by any condition of loading;

DURING AND SINCE THE WAR

6. Columns having L/d ratios greater than 11, designed according to parabolic formulas or the Euler formula depending upon the value of L/d;

7. Allowable shear in joint details, 50% greater than the tabulated values;

8. Reactions under concentrated loads, modified depending upon position of load;

9. Unit stresses in compression on surfaces inclined to the grain, computed by the Hankinson formula;

10. Reductions in shear made for notches, depending upon the depth of notch;

11. Allowances made for length of bearing perpendicular to the grain, increases up to 75% permissible.

CONNECTORS

Timber connectors have been so widely employed in structures of all kinds that connectored construction can now be said to be standard practice. Of the numerous varieties of connectors originally tried, four have emerged and are in regular use: split rings, toothed rings, claw plates, and shear plates. The first two are used for wood-to-wood connections, the last for either wood-to-wood or wood-to-metal connections. All utilize a substantially larger proportion of the joint area to transmit stress than do the older varieties of timber fastenings, thereby increasing efficiency of the joint. Fabrication is simple and easy.

Designs of joints are based upon type, size, number, and spacing of the connectors; species of wood and its moisture content at time of load; and duration and type of load. Allowable loads on connectors depend upon direction of load with respect to grain, edge distances, and end distances, and upon orientation of the axis of a pair of rings with respect to grain.

GLUES

The new adhesives are an important part of many of the new techniques. **Casein,** oldest of the structural adhesives, has the advantage of setting and bonding at temperatures down to freezing. It can be made to possess good durability under ordinary atmospheric exposure. **Synthetic adhesives** have developed rapidly during the past decade. The following classes are of greatest use in timber engineering:

1. Urea-formaldehyde glues can be either hot-setting (up to 300°F) or cold-setting (70°F). They are little affected by dry heat or by water up to about 130°F. Warmer water and warm, humid atmospheres (160°F or higher) may cause rapid deterioration.

2. Melamine-formaldehyde glues are hot-setting, and are similar to the ureas except for superior durability and boil-resistance.

3. Phenol-formaldehyde. When phenol alone is used in the composition, these resin adhesives are hot-setting. They are completely boil-resistant, and are unaffected by exposure to combined high temperatures and humidities, and to fungus or insect attack. They are used as thin films in plywood manufacture and as liquid solutions for either plywood or general-purpose gluing.

4. Phenol-resorcinol. Substitution of resorcinol for phenol allows the setting temperature to be reduced to as low as 70°F. These glues, though relatively costly, are easily handled, are usable at room temperatures, do not require high clamping pressures, and possess the same boil-resistance as the "straight phenolics."

In design, experience indicates that glue lines can safely be assumed to be as strong as the wood itself, when glue bonds are properly made with adequate clamping pressure under shop-controlled conditions. Nail-gluing is adequate for glue lines not subjected to heavy stresses; for important joints it is not acceptable.

GLUED LAMINATED CONSTRUCTION

By gluing small pieces of wood together, larger members can be fabricated than are available in solid lumber. Furthermore, curved members, variable cross-sections, and uniformly dry, high-grade structural timbers can be so fabricated. Intensive development, given a strong impetus by the war, is still continuing, and design criteria are being established as a project of the Central Committee on Lumber Standards of the United States Department of Commerce.

Evidently, if a member can be made of solid lumber, it is cheaper to do so than to laminate, because dressing and scarfing laminae may use a third more lumber, more labor is involved, and glue is not to be had for nothing. Careful design, however, can at least partially offset increased costs per board foot by utilizing certain inherent advantages of laminated timber; and can make timber useful in many ways denied to solid lumber.

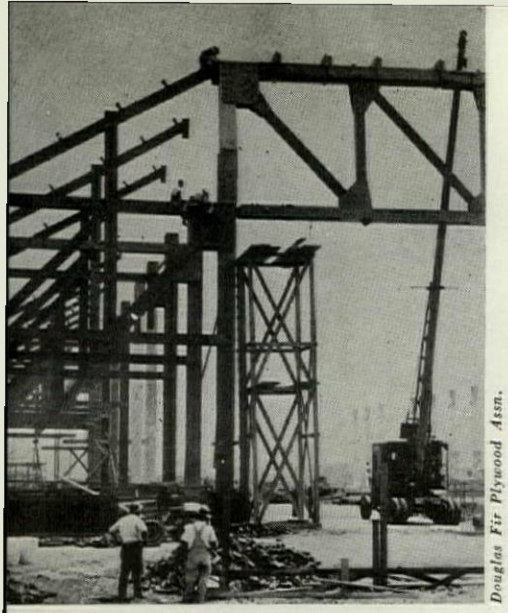
1. Increased allowable stresses. Allowable compression parallel to the grain is increased 50% by the upgrading inherent in laminating. It is hardly likely that of ten laminae, for instance, more than perhaps two will have knots occurring at the same spot. Consequently, a knot which in a solid piece might cause a 50% reduction in strength, would in two out of ten laminations cause an over-all reduction of only 10% in strength.

Bending, perpendicular compression, and shear stresses are the same as for solid members. Although recommendations for laminated timbers make no allowance for the increased stiffness of many species of dry lumber (used in laminating) as compared with green (likely to exist in large timbers), timber engineers frequently do employ moduli of elasticity 10 to 15% higher for laminated timbers than for solid.

2. Position selection. In members subjected to bending, laminae can be selected to place the best material where the highest stresses occur:

a) The outer two-fifths are stress-grade used in the design, the rest are one grade lower.

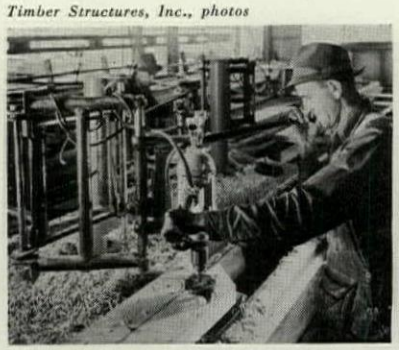
b) All stock is originally all the same stress-grade, but laminae are so arranged that the outer two-tenths have knots not larger than half the maximum permitted in that grade. When so fabricated, allowable bending

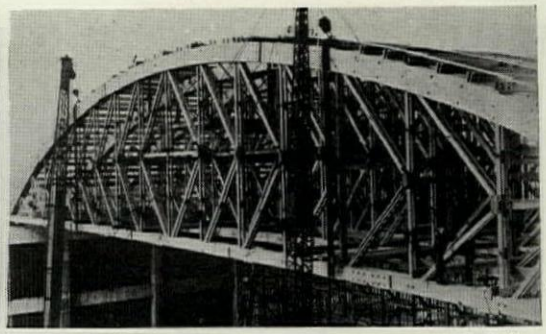


Douglas Fir Plywood Assn.

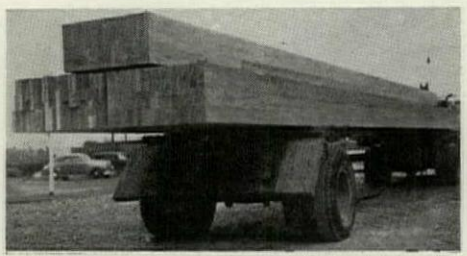
Structural plywood gusset plates in heavy roof trusses, plant for Douglas Aircraft Co., El Segundo, Calif.

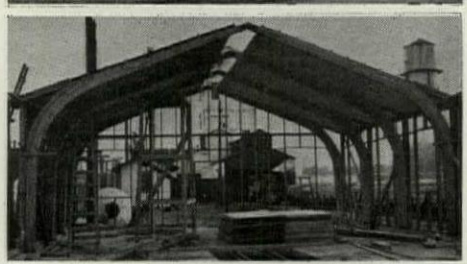
Timber Structures, Inc., photos

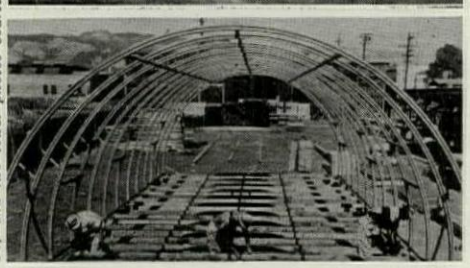




LEFT, fabricating timbers for split-ring connectors. RIGHT, long-span bowstring trusses of timber assembled with connectors; top and bottom chords are laminated, glued.







Top and two lower photos courtesy Timber Structures, Inc.

TOP, heavy glued-laminated timbers used in USO Building, Medford, Ore.; individual laminae side-glued to desired width, end-scarfed to length. NEXT, locomotive shop framed with pressure-treated glued-laminated arches; studding and plywood also pressure-treated. NEXT, cow-barn utilizing curved laminated rafters. BOTTOM, small laminated arched ribs for Quonset huts.

stresses for the member are increased one grade.

3. **Curved members** are utilized to the utmost, and members are **tapered** to correspond with changing stresses.

4. **Hardware is minimized** because members are made up full size and length, thereby eliminating numerous splices and joints. Laminated arches, in particular, require little hardware as compared with framed arches.

5. **Maintenance.** Shrinkage in framed structures built of partially seasoned or green lumber requires servicing to tighten the structure. Laminated members, dry to begin with, require little servicing.

COMPOSITE BEAMS

Composite beams consisting of solid or laminated flanges and plywood webs have found widespread employment. Design is much the same as for metal plate or box girders, with some important modifications required by the properties of wood:

1. **Form factors** must be introduced into the usual flexural formulas to take into account the difference between bending and compressive strengths of wood, and the factor of nine-tenths present in usual allowable stresses which are based upon customary depths of beams. When actual specific form factors are employed, usual flexural stresses are increased one-ninth.

2. **Shear deflection** in wood girders may be a large item and must be taken into consideration. When it is computed, usual moduli of elasticity in bending can be increased; they already allow for some shear deflection.

3. **Horizontal shear** in plywood webs must be computed by methods more precise than the usual assumption that shear is uniformly distributed throughout the depth of the web.

4. **Glue joints** must be designed for shear with careful regard for the direction of the grain. Shear across the grain—"rolling shear"—requires considerably lower allowable stresses than shear parallel to the grain. On the other hand, allowable shear stresses in the webs, especially when the grain is oriented at 45°, are high.

5. **Stiffeners are required** to support the flanges under heavy loads and to stabilize the web against buckling and shear. Because webs are relatively thick, stiffeners can usually be spaced rather widely.

6. **Scarf-gluing is best for joints and splices.** A 12-to-1 slope of scarf is generally adequate. Splice plates are employed when scarfing is not feasible, but precautions are taken to avoid rolling shear if possible.

Douglas Fir Plywood Assn. photos

LEFT, composite wood girders in plant for R.C.A. Mfg. Co., Camden, N. J., with laminated flanges and nailed plywood webs. CENTER, composite construction of wood arches, with lumber flanges and plywood webs, nailed and glued. RIGHT, composite beams with lumber flanges and plywood webs.

Successful composite beams and rigid frames have been made by nailing alone, or by nail-gluing in the field on improvised supports. Shop gluing is preferable.

TIMBER-CONCRETE DECKS

Decks formed of concrete mats, interlocked with a laminated timber base consisting of planks set on edge and spiked together, have been successfully used for highway bridges, docks, and buildings. The concrete mat provides a wear-resisting surface, distributes concentrated loads to the timbers below, and is strong in compression. The timber is strong in both tension and compression as well as light in weight.

The theory is that the two materials act together as a single slab of effective depth equal to their combined depths. In regions of positive moment the concrete is in compression and the timber in tension. In regions of negative moment stresses are reversed; only there is the concrete reinforced.

Shearing resistance is developed at the interface between timber and concrete by flat trapezoidal steel members driven vertically into the timbers and, projecting upward into the concrete, acting like keys. Uplift of the concrete is resisted by heavy flatheaded spikes partially driven into the timbers and partially embedded in the concrete. Continuity in the timber base is achieved by staggering end joints of individual planks. Each third joint occurs at the two quarter-points of the span. In cross-section, alternate plank are two inches higher than their neighbors to provide a series of valleys into which the shear-developers are driven. Spacing of shear developers depends upon shear distribution, small where shear is large, and large where shear is small.

TREATED TIMBER

Increasing use has been made of treated lumber, both to resist decay and to increase fire resistance. Generally speaking, treatment properly carried out results in no diminution of strength with either oily or water-soluble preservatives. Some species of wood, however, require numerous incisions in the surfaces to promote deep penetration of preservative, and the incising may decrease the strength approximately 10% according to some recent tests. Phenolic-resin glued laminated timbers have been successfully pressure-creosoted without weakening the glue line. Salt-treated lumber has been successfully glued. Research is being conducted to determine the feasibility of gluing creosoted lumber.

BIBLIOGRAPHY

Only the salient points in the design of some of the newer types of timber structures have been touched upon. For more detailed information, the following selected references are recommended.

1. *National Design Specifications for Stress-Grade Lumber and Its Fastenings.* National Lumber Manufacturers' Association, Washington, D. C. (1944).
2. *American Lumber Standards for Softwood Lumber—Simplified Practice Recommendation R16-39,* by Bureau of Standards, U. S. Department of Commerce (1939).
3. *Wood Handbook—Basic Information on Wood as a Material of Construction with Data for Its Use in Design and Specifications,* by Forest Products Laboratory, U. S. Department of Agriculture (1940).
4. *Miscellaneous Publication No. 185, Guide to the Grading of Structural Timbers and Determination of Working Stresses,* by T. R. C. Wilson, Forest Products Laboratory, U. S. Dept. of Agriculture (1934).
5. *Technical Bulletin No. 479, Strength and Related Properties of Woods Grown in the United States,* by L. J. Markwardt and T. R. C. Wilson, Forest Products Laboratory, U. S. Dept. of Agriculture (1935).
6. *Wood Structural Design Data, Vol. 1 and 7 Supplements,* by National Lumber Manufacturers' Association, Washington, D. C. (1941).
7. *Douglas Fir Use Book and 4 Supplements,* by West Coast Lumberman's Association, Seattle, Wash. (1940).
8. *Southern Pine Manual of Standard Wood Construction,* by Southern Pine Association, New Orleans, La. (about 1941).
9. *Modern Timber Engineering,* by H. J. Hansen, John Wiley & Sons Company, Inc.
10. *Teco Design Manual for Timber Connector Construction,* by Timber Engineering Company, Washington, D. C. (1944).
11. *Designing Truss Joints with Timber Connectors,* by West Coast Lumbermen's Association, Seattle, Wash. (1944).
12. *Typical Designs of Timber Structures,* by Timber Engineering Company, Washington, D. C. (1942).
13. *Blue Ox Series of Typical Designs,* by West Coast Lumbermen's Association, Seattle, Wash. (1940-42).
14. *Timber-Connector Joints, Their Strength and Design,* by J. A. Scholten, Forest Products Laboratory, U. S. Dept. of Agriculture (1944).
15. *Modern Timber Roof Trusses,* by Timber Engineering Company, Washington, D. C. (1944).
16. *Airplant Hangar Construction,* by National Lumber Manufacturers' Association, Washington, D. C. (1941).
17. *Details of Design with Timber Connectors.* Albert G. H. Dietz, *Journal of the Boston Society of Civil Engineers* (Jan. 1945).
18. *Technical Bulletin No. 597, Lag Screw Joints; Their Behavior and Design,* by J. A. Newlin and J. M. Gahagan, Forest Products Laboratory, U. S. Dept. of Agriculture (1938).
19. *Technical Bulletin No. 332, The Bearing of Wood Under Bolts,* by G. W. Trayer, Forest Products Laboratory, U. S. Dept. of Agriculture (1932).
20. *Formulas for Wood Columns with Side Loads and Eccentricity,* by J. A. Newlin, *Building Standards Monthly* (Dec. 1940).
21. *Reports of Committee 7 on Wood Bridges and Trestles,* American Railway Engineering Association, Chicago, Ill.
22. *Heavy Timber Construction Details,* by National Lumber Manufacturers' Association, Washington, D. C. (1943).
23. *Dept. Bulletin No. 1500, The Glueing of Wood,* by T. R. Truax, Forest Products Laboratory, U. S. Dept. of Agriculture (1929).
24. *Technical Bulletin No. 691, The Glued Laminated Wooden Arch,* by T. R. C. Wilson, Forest Products Laboratory, U. S. Dept. of Agriculture (1939).
25. *Modern Wood Adhesives,* by Thomas D. Perry, Pitman Publishing Company (1944).
26. *Fabrication of Laminated Timber Members,* by Verne Ketchum, *Civil Engineering* (Feb. 1943).
27. *Manual on the Laminating of Timber Products with Low-Temperature Phenolic-Type Resin Glues,* by Forest Products Laboratory, Madison, Wis., and Gamble Bros., Louisville, Ky. Forest Products Laboratory Mimeograph R-1437 (1944).
28. *Glued Laminated Lumber Construction,* by F. J. Hanrahan, Mechanical Engineering (Dec. 1943).
29. *Plywood Design Data,* Douglas Fir Plywood Association, Tacoma, Wash.
30. *Designing for Strength of Flat Panels with Stressed Coverings,* by J. A. Newlin, Forest Products Laboratory, Madison, Wis. Mimeograph 4-1220 (1940).
31. *Timber-Concrete Composite Decks - for Bridges, Piers, Docks, Ramps, Buildings, and other Structures Requiring Heavy Duty Floors.* Service Bureau. American Wood Preservers' Association, Chicago, Ill.
32. *Wood as an Engineering Material (Eighteenth Edgar Marburg Lecture)* by L. J. Markwardt, Proceedings of the American Society for Testing Materials (Volume 43, 1943).
33. *Conference Report on New Developments in Wood Products.* New York State College of Forestry, Syracuse University (1944).
34. *Classified Bibliography on the Physical and Mechanical Properties of Wood and the Design and Construction of Timber Structures (Progress Report of the Committee of the Structural Division on Timber Structures),* Proceedings of American Society of Civil Engineers (pp. 321-339, No. 3, Vol. 70, Mar. 1944).
35. *Lumber Literature (a bibliography of literature available from various lumber manufacturers' associations),* by National Lumber Manufacturers' Association, Washington, D. C. (1942).

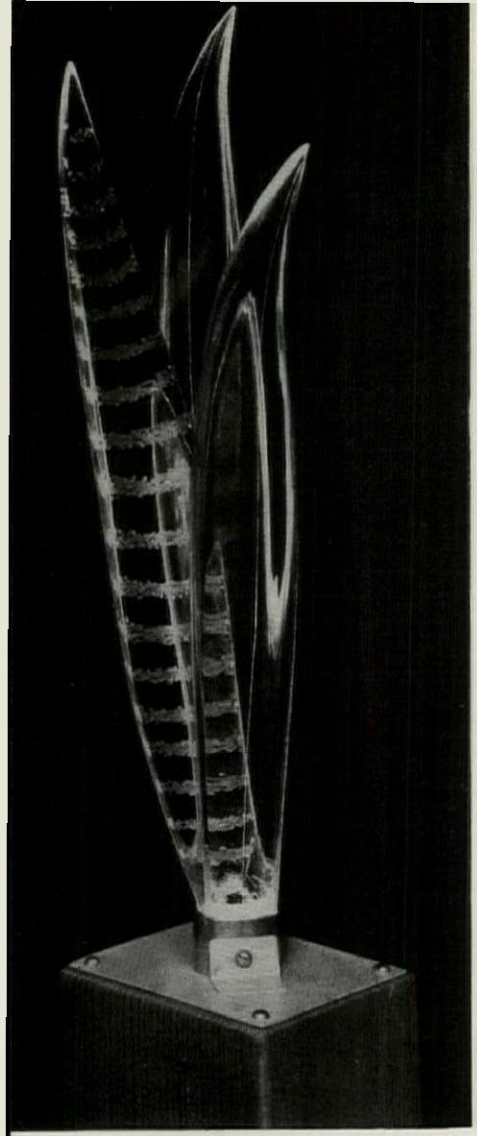


Photo courtesy "Modern Plastics"

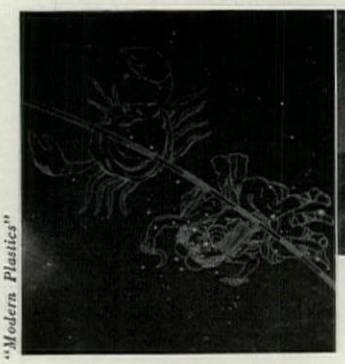
Lucite sculpture by Nishan Toor, mounted on wood base which conceals a light source; surface decoration is emphasized by light conductance of the plastic.

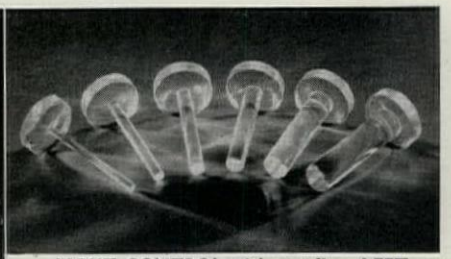
DESIGN DATA FOR ACRYLIC PLASTICS ...PART I

This is the first of a series of brief presentations on methods of employing the great family of plastics architecturally. "Acrylics" are technically methyl methacrylate resins, available in several forms, sold under the trade names *Lucite* and *Plexiglas*. They are thermoplastic; that is, they soften at temperatures from 170° to 200°F, although there is a heat-resistant type which will withstand higher temperatures. They are tough and rigid, highly resistant to water and outdoor exposure, and to most household chemicals and solvents (but paint remover and very strong alcohol should be avoided). They are available in a wide range of colors, possess great brilliance whether colored or clear, and are extremely transparent. Their dielectric and impact strength, and optical properties, are remarkable. Sources for further information include publications of the Society of the Plastics Industry, the magazine, "Modern Plastics," and the manufacturers, Rohm and Haas Co. (*Plexiglas*) and du Pont (*Lucite*).

Primary considerations, when transparency is important, are the laws of optics, whose principles apply whenever acrylics are used as glazing, such as when shatterproof glazing is required, or when the simplicity with which acrylics can be molded or formed makes them desirable for simple or compound curved glazing. Because the material has good optical qualities, prisms or lenses can be cast of it, either as isolated pieces or integrally as part of a larger assembly, casting, or molding. It is well to define exactly areas through which clear vision is essential so that these may be properly fabricated. Areas where optical qualities are unimportant (sections to be covered, painted, or not perfectly transparent) should also be designated so that cost of polishing can be reduced. Scratches ordinarily affect only a small area, and are best untouched if in an optically critical portion. Deep polishing to remove a scratch will impair a large area, producing a wedge or lens which distorts vision.

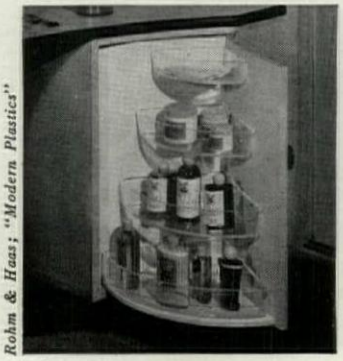
Acrylics conduct light internally chiefly by reflection and re-reflection at very flat angles from the interior of polished outer surfaces, although some light travels through the material in direct, parallel rays. Light conductance is materially aided by the fact that the plastic is almost entirely free from interior "haze." Thus, theoretically, light could be "piped" indefinite distances, but there are limitations. The necessary optically perfect surfaces are impractical to produce in quantity in fabricated or molded plastic. (Cast sheets having these qualities, at least over limited areas, can be obtained.) Also, surfaces must be kept absolutely free from dust or dirt, which reduce reflective capacity. The amount of light which can be introduced into an edge or end of a piece of acrylic plastic is limited. Under certain conditions light rays can be intensified (see sketches).

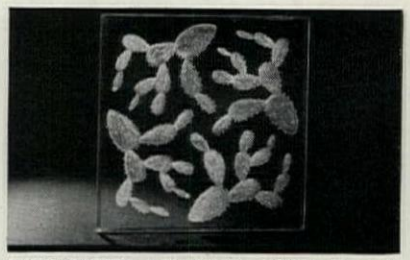




"Modern Plastics"

LIGHT CONTROL with acrylics: LEFT, new star-studded ceiling, Grand Central Station, New York City; CENTER, Lucite light conductors of different sizes used in the ceiling to transmit light from a single source to many stars. RIGHT, acrylic torch for inspecting interiors of shell parts.

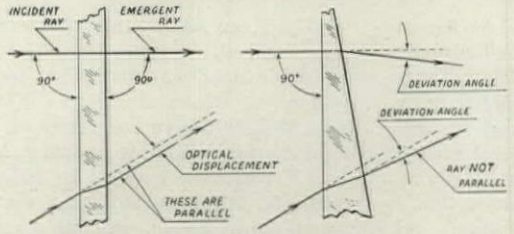




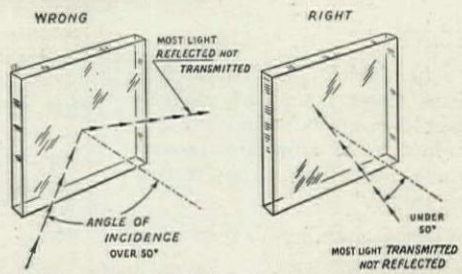
Rohm & Haas; "Modern Plastics"

FABRICATED ACRYLICS: LEFT, Plexiglas cabinet shelves, transparent, shatterproof; rounded, easily cleaned corners. CENTER, surface-engraved Plexiglas. RIGHT, "bubble" shape formed by air pressure; material is a laminate of Lucite and another plastic; each imparts certain properties to the product.

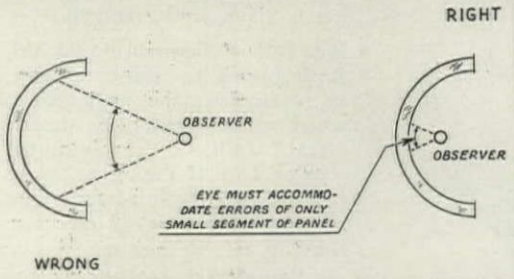
OPTICAL CONSIDERATIONS GOVERN "SEE-THROUGH" APPLICATIONS



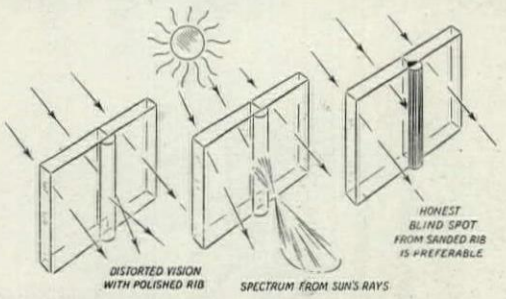
Laws of optics are same for acrylics as for glass. Though casting cannot produce sheets with perfectly plane and parallel surfaces, normal acrylic sheets at least equal most glass (except polished plate). Special optical grades with lower deviation are obtainable. View through transparent sheet at angle exaggerates deviation and displacement effects, sometimes



objectionably. Hence line of sight should be nearly perpendicular to plane of plastic sheet. If sight-line is at 90°, 92% of light will be transmitted, 8% reflected. If incidence angle reaches 85°, light transmission becomes almost zero, observer sees only reflections. Critical angle is 50°.

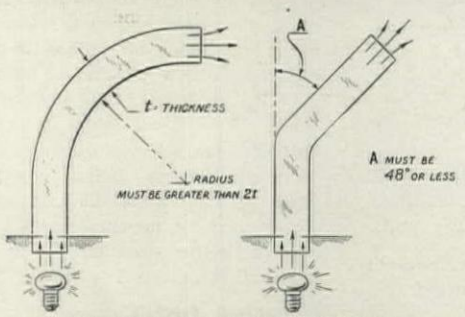


Curved sections: when fixed relationship with observer's position can be maintained, eye position ideally should be such that observer looks through at 90° to tangent at any part of curve. Desirable radius for optical purposes is larger than 6". When short radii must be used (as above) eye position should be close to curved surface. Avoid changing radii, especially quick changes. When conditions like those illustrated

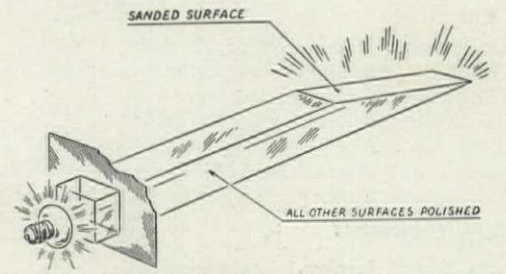


(RIGHT) are encountered, sanded or machine finish is preferable. Polishing not only introduces an extra fabricating operation, it also introduces danger that observer's eye may not compensate for optical distortion, lens effect, or spectrum caused by the change of shape. The honest blind spot is more acceptable to the eye.

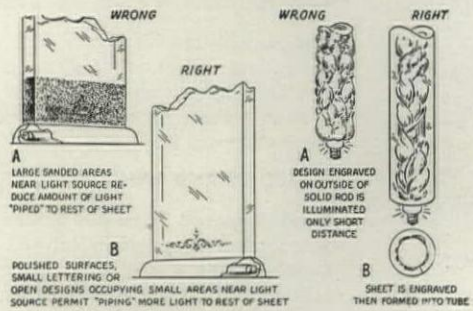
LIGHT CONDUCTANCE ALSO OBEYS OPTICAL LAWS



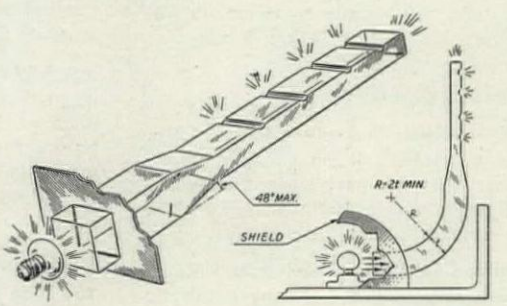
Principles shown here apply to sheets, rods, or tubes. "Edge-lighting" or "light piping" has been satisfactorily used over areas up to 6 ft. long. For best results light source must be shielded, and if light is to be piped around corner, limitations above (based on index of refraction) apply. Light will penetrate around sharper angles or curves, but much will be lost.



Light escapes from interior of the plastic wherever surface is broken, as by sandblasting or engraving. Thus control over escape of light is feasible, becomes useful for instruments, signs, dials, devices for illuminating inaccessible areas; can be used on curved or flat sections. For illuminating areas, tapering as well as sanding "escape" portion increases light emission due to obtuse interior reflection angles of light traveling through plastic.



For efficiency, areas near light source should be polished, otherwise most of the light will escape too soon, little will be piped throughout the sheet. Only small lettering or open designs, preferably on one surface only, should be used near light source. Cylinders are preferable to solid rods due to their much greater area of surface for reflecting internal light



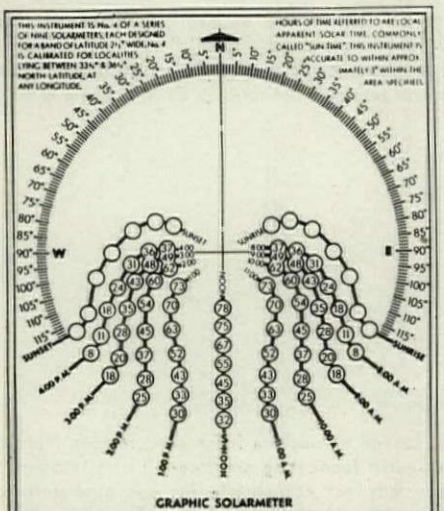
rays. To increase illumination, increase thickness of the plastic near the light source to "funnel" light into a thin section. Funnelling is effective only if light rays are nearly parallel, as when a collimating lens is used or the plastic is a few inches or more from the light source. Note that angle of funnel cannot be greater than 48°.

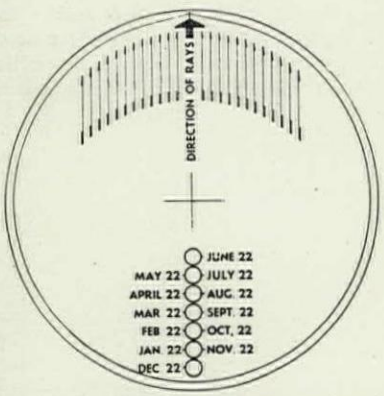
. . . THERE **MUST** BE A REASON!

TRUE STORY

So he says to himself: "All these fantastic stories about houses of concrete that can be blown up like a balloon, and glass, or plastics, or aluminum houses and such, are misleading. They're confusing the public."

He was an actual man, by his own press release, one Fritz B. Burns, Los Angeles builder. He set up the Fritz B. Burns Research Division for Post War Housing, under the direction of a Mr. Joseph Schulte. Mr. Schulte succeeded in prying out of 200 building material manufacturers their secret postwar plans. What did he get? Innovations, that's what!





Considering interest in daylight engineering, the Graphic Solarmeter is most timely. It consists of a disc (above) pivoted on a chart (left), both transparent. Chart is oriented, disc turned so desired date circle falls on hour line on chart. Figures appearing within circle show vertical angle of sun in degrees; arrow on disc shows horizontal direction. Solarmeters are available calibrated for any locality in the U. S.

Well sir, he soon came to see that the only way to interpret these innovations to the public was to build 'em into a house. No piker, Mr. Burns *is* building, on a $75,000 lot in Los Angeles, a house said to be "of contemporary architecture," which he expects to complete by Jan. 15. It's reportedly a redwood plywood solar house, insulated, with reflective roof, Moduflow air conditioning, acoustic ceilings, radio and Musak in every room, and Koroseal bedroom walls. The kitchen is filled with electrical and gas devices, and the carport houses not only a car, but a helicopter, hobby room, and greenhouse.

Mr. Burns' description of the Master Bath ought to give you the picture: It resembles "the packaged bathroom which can ultimately be stamped out of metal." It has a "revolving turret-type shower door of Plexiglas" at one end of the tub . . . "a full-length gas heater" . . . "a new type of circular concave shaving mirror lighted from the rear" . . . "an electric toothbrush and electric shaver attached to cords which pull out and then automatically go back into place" . . . "a sun lamp permitting violet ray treatment while shaving, and a hair drier. The toilet bowl, of the silent, tankless type, may be flushed by merely leaning back. A miniature radio, magazine rack, and ash tray are adjacent."

THIS MONTH'S PRODUCTS

DESIGN AID

Graphic Solarmeter. Transparent plastic device for measuring sun azimuth and declination, useful in determining building orientation, sun control devices, etc. Models available for all localities in U. S. Inventor and distributor: R. W. Justice, Box 122, Belvedere, Marin County, Calif.

ELECTRICAL EQUIPMENT

ML2 Frame Circuit Breaker. Steel-enclosed circuit breaker for 3- and 4-wire solid neutral applications, panelboards. 15 to 100 amp. 600 v. AC; 50 to 100 amp. 250 v. AC-DC, 2- and 3-pole. Square D Co., Switch & Panel Div., 6060 Rivard St., Detroit 11, Mich.

HEATING AND HEATING EQUIPMENT

Re-Designed Boiler. Portable 2-pass type fire-box boiler (high pressure steam, to 150 lbs.) for any fuel. Titusville Iron Works Co., Titusville, Pa.

INDUSTRIAL EQUIPMENT

Karbate Sectional Cascade Cooler. 4-item unit (5 pipe sizes) for cooling corrosive liquids and gases; quick assembly; interchangeable sections easily added. National Carbon Co., Inc., 30 E. 42nd St. New York, N. Y.

Evaporative Coolers. Enclosed units, 6,000 to 56,250 Btu; staggered coil system; automatic air and water bypasses. Worthington Pump and Machinery Corp., Air Conditioning and Refrigeration Division, Harrison, N. J.

Refrigeration Compressors. Worthington Pump and Machinery Corp.:

Type VSA. Vertical, 2-cylinder, single-acting, enclosed, with roller bearings. Sizes: 3" x 3" to 10" x 10".

Electric Driven. Horizontal, double-acting, heavy duty.

Gas Engine Driven. Capacity 50 to 1,000 tons; for single- or two-stage compression; 150-300 hp and 400-1,000 hp power units.

Steam Engine Driven. Heavy-duty, straight opposed type; horizontal, double-acting.

Booster. For low temperature application; horizontal, double-acting, single cylinder, center crank, roller bearings.

KITCHEN EQUIPMENT

Underground Garbage Receiver. Formed steel container (capacities to 20 gal.) for burying in ground; steel lid and foot-lever. Majestic Co., Huntington, Ind.

Pak-A-Way Freezers. 5 to 25 cu ft sizes for home, farm; all-steel sealed; hermetic compressors. Deluxe model has control for quick-freeze or zero storage, 2 unrefrigerated drawers under freezing compartment. Schaefer, Inc., 1000 Hodgson Bldg., Minneapolis 1, Minn.

LIGHTING FIXTURES AND EQUIPMENT

The Van Buren, A-2440. Fluorescent luminaire with **Skytex Satinol** glass panels; mountable surface or suspension, individual or continuous; 4 40-watt T-12's. Pittsburgh Reflector Co., Oliver Bldg., Pittsburgh 22, Pa.

Floodlight Lamp. Clear, reflector, projection types for outdoor-indoor service; 115 to 125 v.; mogul bases for higher wattages. Sylvania Electric Products, Inc., Salem, Mass.

PLASTICS

Forticel. Straight cellulose ester combined with plasticizers; makes tough, brilliant-finish molding materials and sheets, especially good for housing metal mechanisms; high dielectric strength. Celanese Plastics Corp., 180 Madison Ave., New York 16, N. Y.

PLUMBING, PIPING

Bart Lectro-Clad Process. Internal electroplating of steel pipe (to 18" diameter) with metals, for corrosion-contamination resistance; eliminates use of alloy pipe. Bart Mfg. Co., Inc., 227 Main St., Belleville 9, N. J.

RADIOS

Radios. 1946 models feature 60% more sensitivity and selection. Built-in radio-phonographs; plastic and wood table types, etc. Stewart-Warner Corp., 1826 Diversey Parkway, Chicago, Ill.

WINDOWS AND WINDOW EQUIPMENT

Plastic-Screened Storm and Screen Windows. Standard combination metal windows with **Lumite** plastic screen cloth. Chamberlin Co. of America, 1254 Labrose, Detroit, Mich.

Aluminum Venetian Blind. Aluminum slats, one side polished to reflect heat (dust- and grease-proof), other side heat-resistant, satin-finished. MacArthur Smith and Associates, 134 S. LaSalle St., Chicago 3, Ill.