PROGRESSIVE ARCHITECTURE

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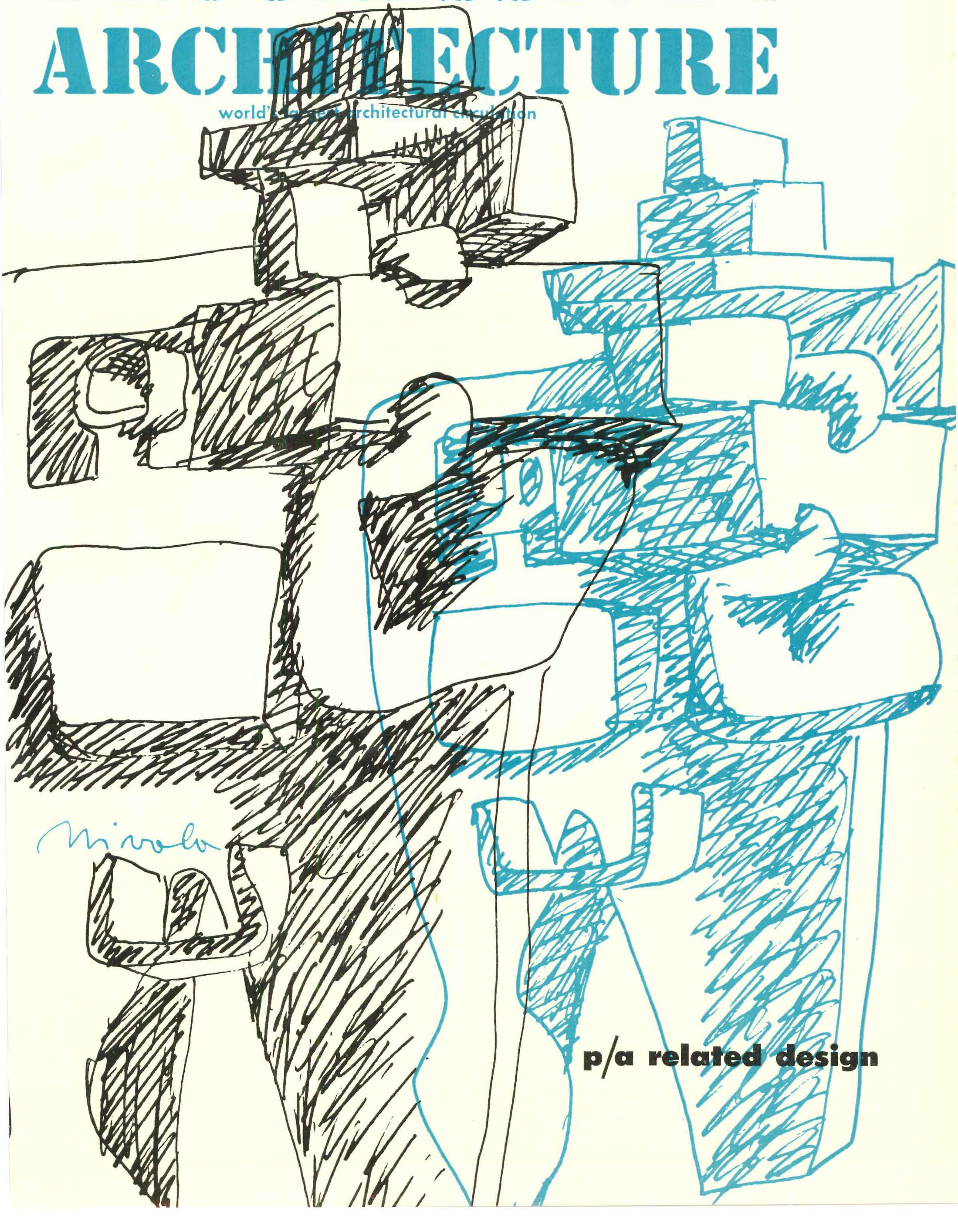

p/a related design

SPECTACULAR ROOF DESIGN—
St. Louis Air Terminal Building

Airport Terminal Building, St. Louis, Mo. Architects: Hellmuth, Yamasaki & Leinw
Structural Engineer: William C. E. Becker; Consultants on Dome Design: Robert
Schaefer of Chicago; Chief Engineer City of St. Louis: W. R. Crecelius; General
tractor: L. & R. Construction Co.; Design of Concrete Mix: Robert W. Hunt Co.; Poz
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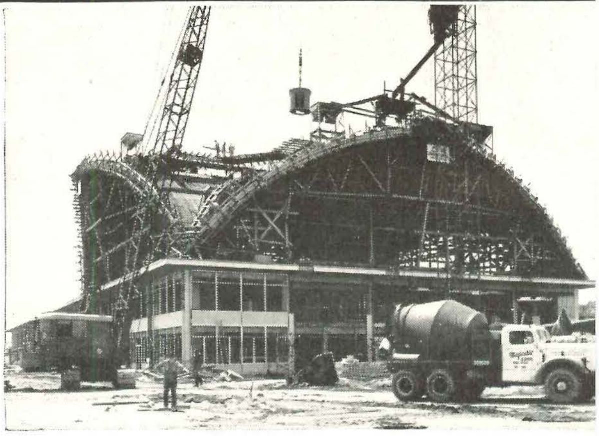
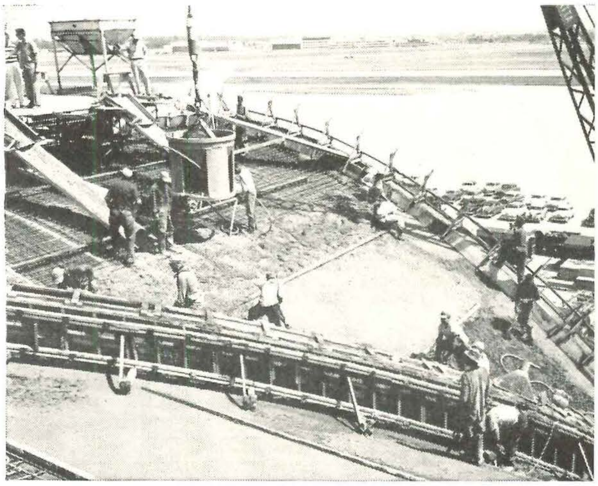


Upper View: Shows roof construction. *Lower View:* Shows placing and finishing concrete. Each dome contains about 400 cu. yds. of concrete and 60 tons of reinforcing steel, and was poured in one continuous operation.



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PROGRESSIVE ARCHITECTURE

April 1956

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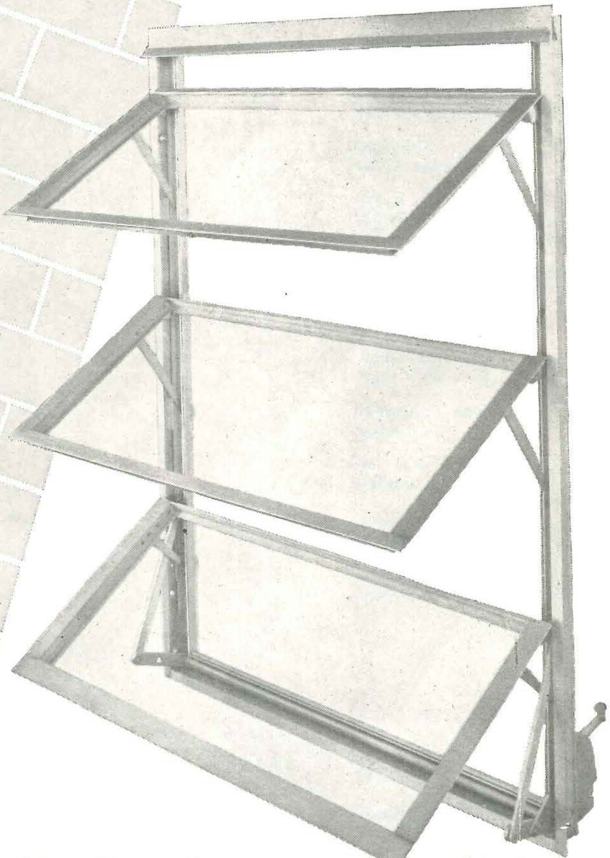

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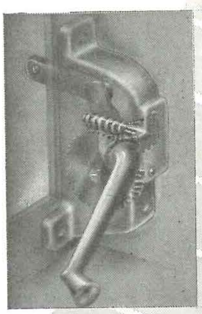

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It's the Law by *Bernard Tomson*

P/A Office Practice *article on the Strengthening and Enforcement of Architectural Licensing Statutes.*

Prior articles have emphasized the importance of militant action on the part of architectural organizations to strengthen architectural licensing statutes and their enforcement (IT'S THE LAW, *December 1949 P/A*). Many states permit the unqualified and incompetent to practice architecture, only prohibiting the use of the title "architect." Other states prohibit the practice of architecture except to duly licensed architects, but provide no effective means of enforcement. In either situation, the public's safety and welfare are jeopardized and the livelihood of the architect is threatened.

During the past four years, the Georgia registration and licensing statute has gone through a series of changes, which has resulted in a much improved law. In 1951, the law of Georgia provided that anyone could legally practice architecture, provided he did not call himself "architect." The law expressly permitted ". . . persons, mechanics or builders (to make) plans and specifications for, or supervising the erection, enlargement or alterations of buildings or any appurtenances thereto to be constructed by themselves or their employees. . . ."

In 1952, the Georgia statute was drastically changed. Plans for all construction over $10,000, except for farm buildings and one- or two-family residences, were required to be drawn by architects. The practice of architecture by corporations was excluded. Architects were required to sign and seal their drawings and a penalty of $1000 maximum or six months' imprisonment was provided. In 1953, the Georgia law was further strengthened by providing an injunctive procedure.

Georgia Chapter of AIA was continually working on plans to strengthen the statute. Many recommendations had been sent to the board which administered the statute. Upon the recommendation of the board, the statute was again amended in 1955 and the changes in the law included many of the recommendations of the Chapter. The statute was redrawn by the office of the Attorney General of Georgia and many provisions clarifying and strengthening the law in respect to qualification, revocation of license, and injunctive procedure were added.

The evolution of the Georgia law is an example of what can be accomplished where the profession itself is active in pressing for action and the co-operation of public officials is obtained. Bernard B. Rothschild, president of Georgia Chapter, in an exchange of correspondence between us, has stated:

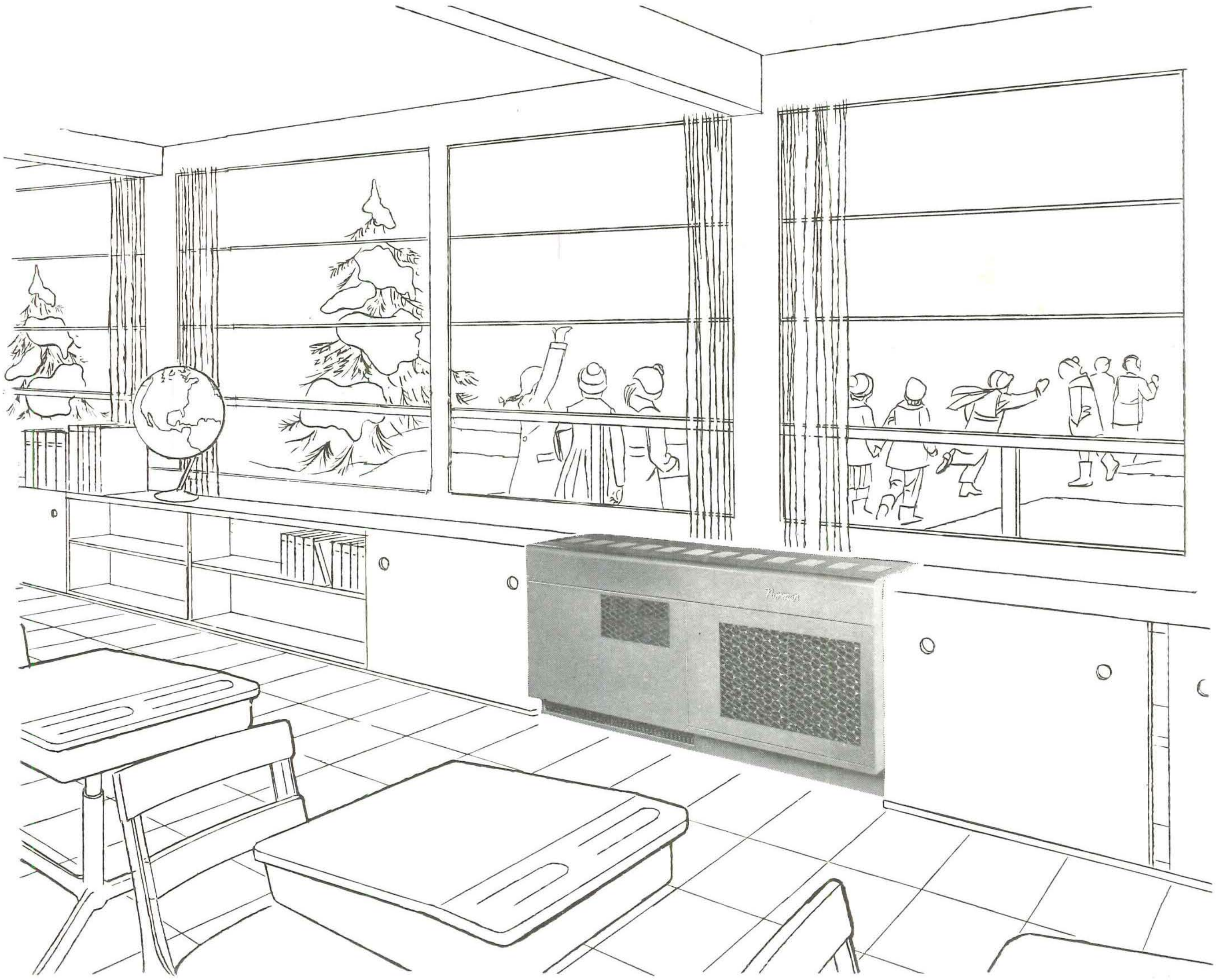
"By and large the law is better than it has ever been and it is approaching the stage where trial and error are proving its workability. The Attorney General's office is working with the Board now to make certain that the law has sufficient teeth. The co-operation between the Board, Georgia Chapter, and the Attorney General's Office is really most gratifying." Rothschild further, however, points out that the Georgia statute requires further change. He states:

"Our law says a corporation cannot *practice* architecture but it can employ an architect to practice for it. This subterfuge permits contractors and others to enter into the architectural profession, with an often unprofessional attitude. I am hoping we will change the law to make firm names contain only the names of living, registered architects or engineers and that all partners, or corporate officers and directors must be registered architects and engineers."

It is a cliché to state that a law is only as effective as its enforcement. Under the Georgia law, for example, I have been informed that there has been no conviction for its violation during the past 16 years. The usual State Board which administers the registration and licensing law often does not have the means or power to investigate possible violations and to police the practice of architecture. Rothschild in referring to the Georgia law points out:

"There is one observation that must be made, however: The teeth in the law are only as good as the enforcing agencies. . . . The next step that we in Georgia Chapter must take—and this is as important as the law itself—is to set up a policing agency. The Chapter is going to have to go to work to see what can be done. . . . How to create and finance the position of deputy or investigator for the Board is the problem we really have to solve. This is a real challenge."

The profession still has much to do in "selling" to the public and to the State legislatures the need for strong legislation with means of effective enforcement arising from the dangers inherent in the practice of architecture by the unqualified and incompetent. There is no substitute for work at the "grass roots" level. Each local chapter must continue and increase its efforts in this direction in its own state. Each State Chapter should consider carefully how to become a policing arm of the State to insure effective enforcement. In many states, the pattern already set up for physicians and attorneys would indicate how enforcement could be made truly effective.



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Mechanical Engineering Critique by *William J. McGuinness*

P/A Office Practice *column on mechanical and electrical design and equipment, devoted this month to Air Conditioning of Socony-Mobil Building.*

With the increasing demand for air-conditioned office space, even at premium rentals, big-building owners today regard year-round air conditioning on the same level with electricity and heating—not any longer as a luxury service but as an essential utility.

Galbreath Corporation, owners of New York's mammoth new skyscraper, the 45-story Socony-Mobil Building, found that an air-conditioning, heating, and ventilating installation designed to fit the building and functionally located for simplified maintenance not only saved thousands of square feet of rentable space, but also reduced by 14 percent the ordinary equipment and installation costs on similar jobs of this magnitude and caliber. Installation costs for the 1,250,000 sq ft of rentable space amounted to about $4.30 per sq ft, considerably below the $5 plus which has been typical for most jobs of this sort. Cost per ton of the 3900-ton refrigeration plant amounted to about $1300, compared with a $1400 average. The same equipment that provides cooled, dehumidified air in summer serves as a heating plant in winter.

The design of this installation differs quite radically from the conventional method of placing all refrigeration in the basement, piping chilled water vertically, and handling the air at each floor level from a heat-transfer and fan room. The Socony-Mobil system makes use of high-pressure, high-velocity (4000-6000 ft/min) air distribution in vertical conduits. Two of these enclosed in a return-air shaft serve the interior zones. Numerous smaller ones (4 to 12 in. in diam), located at alternate exterior columns and supplemented by chilled water at the other exterior columns, furnish the perimeter conditioning.

This distribution permits the concentration of all refrigeration, air-handling, and auxiliary equipment at but three locations: sub-basement, roof, and part of the eighth floor. Much rentable space is saved and the vertical-distribution system is remarkably compact.

The refrigeration plant is divided between the sub-basement and roof. In the sub-basement are three centrifugal machines—one of 500 tons and two of 1000 tons each. Purchased steam operates these machines and then flows at lower pressure to the roof, where it operates three absorption machines with a joint capacity of 1400 tons. The eighth-floor utility space is used for heat-transfer and air-handling units only. Conditioning of the block-square first and second floors is from central units in the sub-basement. Unique, however, is the distribution in the upper stories. Complete, central-station conditioning units utilizing return air and some outdoor air are located on the eighth floor. This may be considered as the center of gravity of the volume of the building, which reduces to a tower at the fourteenth floor. From the eighth, supply is up-fed to the fourteenth and down-fed to the third. Air is returned from these floors through a central shaft. Chilled water originates at the eighth floor and is up- and down-fed at the perimeter, parallel to the vertical high-velocity air conduits. The roof units are identical in principle with those on the eighth floor; they down-feed conditioned air at the interior and perimeter, and produce chilled water for down-feed at the outside walls. This service reaches down to the fifteenth floor.

Six cooling-tower units are located on the roof to serve all refrigeration. The roof units of refrigeration are located near by, resulting in short piping and lower pumping costs.

A strip 15 ft wide around the perimeter of all floors constitutes a peripheral zone. This is subdivided into groups of several stories and also as to directional exposure. Air is received by sill-high continuous cabinets, slowed down, and sound-deadened. It is then discharged upward at the window, inducing flow of room air through the cabinet. The latter passes over coils of chilled water. This is controlled to effect zoning changes and also in response to local thermostats which permit a final adjustment at each bay to satisfy the occupant.

A complementary system distributes air to interior areas. Here, air is pumped at high pressure and velocity through a pair of interior conduits, one containing cool, the other warm air. They are located in the vertical return-air shaft at the core of the building. The proportion of cool and warm air passing into main ducts at each floor can be adjusted by automatic controls. Floor-to-floor temperature needs will undoubtedly vary, but by this "mixture control" method any individual floor can be supplied with the exact temperature desired.

On each floor, lightweight connecting duct branches carry the air outward along the ceiling to control boxes at about the center of every bay. After speed and sound reduction, it is fed through flexible fireproof connections to four ceiling diffusers. The volume of air delivered is controlled by means of a damper. Tenant changes are facilitated by these movable registers which are designed to blend with the ceiling and with the staggered position of the flush-lighting fixtures.

Remarkably little overhead space is required for fitting in the high-pressure spiral ductwork used in the air-carrying loop system. Its slim diameter of only 12 in. is considerably less than that required in conventional air-conditioning systems that operate on low pressure. Much overhead space is thus gained. Moreover, acoustical ceiling material neatly masks all ductwork.

The whole system has been designed to facilitate maintenance, both of the refrigerating, heating, and ventilating plant and of the building itself. One great maintenance advance is expected through the use of electrostatic air filters in conjunction with air-handling equipment. Removing practically all air-borne dirt, dust, soot, and smoke particles—down to 100 times smaller than the diameter of a human hair—the filters will be of immense aid in providing safe, clean, working space.

Centralizing the conditioning equipment on three floors localizes the mechanical maintenance problem. Job modifications which will result in easier maintenance and better control have been effected by Lester Kelly and John Bassett, who will operate the completed plant and who have been on the job to supervise its installation.

Building owner: Galbreath Corporation; Architects, Harrison & Abramovitz and John B. Peterkin; Consulting Engineers: Jaros, Baum & Bolles; General Contractor: Turner Construction Company; Mechanical Contractor: Kerby Saunders, Inc.; air-conditioning equipment manufacturer: Carrier Corporation.

An Important Scientific Contribution
by the National Bureau of Standards
A Law of Appreciating Returns

The Law of Diminishing Returns in Heat Resistance, which affects so many building materials, has been found to be offset by a Law of Appreciating Returns which applies to parallel, reflective spaces.

The *importance* of this LAW will be felt in terms of winter and summer comfort in every kind of building, in fuel conservation, air-conditioning, cold storage. The practical and simple application of this LAW, *at very low cost,* will be about 8¢ per sq. ft. area of top floor ceilings and outer walls.

The findings of H. E. Robinson and F. J. Powlitch, under the direction of R. S. Dill, all with the National Bureau of Standards, were recently published by the Housing and Home Finance Agency in a booklet entitled "The Thermal Insulating Value of Air Spaces, Housing Research Paper 32."

Their findings show that for heat flowing *up* and *laterally,* successive reflective parallel air spaces, follow a law of appreciating returns.

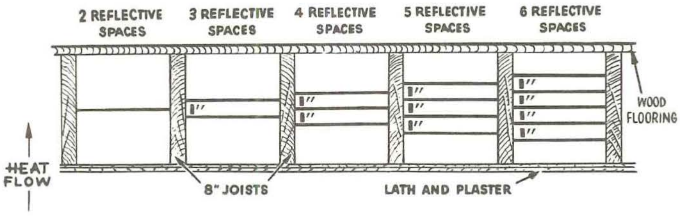
THE EXPLANATION OF THE LAW

If the *temperature difference* between bounding surfaces in an air space is decreased, there follows a significant decrease in convection, which is particularly important in up and lateral heat flow.

Such decrease can be attained, for instance, by dividing 8" ceiling joist spaces with aluminum sheets so they form successive reflective air spaces.

Here's a simple experiment! Assume the depth of one 8" joist space is divided in half by an aluminum sheet; another such space divided in 3 parts by 2 such sheets centered 1" apart; the next space divided in 4 parts with 3 sheets; the next in 5 parts with 4 sheets; another in 6 parts with 5 sheets.

Assuming the original 8" space has a *temperature difference of any fixed amount,* the more the space is divided, the greater is the *division of the*



original spread of temperature; so EACH SPACE CARRIES A SMALLER BURDEN OF TEMPERATURE DIFFERENCE. There follows a *decrease* in convection and a corresponding significant increase in the insulating value of the spaces. This holds true down to space depths of about 1", below which the diminution in insulating value due to increase in conduction because of lessening the depth, becomes the controlling factor.

It was found that *each* 1" reflective space where the joist-space was divided in 6 parts, had greater insulating value than each 1" space where the joist-space was divided in 5 parts; which in turn had greater value than each 1" space where there were 4 subdivisions, etc. The total insulating value in an 8" joist space of 6 such reflective spaces was *more than twice* that of 3 such spaces, more than 50% better than 4 such spaces.

The Thermal Factors below were calculated by Infra engineers, with the use of Research Paper 32. The ceiling joist space was taken as 7⅝" deep; wall stud space 3⅝"; floor joist space 9⅝". For 5 and 6 space side heat flow, 5⅝" stud space was used. The roof was taken as asphalt shingles or roll roofing on 25/32" solid wood sheathing. Air temperatures were assumed as follows:

	Heat Flow	Inside Temp. °F	Outside Temp. °F	Mean Temp. °F	Temp. Diff. °F
Walls	side	70	0	35	70
Ceilings	up	80	10 (attic)	45	70
Ceilings	down	90	120 (attic)	105	30
Floors	down	65	30	48	35

THERMAL FACTORS FOR PARALLEL REFLECTIVE AIR SPACES
(In Btu per sq. ft., per hour, per degree F)
Where Dividing Media are ALUMINUM with .03 emissivity, and PAPER, spaced 1" apart.
Calculated on the basis of work done by the
NATIONAL BUREAU OF STANDARDS
For Housing & Home Finance Agency's Research Paper No. 32

Number of REFLECTIVE SPACES	UP-HEAT C FACTOR	UP-HEAT U FACTOR Attic Floor (roof excluded)	UP-HEAT U FACTOR Ceiling & Roof (unfloored attic)	DOWN-HEAT C FACTOR	DOWN-HEAT U FACTOR Attic Floor (roof excluded)	DOWN-HEAT U FACTOR Ceiling & Roof (unfloored attic)	DOWN-HEAT U FACTOR Floor over Crawl Space	SIDE-HEAT C FACTOR Wall	SIDE-HEAT U FACTOR Wall
4 REFLECTIVE SPACES 2 aluminum sheets 1 paper sheet . . . . ⅞" apart	.106	.084	.082	.035	.032	.032	.039	.069	.057
5 REFLECTIVE SPACES 3 aluminum sheets 1 paper sheet . . . . 1" apart	.082	.068	.066	.031	.029	.028	.033	.051	.044
6 REFLECTIVE SPACES 3 aluminum sheets 2 paper sheets . . . . 1" apart	.067	.058	.056	.029	.027	.027	.028	.043	.038

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Card-Indexing for Manufacturers' Literature

*by Harry Terry**

P/A Office Practice ***column on supplementing the AIA filing system for manufacturers' literature with a Dual-Card-Index System.***

Properly prepared catalogs and other literature from manufacturers of building products are an integral part of any engineer's or architect's office. They are invaluable for technical reference, for prices, and for specification information.

The question is: how they can be used most effectively—a question just as important to the manufacturers who supply such literature as it is to the recipients.

Despite its 35 years of service, the Standard Filing System and Alphabetical Index of the American Institute of Architects lacks complete effectiveness for indexing information on the materials, appliances, and equipment employed in construction and related activities.

The New York Association of Consulting Engineers has developed a dual-card-index system to supplement and utilize the AIA system and to improve its efficiency; a system which could be installed with little, if any, additional expense to architects, engineers, or manufacturers.

The basic AIA system of numbering each item with code numbers from the Alphabetical Index (or having manufacturers do so) permits filing of the material so that rapidity and accuracy of refiling are assured, and an opportunity exists for indefinite expansion of the files. (The Alphabetical Index gives classifications and file numbers for 41 principal product divisions and an alphabetical index of products. Titles of the divisions conform in general to those usually included in a comprehensive construction and mechanical equipment specification. The major division classifications are supplemented by subdivision classifications and file numbers referring particularly to individual types of materials, appliances, and equipment.)

To find something under the AIA system, however, two searches are necessary: one of the manual giving classification numbers under which it may be filed; the other, a search of the files themselves to pick out the desired item.

Furthermore, this system fails to accumulate a manufacturer's literature in one position in the files, inasmuch as they are cataloged by products. Frequently, considerable printed matter must be perused to find one item or even to determine whether such an item is on file. Frequently, also, much printed matter is received by the average engineer or architect that fails to conform to the AIA subdivision classification numbers and hence is "hidden" in the files under some general division number.

In the offices, the system often means wasted time for the engineers, architects, draftsmen, specification writers, and others. In addition, salesmen or manufacturers' representatives often receive hurried calls for literature which cannot be found, even though it may have been received and filed. One reason for this may be that catalogs and other literature are often out of the files and in use—or perhaps are lying in a basket to await refiling—while another prospective user searches futilely, unaware that such material exists in the office.

The index system developed by the NYACE obviates practically all these problems.

It is based on two sets of indexing cards: one based alphabetically on the names of manufacturers, listing their products, and giving the file index number; the other set based on the products, bearing the names of manufacturers. Together, they provide a cross-index locating the catalogs and other printed material without extensive searches of the files. They provide a record also of *what* is on file. Some engineers and architects already are cross-indexing their printed material in this or some similar manner. While the system involves clerical time, it is economical from a standpoint of time saved for professional and technical aides.

The NYACE, after extensive surveys and careful study, is convinced that issuing companies would assure better use of their products by providing such cards originally with their literature. The cost of the cards would be small. They should be suitable for a 4" x 6" card file since, even with the manufacturers furnishing printed index cards, some hand-written ones to be prepared by engineers and architects would be required.

For the architect and engineer, the value of this system seems obvious. Folders containing manufacturers' literature would be filed by the AIA classification numbers, as at present with the AIA system, and the index cards would speedily provide a cross-index for locating material in the catalog file. The product-index cards filed by AIA classification numbers would present convenient groupings of products for rapid location in catalog files; and manufacturers' index cards filed alphabetically would show on one card the products available and the catalogs received from each manufacturer.

These are also distinct advantages for the manufacturer. Certainly, a card-index system would assure better and more efficient use of literature which has been distributed. Thus, there should be an appreciable conservation and more effective use of the material. Too much literature is wasted through duplication and careless handling. It is entirely possible that the additional cost of the cards, if provided by manufacturers, would be offset by resultant economies in printing and distribution costs.

**Public Relations Chairman, New York Association of Consulting Engineers.*

Masonry Walls: Specification Clinic *by Harold J. Rosen**

P/A Office Practice ***column on a clinic to diagnose materials that appear in specifications.***

From time to time this space will be used as a clinic to diagnose materials that appear in specifications. Formats for specifications are plentiful, but information on the chemical and physical properties of materials and combinations of materials, while available in voluminous reports from many sources, requires considerable time to digest, evaluate, and incorporate in new specifications. Carefully planned designs require materials which will not cause the loss of a client because your dream house leaks, doors warp, calking sags, built-up roofs blister, paint peels, and plaster pops.

Let's analyze leaking masonry walls. Leaks in masonry walls are the result of the penetration of water through openings between mortar and brick rather than through mortar or brick. The specification must be written so as to minimize or eliminate almost completely this possibility. Most authorities agree that workmanship, rate of absorption of masonry units, and water retentivity of mortar are the controlling factors affecting the construction of watertight masonry walls.

WORKMANSHIP: Under the heading of workmanship, or laying of masonry, specify the following:

"Brick shall be laid in a full bed of mortar without furrowing. Head-joints in stretcher courses shall have head of each brick fully buttered with mortar. Header brick shall have side fully buttered with mortar. All brick shall be 'shoved' into place so that the mortar oozes out at the top of the joints without reliance on later slushing to fill the joints."

Laying the heavy back-up first and parging its outer face is preferable to laying lighter face brick first. This prevents the possibility of dislodging facing brick when laying heavier units and breaking the mortar bond of the face brick. Parging between face brick and back-up adds to the moisture resistance of the wall. In addition, parging of back-up is less likely to dislodge the heavier units than parging the lighter face brick.

If hollow clay tile or concrete units are used for back-up of face brick specify the following:

"The back-up shall be laid first to header-course height and then the surface of the back-up in contact with the face brick shall be parged with a full ⅜" coat of mortar. Then lay the brick facing, filling with mortar any voids between brick and parging."

The method of finishing the mortar joint has much to do with increasing the resistance to moisture penetration. The tooled, concave joint which compresses the mortar tightly against the masonry units produces the best resistance to water penetration by densifying the surface of the mortar. Joints should be made after the mortar has received its initial set; any initial shrinkage is then compensated for. Specify joints as follows:

"After mortar is 'thumbprint' hard, finish joints with a pointing tool to form a concave joint, using sufficient pressure to compact the mortar and provide a smoothly finished joint with exposed edges of mortar in positive contact with the brick."

RATE OF ABSORPTION OF BRICK: For mortar to reach its ultimate strength and develop full bond with masonry units, it must have sufficient water present to complete hydration. Brick with a high rate of absorption will suck the water from the mortar before hydration is complete, weakening the bond between mortar and brick and inducing shrinkage cracks in the mortar through which water may penetrate. The suction rate of brick, not to be confused with the total water absorption, will determine whether the brick will suck water out of the mortar. Wetting of low-absorption brick or excessive wetting which results in water on the surface of the brick eliminates the proper brick suction necessary to draw the mortar into the pores of the brick and diminishes the bond between mortar and masonry. A simplified method of determining rate of absorption may be incorporated in the specifications as follows:

"The rate of absorption of brick shall be determined by drawing a circle 1" in diameter with a wax crayon on a surface which will be in contact with mortar. With a medicine dropper, place 20 drops of water inside the circle and note the time required for the water to be absorbed. If the water is absorbed in less than 1½ minutes, the brick pile from which the sample has been taken shall be wetted. Wet such brick by playing a stream of water on the pile until water runs from each individual unit. This shall be done several hours before the brick units are used so that no film of water will be present on the brick surface when laid."

Total absorption of brick is of importance also. Hard-burned brick with a total water absorption of less than 4% are generally vitrified or glassy and become extremely difficult to bond with mortar. This permits a separation of brick and mortar and opens up a passage for water leakage. Specify brick having a total absorption of more than 4%.

If concrete block is used for back-up it should be kept dry and laid dry. We will cover the subject of concrete block more thoroughly in a future article.

WATER RETENTIVITY OF MORTAR: In general, water retentivity is a measure of the flow and workability of a mortar. In the laboratory, the water retentivity is determined by measuring the flow of mortar initially and then measuring its flow after removing some of the water by suction. The water retentivity is expressed in terms of "flow after suction" and it has been determined that mortar should have a flow after suction of not less than 70% of the initial flow. Water retentivity is the property of a mortar which prevents "bleeding" or "water gain" when the mortar is in contact with relatively impervious units. Mortars with low water retentivity on controlled tests have been observed to result in more water-permeable walls. Specify as follows:

"Water retention of mortar shall be determined in accordance with ASTM Specification C91 and shall have a flow after suction of not less than 70% of that immediately after mixing."

If however, close inspection cannot be exercised to incorporate these provisions, the designer should give serious consideration to cavity-wall construction.

*Professional Engineer, Architectural Engineer, Research Section, Veterans' Administration.

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REINHOLD

safeguarding Capitol

The letter below, printed by permission of the writer, highlights the present threat to the historic fabric of the U.S. Capitol from zealous Congressmen who must have more restaurant space at any cost. It is not too late for readers who appreciate the 1827 façade to appeal to Congress to "spare that East Front."

C. M.

Honorable Sam Rayburn, Speaker
House of Representatives
House Office Building
Washington, D.C.

Dear Mr. Rayburn: I am taking the liberty of writing you in connection with the proposed demolition of the East Front of the central block of our Nation's Capitol. I am deeply concerned lest that building, which, perhaps in larger degree than any other, stands as a symbol of the integrity and strength of our Government, may have its historic importance jeopardized.

As this part of the façade stands, it is a great original American architectural document, which speaks with honesty and directness about the high architectural quality prevailing in the early days of our young Republic. It offers incontrovertible testimony to the quality of achievement possible at the time our laws were framed and our Nation took form.

Three of our most important architects, historically speaking—Thornton, Latrobe, and Bulfinch—engaged on the design of this part of the Capitol. If we destroy their work, an historical document has been invalidated. The insight that it now gives to the design skill, technical capacity, and methods of workmanship practiced at the end of the 18th Century and the early part of the 19th Century will be destroyed. What replaces it will only have the value of a 20th-Century forgery of an original work.

I realize that a person such as yourself, only too well realizes the great loss that would accrue to the nation if this destruction were permitted. May I respectfully urge that you do all in your power to prevent what future historians and commentators may refer to as an act of thoughtless vandalism.

I realize that a person such as needed in the Capitol, but I do most warmly urge that these facilities be provided in the later 19th-Century parts of the building. The central and immensely important portion of the building under discussion should be allowed no further alteration.

I understand that the American Institute of Architects has offered its services in making a thorough study as to ways in which to provide safely the needed additional space without disturbing the historic façade. I feel confident that they would be zealous and forthright in studying the entire problem.

Happily, the project has not progressed beyond the planning stage at this time. It is not too late to save our making a mistake for which future generations would heavily blame us.

I respectfully urge that no structural changes be permitted in the central part of the East façade at this, or any future, time.

JAMES GROTE VAN DERPOOL, President
Society of Architectural Historians
New York, N.Y.

critique of the month

Dear Editor: The results of the Third Annual P/A Design Awards Program indicate important architectural currents.

The increase of interest in urban development and redevelopment and the quality of the designs commended is very heartening; and this seems to indicate that the efforts of architectural leaders, the architectural schools and professional press

(Continued on page 14)

p/a views

(Continued from page 13)

to emphasize the importance of civic design is beginning to pay dividends.

The designs for specific buildings seem to have encouraging maturity and richness, and it is noteworthy that the awards represent wide geographic coverage.

PROGRESSIVE ARCHITECTURE is to be congratulated for an important program in education on the level of architectural practice.

HARLAN E. MCCLURE
Clemson College
Clemson, S. C.

awards questioned

Dear Editor: When I first picked up the January issue of P/A and looked through it, it wasn't long before I put it down. Now that my first feeling of revulsion has passed I am calmly writing this letter to let you know my reaction to the "Design Awards." I wonder if it was the inability of the Jury to see good design, or if it was because the entries were for the greatest part bad, that such really mediocre designs should even come close to receiving Awards.

Personally, I saw nothing in the submissions, save five of the 49, except dull and unimaginative refinement of conceptions of space and light, which are slowly being wrung dry by small minds. I suppose this is what you meant in your introductory page, "Second, there seems to be a more relaxed attitude toward the handling of contemporary forms than in the past."

I wonder also, if whoever wrote this page really believed it; or was he trying to say something which would make "everybody happy." I realize that yours is a commercial magazine, and that it must sell to keep going, but anemic writing such as this will, no doubt, do more harm than good.

To make my point I should be more specific in my criticism, but to go through all of this mediocrity would just sicken me. I shall choose a few of the worst. I shall also end with a few good words for the designs which showed some spark of thinking and of life.

I couldn't help but laugh when I saw what won the Education Design Award. The design for the Concordia Senior College for the Lutheran Church is about the worst conglomeration of hack form to be called architecture that I have seen to date. The total lack of any kind of thought is so apparent that it seems a waste of time to even discuss it, but since it was given a Design Award somebody should voice a protest against it happening again.

In your introductory page you wrote, "First, there is an obvious concern . . . for planning and for relationship of the buildings to one

(Continued on page 16)

CARIBBEAN REPORT

T. H. Creighton

17 y M Apartment building, Havana, Cuba. Architects: Ernesto Gómez Sampera, Martín Domínguez, Bartolmé Bestard, Manuel Padrón. Structural Engineers: Luis Saenz, E. R. Cancio, Ignacio Martín.

CARIBBEAN REPORT by Thomas H. Creighton

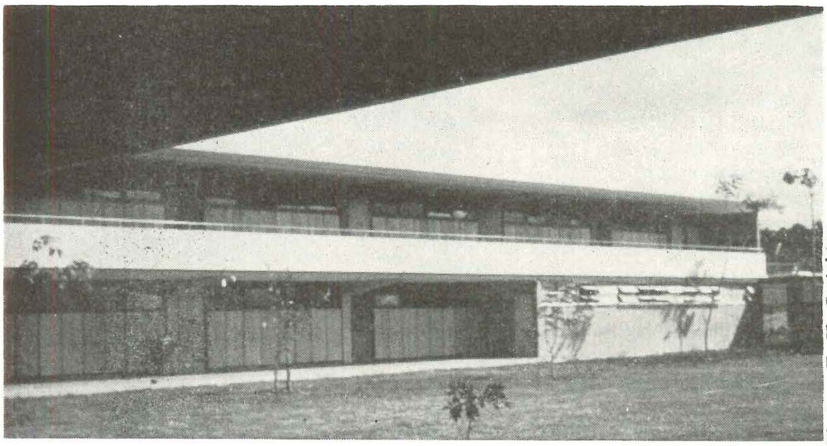
Design and construction activity on the islands which circle the Caribbean Sea—almost all of them now easily accessible by air from the east coast of the United States—is at a remarkably high level. While in some areas (perhaps notably the Dominican republic, where a huge Trade Fair is now in progress) the design quality has been reminiscent of the period we now regard as "modernistic"; in some others, marked advance has been made in adapting contemporary design principles to tropical climates. Examples are shown here from two islands; Cuba, where a large volume of public building and long-range planning under the capable direction of Minister of Public Works Nicolas Arroyo (himself a first-rate architect) and private activity in hotels, apartments, and commercial buildings provides some fine examples; and Puerto Rico, an "Associated Free State" of the United States, where U.S. tourists, U.S. tax-exemption-tempted industry, and a strong desire of the people to raise living and cultural standards have resulted in a design resurgence.

These two islands are used as examples primarily because they provide the best illustrations of local work by local people. Haiti has been handicapped by economics and aside from a few new exposition buildings completed several years ago has little recent work to show. Most of the distinguished current design in Jamaica (such as Stone's Bay Roc Hotel) has been done by New York or Miami architects. In the U.S. Virgin Islands, where tourism has resulted in haphazard homebuilding and moderne hotel expansion, a pleasantly relaxed resort at Caneel Bay on St. John is being completed for Laurance S. Rockefeller by L. Bancel LaFarge, New York architect, with Bryan Lynch as landscape designer.

Cuba's long-range planning and public works program will be documented by P/A as it reaches further realization. José Luis Sert & Paul Lester Weiner have been retained as consultants by the Government, and have helped set up a Junta de Planification, now actively functioning. Among the private ventures most striking is the 39-story reinforced-concrete apartment house shown on page 87, dominating the Vedado section of the city, where a few years ago the U.S. Embassy (*February 1955 P/A*) was the tallest building. Based on a box-frame structure, with "through" apartments sold on the co-operative plan known as "horizontal property ownership," the building sits on a huge block with two floors of parking below grade, two "shopping center" floors at street level, and a recreation park (including swimming pool) at the base of the Y-shaped superstructure. Going through it recently with one of the architects, Ernesto Gómez Sampera, the writer was impressed with the high quality of detail, construction, and refinement of design in a building which, by its very size, *might* have been a monster.

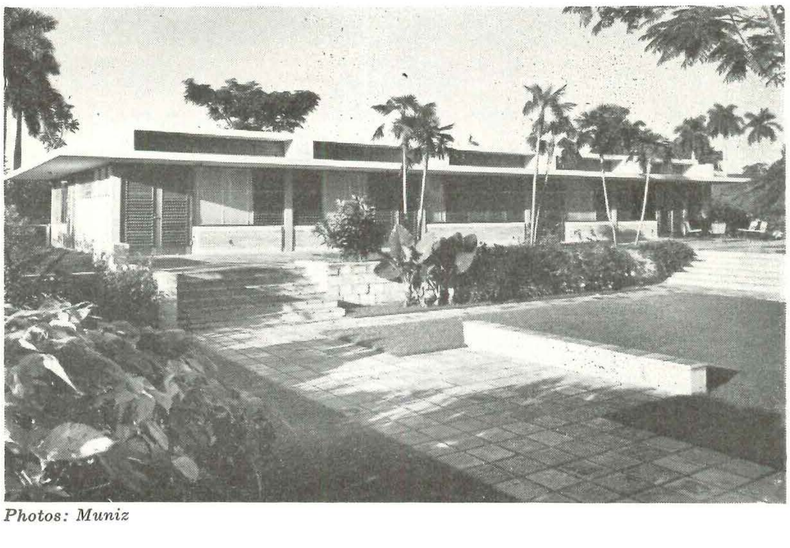
Among the other buildings, the private Morris School (*below*) designed by Arroyo and his architect-wife, Gabriela Menendez, seems outstanding. For all grades from kindergarten through high school, the various buildings are gay and colorful, and at the same time well related to the site, to each other, and to the climatic conditions.

Contemporary houses in Cuba are likely to be well planned to catch the constant breeze, but overdesigned in detail. An outstanding exception recently completed is the house illustrated (*below*), by Harvard-trained architect Mario Romañach. Various terraced levels, as well as the interior rooms, make full use of the possibilities for outdoor living, and the whole has a feeling for scale and

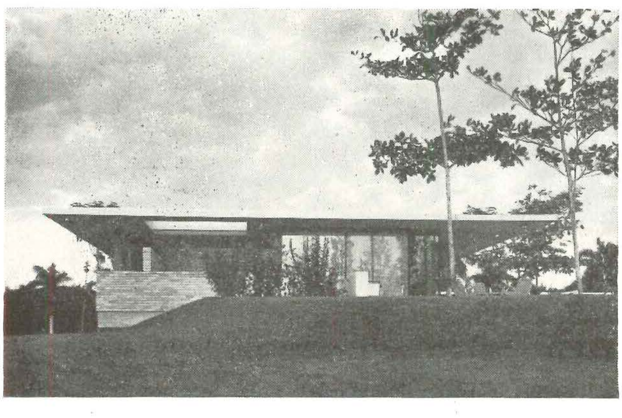


Photos: T. H. Creighton

Morris School (above), *Havana, Cuba. Architects: Arroyo y Menendez.*
Residence (right *and* below), *Havana, Cuba. Architect: Mario Romañach.*



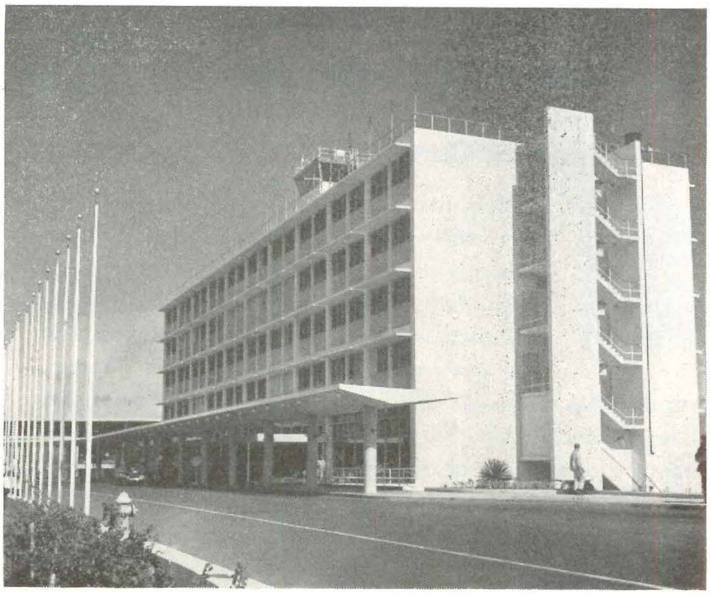
Photos: Muniz



texture that is refreshing.

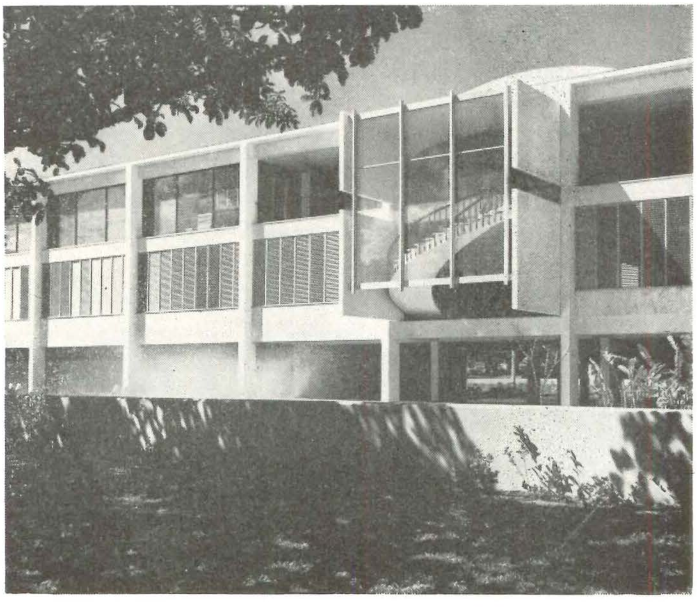
In Puerto Rico there is a tendency, understandable in that flamboyant climate, to be unrestrained in design. The work of two firms stands out. Henry Klumb, highly original designer, is touched slightly with the Frank Llyod Wright brush; and Toro & Ferrer are best known, so far, for their contribution to the design of Caribe-Hilton Hotel in San Juan. Klumb's work at University of Puerto Rico repays a visit by the architecturally minded tourist, and his La Rada Hotel (*below*) is an ingeniously planned and visually pleasant open-corridored building on the Lagoon.

Toro & Ferrer were local architects for both the new International Airport and the Supreme Court Building (*bottom, right*). The Air Terminal, on which they were Associates of Knappen-Tippetts-Abbett-McCarthy of New York, is one of the most thoughtfully planned of the complicated international terminals, and provides a handsome focus for what is a rapidly developing section of San Juan. For the Supreme Court, Warner-Leeds were Associated Architects (primarily for interiors) and the combination has produced a distinguished, dignified public building well planned for the climate (open wood slats allow ventilation), for efficiency (a flexible office unit, with partitions open at ceiling and floor, used as a module), and for the court functions (below the shallow dome). A reflecting pool is before the building, in the direction of a city park.



International Air Terminal, San Juan, Puerto Rico. Walther Prokosch, Architect for Knappen-Tippetts-Abbett-McCarthy, Engineers. Associated Architects, Toro & Ferrer. Photos: Lee Boltin

La Rada Hotel, San Juan, Puerto Rico. Architect: Henry P. Klumb.



Supreme Court Building, San Juan, Puerto Rico. Architects: Toro & Ferrer. Associated Architects: Warner-Leeds.

Washington Report

by Frederick Gutheim

Looking back over five years of experience in promoting modular co-ordination, William Demarest has concluded that there is no doubt that this system of dimensional standardization will find universal acceptance. The only question is how fast this will happen. Demarest has resigned as modular co-ordinator in the national headquarters of AIA, where he has worked since 1950, to become a member of the Washington staff of NAHB. The semantics give a clue as to what has happened to modular in those six years. Five years ago it was called "modular co-ordination" in reflection of the architect's attitude; today it's called "modular measure" to reflect the attitude of industry and builders, the men on the receiving end of drawings and specifications. Much of this change can be traced to the growth of the modular idea as it got off the drafting board and onto the job. But a lot is also due to the five years of skilful and energetic promotion that Demarest put into this little-known venture sponsored by the AIA, the Producers' Council, and allied building interests.

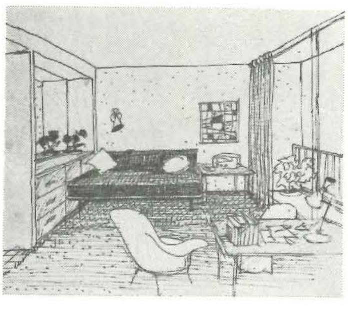
The most significant accomplishment of modular measure was in the field of masonry, where nearly everything is now controlled by the 4 x 4 x 4 dimensional standard. Bricks fit bricks—but they don't yet fit doors. Of equal importance, the architects have been sold on modular. By drafting-room demonstrations, public talks, articles in the "Grid Lines" department of AIA's Bulletin, practical difficulties have been overcome. Scores of architectural offices that have switched to modular have found they have reduced drafting costs. Contractors can be found who refuse to bid on drawings not made to modular principles.

Good as this is, some distance has yet to be traveled before building's dimensional problems have been solved. The continuing industrialization of building is the chief reason why dimensional standardization is imperative in the drafting room, in the manufacturer's catalog, and on the job. This is a bigger job than was envisioned. But dimensional standards need an anthropometric base. Plumbing, kitchen equipment, windows, and doors—indeed the whole of architecture—need to be informed by a kind of research in dimensions that has only commenced. There are problems in measurement, itself, the desirability of the metric system among them, which deserve consideration. If it is agreed that "all dimensioning in building will soon be modular" (as Demarest concludes) then it is time to face the questions that must be solved before building can be improved in design and

News Bulletins

• A HALF CENTURY OF ARCHITECTURAL EDUCATION, exhibition to open at Georgia Institute of Technology, April 29, will show work completed by alumni over past 50 years. Retrospective exhibition is in honor of Harold Bush-Brown, Director of School of Architecture, who is retiring this June after 31 years of teaching.

• Design for 16-story YWCA Metropolitan Headquarters in downtown Pittsburgh—by Pietro Belluschi and Skidmore, Owings & Merrill—will provide unusually attractive living facilities for 150 single, working women. Living quarters, from sixth floor up, to feature private baths, storage, and glass wall opening onto balcony (below); three floors of tower will be occupied by administrative offices and reception areas surrounded by roof terrace. Dining facilities and



Activities Rooms will be located on first two floors, which cover entire site on Wood Street from Third to Fourth Avenues; swimming pool, gym, and bowling alleys will be in basement.

• The James F. Lincoln Arc Welding Foundation is offering $20,000 for ideas to accelerate progress in design or application of arc welding. Competition (open to all U. S. citizens) closes July 30. Write: The James F. Lincoln Arc Welding Foundation, Cleveland 17, Ohio. . . . 1956 Leather in Decoration Design Competition—awarding seven $1000 prizes—is sponsored by The Upholstery Leather Group to encourage use of leather in architecture and design. Competition (open to professional architects and designers) closes May 20; write: Design Competition, The Upholstery Leather Group, Inc., 141 E. 44 St., New York 17, N. Y. . . . Rendu for 1956 LeBrun Traveling Scholarship—$3000 grant for six months' travel in Europe—will be held April 30. Nomination forms and programs for "A Town Center" are available from Chairman Benjamin Lane Smith, LeBrun Committee, New York Chapter, AIA, 115 E. 40 St., New York 16, N. Y.

• Jury for AIA's Eighth Annual Honor Awards Competition announces selection of five Honor Awards and 14 Awards of Merit, to be presented at Convention in Los Angeles, May 15-18. Honor Awards winners: John Lyon Reid & Partners, for Hillsdale High School, San Mateo, Calif.; Philip C. Johnson, for Hodgson House, New Canaan, Conn.; Wurster, Bernardi & Emmons, for Center for Advanced Study in Behavioral Sciences, Inc., Stanford University operationally preplanned through this method.

The chief need is for a new organizational sponsor for modular measure and the related kinds of dimensional work. This has now become a broad movement rather than a project. It involves all building interests. Rank and file, no less than management and professional men, are all concerned. Demarest's idea is that a large conference-type membership organization concerned with all aspects of dimensioning in building is needed. Draftsmen and foremen, superintendents and mechanics, as well as architects, manufacturers and contractors, would belong. Men who lay out building work, who today have no organization except a trades union to which they belong, could come together here to advance their occupational and craft interests. In this broader form of organization, Demarest believes, a realistic, practical, effective development of what has been so well begun can be undertaken. Here is a bold plan that deserves serious consideration, not only by the AIA and Producers' Council committee (which has sponsored Demarest's work in the last five years) but by a more representative audience they should call together.

• UNDERCURRENTS: An enlarged program of international cultural exchanges is in prospect, but there is little likelihood of action on the more comprehensive Arts bills proposed by Rep. Frank Thompson. • Eric Gugler's design for a Theodore Roosevelt memorial here is an armillary sphere to be erected on an island in the Potomac. • Only Congressional action can now alter Central Intelligence Agency's plan to build its $49-millions headquarters, designed by Harrison & Abramovitz, on a rural site at Langley, Va. • Foster Dulles has also secured White House support for an exemption to dispersal standards, and will build a greatly enlarged $50-millions State Department, Washington's single, biggest, government building, five blocks from the White House. • One of the greatest local planning controversies has been concluded by the decision to route a new heavy-duty inner-loop expressway along the north side of the Tidal Basin, rather than south along the Potomac. • The National Auditorium Commission has dropped sports events from its program, and in its final report (due May 1) will concentrate more on music, theater, and arts activities. • The largest Federal building outside Washington will be the $45-millions lease-purchase building planned as part of the new San Francisco civic center. • Federal aid for education is indefinitely stymied in the House Rules Committee. • Senator Lehman's bill to create a Federal middle-income housing program (S. 3158) is not likely to receive favorable action in any form, but it should measure the political appeal of such a program. • Inventory shows a 21.4% of continental U. S. is Federally owned land, and even in Washington, D. C., the figure is only 29.8%. • A detailed $125-millions improvement program to be executed over the next 10 years has been announced by the National Parks Service. • Topping the Smithsonian's building program is a $33-millions budget request for a Museum of History and Technology, on a site facing the Mall.

Grounds near Palo Alto, Calif.; Hellmuth, Yamasaki & Leinweber, for Lambert-St. Louis Airport Terminal Building, St. Louis; and Skidmore, Owings & Merrill, for Manufacturers Trust Company Fifth Avenue Branch, Manhattan.

• *Look* Magazine invites nominations for "Community Home Achievement Awards"—nine top awards to be given to cities and towns for developing and improving residential areas during 1956. Citizens, public officials, or civic groups may obtain nomination blanks and rules (due June 1, 1956) from Raymond Ruffio, Building Trades Manager, *Look* Magazine, 488 Madison Ave., New York 22, N. Y.

• Architectural League of New York presented awards to winners of Annual Gold Medal Exhibition at dinner held March 15. Gold Medal in Architecture went to Leo Lionni, Designer, and Giorgio Cavaglieri, Architect, for Olivetti Showroom and Offices, San Francisco. Honorable Mentions in Architecture: Paul Thiry for Northeast Branch Library, Seattle; and Eero Saarinen Associates, Architects, with Anderson, Beckwith & Haible, Associated Architects, for MIT Auditorium and Chapel. Gold Medal in Sculpture: Marshall M. Fredericks of Royal Oak, Mich. Gold Medal in Mural Decoration: Fred Conway of Ladue, Mo. No awards in Landscape Architecture or Engineering.

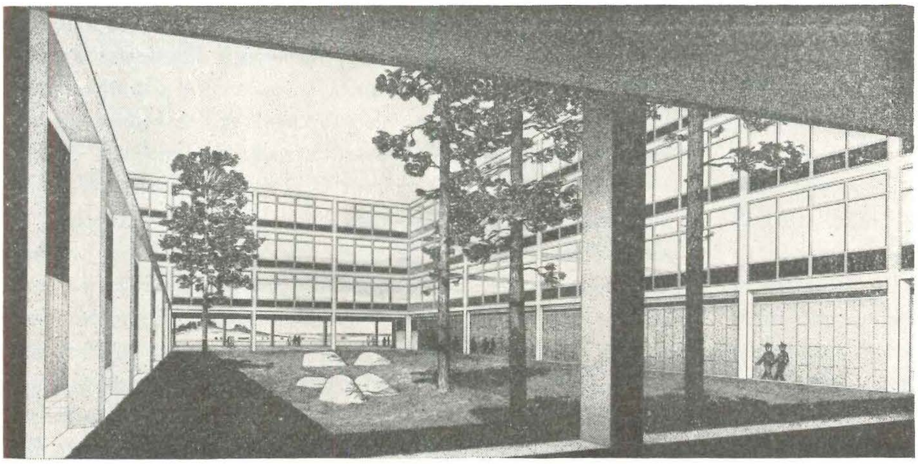
• Aluminum Company of America Foundation's $2500 grant to RPI will finance series of lectures—to be known as "Alcoa Lectures in Architecture"—by eminent architects and outstanding men in allied fields.

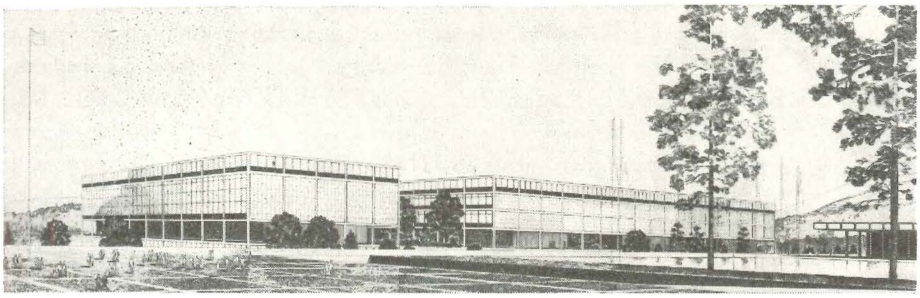
Lawrence Williams

• New 13-story office structure overlooking Philadelphia's historic Independence Mall, was designed by New Orleans Architect Charles R. Colbert. Building, located at Fourth and Chestnut Streets, is sheathed in glass, aluminum, and granite.

• Six architectural firms have been invited to enter competition to design new $3.5-millions John M. Olin Library at Washington University, St. Louis, Mo. Drawings, to be judged May 4-5, will be submitted by: Hellmuth, Obata & Kassabaum, Inc.; Jamieson, Spearl & Grolock; and Murphy & Mackey, all of St. Louis; Louis I. Kahn, Philadelphia; Caudill, Rowland, Scott & Associates, Bryan, Tex.; and Edward D. Stone, New York City. Construction of air-conditioned structure is expected to begin in March 1957.

• Arthur L. Guptill, 64, architect, author, and publisher, died in Stamford, Conn., Feb. 28. His first book, "Sketching and Rendering in Pencil" (1922) was also first book of *Pencil Points Library;* Guptill also taught at Pratt Institute and Brooklyn Museum, was co-editor of *American Artist,* co-founder of Watson-Guptill Publications, Inc., in 1937, and founder of Amateur Artists Association of America in 1951.





Air Force Academy Buildings OK'd

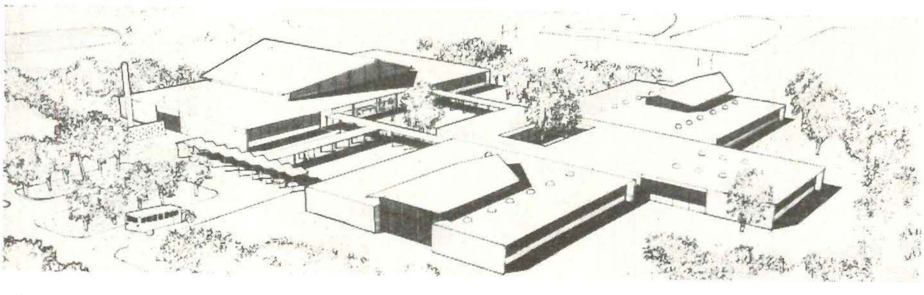
COLORADO SPRINGS, COLO., March 12—Exterior design of all buildings planned for the academic area of the new Air Force Academy (with the exception of the chapel) has been approved, Secretary of the Air Force Donald Quarles announced today. To be constructed on the 17,500-acre permanent site seven miles north of here, the final designs (*classroom building, left*) represent restudy of original concepts. Skidmore, Owings & Merrill, principal Architects-Engineers; Welton Becket, Pietro Belluschi, Roy Larson, and Eero Saarinen, Architectural Consultants; Lawrence W. Roberts, Engineering Consultant; Lt. Gen. H. R. Harmon, Superintendent of the Academy; Col. A. E. Stoltz, Director of the Air Force Academy Construction Agency.

New Eames Lounge Chair Uses Feathers and Down

NEW YORK, N. Y., March 14—Unveiled today was the latest of Charles Eames' remarkable innovations in seating developed for Herman Miller Furniture Company—a super-comfortable, tilting, swiveling, lounge chair and ottoman. Not least remarkable about the combination is price—$600 in muslin; $680 upholstered in soft, black leather; also available in Naugahyde or Alexander Girard fabrics.

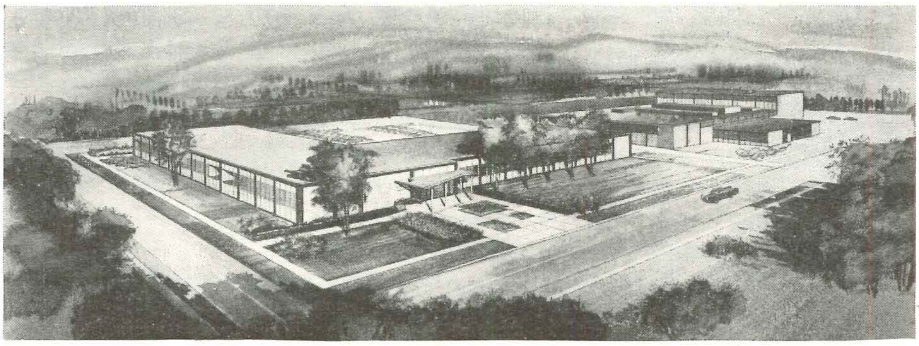
Parts include three molded-plywood shells of rosewood-face veneers joined by black-enameled, cast-aluminum spacers, attached through neoprene "shock mounts." The five-pointed chair base and four-footed ottoman support are also enameled, cast aluminum. Seat cushion has a foam-rubber core, enveloped in feathers and down; interchangeable, detachable back cushions are wholly feathers-and-down filled.

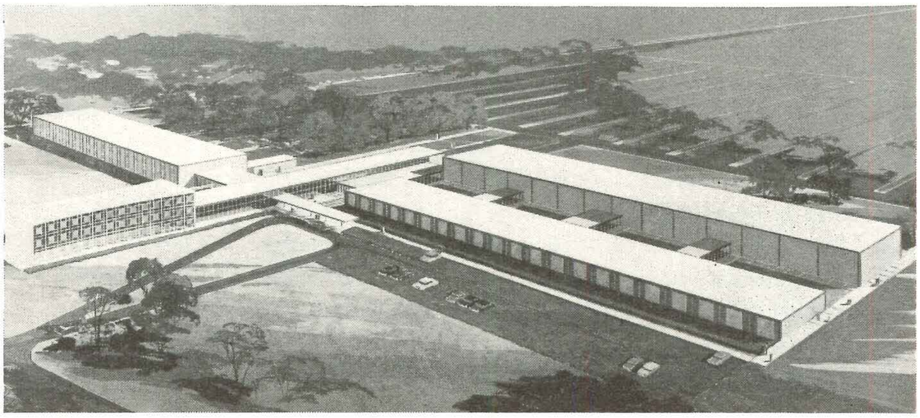
Winners of St. Louis School Design Competition Announced



On the basis of a competition, open to all registered architects in the St. Louis metropolitan area, Hellmuth, Obata & Kassabaum, Inc. were selected as architects for this proposed Junior High School. Jurors for the Parkway Consolidated School District Competition were: William W. Caudill, Charles R. Colbert, and George D. Englehart, with Buford L. Pickens as Professional Advisor. Second place went to Eric W. Smith, Jr. & Robert E. Entzeroth; Honorable Mention with Special Recognition, to Joseph Passonneau.

Two Air-Conditioning Manufacturers Build New Units





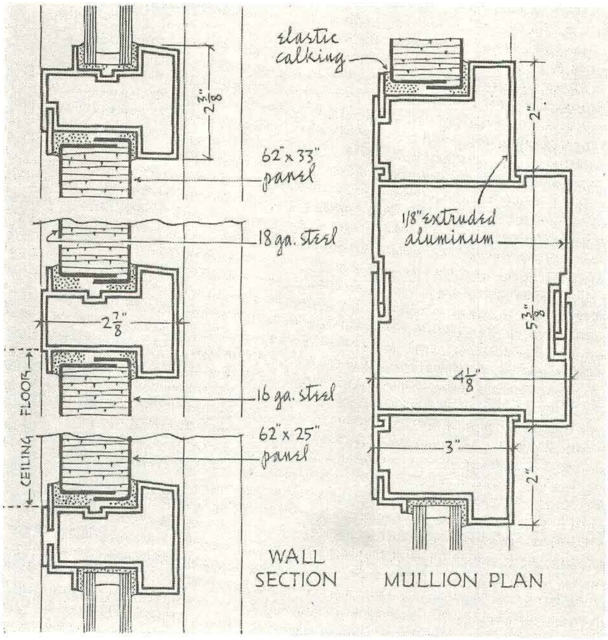
Plans for extensive building programs have been announced by the Trane Company of La Crosse, Wisconsin and Carrier Corporation of Syracuse, New York. The L-shaped building (*top right*) will house Trane's engineering departments, as well as conference rooms, dining, and other adjunct facilities. F. A. Fairbrother is the Architect for this building; George H. Miehls, Engineer; Albert Kahn, Associated Architects & Engineers, Inc., Consultants. Rendering (*right*) represents the new headquarters, research, and development buildings for the Carrier Corporation. Project Architects and Engineers are Schmidt, Garden & Erikson; Carson & Lundin, Consultants; Clarke & Rapuano, Landscape Architects.

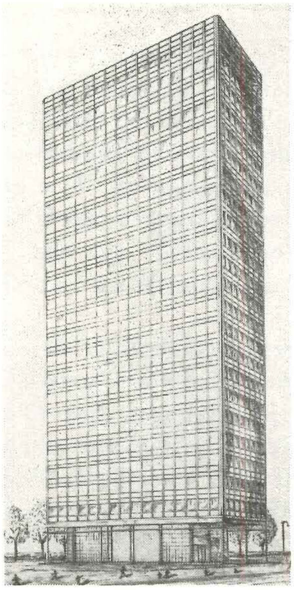
Tallest West Europe Office Building To Have Aluminum, Porcelain-Enamel Wall

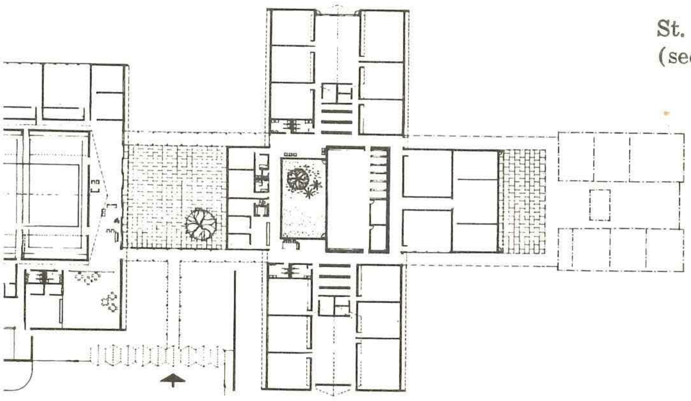
Düsseldorf, Germany, will soon claim the tallest office building in Western Europe. The 26-story structure will be clad with a curtain wall composed of 1800 light-blue porcelain-enameled panels, extruded-aluminum mullions, and double-glazed windows (*right*). Owner Mannesmann, A. G., one of Europe's largest steel producers and fabricators and German licensee for porcelain-enamel products developed by The Bettinger Corporation, Waltham, Mass., will use the latter's methods in manufacturing the walls.

The insulated panels (to be set from within) will be made of two steel shells enclosing a cement-impregnated, kraft-paper core filled with vermiculite. Exterior surfaces will be enameled and inner facings will be bonderized.

Mannesmann's architectural department, headed by H. Knothe, designed the curtain wall in collaboration with Bettinger engineers.







St. Louis School
(see acrosspage)

Flashing Fluorescent

For the first time, 40-watt rapid-start fluorescent lamps will flash on and off. Flashing has been made possible by General Electric's new circuit design involving continuous heating of lamp cathodes while current is switched on and off. This development will permit new animation for translucent signs. Besides standard and de-luxe whites, red, gold, green, blue, and deep-blue colors are available.

Financial News

by William Hurd Hillyer

The fateful ides of March have come and gone, without impact of the economic disaster feared by certain soothsayers. However, April's inconstant skies disclose signs that are dampening the ardor of many meliorists. For the first time in half a dozen years, some banking authorities confess that there are two divergent views of the outlook, neither of which they definitely adopt.

Since all quarters concede that the remainder of '56 will be a time of directional changes closely affecting construction and architecture, a briefing of this double approach as set forth by the Federal Reserve Bank of Kansas City is profitable. The "optimistic" side is first presented. The bank notes an increase in the average one-family dwelling from 1140 sq ft in 1954 to 1170 in '55, plus the inclusion of more appliances, such as washers and air conditioners. Resultant cost increase of about $1400 in the median new home price is expected to more than absorb a numerical downturn and lift the dollar outlay on housing by some 2% over 1955. Other hopeful factors include: Gross national product rising to an estimated $410 billions annually; plant and equipment expenditures at a projected $32 billions for '56; substantial backlog of industrial orders, with markets expanding; reversal of Federal downbeat.

The "pessimistic" angle reveals, as principal sources of hazard, a lessening rate of residential construction, growth of consumer and mortgage debt, inventory behavior, declining sales and production of automobiles, difficult farm-income situation. As a general conclusion, the Kansas City Federal Reserve maintains that dour forecasts are typically "qualitative," and that "quantitative" signficance cannot easily be attached to each factor.

Frankly cheerful is the Federal Reserve Bank of Chicago. Admitting that "some of the steam has gone out of the business boom," the Midwest "Fed" avers that no sharp decline in the current high-level business pace is sighted. On the other hand, "impressive sources of strength" are discoverable. This outlook is shared by the Federal Reserve Bank of San Francisco, which considers the situation "highly favorable" despite evidences of a slowdown in business expansion and a marked residential construction decrease. The bank feels that such downward movement may be reversed by the uplift of improved FHA-VA mortgage terms.

Certain commercial banks of large caliber are likewise stressing reassurance. The advance in over-all production and trade has come to a halt, New York's largest national bank admits; but there are few indications of a decline, and the downcurve in housing construction is "flattening out." The Guaranty Trust Company of New York, after due recognition of prevailing "cross-currents," opines that the sharp quarterly rise in personal saving may mean that consumer attitudes have begun shift toward restraint.

• Residential building standards will be substantially raised if a nationwide drive—launched this month by the U.S. Savings & Loan League—is successful. The undertaking is part of that organization's program to celebrate the 125th anniversary of the savings-and-loan business. Its avowed purpose is to improve the quality of new construction financed by savings and loan associations, which furnish 38% of all home buying money.

"It is the job of the architect," asserts U.S. Savings & Loan League's Walter Dreier, president, to find continually new and advantageous living space in the homes that are built under rapidly changing conditions. Dreier calls for a "complete re-examination" of building programs, now that the postwar housing shortage has disappeared. He maintains that tomorrow's buyers of new houses will be for the most part families that have paid off their mortgages or built up substantial equities in their present domiciles. For the benefit of these discriminating purchasers, the USS&L president declares that new privately built houses will require new ideas, designs, interiors, all with engineering features abreast of the latest technological advances.

• A $10-billions market for residential remodeling and repair during 1956 is envisioned by the special committee formed under U.S. Chamber of Commerce sponsorship and Government blessing, to encourage home improvement. The committee includes manufacturers, dealers, builders, lenders, who are said to be in conference nationwide, formulating a sales program under the caption "56—The Year to Fix." Most of the contracts are expected to cost more than $1000 and a great many will require architectural services.

• Shopping centers as branch-bank sites are the latest subjects of official scrutiny. Standards have been set up by the New York State Superintendent of Banks to evaluate requests for branch-bank locations therein. These standards include over-all dimensions of shopping center; size of buildings, extent of remaining area and parking accommodations; property zoning; available water, sewer, electricity. Does the developer own the land? Has financing of this center been arranged? Have plans been filed? Has contract been let for the center, and if so, when will excavation begin and what date is set for completion? Details of signed leases are targets of inquiry. The New York Banking Department proposes to charge a $250 fee for exploring these questions on behalf of applicants. For clients toying with the idea of building in a shopping center, architects might find data along such lines of use, no matter what the client's business project.

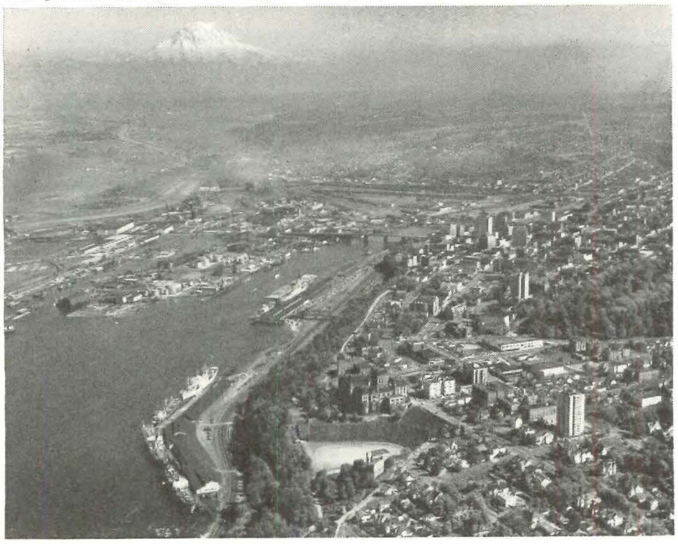
• As the year progresses, "mild adjustment" is ticketed by a leading credit and financial authority as a small price to pay for free enterprise. "No doubt in modern days," says Executive Vice-President H. H. Heimann of the National Association of Credit Men, "we can reach the objective of preventing what might be called a business disaster" comparable to that experienced in 1929. "That we can acquire perpetual prosperity, however, is most doubtful."

the architect and his community

With the exception of Mrs. Price, all the architecturally trained members of the staff appear in photo (left to right): Robert Waring; Donald Seifert; James Jacobs; R.B.P.; Art Forbes; and Robert Jones, Associate.

Their community: Tacoma—"Gateway to Rainier National Park"; population: 156,000; important sea and rail terminal, manufacturing center, and recreation crossroads.

Air photo: Harry R. Boersig; Courtesy of Tacoma Chamber of Commerce



Robert Billsbrough Price: Tacoma, Washington

For nine years now P/A has periodically published "The Architect and His Community" series—reports on architectural firms whose practices in their localities have been (1) consistently distinguished in design and (2) of the widest diversification. We have reported on the work of small offices in small communities and large, established firms in major cities. The office of Robert Billsbrough Price—less than seven years old—is the youngest firm we have documented to date.

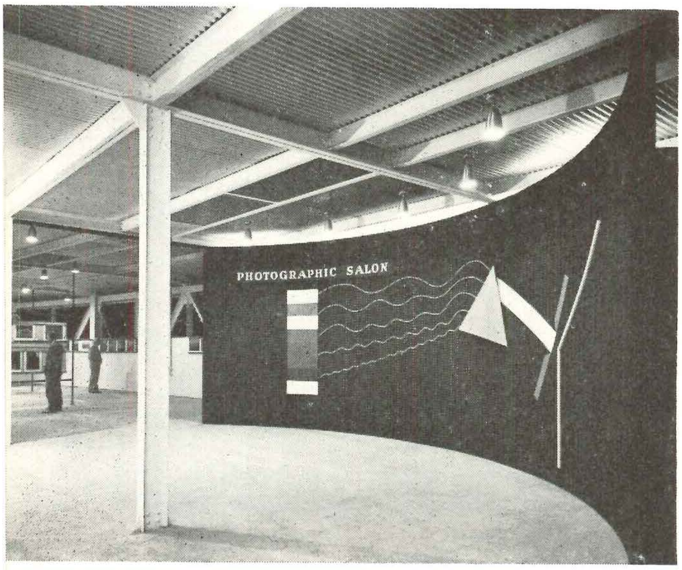
Price's background includes schooling at the College of Puget Sound; study of architecture at the University of Washington; a Lieutenancy in the USNR Air Corps, with service in England, Pearl Harbor, Australia, India, and China; and an M.A. degree from the Massachusetts Institute of Technology (1948). Before opening his own office late in 1949, he worked in the offices of others as both draftsman and designer. His wife, Joan A. Price (B. Arch., U. of Wash., 1947) has worked with him from the start. "However," Price tells us, "the raising of a family has slowed this department some."

Among Price's distinctions and affiliations are former Presidency of the Tacoma Society of Architects; Corporate Member of the American Institute of Architects; former Board Member of the Washington State Chapter of AIA; Board Member of the Southwest Washington Chapter, AIA; Member of the National Committee of AIA Department of Education and Research; Member of the Tacoma Chamber of Commerce; past Presidency of the Tacoma Art League; and Member of the Tacoma Building Code Committee.

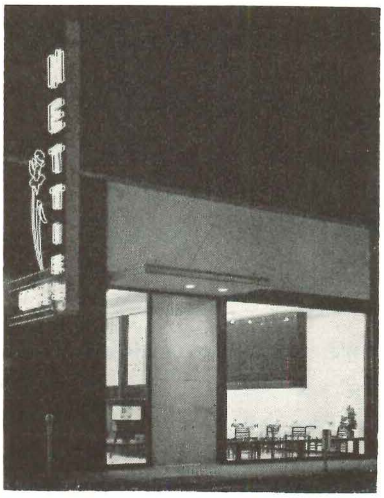
Choice of Tacoma as the location for his office was an obvious one for Price. It was his home, and "my belief was that the advantages were as great here as elsewhere. I love the country; many of my school and college friends live there . . . I have not regretted my decision."

Photos: Dearborn-Massar

the architect and his community: Robert Billsbrough Price

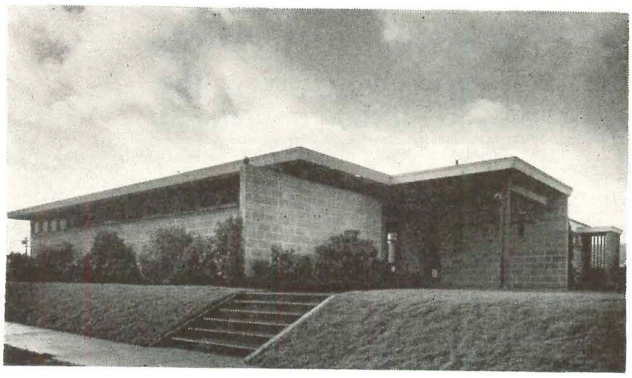


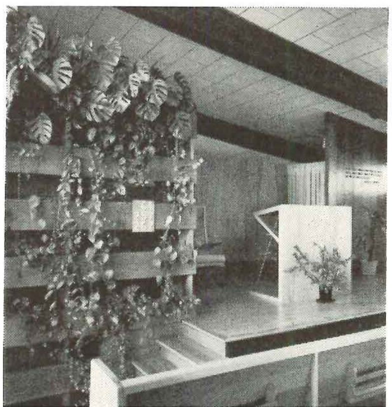
Exhibition space: Western Washington Fair



Restaurant: Puyallup, Washington

Christian Science Church: Olympia, Washington





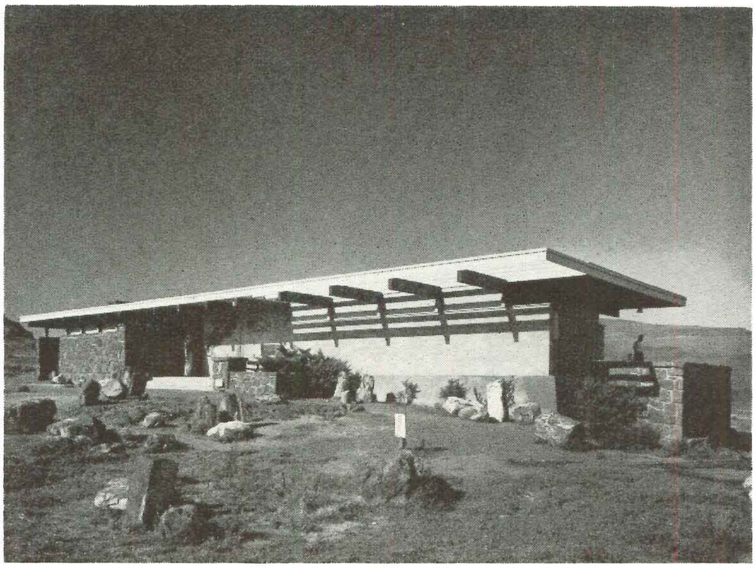
"Service—architectural service," Price says, is the basis of his practice and philosophy. "To every client we try to give our very best. We do no pot boilers. If we take a job, it is with the understanding that to that individual it is the most important commission in the office." This attitude, he feels, not only makes each job more interesting, but also makes friends. "Without staunch and loyal friends for whom we have done work (who are also our public-relations spokesmen), we would soon dry up."

As to design itself, "I do not subscribe to any one school of thought. My personal belief is, that is the easy way out. To become simply a disciple of one of the 'greats' has no merit, much as I may admire and appreciate his work." For his own convictions, Price feels particularly indebted to Lionel Pries of Washington and Gyorgy Kepes, of MIT.

"I believe that no client ever made an architect do a bad job," Price comments. "No client made us use bad proportions or work out a poor *parti,* etc. Some jobs turn out better than others, of course. For those that don't, I blame myself."

Price sees the architect as "one of a group of specialists. Because of his position as originator, conceiving the solution of the problem, he should act as co-ordinator." However, he views practice as far from a one-man show, rather as a team including the structural engineer, the electrical engineer, the acoustical engineer, landscape architect, artist, and sculptor. "If these consultants can be inspired to go beyond the problem and be made to feel they are contributing not only their part but also toward the success of all other phases of the problem, the job has a much better chance of being a really fine project." And this most certainly applies to the draftsmen, too. "This feeling should extend to the sheet composition of the drawings and into the wording of the specifications. . . . All should be made to feel responsibility for every detail."

In addition to Price himself, the firm consists of six architecturally trained persons and a secretary-receptionist. Usually Price develops preliminaries himself. Thereafter, he makes no effort to define



The Sherman Elementary School (top) *in Tacoma is one of several schools the Price firm has designed (at the moment they have four in the office). Photo shows the kindergarten first-grade play court with its highly decorative roofed shelter. Construction of the school employs prestressed-concrete beams; precast - concrete columns; precast-concrete spandrels; and manufactured, long-span, acoustically treated steel roof decking. Superintendent in charge of construction was James A. Hopkins.*

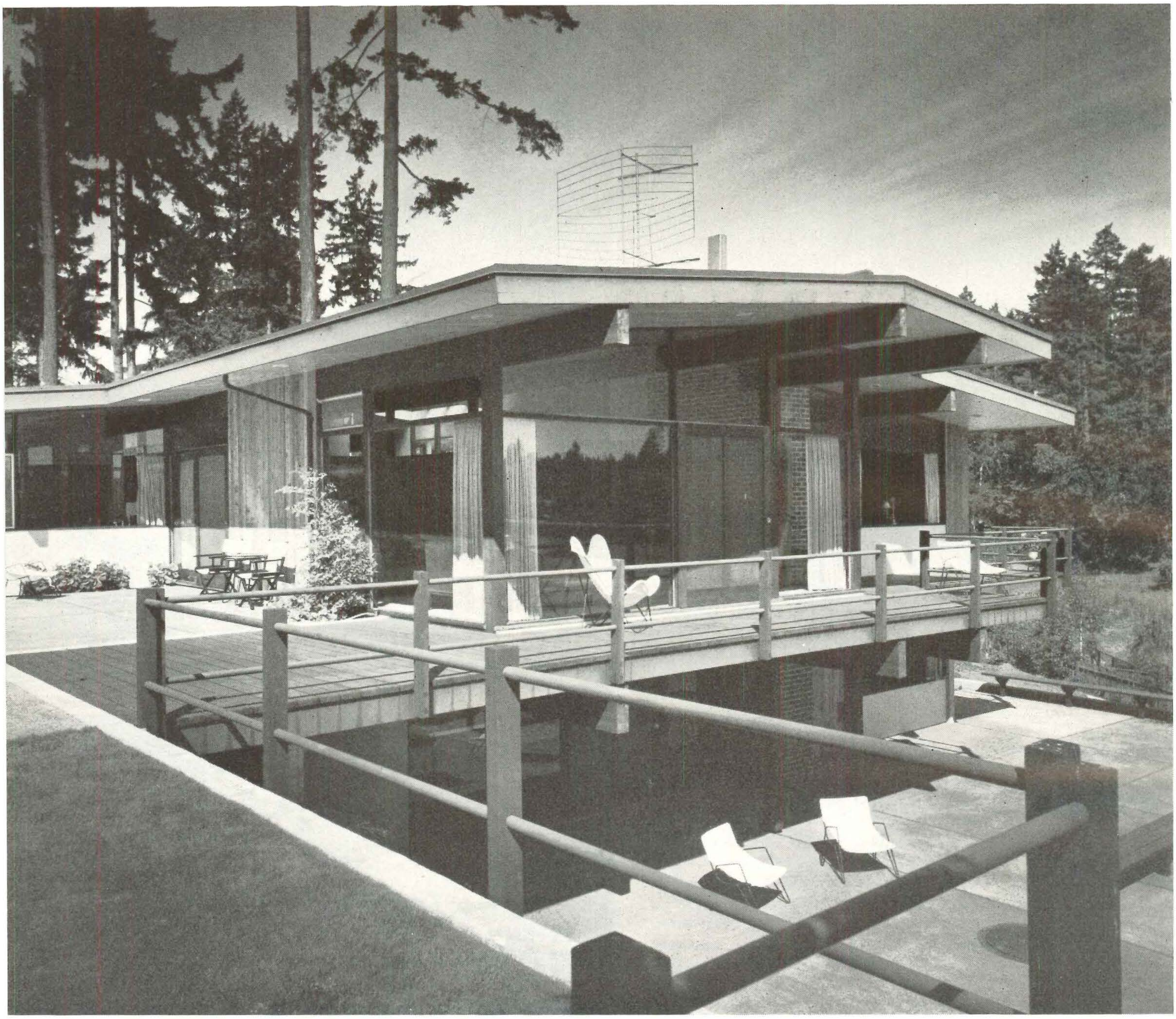
The Ginkgo Museum (right) *in Washington's Ginkgo Petrified Forest houses displays of stone relics of the Ginkgo trees that grew on the site prior to the ice age. Associated with Price was Carver L. Baker, Architect for the State Parks Commission.*

duties, though one man usually follows the job through. "We make it a practice to work very closely with the contractor and subcontractors, not only on the job but also during the actual designing. If there is one myth we wish to dispel, it's the 'Architect in the ivory tower.'"

Preliminary drawings are kept very rough. Consultants—sometimes the entire office force—are called in and "we hash the whole program over. . . . Only when we have arrived at what we believe to be the very best solution, do we make our presentation to the client."

Currently the firm has about $4,672,000 of work under way. "This is more than ever before, and yet the coming year looks better than this." Asked whether he would prefer more specialization, Price replied: "I'd like it to continue just the way it has been going. We have plenty of diversity and . . . I do not wish to specialize. I believe this is the surest way in the world to get into a rut."

house



A long, narrow strip of wooded land that falls away to the east some 35 feet to the shore of American Lake and a distant view of Mount Rainier was a governing factor in the design of this Tacoma home of parents, two young girls, and a boy of high-school age. No small part of its harmonious relation to site derives from the fact that Lawrence Halprin, Landscape Architect, worked from the start with Price and Associate Robert M. Jones. "This is as it always should be," Price comments.

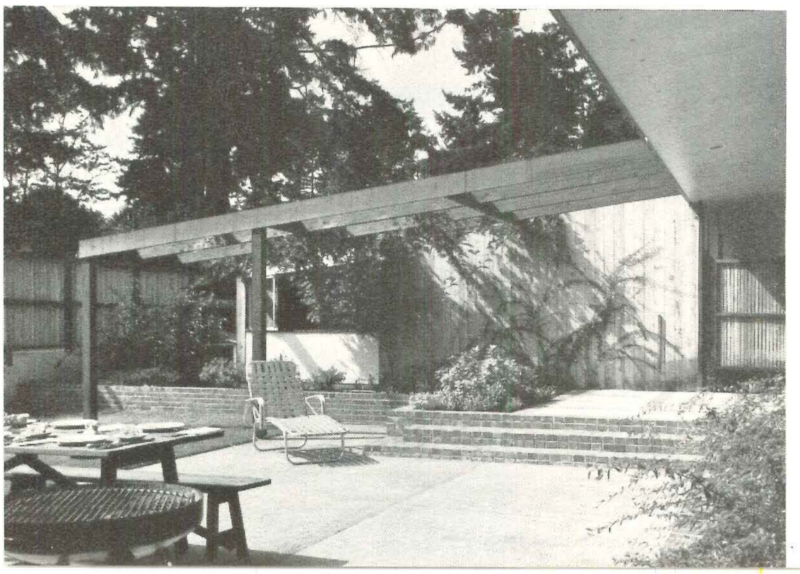
The house was placed as near the lake as the slope would allow, to make the water view a daily part of living and so that the children, even when on the swimming float below, could be supervised from the house. Because much of the family's interest centers around the children and their friends, a complete area on the basement level (*not shown*) was designed for their use, including a recreation room and shower and dressing facilities. In addition, notice the children's bedroom wing that overlooks the sheltered, south-facing inner court. The extraordinary kitchen/utility/eating wing of the house forms one wall of this court enclosure.

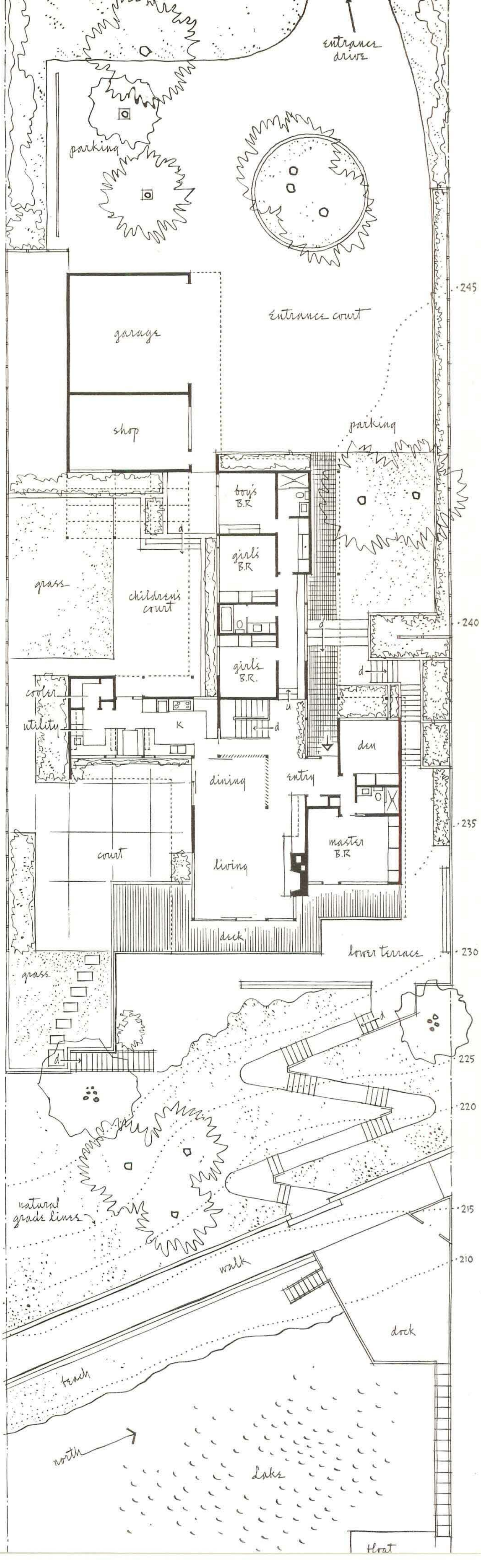
Framing consists of laminated columns and beams, with 2″x8″ joists covered by plywood roof sheathing and built-up roofing. Exterior siding is rough-sawn cedar, with accent panels of pale-yellow, plastic-surfaced plywood. Sash, decking, posts, etc., are redwood. Heating is by oil-fired boiler, with baseboard radiation, chiefly, and some wall-mounted convectors.

Extension of the side yard beyond the house, toward the lake (acrosspage), *is a design element for which Price gives the landscape architect full credit. "This enables one to look back at the house," he remarks, "a suggestion that made the scheme much better in my estimation." The lower terrace adjoins the children's recreation room.*

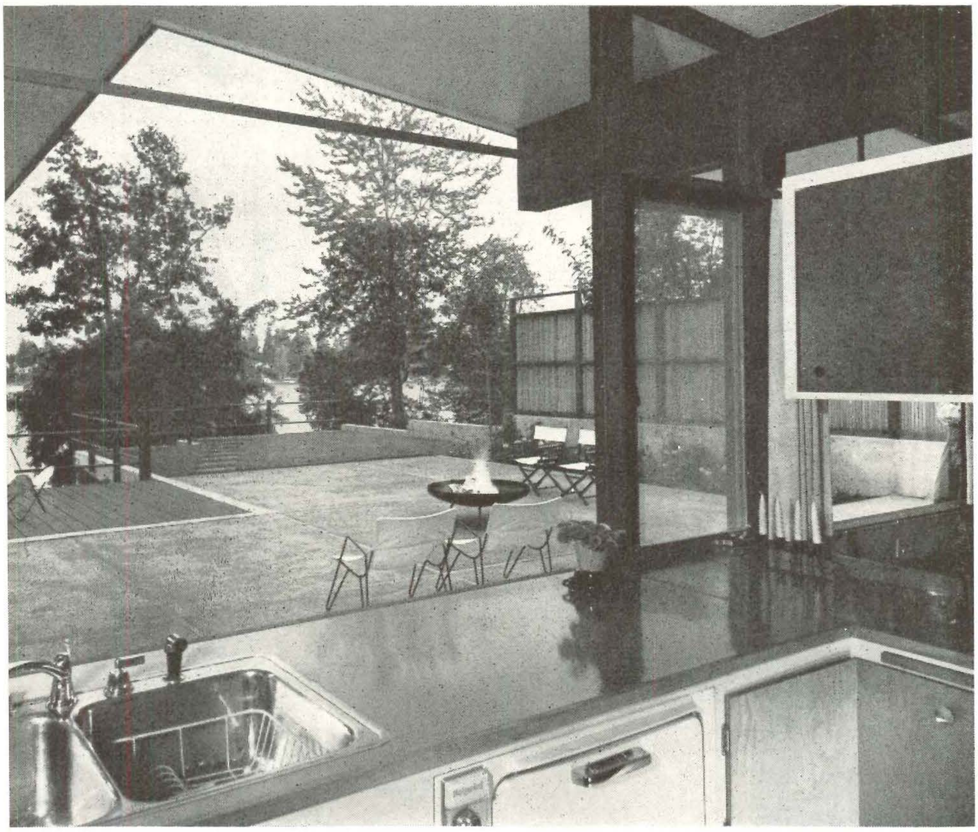
The glazed and planted corner of the entrance hall (above) *offers a view of the stepped up entrance walk.*

The inner court (below) *provides privacy and enclosure—sometimes a welcome change from the extreme openness of the view side of the house.*





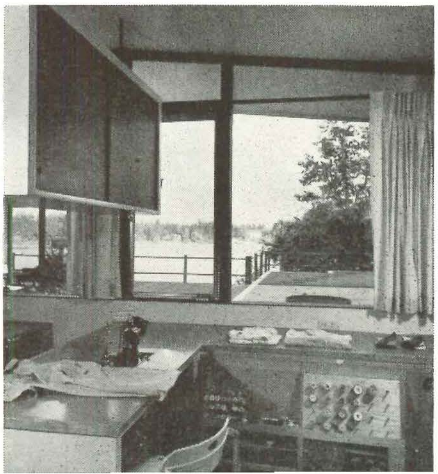
the architect and his community: Robert Billsbrough Price

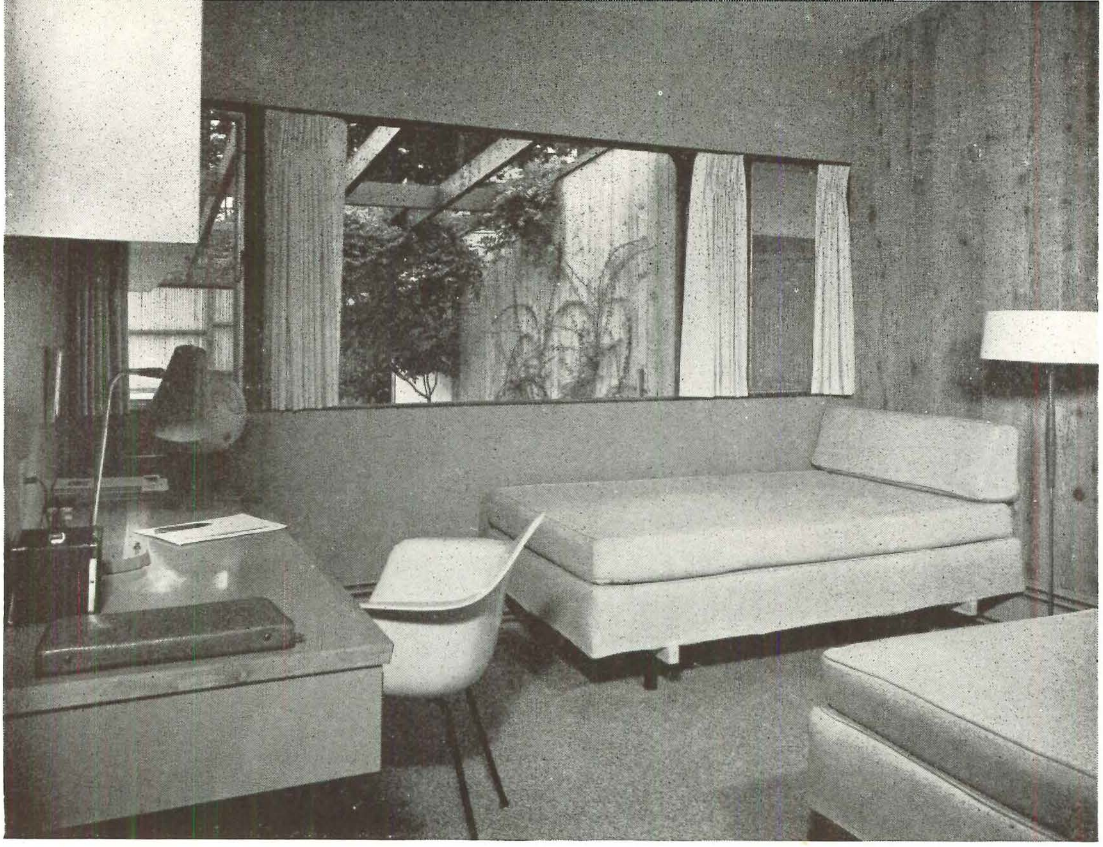


From the forward deck adjoining the living/dining wing of the house (above), *the view of the lake and distant shore is an everyday experience for this fortunate family.*

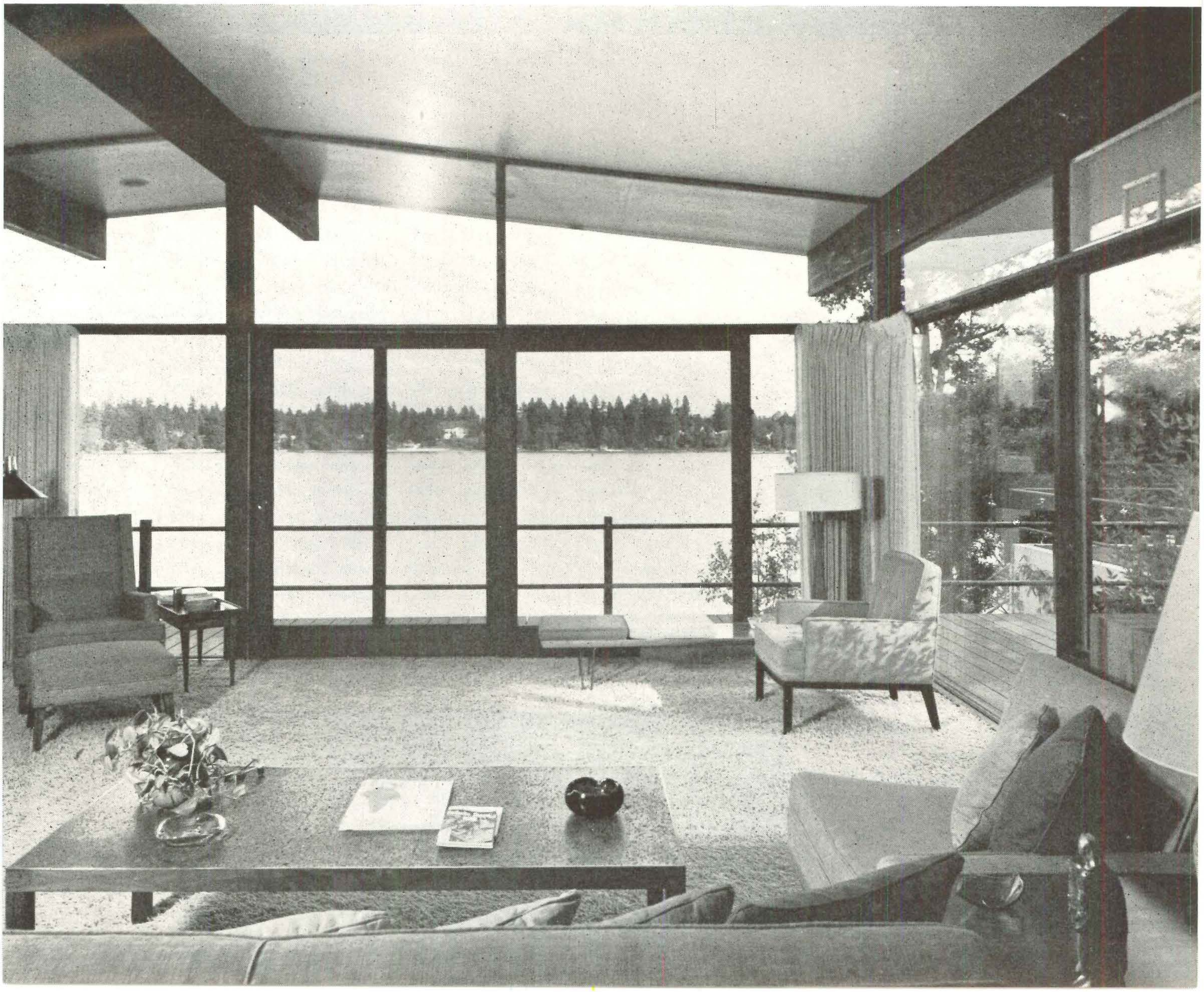
Even the kitchen sink (left) *commands a serene outlook across the terrace to the water beyond.*

A specially fitted sewing corner (below) *occupies a portion of the kitchen/eating/utility room, whose functional elements are separated by low storage-and-work units or ceiling-hung cabinets.*

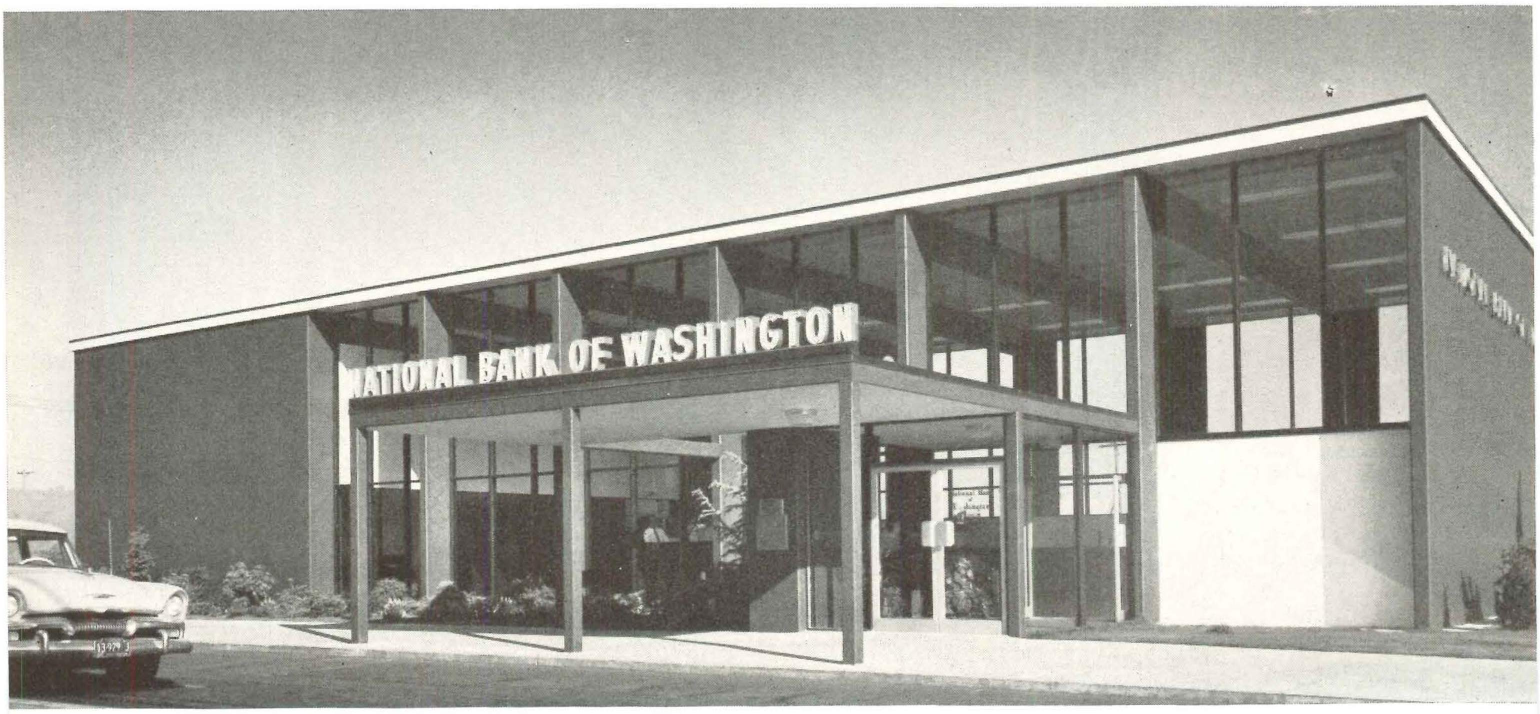




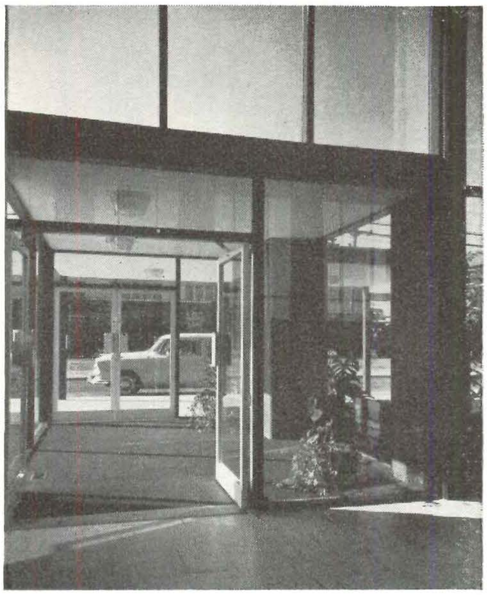
The house interiors were developed by Ted Herreid, who, Price observes, "did a very fine job." General Contractor was Swen Johnson.



the architect and his community: Robert Billsbrough Price



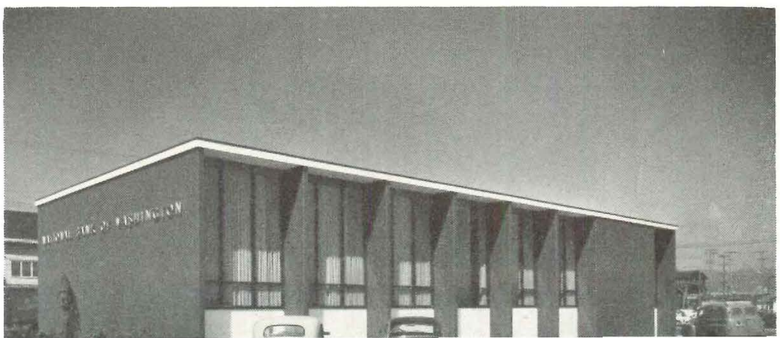
bank

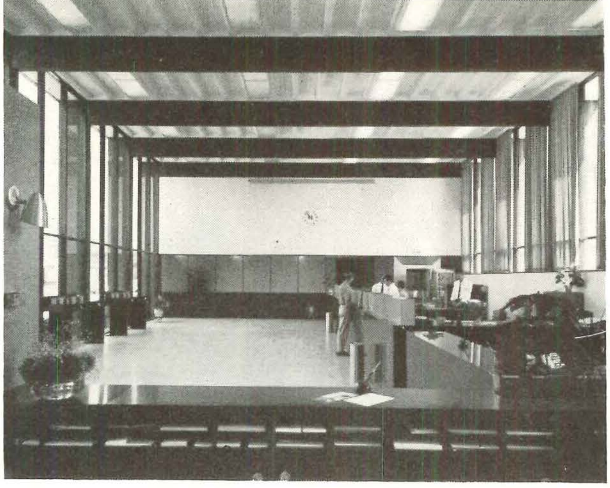


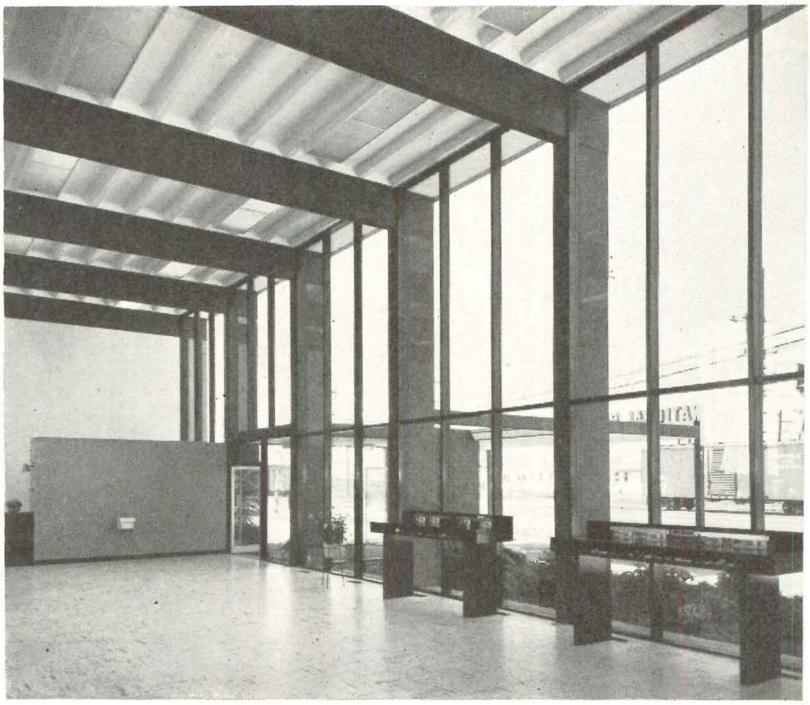
The basic program for this Industrial Branch of the National Bank of Washington called for a bank of approximately 2800 square feet with the customary administrative and service facilities, plus a work area that would be readily accessible but screened from public view. The corner site, in the center of Tacoma's rapidly expanding manufacturing area, was anything but routine, for it consisted of reclaimed tideland with the water table less than three feet below the surface. From this condition derives not only the unusual structural scheming but the finished design expression as well.

The choice was between an expensive system of piling or—the system selected—"floating" the building. To avoid differential settlement within the building, the floor slab is designed as a two-way, reinforced-concrete mat 12 in. thick, increasing to 18 in. under the vault. All building loads are carried to the perimeter of the slab, and weight is distributed over the entire building area.

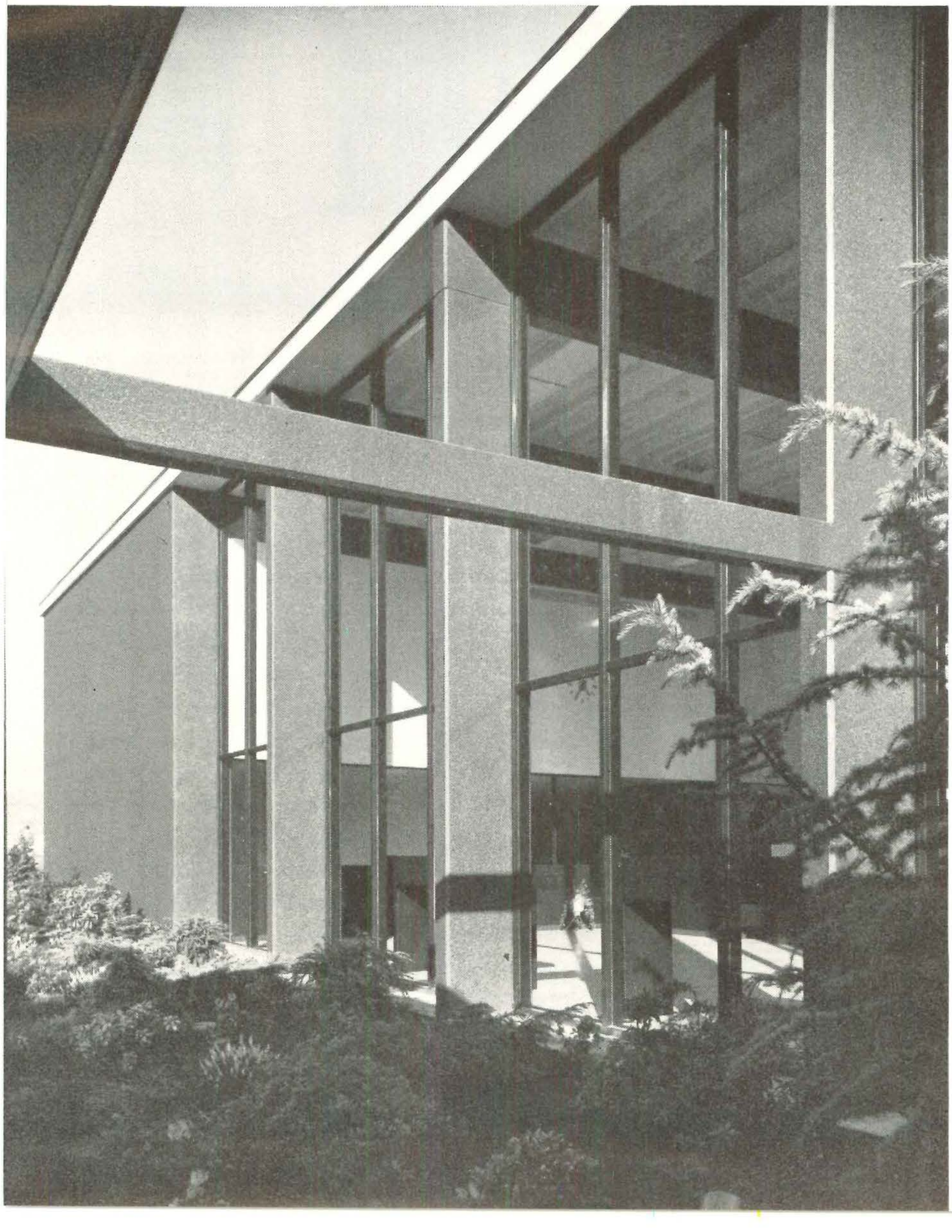
With the exception of solid walls, all of the concrete structure was factory produced, either precast or prestressed. To resist transverse seismic forces, the main frames are treated as rigid bents. Joints between precast column and prestressed roof beams are moment resisting—accomplished by making beam lengths equal to the clear span between columns plus half the column depth.

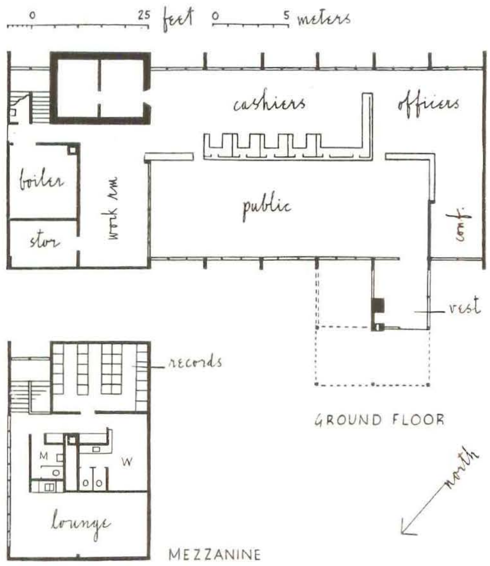






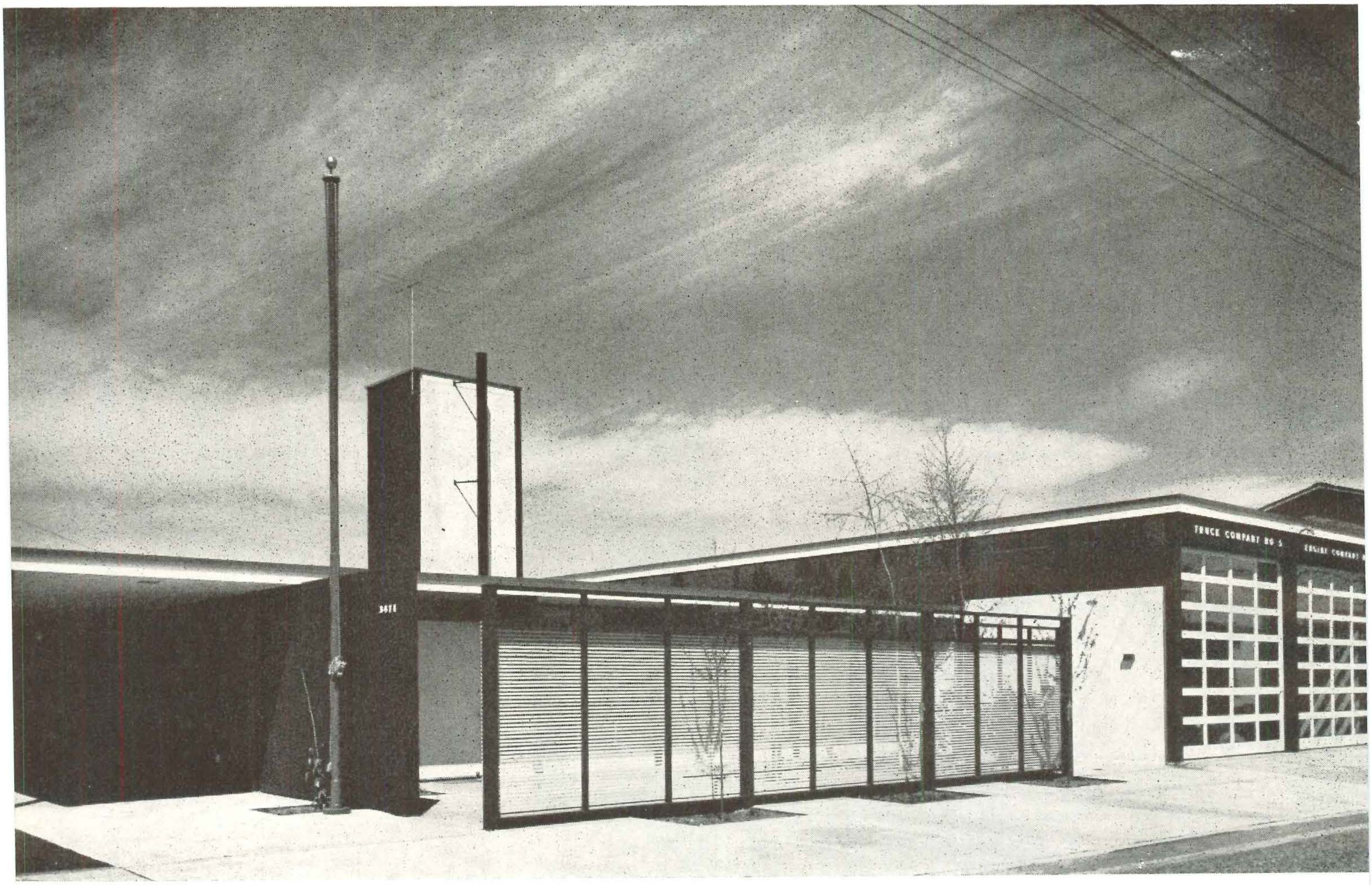
The structural frame is a dark red-brown; the spandrels, white. Inside, exposed roof slabs are white, and pumpkin is used as a color accent. The end walls are surfaced with perforated, pressed-wood paneling over 1½-lb-density, glass-fiber, acoustical blanket. Heating is by a hot-air perimeter system. Associated with Price on the job were Dr. Arthur Anderson, Structural Engineer; Earl P. Whitson, Mechanical Engineer; and Walter S. Gordon, Electrical Engineer. Concrete Engineering Company was General Contractor.





the architect and his community: Robert Billsbrough Price

fire station

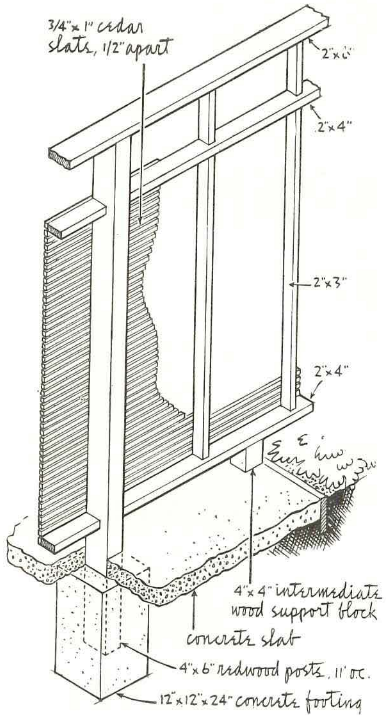


Undoubtedly the prime requirement for a fire station, other than provision of the different spaces needed, is for rapid access to the engines and trucks, wherever the men may be when an alarm occurs. And here, it will be noted, doors to the apparatus room (for a 1000-gallon pumper and 75-ft aerial ladder truck) open directly from the living/dining area, the locker-room/bath unit, and the dormitory. Accommodations were required for a crew of eighteen men and six officers, with six men and two officers on duty at all times. For desired sunlight, the living spaces—treated as a single area with only partial subdivisions—face south. For privacy, a slatted fence borders the sidewalk and defines a pleasant paved and landscaped entrance court. The men's dormitory and officers' room are placed toward the rear, away from street noise. And a hose-drying tower occurs in easy proximity to the apparatus room as well as providing a vertical design element. At the back of the building is a tinkering and parking area for the men's own cars.

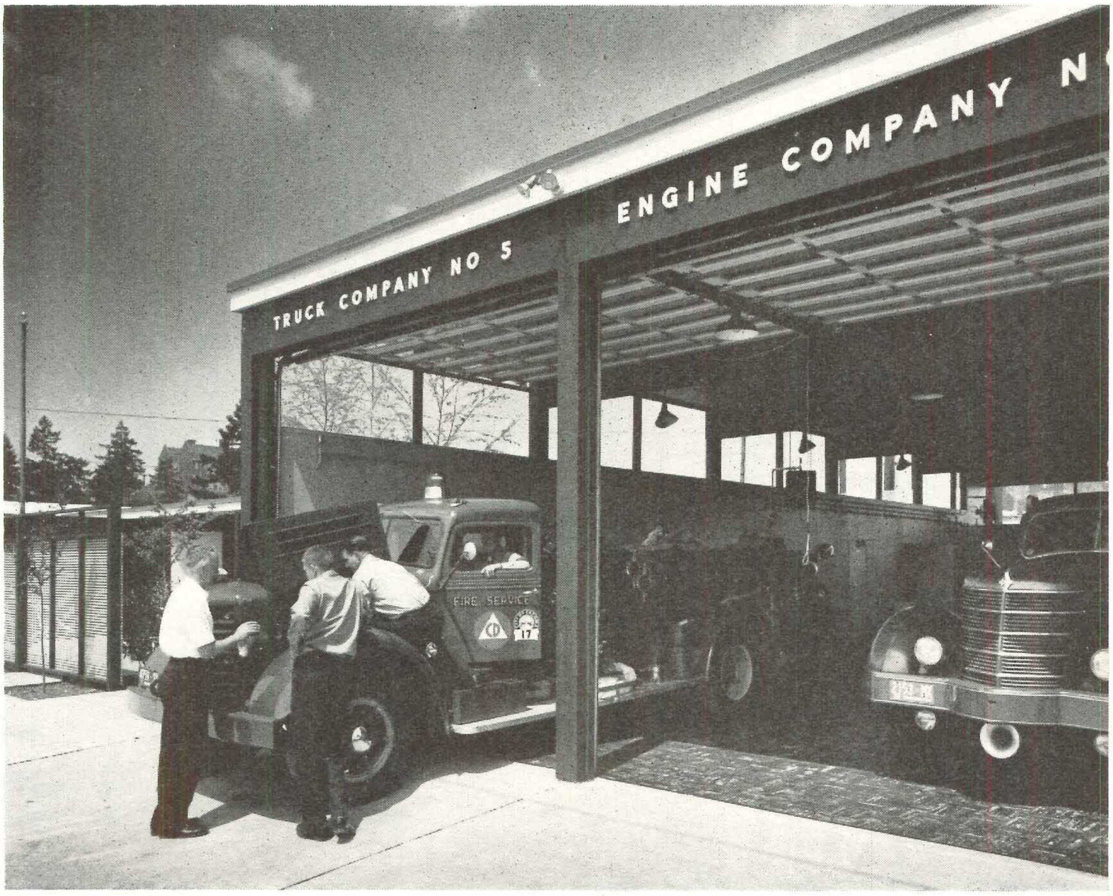
Structurally, the building consists of a concrete slab, laminated beams supported on laminated columns, and a dead-flat roof of 2"x6" joists with plywood sheathing. Price comments that he chose the flat-roof form "for simplicity of construction and because it allowed the three levels to read honestly in elevation." A double skin of plywood provides diagonal strength. The hose-drying tower has walls of plastic-surfaced plywood over plywood sheathing.

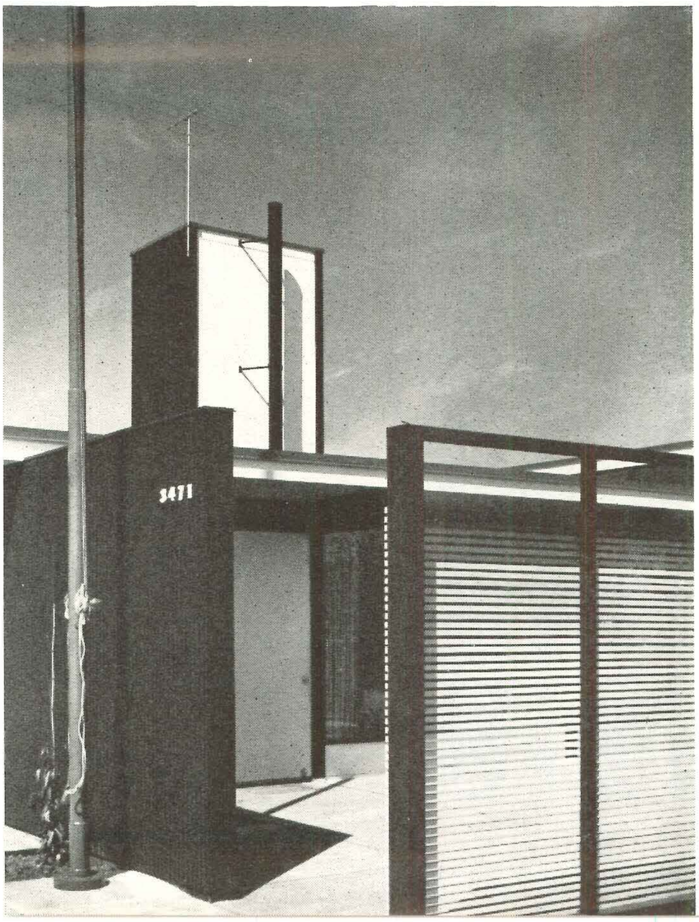
Heating of the building is from a hot-water system, with baseboard units for most of the job and radiant panels under the fire trucks to keep them warm for quick winter starts.

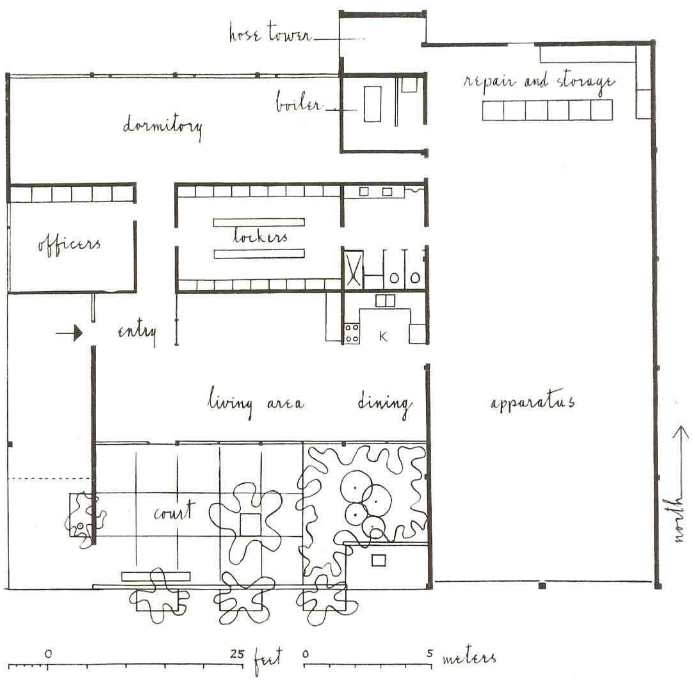
Color is an important aspect of the design. All exterior plywood, beams, columns, and sash are stained black-brown. Cement-plaster wall panels and panels of plastic-faced plywood are white. Accent colors include Chinese red, pale yellow, blue, and black.



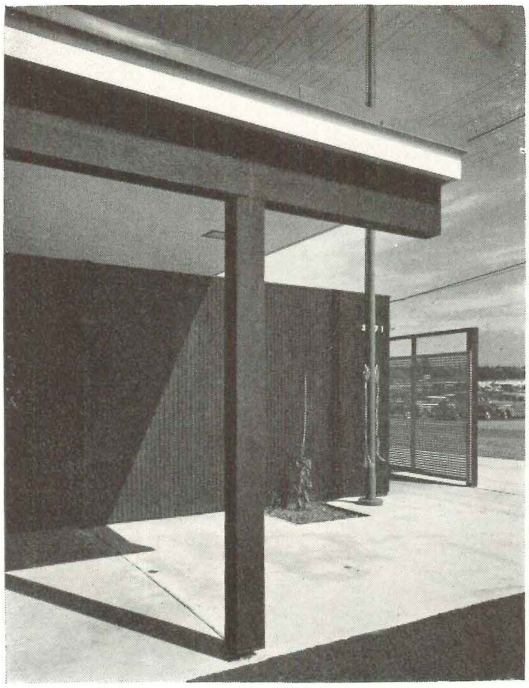
FENCE DETAIL



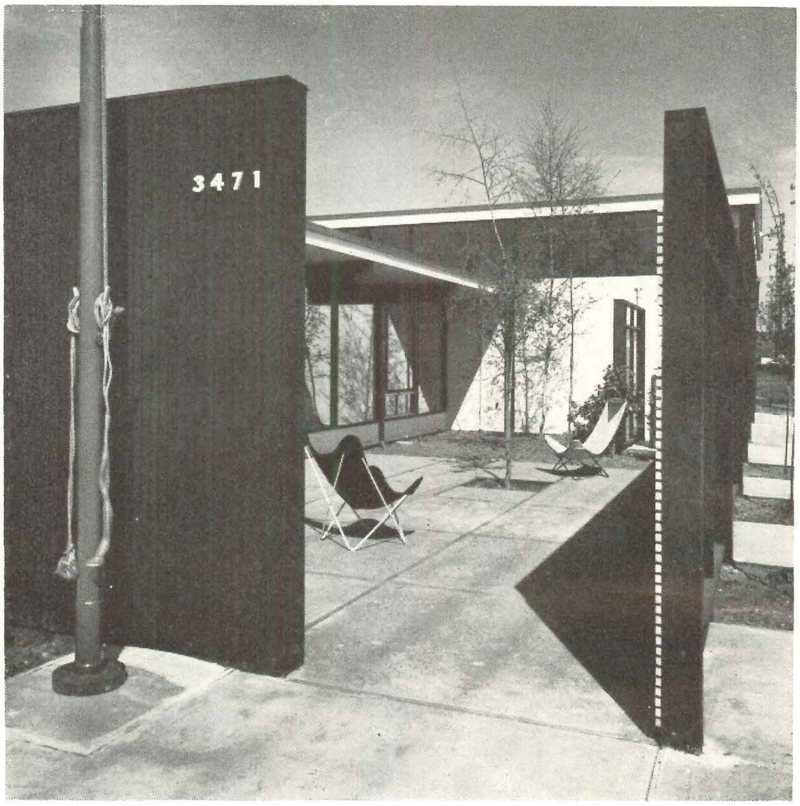


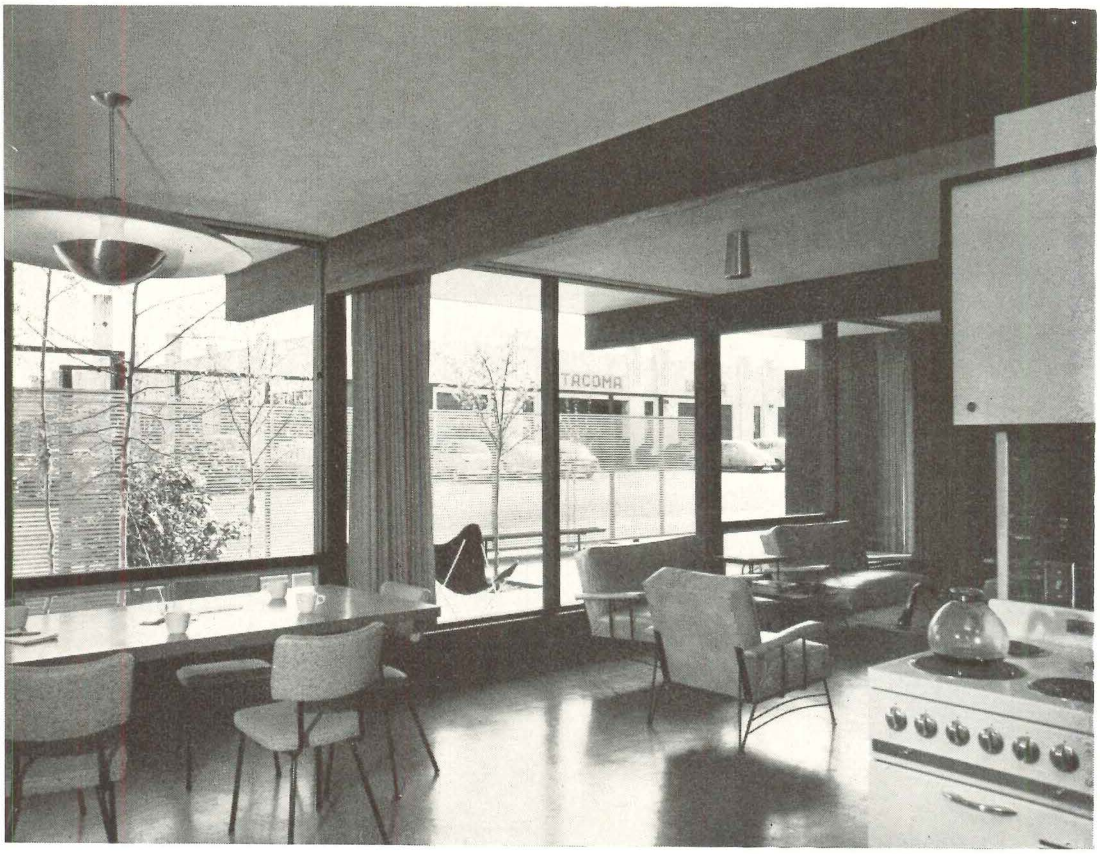


the architect and his community: Robert Billsbrough Price



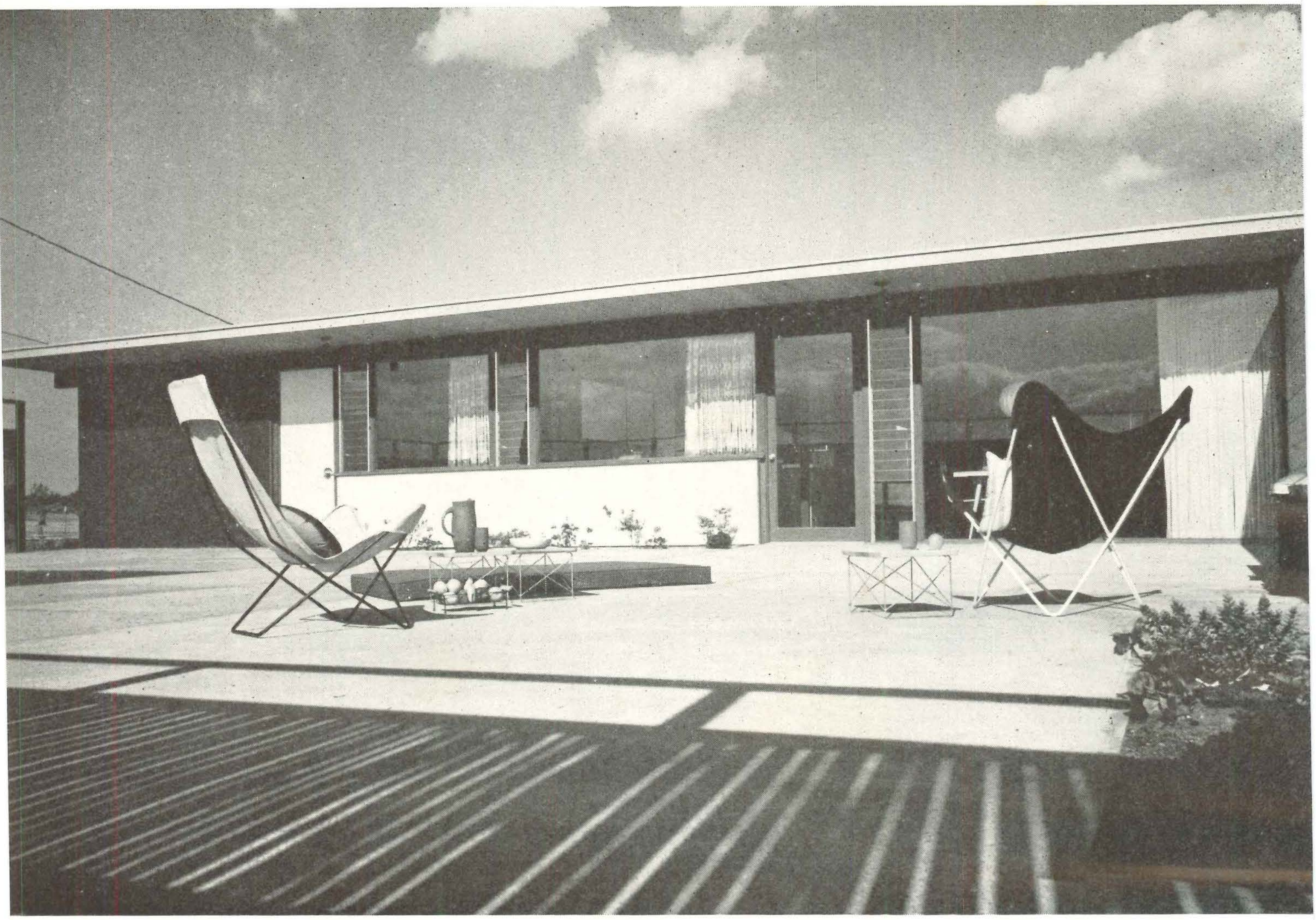
fire station





the architect and his community: Robert Billsbrough Price

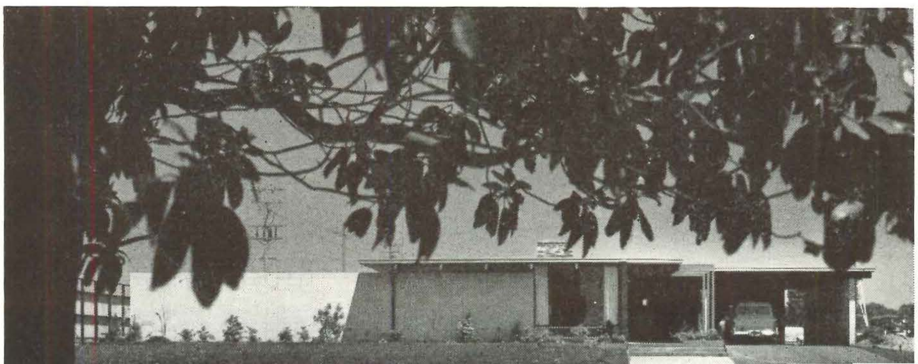
builder house



The only strings attached to this house designed for the Tacoma Master Builders were: (1) that it be a familiar type of construction; (2) employ locally available materials; and (3) be able to compete in price with other builder houses of similar size. Built on a typical corner, subdivision lot, the house is planned for a young couple with two children. In spirit, Price says, "the house is one I had hoped to design for a long time . . . I endeavored to prove that a builder could construct a competitive house that a young family would buy, not only because they liked the house but also because, cost-wise, it was something better than was being offered."

The plan is a simple rectangle with a double carport off the entrance way and a fenced court on the opposite side, providing privacy for all areas despite the open plan. The living/dining area is separated by a central kitchen from the all-purpose space (including the children's bedrooms, which are partitioned by colorful, plastic, folding doors). In fact, the only wholly closed-off space in the house is the master bedroom suite.

Joan A. Price handled interiors; Sherman Rowland was General Contractor.



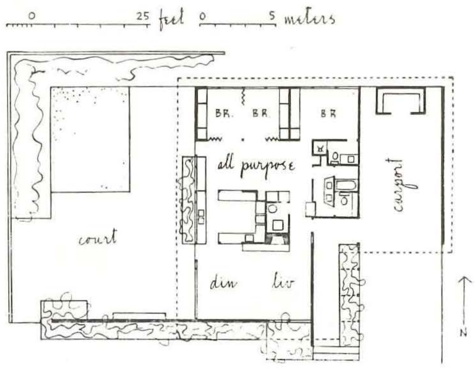
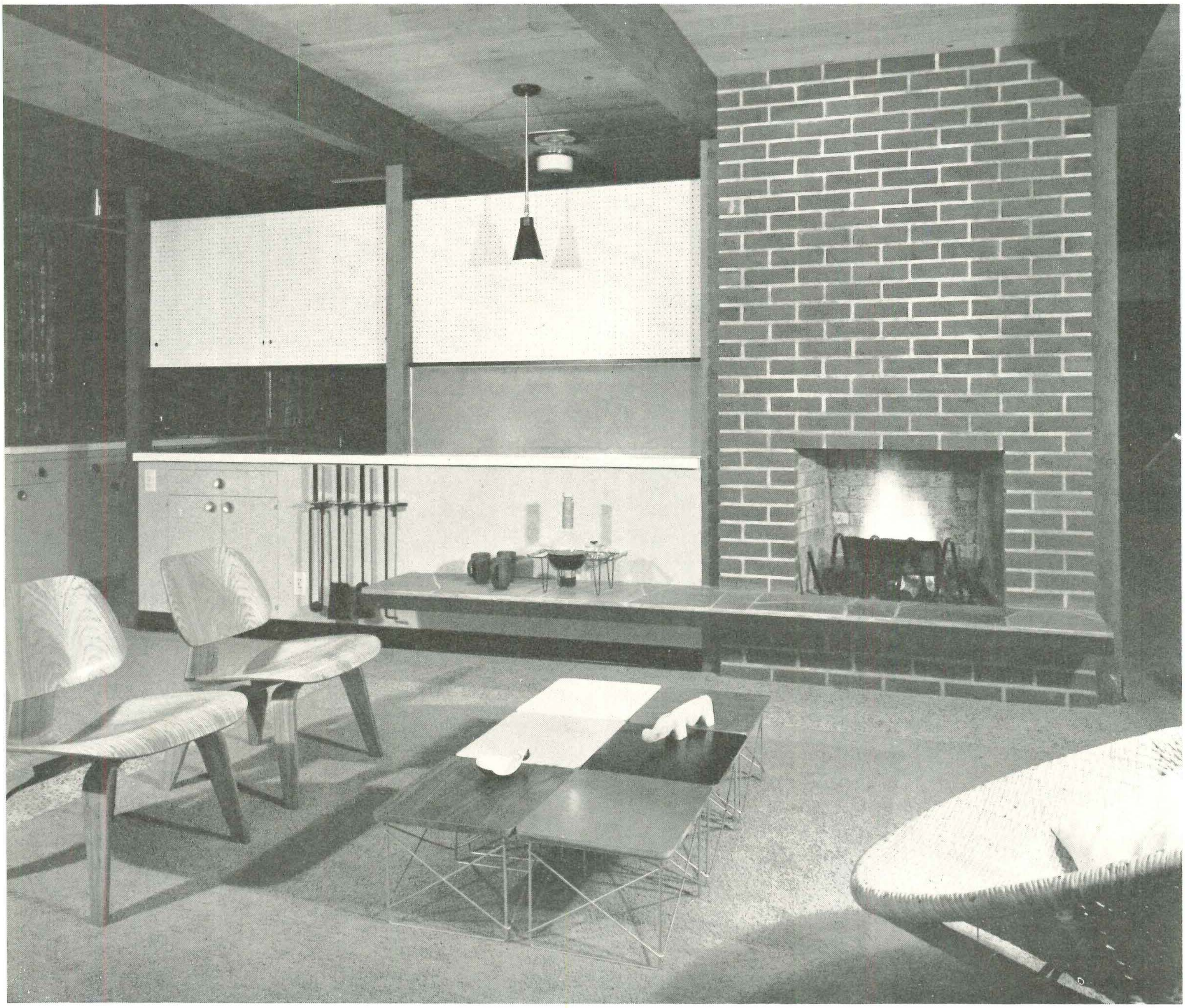


Photo: Dearborn-Massar for Family Circle

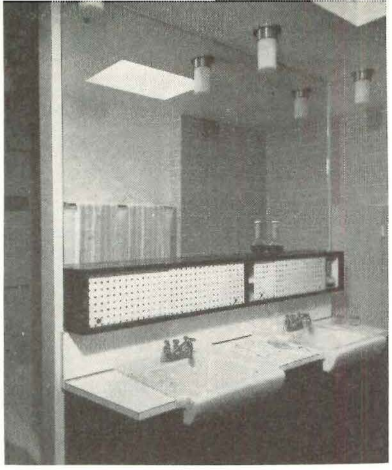
builder house

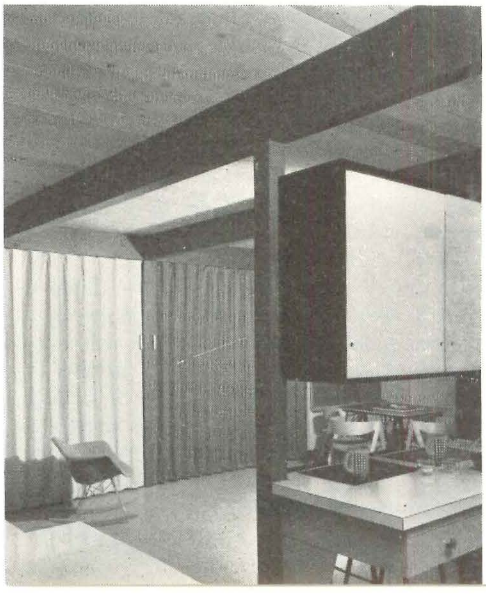


The fireplace and heater room are located back to back, for efficient use of the single chimney.

From the kitchen "control center" (right), indoor or outdoor meals are served with equal ease.

Basic construction is of 4"x4" posts supporting 4"x10" beams, with a 5' module in the east-west direction and 5'-6", north and south. Plank roofing is also the finished ceiling. Exterior wall surfaces are stained, textured plywood; unpainted pumice block; or painted, overlay plywood. The heating system is perimeter warm air. Cost of the house: $17,500.





Extension of the house wall beyond the building both provides privacy and greatly increases the apparent living area. Flooring throughout is all-over, white, confetti-patterned asphalt tile, selected "to give continuity and a feeling of space."

architecture and the democratic community

Walter P. Reuther

I should like on behalf of the members of the Detroit Citizens Redevelopment Committee, now the Citizens Redevelopment Corporation, to extend our hearty congratulations to the three architects who labored hard in the vineyards to make the planning design for the Gratiot-Orleans project possible: Mr. Gruen, Mr. Yamasaki, and Mr. Stonorov.

They brought to this project not only high technical competence, but I think perhaps what is the most important ingredient to this kind of undertaking, and that is a high sense of social responsibility; because architecture unrelated to the basic needs of a free people will fail to meet or serve its basic purposes. I believe they came to this project not to earn an attractive fee, but to share in a joint effort of trying to create a new neighborhood in the core of Detroit. They, like the committee, realized that this problem of our decaying cities is one of the most challenging problems we face in America.

I want to congratulate the members of the Jury, because they came to the same conclusions as our committee. We thought this a mighty fine beginning of a redevelopment plan in the center of Detroit.

There are a number of things that I think are significant here, that bear pointing out. First of all, we in Detroit realize that the automotive industry has given the American people a kind of new freedom, freedom of great mobility, and that that mobility, exercised by millions of people in our country, has created a new problem: as the cities begin to decay at their core people seek to escape by escaping the cities, but they leave the problems behind to be solved.

Cities represent tremendous investments in the way of schools and churches and utilities and commercial establishments and many other things. The problem is to meet the challenge of decay at the core. How can we preserve the great cities as cultural centers and yet make them compatible with this new freedom of mobility?

We came to the conclusion that the only way you could resist the trend to escape the cities was to provide within the core of the city a wholesome, healthy, attractive neighborhood that could give people the things they ran out of the city to find, to provide those things in the city in close accessibility to the cultural advantages that the big city offered.

We started out, not just to redevelop a land area which has been cleared, in which the slum property has been torn down, just for the sake of building new buildings on that land area. We believe that too often slums are torn down only to be replaced by more modern slums. A community is more than just buildings; it is a total climate. There is a kind of intangible value you have to put into these communities to make them attractive and to get people to be willing to move into them.

The first important lesson we learned was that this problem of redeveloping the cores of our cities was not something that people generally could leave to your profession, that this problem of slums and decay was the problem of all the citizens of any metropolitan city.

I had the task first of approaching some of the executives in the automotive industry. When I said that this project was part of their responsibility they pointed out that this was not their business, and they made passenger cars and trucks and they knew nothing about this. I pointed out that clearing the slums and wiping out the social cesspools of the great cities was the problem of all of our citizens. We then began to pull together as a functioning, co-operative citizens group, making the clearing of slums and redeveloping of our city the responsibility of the whole community.

I think that is the first and important lesson. You have to make people in every walk of life realize that this challenge of slums and decay is the problem of everyone. If we are going to make our cities the kind of places in which people will want to live and raise their families, cities that symbolize the highest aspects and aspirations of free men, then we have to work at it together.

We pointed out that too often the very people who criticize governmental action in the field of city redevelopment make government intervention a necessity by their unwillingness to assume their share of the responsibility and by their failure to participate on a voluntary basis.

Second, we did not want to build a new slum. We want really to wipe out the slum for keeps. We said that somehow we had to get away from the concept of replacing old slums with new ghettos. We had to take into consideration in the site planning the fact that adjacent to this land area there was contemplated the construction of public housing—I think, 3800 units.

We then made the basic approach that we break up these large public housing groups into smaller groups and begin to find a pattern by which public housing could be integrated into middle-income housing. One of the reasons people who live in middle-income areas have resisted public housing is because we tend to drop a huge block of public housing near a good neighborhood, and then the lower standards of the public housing tend to drag down the higher standards of the middle-income housing.

We said, if we can break up the large public housing blocks and integrate small groups of public housing in a middle-income neighborhood, instead of the public housing dragging down the higher standards, the higher standards will have the positive impact of *raising* the standards of the public housing.

The basic concept is important here, because it can be the key to the third important question: How can we build by redevelopment in the cores of our cities, not new ghettos, but wholesome, balanced neighborhoods, balanced economically and integrated racially? Look around the cities in America and you will find that most of them are developing a new ghetto at the core. We believe that this is un-American and anti-democratic in its basic concept.

We are going to see this through because of the challenge we believe we face in the world of proving to the rest of the world that America knows how to meet the problem of narrowing the gap that exists in America between American democracy's noble promises and its ugly performance in the field of race relations.

We know that somewhere, some place, we have to break through the old pattern; we have to begin to find a way to build a racially integrated neighborhood.

We think this can be done.

We think there is enough good will, there is enough common sense, there is enough common dedication and determination in Detroit to point the way. We believe that if we can do it in this particular neighborhood, there are many other areas of Detroit where our committee can apply the same lesson and the same basic approach.

We are greatly honored that Progressive Architecture and its Jury have given this recognition to our project. We hope that what we do here can inspire other people in other cities to take on this practical task of redeveloping the decaying cores of our cities.

We think it can be done. We think that the neighborhood that we are going to create in this land area will be as attractive as any other area in greater metropolitan Detroit. We believe that all kinds of Americans will move in there; that white and black can live together and raise their children in the kind of democratic community that America ought to symbolize in this very troubled world.

Reproduced on these pages are two talks heard at the P/A Design Awards dinner in Detroit, January 20. Speaking for the client group was Walter P. Reuther, Head of the Industrial Union Department, AFL-CIO. Representing the Jury was Pietro Belluschi, Dean of the School of Architecture and Planning, MIT. Springboard for both talks was the Gratiot-Orleans Urban Redevelopment project in Detroit, First Design Award Winner.

Pietro Belluschi

Having had considerable first-hand experience in the ways of juries, I would not be inclined to view their decisions as being always made in Olympian all-knowing equanimity. Even with all the time and knowledge at its disposal, it is a most difficult thing for a jury to be free from prejudices—personal prejudices and those of the age in which we live. The mental picture of our world is distorted in various degrees by images imposed by custom. National culture itself is composed of prejudices; they are an intrinsic part of human nature, and it would be not only difficult but undesirable as well for a jury to be wholly free of them. To have pre-established notions of what is appropriate in Art or Architecture or Music means that at any given time certain trends or certain moods or ways of seeing and feeling have entered the consciousness of the social and professional body and left a mark thereon.

To ask a representative group of men to sit in judgment is to ask them, within their limitations, to reassess, to note what progress or lack of progress has taken place; it means that standards are brought up to date, new controls established, and public opinion shaped in such a way as to act as useful restraint against capricious license, arbitrary fashion, and the damaging abuses of mediocrities. At the same time, by their verdicts they make change possible and acceptable. One may presume that while works of men of great talent prevent stagnation, and by their uniqueness stimulate innovation, the vast majority of works must be contained, or rather restrained, within the great body of public opinion and acceptance.

Some of my individualistic friends will be outraged by these statements, but they will possibly agree that there must be a way to preserve continuity, if sound evolution is our goal. But if that is so, it is essential that our output be constantly and critically re-examined to be sure it expresses the social, moral, and esthetic philosophy of our age, and has not become a stale and sterile attitude of mind. I believe award programs such as these and others of similar nature are in a sense milestones in our historical course and one of the means by which tradition is made, and for this we owe our thanks to the Editors of Progressive Architecture for their wisdom and generosity.

If you will allow the Jury then refuge behind its shortcomings, but with a deep sense of the importance of its duty, it will report a great satisfaction, even elation, on what has been shown in this year's award submissions. We all felt that even more significant than the actual quality of the winning entries were the signs in almost all works of great maturity, of real understanding of what architecture is meant to be in our society. If there were any doubts in the past about whether our profession was prepared to rise to the challenge of our age, a challenge of unprecedented dimensions and form, such doubts may now be dispelled.

A new world is in the making, and the architect is now ready to be among those who give it shape. As we look back at the events of the last few decades, we begin to see how our struggle against dogmas and style revivals with all their apparent narrowness was really but a prelude, a clearing the decks, so to speak, for a vastly more important task—that of reshaping our environment in enlightened freedom. Now our main worry is no longer style as such, important as it may be to achieve individual quality, but a fresh interpretation in physical terms of our own civilization. From the top winning design for the renewal of part of Detroit and from many other projects, premiated tonight, we are finding that architecture is more than a superficial concern for style—it is becoming indeed a way of life. As an art, it is now more clearly and forcibly directed toward a goal beyond mere form.

I have been criticized for having said, many years ago, that I believed great architecture, at least for our kind of society, would eventually come from the receptive soil of wide popular understanding. I still believe, and with greater conviction now, that we are witnessing the success which follows our attempts to show the public, by means stronger and more common than those evoked by pure esthetics, the reasons which have determined the forms, above all the values embodied in those forms.

It is of deep significance to me that Detroit, the world capital of the great automobile industry, an industry which has affected to an unbelievable degree the structure of our cities and changed the very scale of man's existence, would show the way toward a long range and imaginative solution to the ills which it has unwittingly produced in varying degrees in all cities of the civilized world. In America, the joint impact of prosperity and higher standards of living, together with the accelerating rate of obsolescence, much of it caused by the automobile, has all of a sudden opened up a fantastic panorama of what must be done; and the task, the enormous, endless task of rebuilding our cities, is beginning to emerge with great clarity. We are encouraged by what we have premiated to think that old mistakes will be avoided, that the leaders and the great body of citizens may have learned to face with confidence a great task to be achieved in harmonious collaboration, free of petty motives.

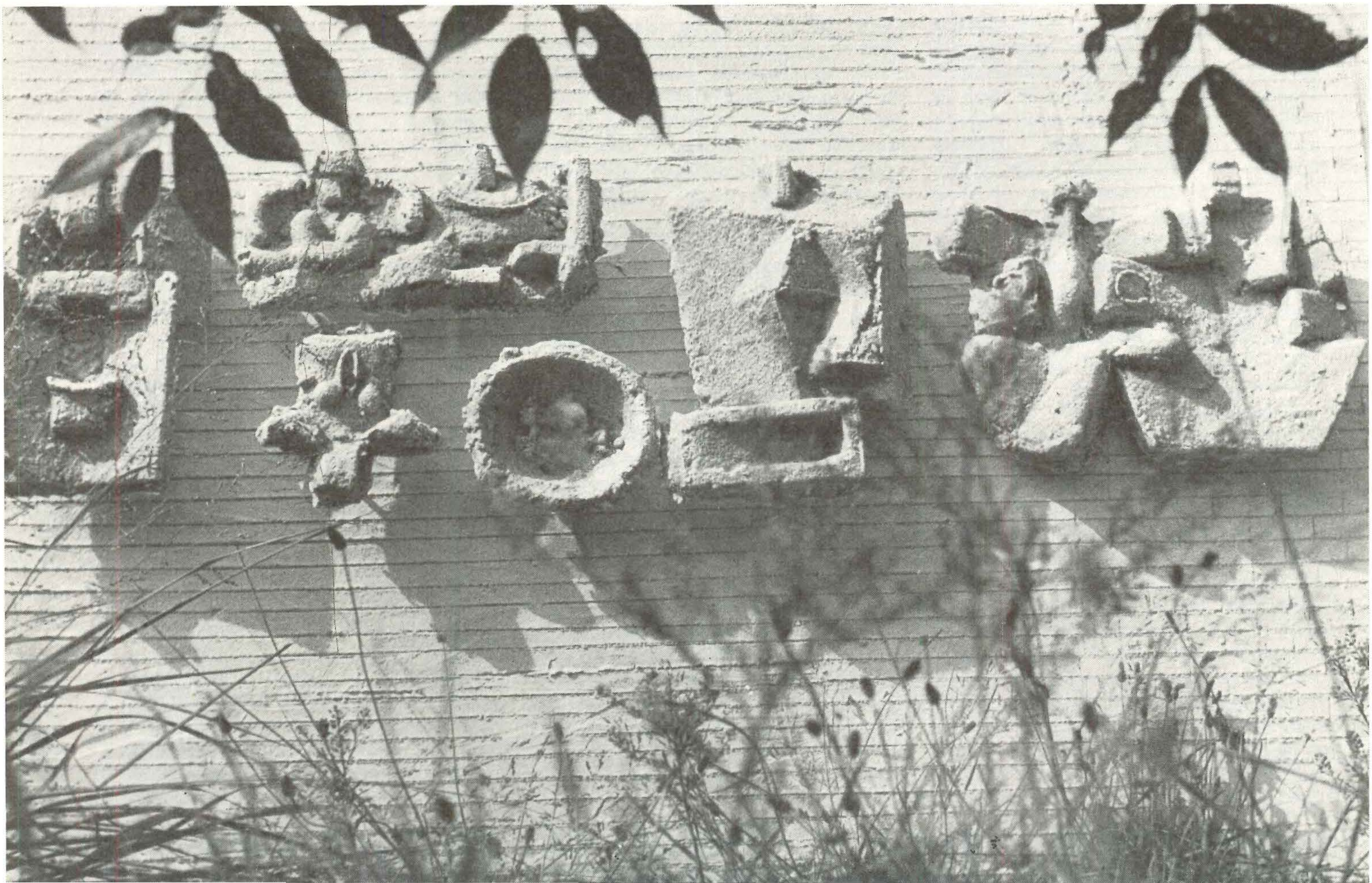
In the advent of this American Dream, the architects can and must have a key part. We all know the enormous cooperative efforts which go behind any of the large projects. We may well remind ourselves that the success of our way of life in this technological era is due to our having learned to work together, and the architect as a man of vision can no longer act alone in arrogant self-sufficiency but needs to know and be motivated by a large body of facts which only the specialists in many fields can gather and furnish him. Architects are beginning to acquire more receptive and flexible habits of mind; they are learning to observe and to weigh before rushing to a solution.

We may remember that while the men of genius may stimulate us, the great body of structures forming our cities is produced by earnest, intelligent, painstaking realists who, by their day-to-day effort, by their ability and willingness to be part of a team and to accept the realities of life, succeed in making their influence felt in the communal process of giving form to a healthier and happier society. The signs are here, and many of the entries submitted had social awareness or were community projects.

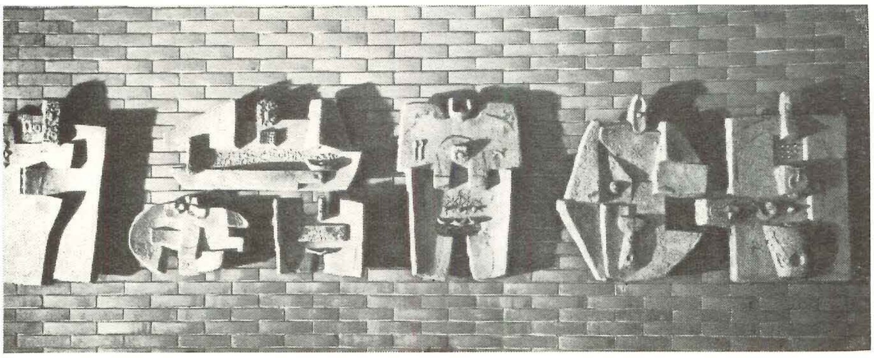
The buyer of architecture, more than ever before, is the corporate and not the individual client. Through the economic realities of the American system, architects are learning to make a virtue of what used to be a handicap. A greater concern for economy means now a wider distribution and therefore greater social impact. This may have been done at the expense of the highest standards, but it has resulted in a great raising of the lowest standards, in a greater sense of what is appropriate and important, in a greater logic of structures and in more thoughtful planning. But beyond these—even beyond proportions and good function and beauty—is an obvious acceptance of life in all its richness and variety, in its joy and complexity, a feeling of duty to rebuild, give physical order and meaning to our lives, a task to which all of us must give our best.

the work of COSTANTINO NIVOLA

Nivola's primary and principal concern as an artist is to make man's dwelling places and environment more stimulating and enjoyable. Like his ancestors who created ancient sculptures and constructions of Sardinia, he is remarkably talented in these arts. And like his forebears he is capable of creating visual drama out of the most primitive substances. "My sculptures," says Nivola, "are made of common materials—brick, concrete blocks, lime, plaster—using the natural elements—sunlight, water, sand." Nivola employs a mason's technique which was acquired through working with his father, a master mason, in Sardinia. Many of his pieces exhibit the imprint of this background, both artistically and technically. In discussing his work, Nivola pays tribute to still another master: "I learned from Le Corbusier to be conscious of the role every element must have in a plastic organization and its relation to architecture." In his unpretentious though exuberant and lively way, he has had great influence on latest architectural development. Many critics feel that Nivola has had an effect on the master himself—Le Corbusier, who has lately turned his attention away from the *machine à habiter* to such plastic expressions as the Chapel of Ronchamp or the High Court Building of Chandigarh. Nivola's latest and perhaps most significant pieces are constructions similar to the one shown in the process of assembly (*acrosspage*). The possibilities of these sectional sculptures, in which volumes are juxtaposed as in architecture, are unlimited and Nivola himself suggests, "My dream is to make them as big as buildings." This scale has been partially realized in the memorial fountain (page 119) and more fully in a design for his own house, to be shown in June 1956 P/A. In effect, one finds it difficult to tell where Nivola the sculptor leaves off and Nivola the architect begins.



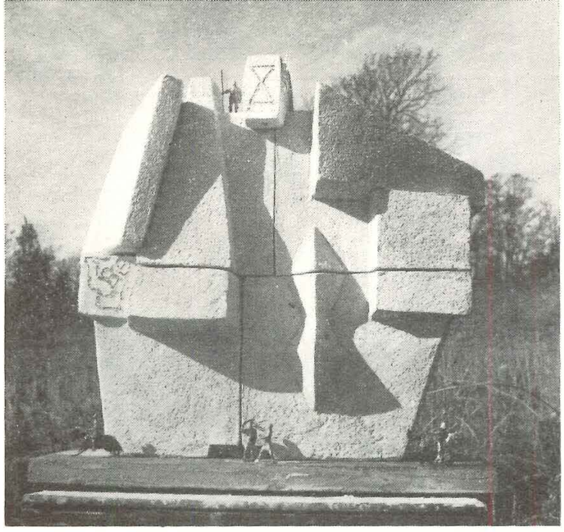
Hans Namuth

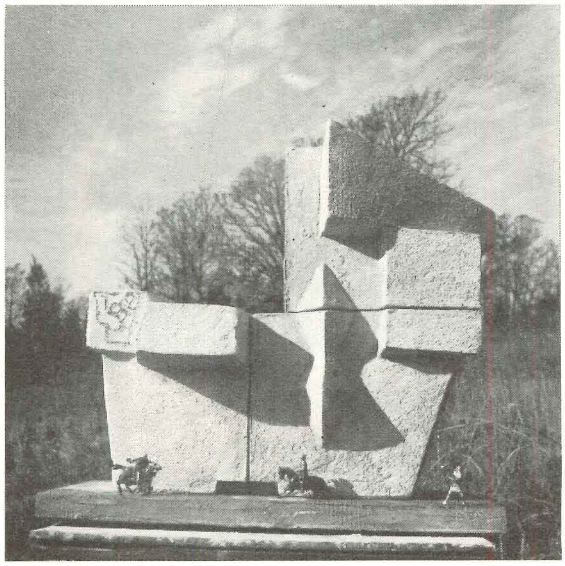


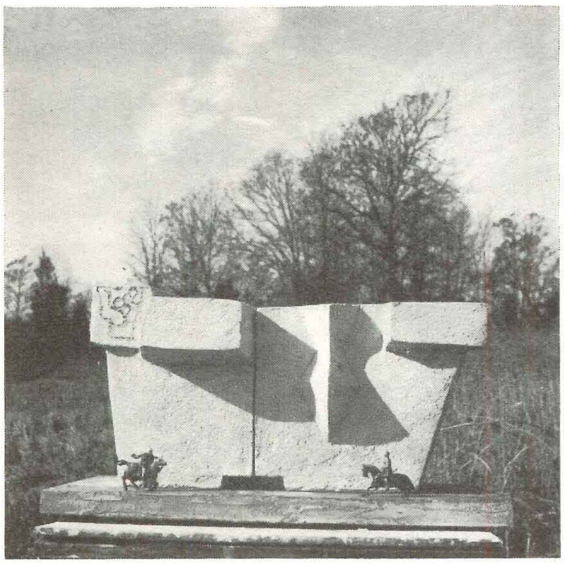
Free-standing garden wall (above) *defines one side of the entrance patio of a New York apartment house. Nivola's low reliefs of concrete, cast in sand, stand well out from the wall, their plastic quality thus emphasized. Earlier model* (acrosspage) *suggests a less pronounced background, perhaps more in keeping with the sculptured plaques.*

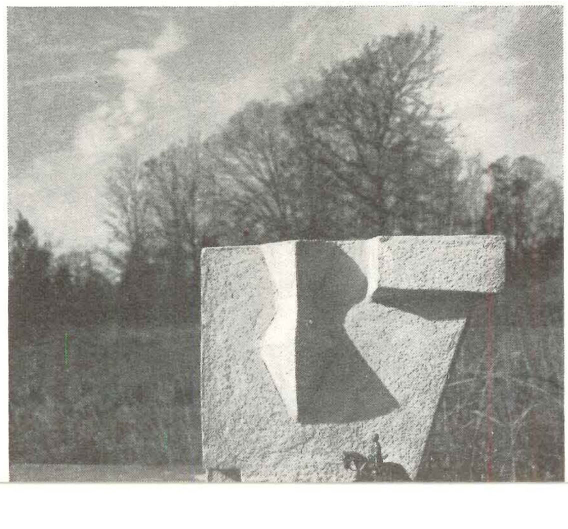
"Building blocks" (right) *are interlocking monolithic sections of built-up concrete which Nivola assembles like masonry. Toy figures suggest the monumental scale these constructions can assume.*

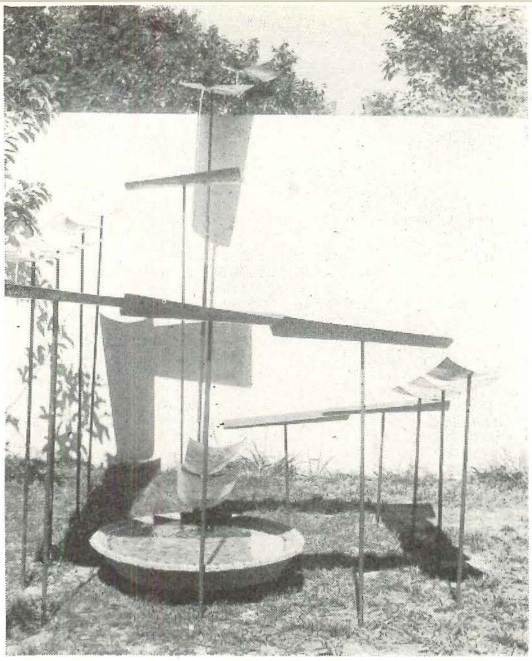
Photos (except as noted) : Costantino Nivola

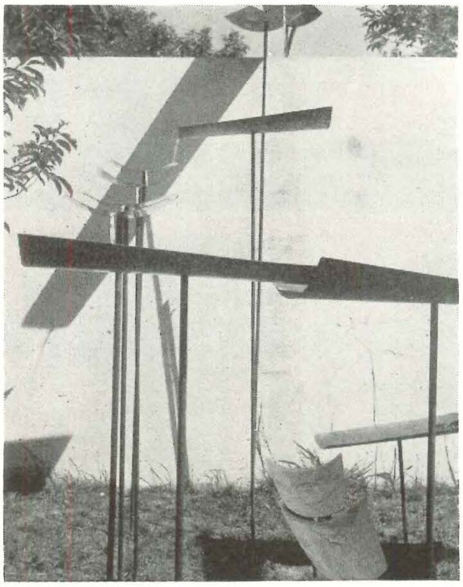


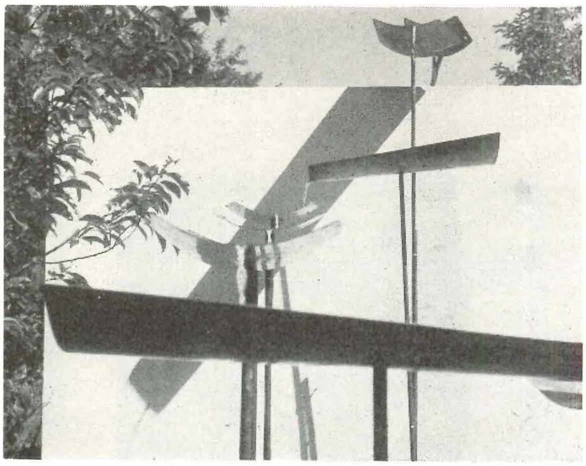


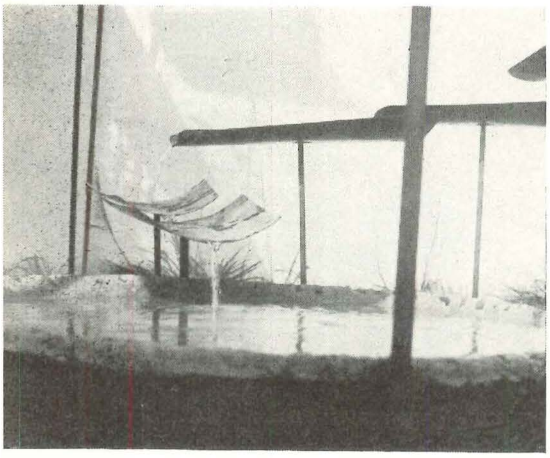




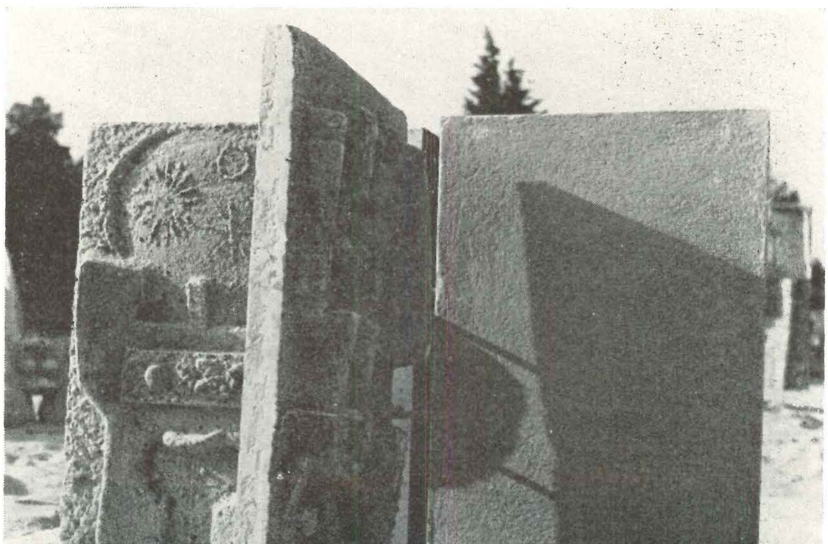




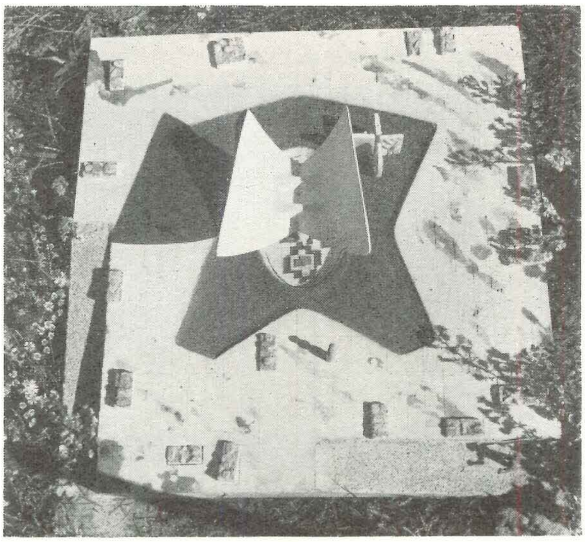


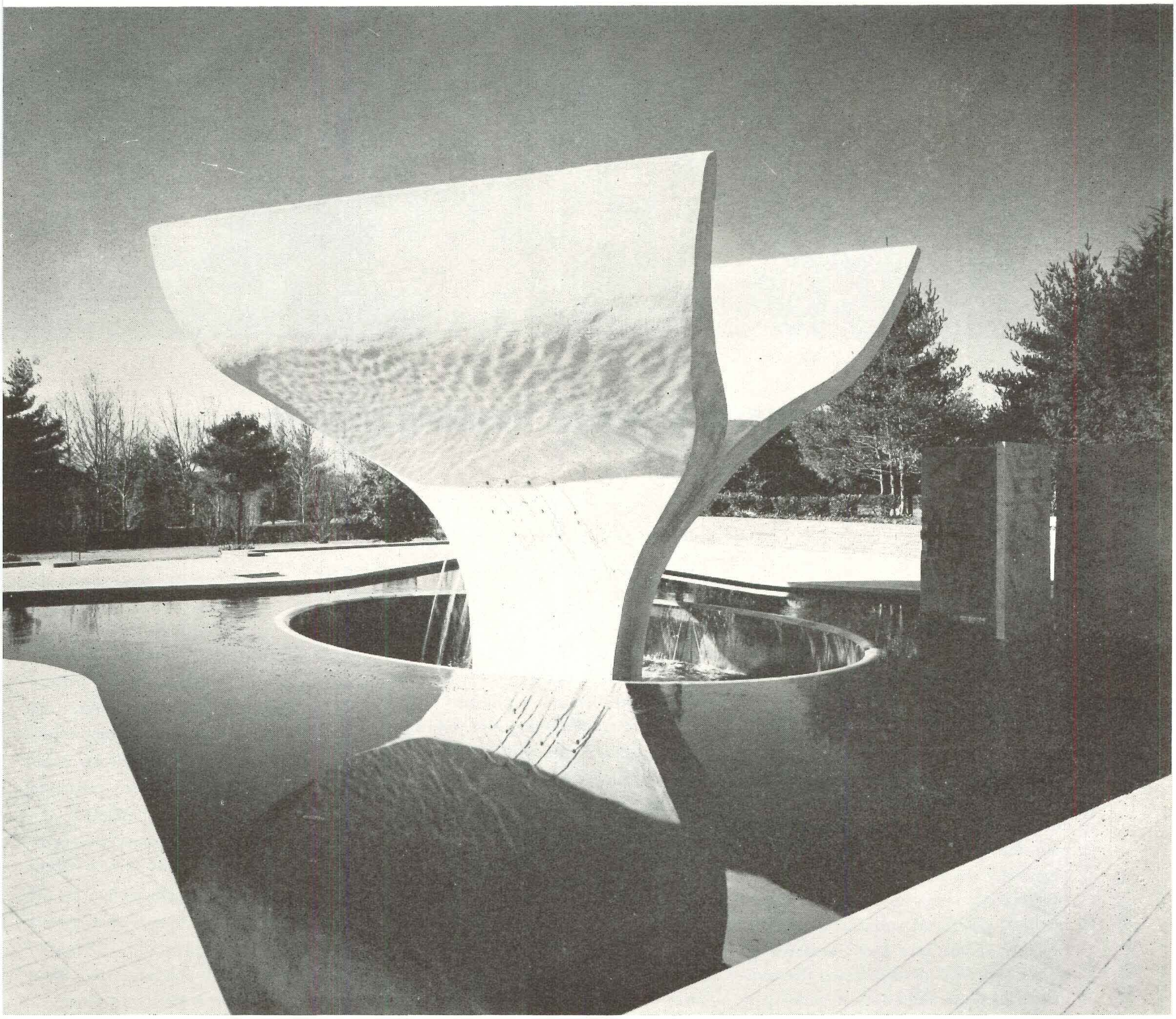


By the simplest means—with bent-brass sheeting and an assortment of slender brass rods—Nivola has fashioned an engaging and lively fountain (left *and* above) *adaptable to anyone's garden. Water is brought up through the first stem, a hollow pipe; then it falls from one level to the next, introducing elements of movement and music into an otherwise static landscape. Different notes are sounded by varying the length of the stems.*

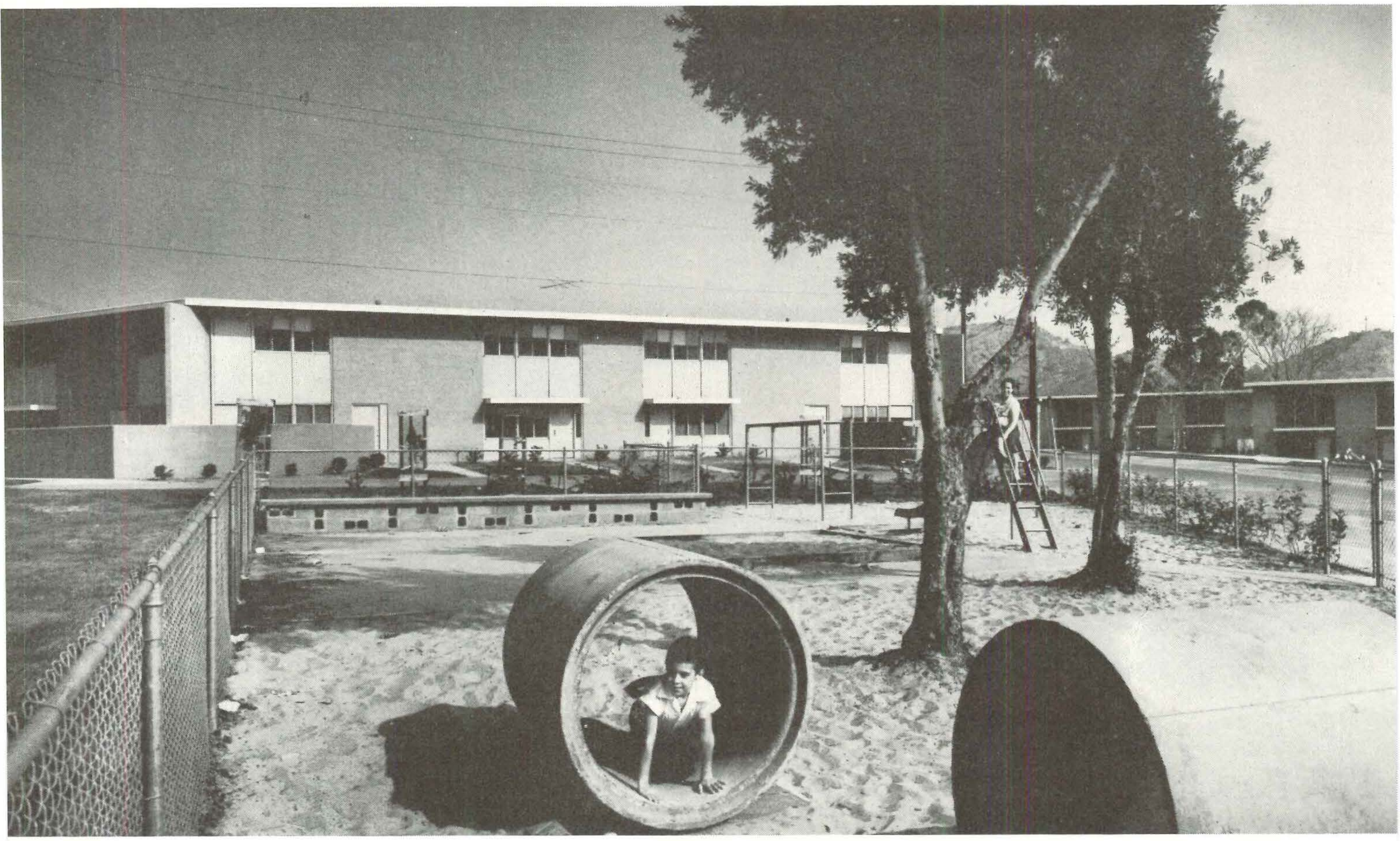


Designed for a nonsectarian cemetery at Falls Church, Va., the Memorial Fountain, dedicated to the four chaplains who gave their lives in a wartime sea disaster, is one of Nivola's largest architectural sculptures. Again, it is an economically executed work using simple materials. Dominant element in the composition is a concrete form, a symbol of the sinking ship. Dark, star-shaped area (model right) *signifies the ocean; the oval in its center, the world beyond. It was the sculptor's original intention to build this oval of light and colorful tiles on various levels, symbolizing the eternal city to come, and also to give visitors a view down into it from the nearest point on the platform above. The four panels suspended above the level of the "ocean" are sculptured on one side only and fresco-colored on the other* (detail acrosspage bottom). *As the sun moves, each panel is lighted in turn and each color given* **emphasis.**





Robert C. Lautman

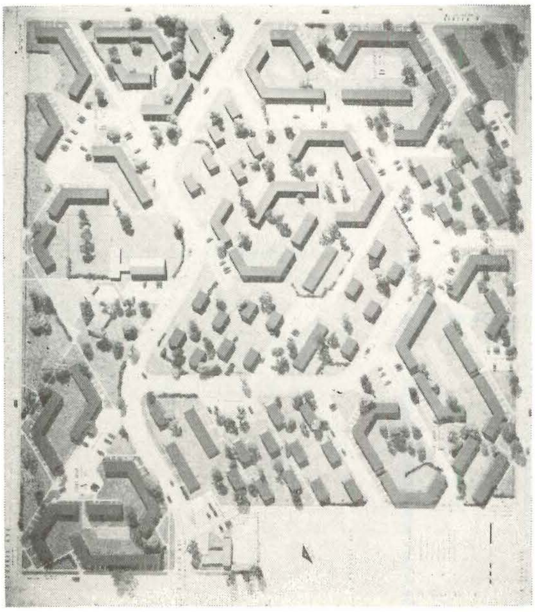


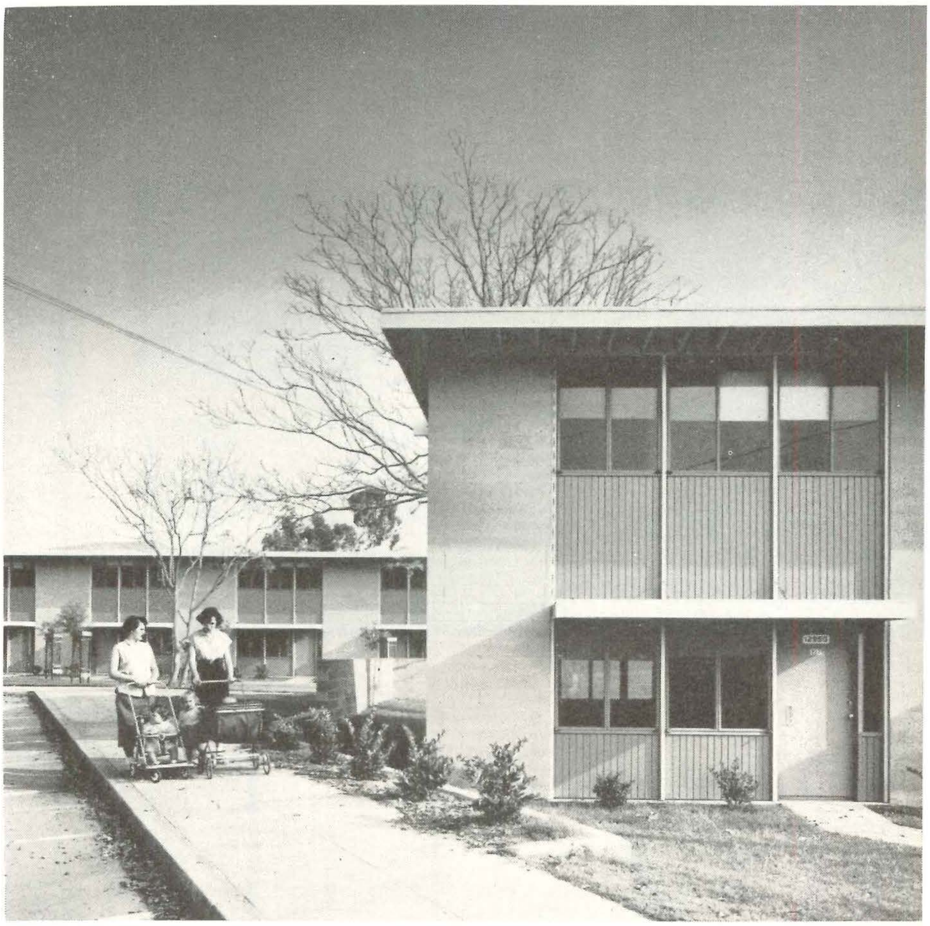
general practice: housing project

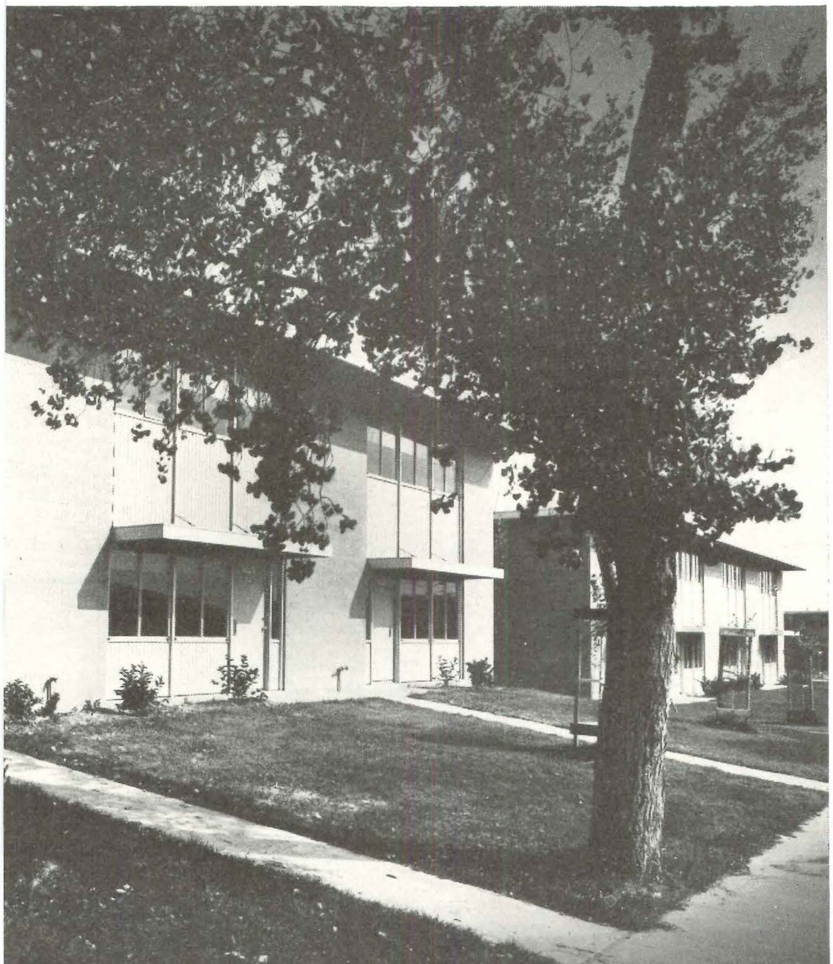
location	Pacoima, Los Angeles, California
associated architects	Arthur B. Gallion and Victor Gruen
landscape architect	Francis Dean

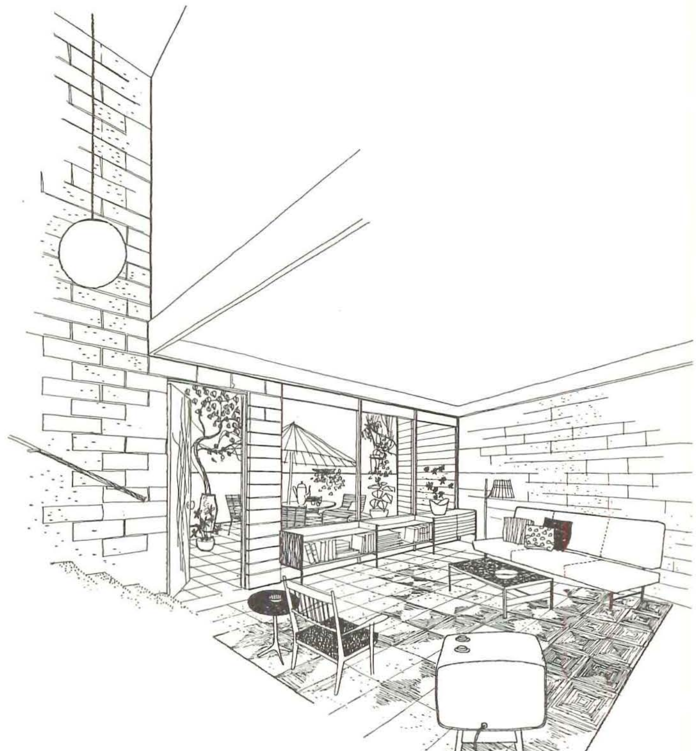
Completed since October, 1955, these housing units have already had a tremendous upgrading effect on the entire neighborhood. Not only have 175 substandard shacks, tents, and scrap-lumber shelters been replaced by 448 solid and comfortable living quarters; but also adjoining areas have been enlivened with new commercial buildings, and impetus been given to the start of five new subdivisions, housing close to 1000 families. One local authority states that property values have been increased by as much as 500 percent since the completion of these buildings. A major part of the credit for this vast improvement is due the architects who, despite a density of 15 families per acre, managed to retain low-rise buildings arranged in an orderly though informal fashion, with pleasant vistas and private terraces for all. Buildings have remained the same since P/A's publication in February, 1954, of this project in the design stages—predominantly one- and two-story row houses interspersed with two-family houses and angled buildings. Combined as a large composition, these assorted buildings achieve a feeling of unity without monotony, and a sense of spaciousness and lightness. Special thought was also given to the preservation of many beautiful trees which enhance the site immeasurably and set this project apart from the usually raw and barren appearance of newly completed housing developments. Subdued colors, used within the regular pattern of white-painted mullions, soffits, and fascias, add further to the attractiveness of the complex. Exterior walls are partly of lightweight-reinforced concrete blocks which have been painted and waterproofed. These masonry panels alternate with wood frames (*see* SELECTED DETAIL) which were assembled in the shop and erected by means of a special platform mounted on a truck. Edgardo Contini was Civil Engineer for these buildings; Bartlett & Berky, Mechanical-Electrical Engineers; and Richards Construction Company, General Contractor.

Photos: Julius Shulman

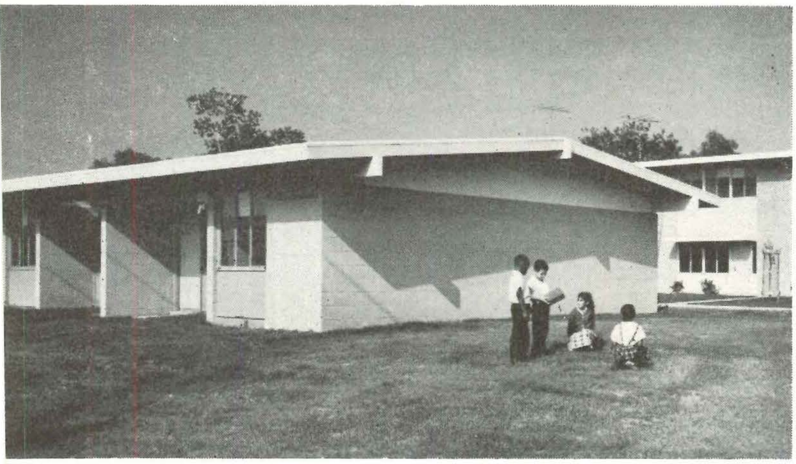


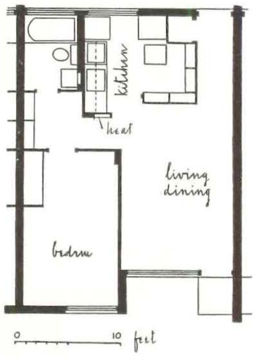




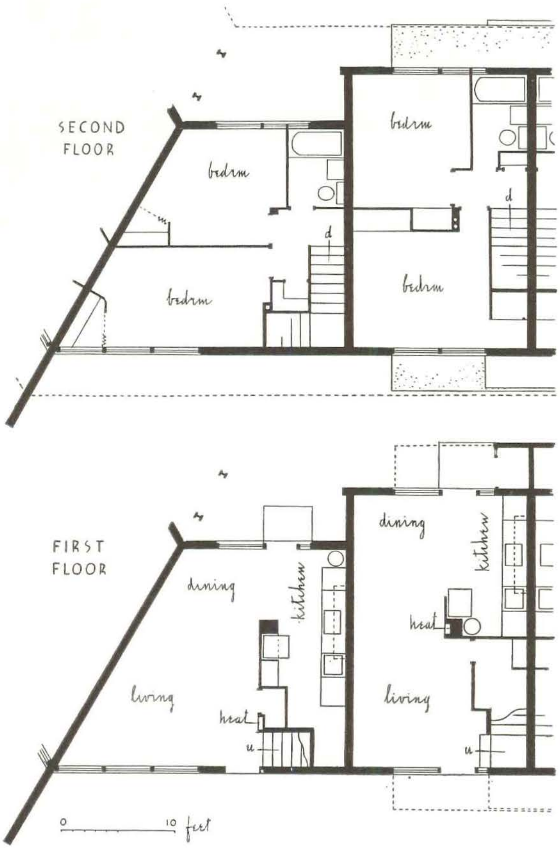


housing project

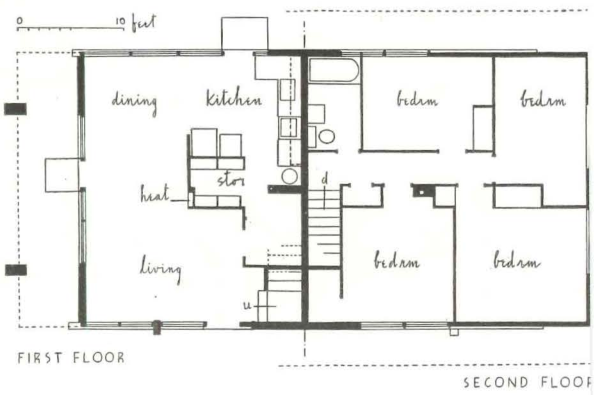




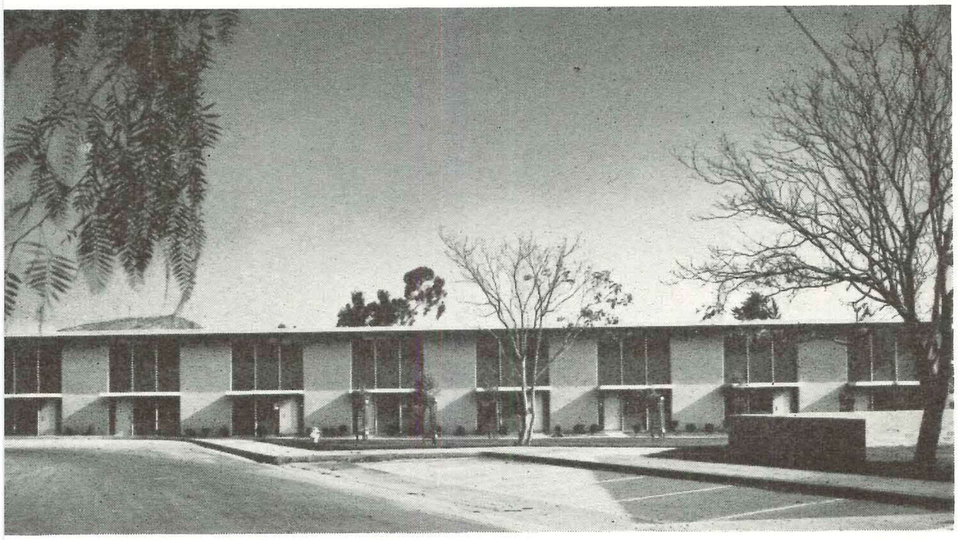
One-bedroom units (plan *and* photo left) *in single-story rowhouses alternate with duplex apartments for larger families. All buildings have cross ventilation and feature individual terraces at ground level.*

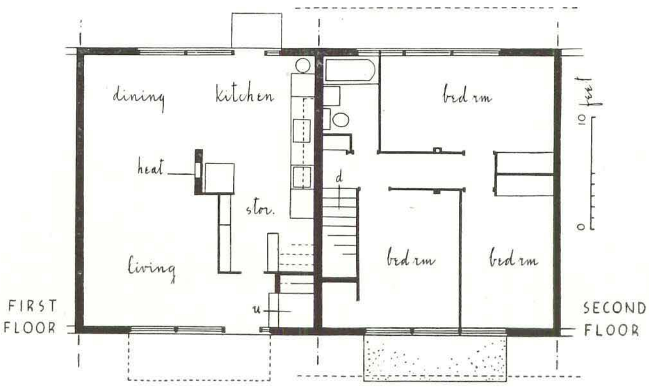


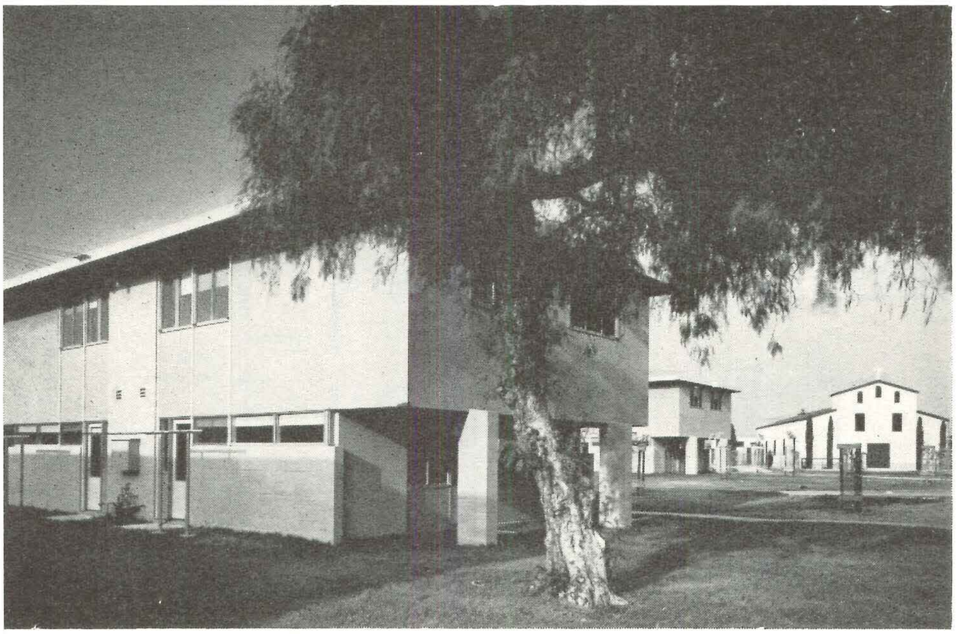
Two-bedroom units (plan *and* photo above) *are prominent in site plan for their angled building shape. Angles are wide and open, to avoid dark corners. Rooms are distributed on two floors—bedrooms and bath upstairs, living-dining room and kitchen on the first floor. Note individual garden enclosures for corner apartments. More of these patio walls, steps, and retaining walls were originally intended, but later eliminated for lack of funds.*



Three-bedroom units (photo *and* plan below), *in contrast to angled two-bedroom units, are arranged in straight lines of two-story row houses. Handsomely proportioned masonry walls with alternating shop-fabricated wood panels successfully break the lengths of these blocks.*







Four-bedroom units (photo above *and* plan across-page left), *as well as similar five-bedroom units, are located in two-family houses. A slight projection of the upper story provides a pleasant, sheltered terrace on the ground level, off the living rooms.*

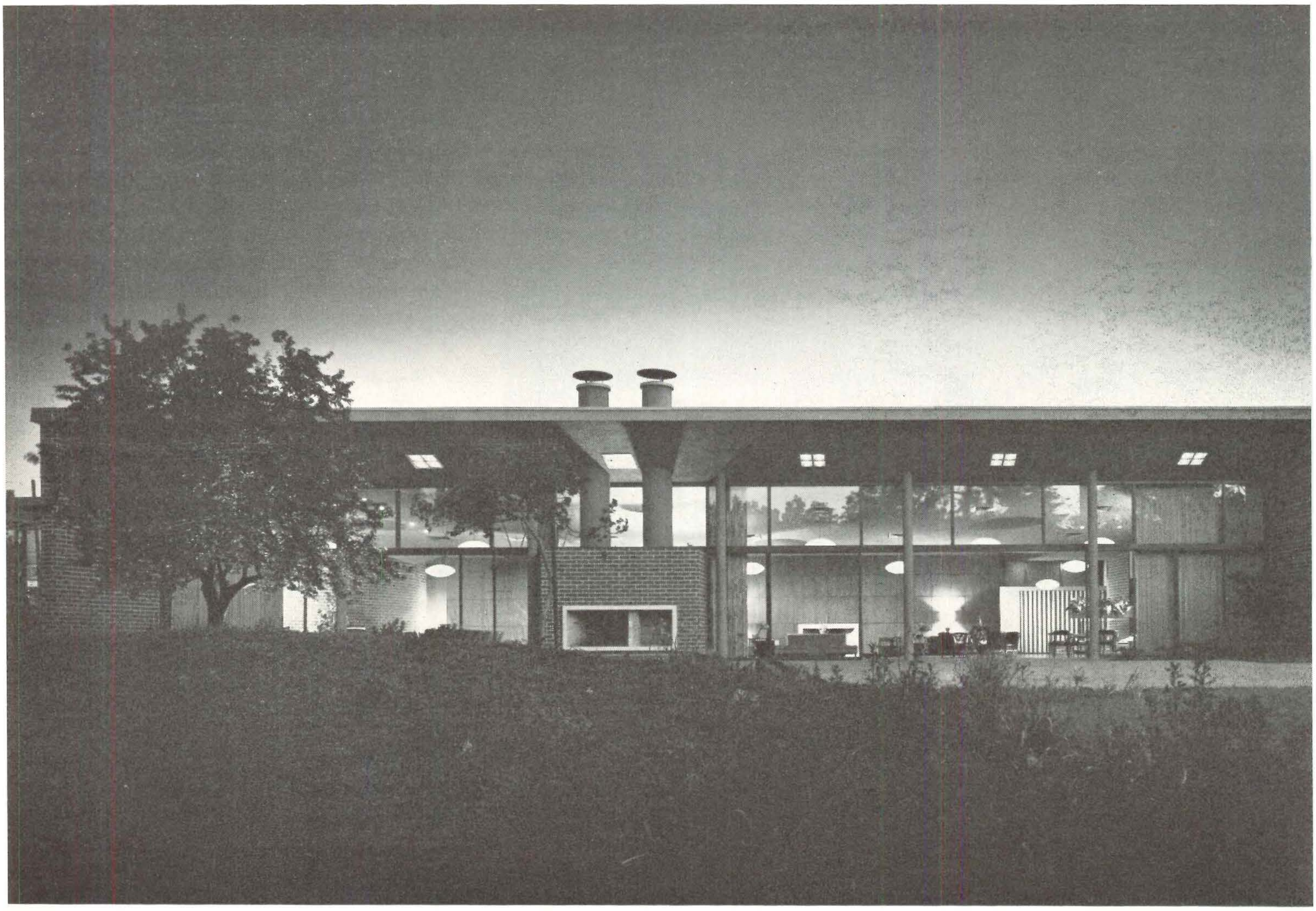
Materials & Methods

construction

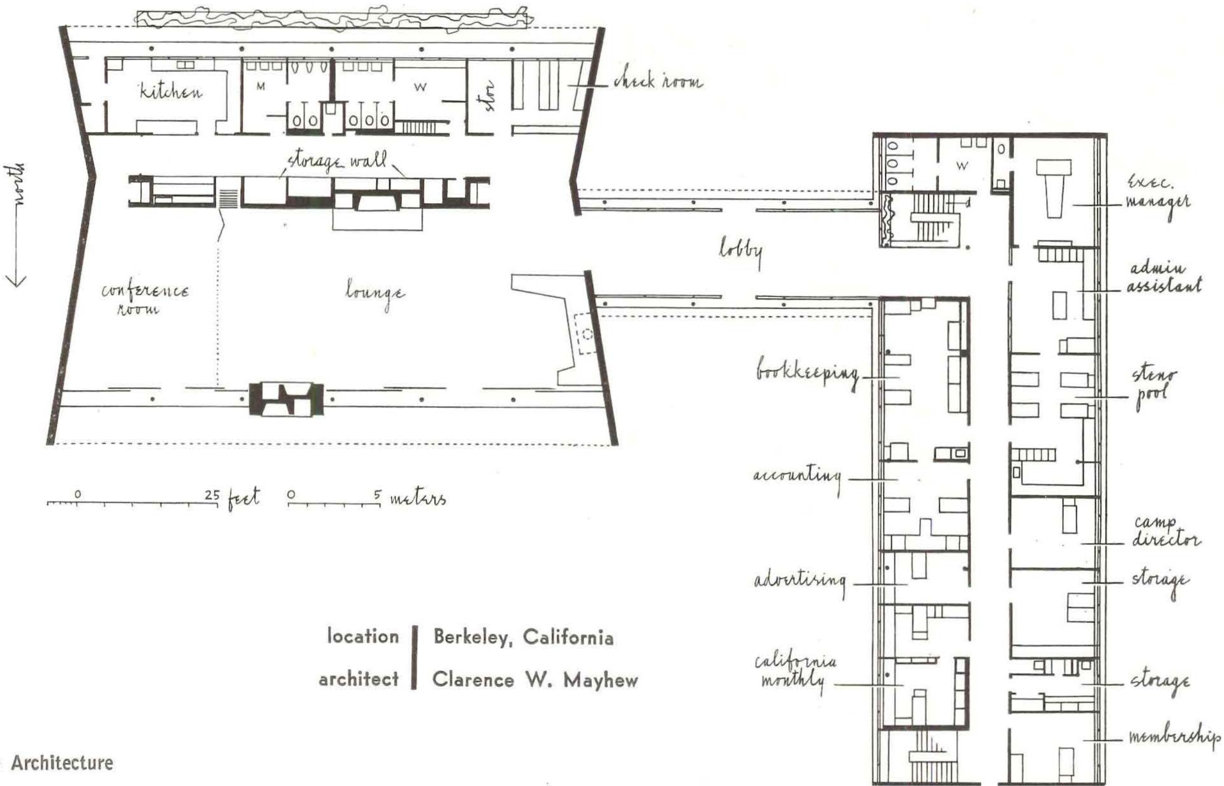
Foundation: concrete. **Structure:** frame, roof: Douglas fir; walls: reinforced concrete block; floors: wood and concrete slab on grade, **reinforcing steel**—Bethlehem Steel Company. **Wall surfacing:** exterior: wood siding, painted concrete block; interior: integrally colored plaster and painted plaster; rest rooms, toilets: painted plaster. **Floor surfacing:** oak T&G flooring; asphalt tile—Mastic Tile Corporation of America; linoleum—Congoleum-Nairn Inc. **Ceiling surfacing:** integrally colored plaster and painted plaster. **Roof surfacing:** built-up roofing—Koppers Company, Inc. **Waterproofing & dampproofing:** masonry waterproofing—Wesco Waterpaint Company. **Insulation:** foil-backed gypsum lath on ceiling—United States Gypsum Company. **Partitions:** solid plaster on gypsum board, no studs—United States Gypsum Company. **Windows:** steel sash—Detroit Steel Products Company. **Doors:** interior wood-panel doors and solid-core slab elevator doors—Deats Sash & Door Company. **Hardware:** Schlage Lock Company and The Stanley Works. **Paint & stain:** exterior: concrete-block paint—Wesco Waterpaint Company; interior: wood, concrete-block, and plaster paint—Dunn Edwards Corporation, integral color for plaster—Highland Stucco & Lime Products, Inc.

equipment

Specialized equipment: ranges—Dixie Products, Inc.; refrigerators—Frigidaire Division of General Motors Corporation. **Lighting fixtures:** interior fixtures—Harvey Hubbell, Inc.; outdoor floodlights—Crouse-Hinds Company. **Electric distribution:** panelboards—Meyers Electric Company; multibreaker—Square D Company; conduit—General Electric Company; transformers—Westinghouse Electric Corporation. **Plumbing & sanitary:** water closets, tubs, and lavatories—Universal-Rundle Corporation; toilet seats—Olsonite Plastics Division of Swedish Crucible Steel Company; individual, gas-fired water heaters—Southern Heater Corporation; faucets—Crane Company; incinerator—American Incinerator Corporation; galvanized-iron and cast-iron pipe—Bethlehem Steel Company, Kaiser Corporation, and Jones & Laughlin Steel Corporation; steel medicine cabinets—Jensen Industries. **Heating:** recessed wall heaters—Superaire Manufacturing Company; fuel—gas.



general practice: alumni house

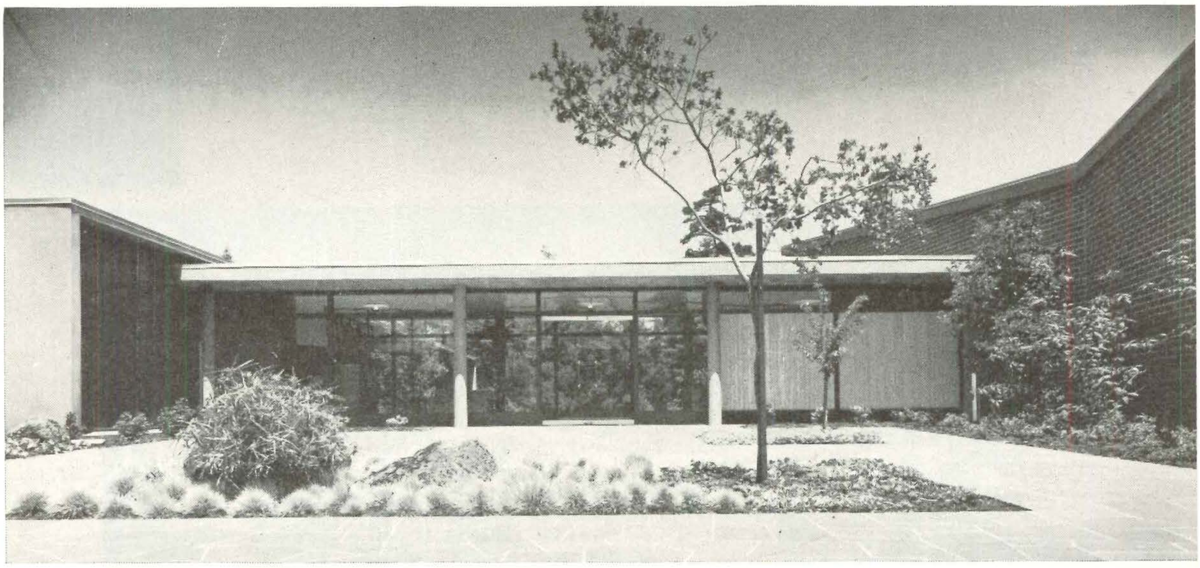


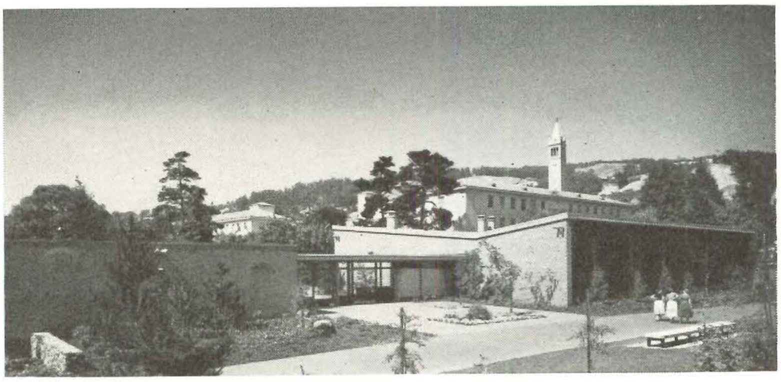
location | Berkeley, California
architect | Clarence W. Mayhew

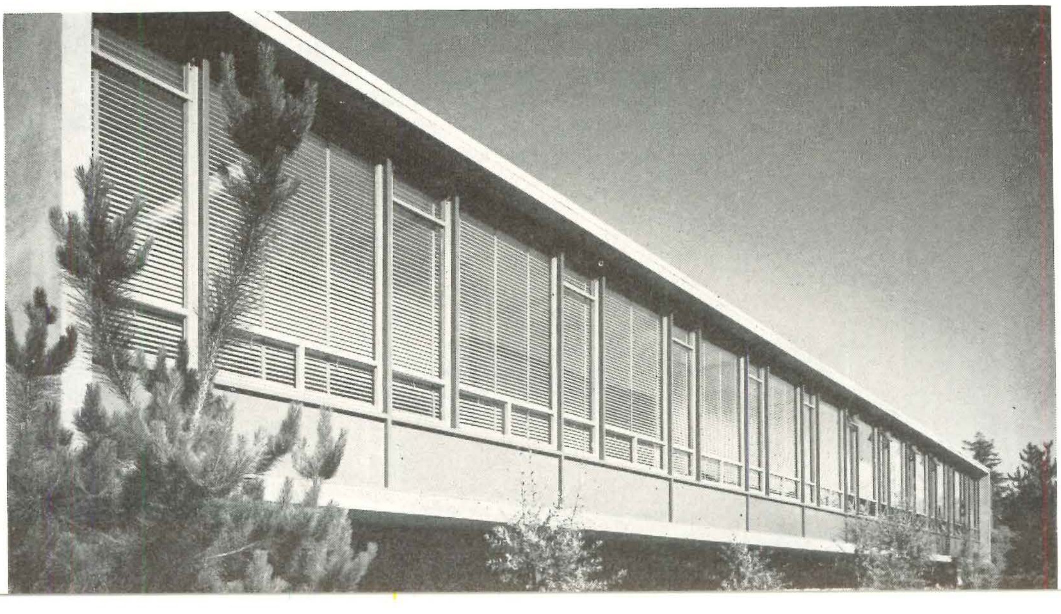
This building on the campus of the University of California was designed to provide office space, conference and social rooms for the University's Alumni Association. Headquarters offices for the association are in a wing to the west of the property. A glassed-in entrance lobby connects this wing with lounge and conference room which may be used separately, or combined for large committee and alumni meetings and social occasions. Kitchen facilities also permit the serving of catered luncheons and banquets. The use of lounge and conference room can be further extended during favorable weather by sliding back large glass doors opening onto a paved court and an attractively landscaped terrace and garden.

The basic structure is a light steel frame with concrete, lateral bracing walls. Major materials include natural stone and Roman brick used as veneers on concrete walls. Window walls are of light steel. All ceilings are surfaced with acoustical plaster. The heating system employs fan convectors below the windows of the office wing, and forced-air ventilating system for lounge and conference wing.

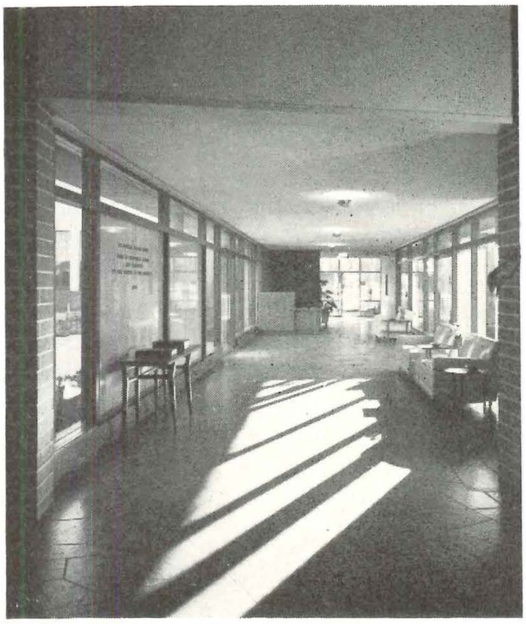
Prof. H. Leland Vaughan, Chairman, Department of Landscape Architecture at U of C, was Landscape Architect. Interiors are by Karl Rhode-Hamel with James Hill and Bonynge's; Structural Engineer, A. E. Waegemann; Electrical-Mechanical Engineers, Stelmec Engineers; General Contractor, Robert L. Wilson with Midstate Construction Co.

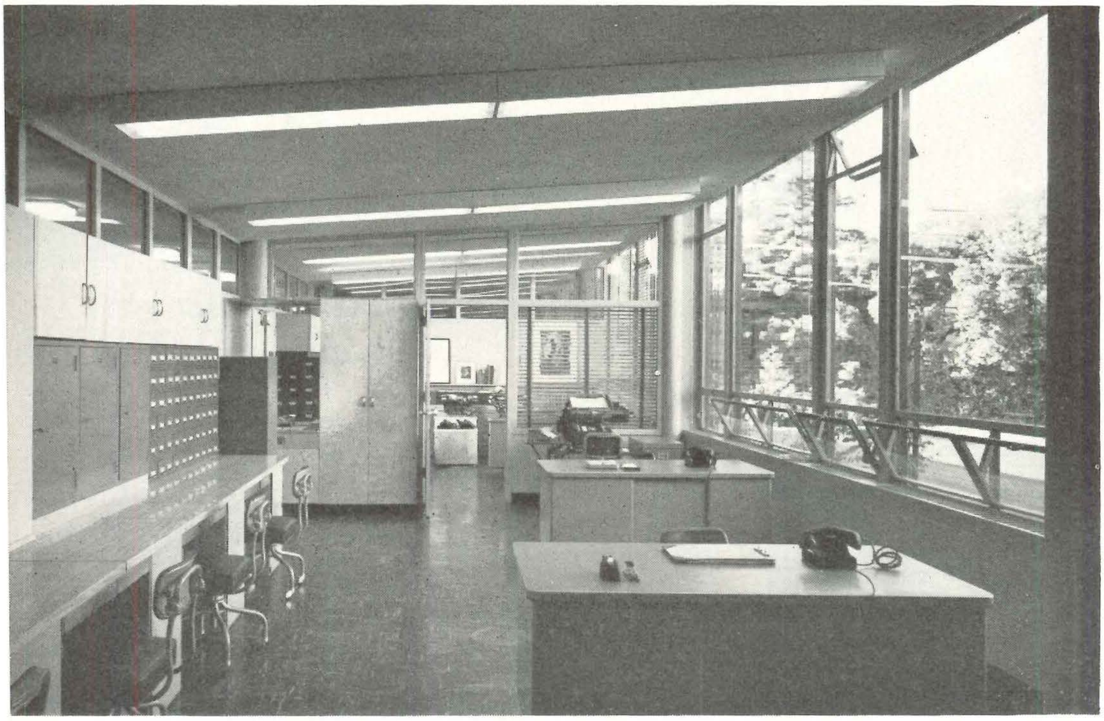






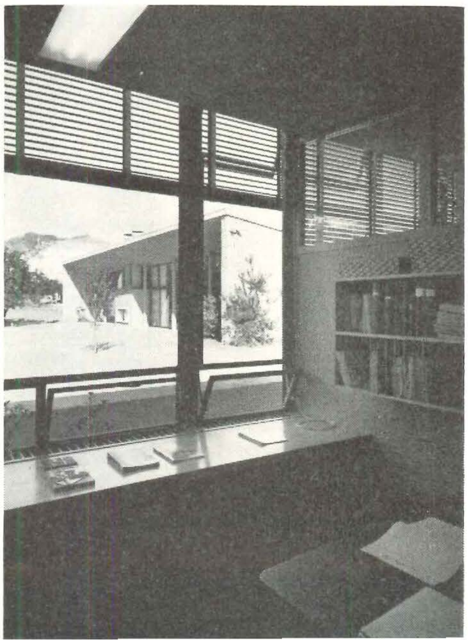
alumni house

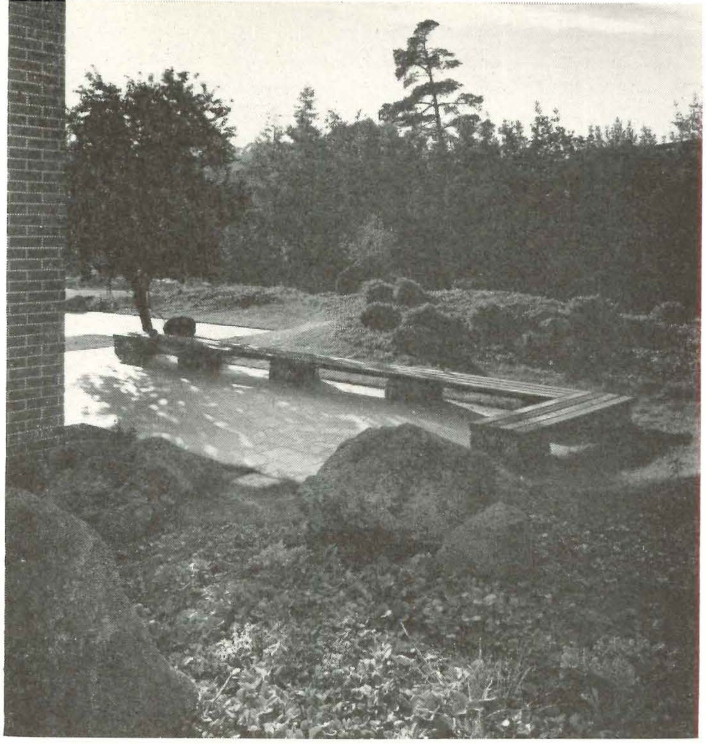




Bookkeeping office (above) *and alumni magazine office* (right) *face east toward terrace and social wing. Artificial lighting is by fluorescent fixtures, providing 50 foot-candles at desk height. Window walls with awning sash are of light steel. Flooring throughout office wing is asphalt tile. Floor below office wing is used for storage purposes.*

Photos: Morley Baer





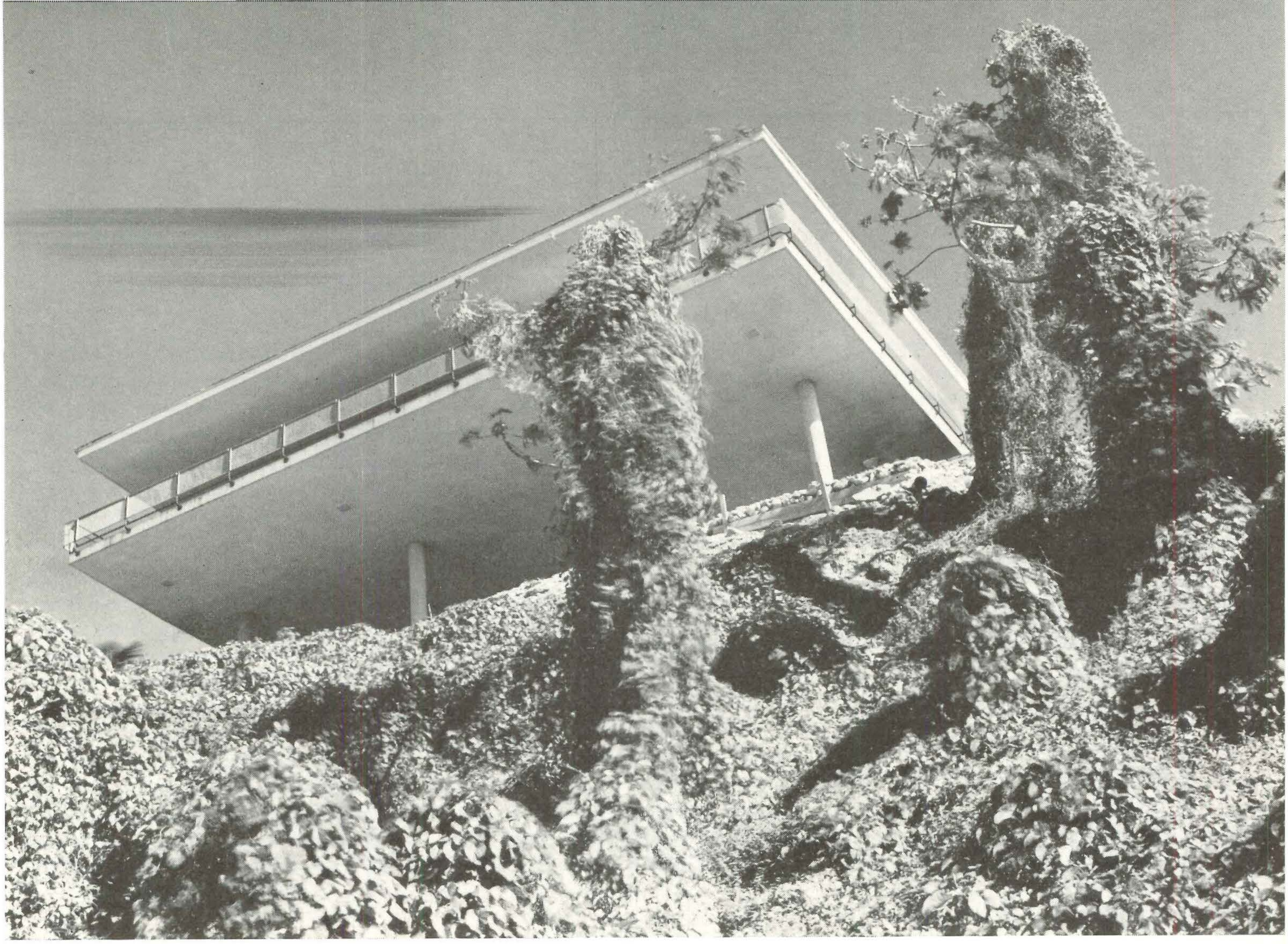
Lobby (acrosspage top) *joins office wing at far end of entrance lobby with lounge* (below) *and conference room beyond. Both lounge and conference room open directly onto a handsomely landscaped terrace and garden* (right).

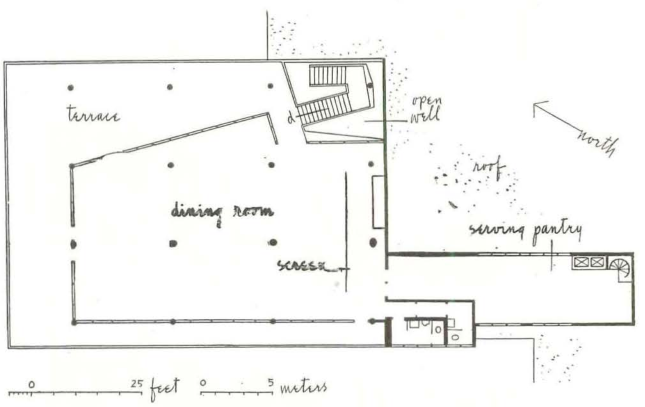
general practice: officers club

location | Ramey Air Force Base, Puerto Rico
architects | Weed, Russell, Johnson Associates

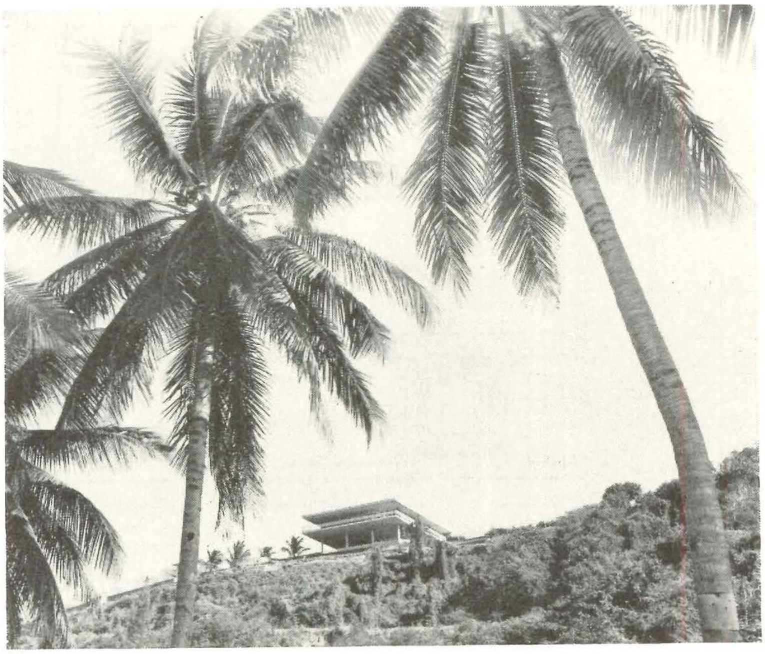
Cantilevered slabs of this reinforced-concrete structure were set as close as feasible to the edge of the 200-ft cliff above the Caribbean—to take full advantage of the dramatic prospect and to gain more floor space on the view side for this new two-story addition to the existing officers club. The lower floor, on a level wih the existing swimming pool, is actually an open space connecting the pool with a dance patio. This area also borders on the existing kitchen and is often used as an open-air, though sheltered, dining terrace. A handsome stairway connects with the glassed-in floor above, which contains space for dining and cocktail parties, and a service kitchen, directly over the existing main kitchen. Three sides of the upper level have access to a broad balcony. Floors in the newly finished sections of the building are terrazzo. The ceiling on the upper floor is surfaced with acoustical tiles; the terrace ceiling below employs stucco. Exterior walls in the enclosed dining and cocktail room alternate between floor-to-ceiling glass and wood jalousies. Eduardo J. Amaral, Architect, of Santurce, Puerto Rico, was responsible for the initial conception of this addition. Norman J. Dignum were Structural Engineers; R. L. Duffer & Associates, Mechanical Engineers.

Photos: Alexandre Georges





terrace
open well
north
roof
dining room
serving pantry
screen
0 25 feet 0 5 meters



PRESTRESSED AND PRECAST CONCRETE:

by Fred E. Koebel* and Eric C. Molke**

In recent years there has been a general trend throughout the construction industry toward more acceptance and use of precast, prestressed-concrete structural members. In the United States today, there exist more than 5000 precast-concrete plants, many of which are equipped to do prestressing work in conjunction with precasting work. Added to these many plants is the willingness of general contractors to do job-site precasting under special conditions for special jobs.

types of members

From the many products which can be manufactured, a few members have become more or less standard and their use has been accepted by architects and engineers quite broadly. Figure 1 shows a sketch of a typical roof panel manufactured in many plants throughout the country. This Double-T section is adaptable for spans from 20′ to 35′ in general, although spans of 50′ have been built. This type of slab is usually reinforced with pretensioning steel and is manufactured by the long-line process. The supporting members are generally prestressed girders, with spans up to 50′ in length, or loadbearing walls.

Another system of floor and roof construction used to a great extent, particularly in Europe, is a system utilizing various precast products tied together with pretensioning steel mortared into grooves. Figure 2 shows two schemes of this type of floor and roof construction. Basically this system consists of prefab-prestressed joists and hung-in filler blocks forming a level ceiling over which in-situ concrete is placed at the job site. The joists may be concrete as in Scheme 1 or clay tile as in Scheme 2 (known as Stahlton in Europe) and they are provided with vertical grooves to receive the prestressing reinforcement. The joists are fabricated from small, easy-to-handle pieces on a pretensioning bed. The wires are placed in the grooves and mortared-in to develop the necessary bond on the steel. The joists are then carried to the job site, erected, and filler blocks placed. The in-situ concrete is then placed. Manufacturers of this system are able to keep a stock of joists and filler blocks which will fit practi-

* *Vice-President and Chief Engineer, Prestressing, Incorporated, San Antonio, Tex.*
** *Vice-President and Technical Director, Prestressing Research & Development, Inc., San Antonio, Tex.*

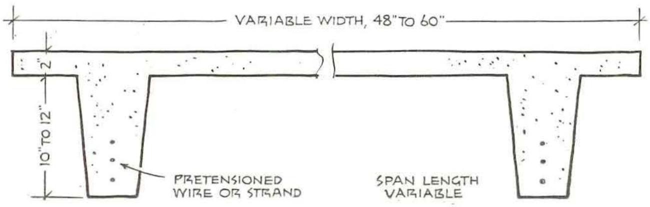


Figure 1—double-T section.

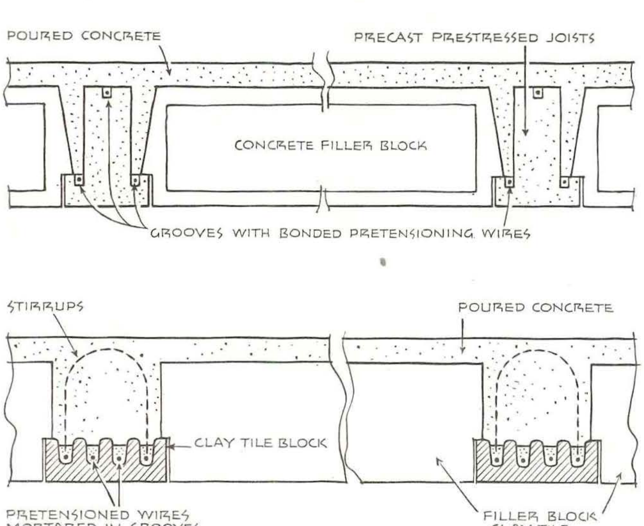


Figure 2—prefab floor and roof systems.

Figure 3—freight terminal utilizes long-span, channel-slab type of precast-roof construction. Channels rest on prestressed girders.

design and construction trends

cally any job condition. Architects are accustomed to designing floors and roofs for these available stock sizes, which explains the rapid acceptance of this system. One of the basic advantages of this method is the flat underside which can be plastered or finished quite economically. This system is particularly well adapted to exposed-ceiling construction and to buildings where floor-to-floor height is of importance.

Another system of precast roof construction used successfully today is the long-span channel-slab type of construction. Figure 3 shows a building utilizing this type of construction. These channels are supported on prestressed girders and are 2′ in width and the legs are 9″ deep. The thickness of the top slab is from 1″ to 1¼″ and it is reinforced with a light mesh. Reinforcing bars of various sizes depending on span are placed in the legs. The maximum span is usually about 22′. Channels are usually manufactured from lightweight concrete. The channels in this roofing system are supported by precast, prestressed girders 50′ in length. The cantilever is 15′ and the interior span is 35′. The total depth of girder, including 9″ of fill concrete for the tying of the roof channels, is only 26″.

Another type of channel slab sometimes used is a prestressed-channel slab. These slabs are from 4′ to 5′ in width and span up to 40′ in length. The depth of slab varies from 9″ to 12″ and the weight varies from 27 lb per sq ft to 35 lb per sq ft. Figure 4 shows a stack of prestressed-channel slabs ready for erection. These slabs may be either pretensioned or post-tensioned. When the slabs are post-tensioned, vacuum curing and lifting can be used to advantage in order to free forms more rapidly for reuse.

Still another type of channel slab is shown in Figure 5. These channel slabs span 33′ and are 12″ deep; they are 5′ in width and the top slab is 1¼″ thick reinforced with mesh. The slabs are supported on cast-in-place rigid frames spanning 66′. In this particular job the contractor elected to cast these panels on the job site as shown in Figure 6. Both vacuum curing and vacuum lifting were utilized to expedite casting and erection.

Perhaps one of the most flexible roof systems available in precast concrete is

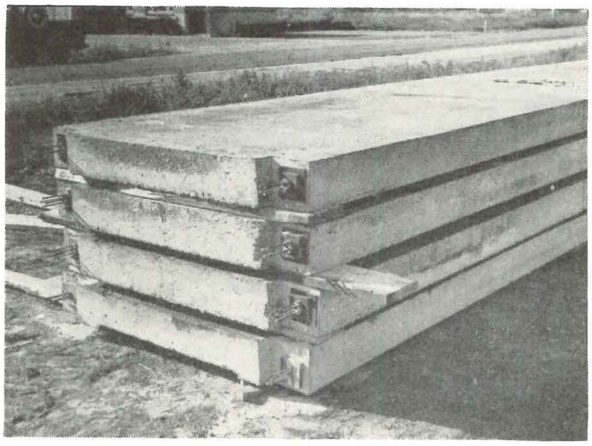


Figure 4—precast, prestressed-concrete roof panels, 5′ x 28′, ready for erection (left); *depth, 7½″; weight 28 psf. These slabs may be pretensioned or post-tensioned.*

Figure 5—channel slabs spanning 33′ in roof are 12″ deep; top of slab is 1¼″ thick and 5′ wide (below).

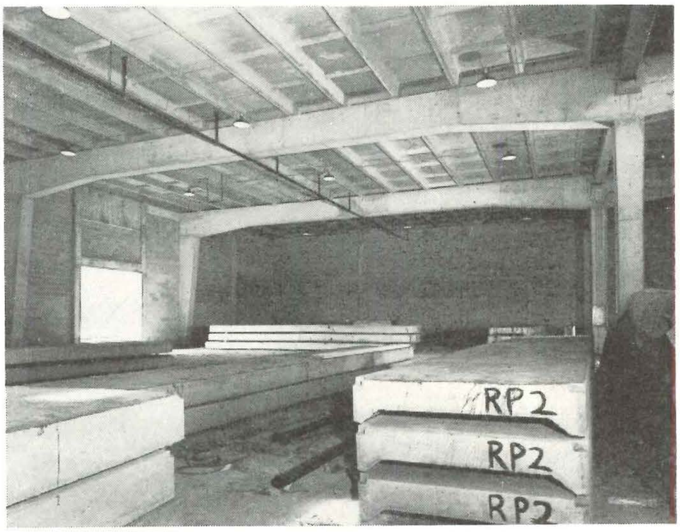


Figure 6—channel slabs shown in photo (above) *were cast at job site* (left).

shown in Figure 7. This system utilizes precast and prestressed purlins from 6′ to 10′ on center combined with precast roof plank or channel plank spanning the 6′ to 10′ span. The purlins are supported by prestressed girders serving as the main members. This system can be adapted for bay sizes from 20′ to 50′ with very little increase in dead weight of structure. The filling slab used is always the same and only the purlin increases in weight. Hence the unit load is held more or less constant regardless of span. As an example of this, one structure using the system shown in Figure 7 has bays of 40′x25′. The roof purlins span in the 25′ direction and are 10′ on center. The purlin weight is 90 lb per running foot or 9 lb per sq ft of area covered. The channel plank spanning the 10′ direction weighs 14 lb per sq ft, thus giving a total weight of roof structure of 23 lb per sq ft. The purlin shown can span 35′ with a roof load. Thus the span was increased 10′ with no increase in dead load of structure. This system can also be successfully adapted to floor loadings with the precast panel or channel serving as a form for any additional in-situ concrete. With the purlin framing into the bottom flange of the girder, over-all depth of roof system is held to a minimum dimension.

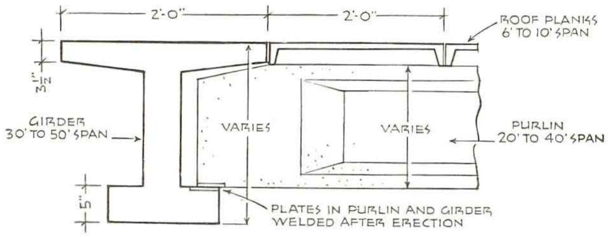


Figure 7—girder-purlin-plank system.

Utilizing these precast and prestressed concrete members has made possible the construction of warehouses, schools, garages, and many other buildings at a relatively low initial cost. When this low initial cost can be achieved, the advantages of lower insurance rates and lower maintenance costs are added incentives for construction of this type. A 25,000-sq-ft warehouse recently built in the Southwest was constructed for less than $4 per sq ft. The structure, with office space, utilized bays of 50′ x 30′. The structural frame was built for $1.25 per sq ft, including columns. The owners will realize $24,000 in savings from insurance-rate differences in 20 years.

Figure 8 is a view of a gymnasium recently completed. This gymnasium roof has girders with a maximum span of 109′. Girders were cast in place in this instance, utilizing two sets of forms that were reusable. The depth of girder is 5′-6″. The roof structure is composed of precast joists, spanning 21′, and 2″ of insulation on T-bars.

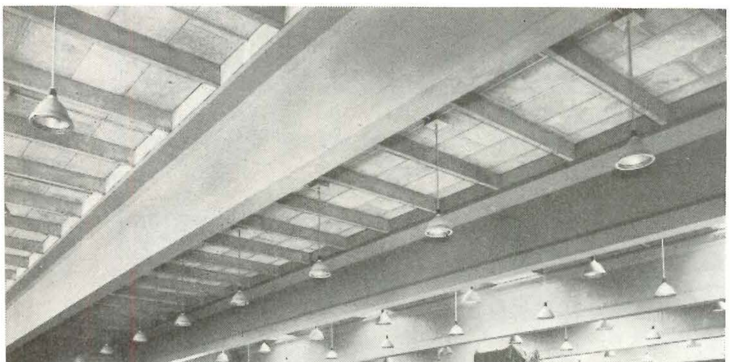
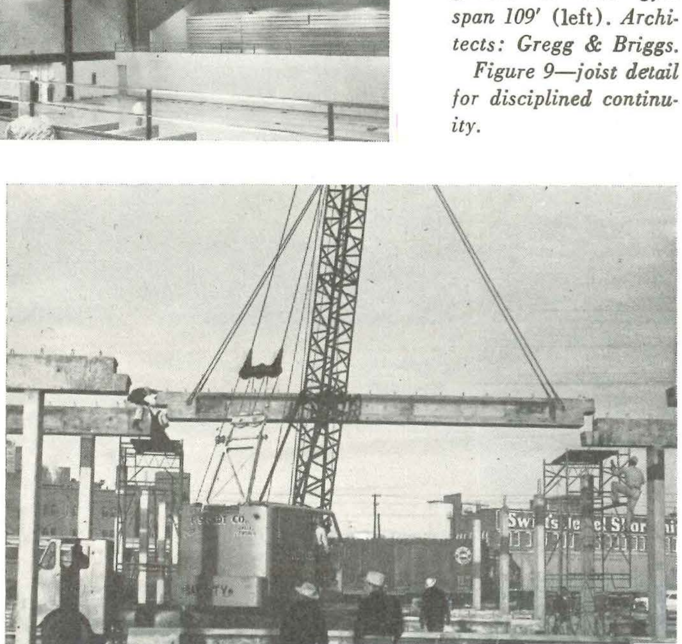


Figure 8—cast-in-place girders in this gym span 109′ (left). *Architects: Gregg & Briggs.*

Figure 9—joist detail for disciplined continuity.



continuity

With the increased acceptance of precast concrete and prestressed concrete there has also developed the use of continuity for prestressed-concrete members. As with all structural materials, in order to utilize the material to its fullest, continuity should be developed. With prestressed-concrete members, continuity introduces various problems not encountered in simple-beam design, among which are friction during construction and secondary moments which the designer should be cognizant of during the analysis of his structure. In general, continuity in prestressed concrete can be divided into four broad classifications:

I disciplined continuity,
II composite continuity,
III joint continuity,
IV monolithic continuity.

The first type of continuity, while not true continuity, is a type of design which takes both negative and positive moments into account. The title "disciplined continuity" is given because that is just what is done in the design—negative and positive moments are controlled by careful selection of the length of members. This system is utilized in steel design and sometimes with laminated-wood girders, but has not been employed to a great extent in concrete design. Nevertheless, precast concrete is particularly well adapted to this type of construction. The system is composed of "drop-in" beams which take their reaction on cantilevers extending from girders which in turn extend from the adjacent bays. Theoretically, the positive and negative moments in the girder with the cantilevers should balance; however, due to the fact that the cables are raised and the section of the girder is changed at the support, the negative moment is usually held to approximately 80 percent of the positive moment. The resulting span for the drop-in girder is reduced, with a corresponding reduction in moment. The joint between drop-in members and the cantilever member remains as a pin and functions as a pin under all load conditions. The entire system is statically determinate and stable so that there are no secondary prestressing moments developed. Friction between prestressing cables and the ducts or concrete is of no measurable importance because prestressing cables do not have a double reverse in direction. The most practical application of this type of structural framing is in multibay warehouses. Lateral stability of the structure is maintained by the roof system which may be any of the precast systems outlined in the earlier sections of this paper. Figure 9 shows a typical joint for this type of construction. Figure 10 shows the values of moments developed in the structure and compares them to a simple construction. The section of the girder used is also shown. It can easily be visualized that the section shown could not carry the loading as a simple beam with the same strength concrete or the same quantity of prestressing steel. The authors have found that this type of construction is not particularly adaptable to skip-loading criteria.

This type of construction has many advantages. The primary advantage is the saving in materials and in reduced depth of member. Advantages in prestressing are also gained, i.e., no secondary moments are developed and friction loss during stressing is at a minimum. Minor disadvantages are joinery and differences in span length, which introduce forming difficulties if it is desired to use the same form for both types of members.

The second type of continuity that can be developed with prestressed, precast members is composite continuity or continuity that is obtained with the use of mild-steel reinforcing to develop the negative moment at the continuous joints. This has been done successfully with precast roof members that have been made continuous across the supporting girders, and in frames erected from precast members. Figure 11 shows a rigid frame recently completed using this type of continuity. Columns with sufficient dowels were cast in place. Girders 42" in depth were built on the floor slab and prestressed to the full value of prestressing force required for the maximum positive moment developed under all conditions of loading. The girders were erected and the mild steel from the girders was welded to the corresponding steel from the columns to develop a continuous joint at the knuckle.

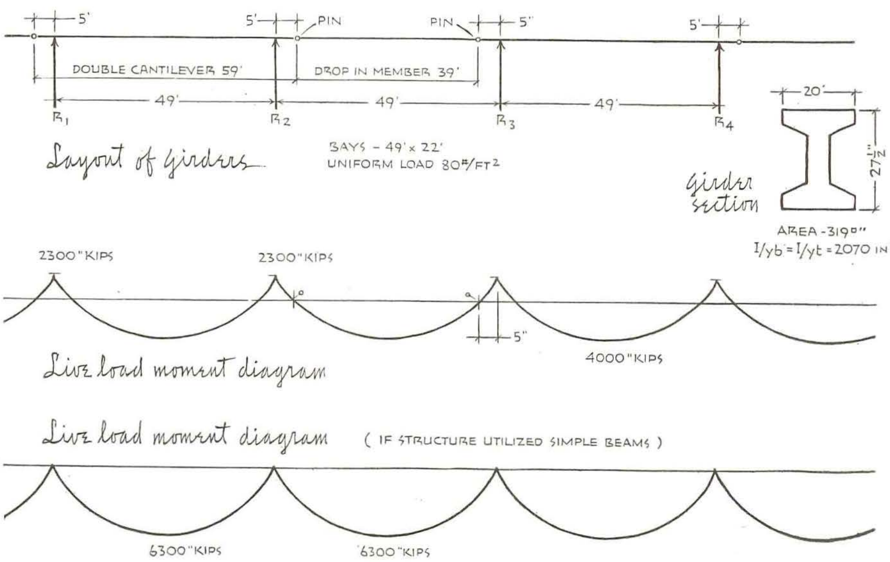


Figure 10—disciplined continuity.

Figure 11—rigid frame with composite continuity.

Figure 12 indicates the various moment conditions developed with this type structure as well as a comparison between simple-beam moments and the continuous moments. The frame utilized was designed for hurricane-wind stresses. The mild steel at the joints was designed for the maximum negative and positive moments that were developed at the joint. The simple beam-and-post system obviously would not resist these particular design criteria.

The third type of continuous structure that can be constructed with prestressed, precast concrete members is that type in which continuity is obtained by the introduction of post-tensioning reinforcing across the joint after the various sections or pieces of the structure are erected. An example of this type of construction is shown in Figure 13. In this structure the girders, 144′ in length, 84″ in depth at the center, and 66″ at the ends, and weighing over 200,000 lb, are cast on the ground and then erected through the split columns by means of hydraulic jacks resting on top of the columns. Figure 13 shows the erection of this girder system. When the girders are raised to the right elevation they are temporarily pinned and the roof system placed. The roof panels are placed on the bottom flange, thus presenting an upstanding girder. After the girder has taken its full deflection from the dead load of the roof structure, short prestressing units are introduced at the "knuckle" for full rigid-frame action under all live load and wind loads. Figure 14 shows the moments developed on this structure. Obviously the comparable simple-beam moment could not be developed in the girder section used in this rigid frame.

One interesting point which should be brought out about the above three systems of continuity is the fact that the designer can control critical moments either by judicious selection of span lengths and cantilever lengths as in Type I or by the control of the time of placing known dead loads. In this manner, the size of the footings, columns, and members can be readily controlled to meet any design criteria. For example, the roof structure in the rigid frame shown in Figure 13 could have been placed after the joint had been prestressed and made continuous. However, the footing stresses would have been excessive and in this instance soil conditions prevented this action.

The fourth system of continuous prestressing is the monolithic-continuous type in which the prestressing tendons extend in general throughout the entire length of the members. Usually this type of structure is cast in place, although various systems have been introduced to precast this type of member. In this type of continuous prestressed-concrete structure, friction between concrete and prestressing tendons becomes important. Various methods to reduce this friction value have been developed. First the tendons may be laid-in straight and the soffit of the member curved to develop the eccentricities of tendon desired. Va-

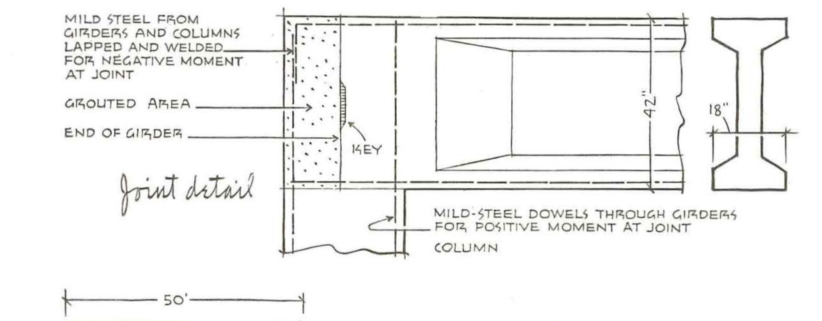
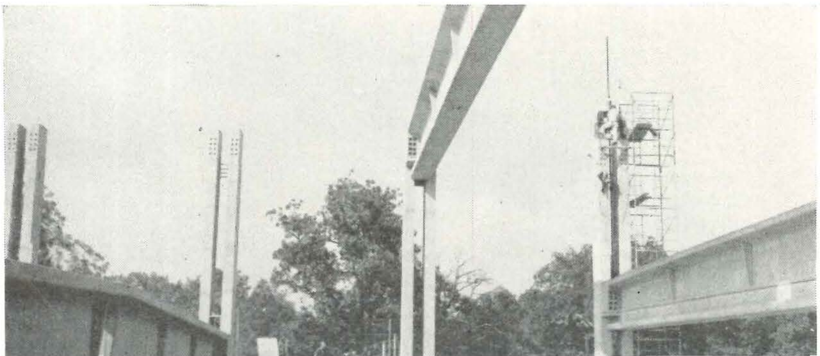


Figure 12—composite continuity.

Figure 13—these 144′ prestressed girders were cast on ground and erected by means of hydraulic jacks resting atop split columns.



rious friction-reducing plates may also be used. However, in continuous construction it is necessary to provide means to account for any calculated friction losses. Care should also be taken in construction to prevent lateral "wobble" of cables which will increase friction substantially.

Figure 15 shows a four-span continuous flat-slab bridge. The spans are 45'-65'-70' and 45'. The maximum depth of slab is 24". Dead weight was reduced by the use of tubular fiber forms throughout the structure.

secondary bending moments

In systems III and IV mentioned above, the effects of prestressing must be accounted for in the stress analysis of the structure. The prestressing forces brought into the continuous member introduce secondary bending moments, the magnitude of which is not negligible. The designer of an indeterminate prestressed-concrete structure must be cognizant of this effect in the evaluation of stresses developed in the structure. Many articles have been written outlining various procedures to evaluate these secondary bending moments. In general the authors have found the following procedure satisfactory in the analysis for an indeterminate prestressed structure:

1—analyze the structure for all loading conditions, i.e., dead load, live load, wind load, etc.;

2—design the prestressing reinforcing and girder section to resist these stresses;

3—evaluate the secondary moments caused by this prestressing reinforcing;

4—superimpose this secondary effect on the other stress conditions and check all stress stages;

5—make any necessary adjustments in geometry of the girder and cable layout;

6—repeat steps 3, 4, and 5 until desired allowable stresses are obtained.

All of these steps can be taken utilizing the ordinary tools of structural analysis, i.e., slope deflection, moment distribution, angle change, elastic weights, etc.

Step 3 (*above*), the evaluation of the secondary moments, is really the only different concept involved in the analysis of indeterminate prestressed-concrete structures. The secondary moments introduced into the structure are due to the basic relationship of stress and strain. A statically determinate structure, i.e., a simple girder, can develop its elastic strain under the action of prestressing without alteration of the external reactions on the structure; however, in a structure that is indeterminate the external reactions will be modified by the change in elastic shape of the structure induced by the application of prestressing forces. The basic problem is then one of evaluating this change in elastic shape of the structure.

Steps 4 and 5 (*above*) are therefore nothing but check steps and are similar to any indeterminate analysis.

Continuity thus can be seen to be a logical development in the prestressing industry. In the past years it has been

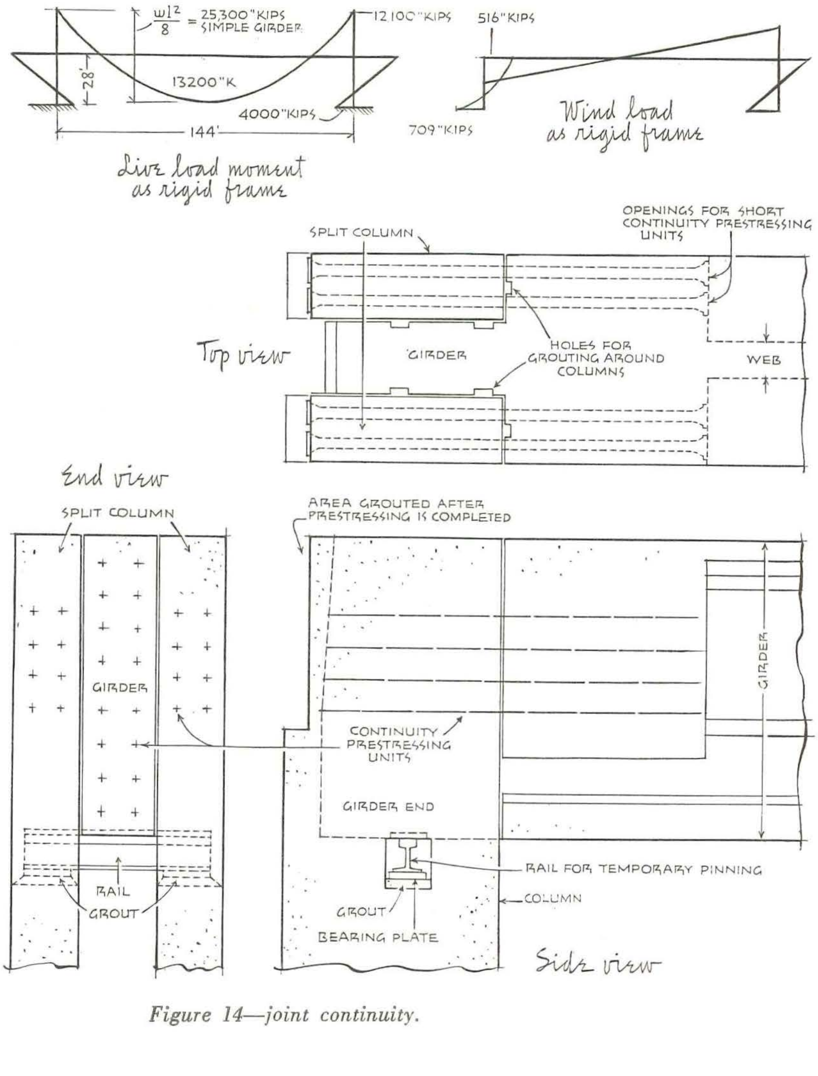
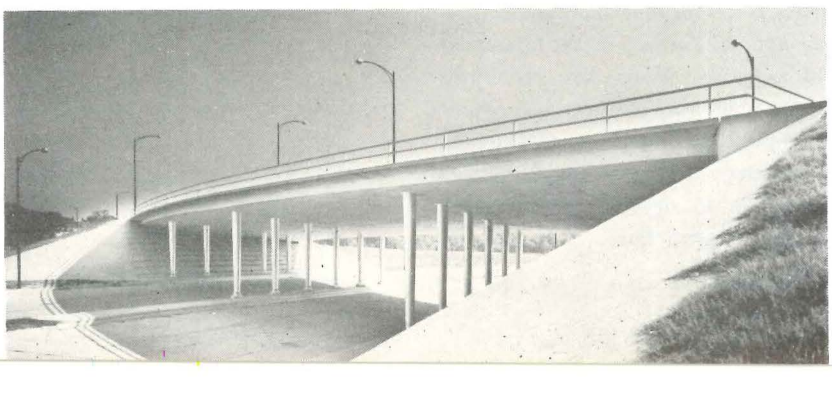


Figure 14—joint continuity.

Figure 15—four-span continuous flat-slab bridge; maximum depth 24". Consulting Engineer: Francis J. Niven.



shown that with simple structural members prestressed concrete is competitive to other structural materials which are designed as continuous members. Undoubtedly, with the use of continuity, prestressed concrete can become even more competitive.

thin-shell domes

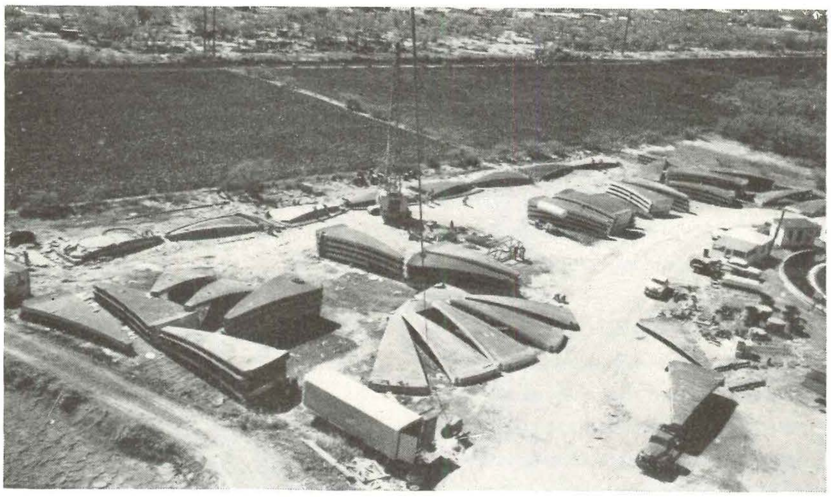
One type of structure which has not yet been precast to a great extent is the thin-shell-dome type of structure. Figure 16 shows a job-site casting yard for precast tank covers. The span across the tank in Figure 17 is 75′ and the average thickness of the dome skin is 2″. This tank cover was constructed from sixteen precast elements. These elements were curved to a radius of 100′ in both directions. The segments were placed in position by use of a derrick. One end of the segment rests on the tank wall and the other end rests on a wooden tower at the center of the tank, as shown.

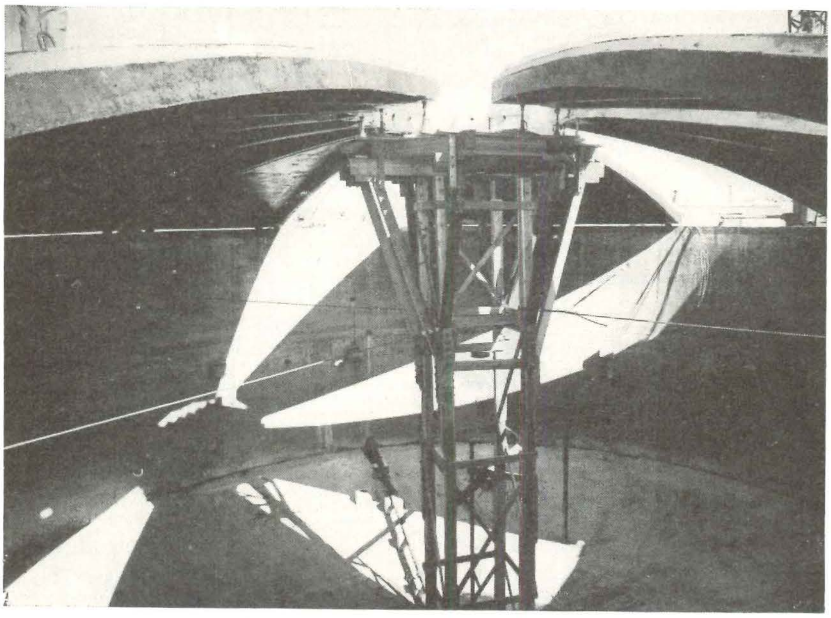
The segment ribs had to be designed in such a way that they could carry the dead load of the segment between the center tower and walls during construction. The circular base ribs resting on the tank walls were cast with holes, into which were threaded the prestressing units for a tension ring to take up the dome thrust. A top compression ring was cast around the top ends of the segmental dome panels which left an opening big enough to hoist and remove the central tower after all panel joints were grouted and the prestressing introduced. Thus the slabs in the final stage act merely to resist the dome compression. The radial dome ribs give added stiffness to the dome structure and offer a pleasing architectural appearance. This type of construction should therefore have a wide application for more monumental buildings of round or square plan area.

Obviously, since World War II there has been a tremendous increase in precasting and, of course, in the prestressing of concrete. Many fine structures both here and abroad have been built utilizing these mediums of construction. It is felt that architects and engineers will continue to develop these "tools" of concrete construction.

Figure 16—casting yard at job site for precast thin-shell domes (below).

Figure 17—erection of thin-shell segments. A top compression ring was cast later (bottom)





closed-circuit tv

by Max H. Kraus*

Exactly what is closed-circuit television? This question has been raised by architects and engineers with increasing frequency during recent months, and many more might well be asking the same question.

The terms, "closed-circuit television" and "industrial television," have been used to encompass a variety of TV applications in which signals are carried from one or more origination points to viewing locations, in a manner that prevents their widespread reception. In order for the designer to realize the full benefits of closed-circuit television, it is important to recognize the types of television systems than can be employed.

In the simplest of applications, television can be applied to the operation of a rolling mill, where the operator is assisted by a television camera that pictures—on a conveniently located monitor—aspects of the operation which are normally beyond his range of view. The basic requirements here can be met with one camera and one monitor connected by a short length of cable. Since no long distances are involved and only one operation is being viewed—without any requirement for transmitting voices or other audio signals—the composite video signals can be sent directly from the camera to the monitor which, in this case, contains only the circuits necessary to display the picture (*Figure 1*). Depending upon the light intensity and installation problems encountered, all necessary equipment can be purchased and installed for a cost of $2000 to $5000.

In many cases, a far greater degree of flexibility is desired to enable a number of viewing locations to be served by a central origination point (*Figure 2*). An example of this situation is one that arises in airports, where an airline must relay flight information to the ticket counters, information desk, baggage-handling room, and food handlers simultaneously and rapidly, without the errors and delays that creep in when messages are relayed from place to place by conventional means. Similarly, the familiar master-antenna system falls in this category, since it provides a means of distributing signals obtained at a single point (the apartment house or hotel rooftop receiving location) to a number of receiving locations (the tenants' living rooms or guest rooms). Here again, closed-circuit television steps in to provide a new factor to consider—local program origination. The 1600-unit co-operative housing recently built on the east side of New York City by the International Ladies Garment Workers Union, not only includes a complete master television-antenna system to provide coverage of New York's seven commercial channels for all apartments, but also has provision for closed-circuit television transmission originating local programs that bring shopping tips and advertising from a nearby shopping center to all tenants. Another closed-circuit TV development is evolving in Pocatello, Idaho, where the local community antenna system, which provides TV reception for the city, is expanding its facilities to enable the local public schools to be linked to a television-studio location on the campus of Idaho State College. In each of these cases, the system uses radio-frequency distribution, in which the video and sound signals are used to modulate radio-frequency carriers, thus making it possible to send simultaneously seven or more signals over the same coaxial cable. While it is difficult to generalize cost in a multichannel, multioutlet installation, it is frequently true that in most buildings the extra cost of the distribution equipment is usually insignificant when compared to the cost of the camera and related equipment needed for the simplest single-camera, single-monitor installation.

The greatest degree of flexibility becomes possible through the use of two-way television (*Figure 3*). This recent innovation makes it possible for a number of cameras and receivers to be installed throughout a building with complete freedom of movement for both. Camera and receiver connection points are provided throughout the area so that television becomes merely another communication service with easy plug-in features at all desired points. At Case Institute of Technology, Cleveland, and at Chicago Teachers College, systems of this type have made improvements in teaching possible by bringing "into the classroom" large projects which otherwise could not be adequately discussed. Similarly, difficult or expensive experiments can be performed before a much larger student audience—with good viewing conditions for all. To facilitate discussion, in addition to the sound which can be carried over the television facilities, one or more twisted-wire pairs are included to provide regular intercommunication circuits.

With these basic tools—point-to-point closed-circuit TV, multichannel general-purpose TV, and two-way TV—the architect has a powerful new medium at his disposal. However, this new type of system imposes an added responsibility on the conscientious designer. He has a responsibility to his client and to himself to see to it that he uses closed-circuit TV properly and fully, whenever it can fulfill a need. In some cases, this will mean nothing more than allowing sufficient space in the projection booth of a new motion-picture theater for a

**Jerrold Electronics Corp., Philadelphia, Pa.*

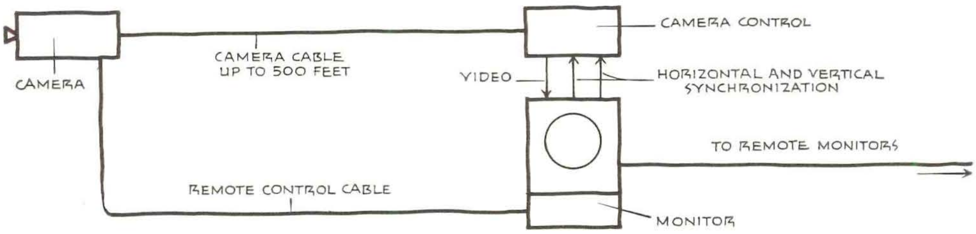


fig. 1

TYPICAL SINGLE-CAMERA TELEVISION SYSTEM

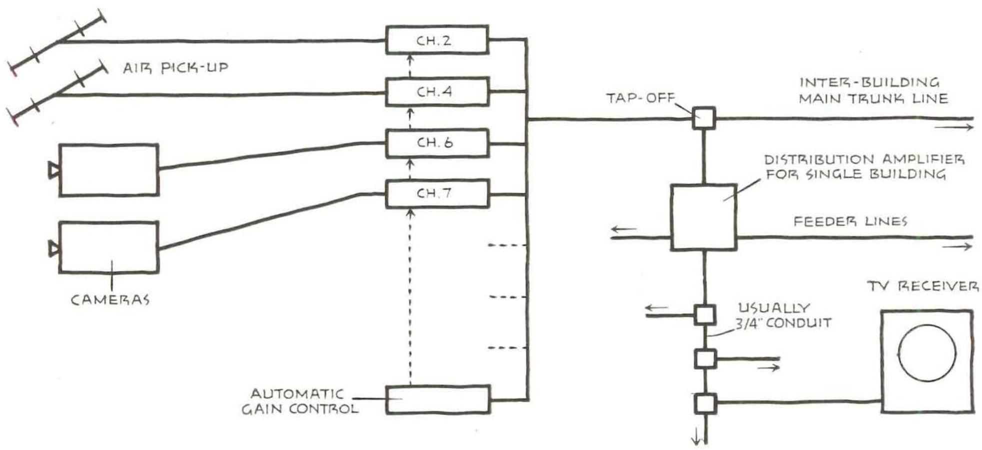


fig. 2

BASIC TELEVISION DISTRIBUTION SYSTEM

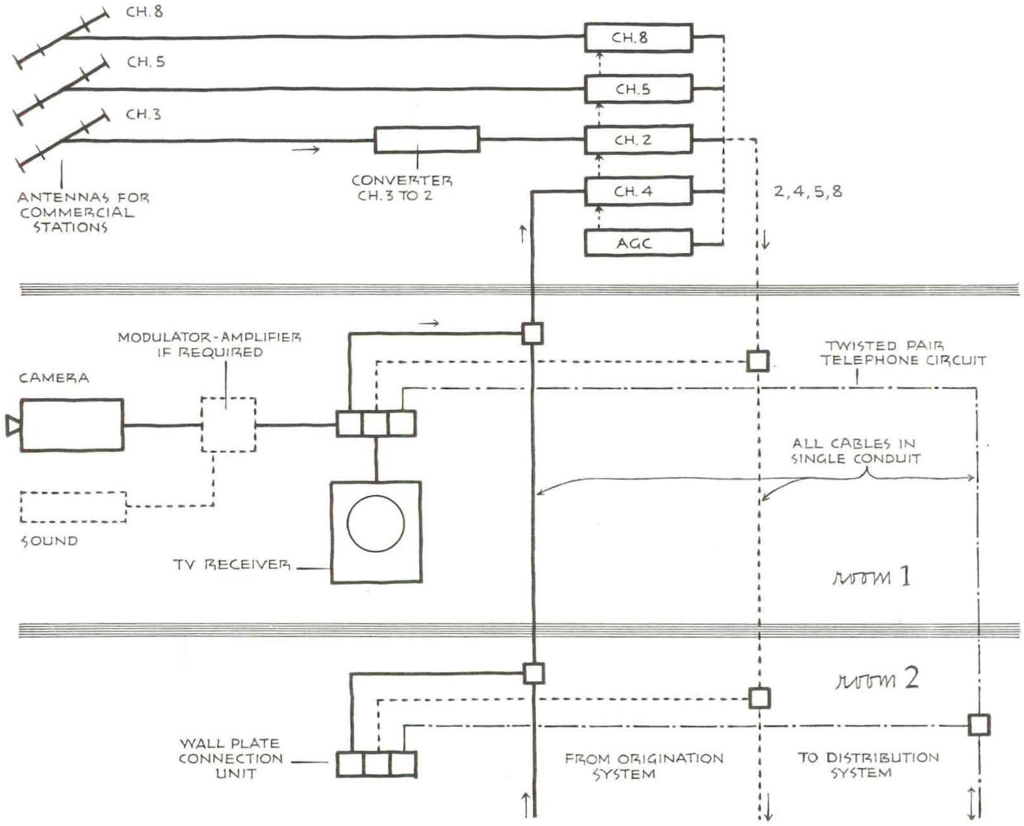


fig. 3

BASIC 2-WAY TELEVISION SYSTEM

unattended central facilities

large-screen TV projector, plus conduit to the roof for an antenna lead-in, and conduit to the basement for connection to a line which will bring future closed-circuit programs over special telephone-company facilities. In other cases, the entire design of a building may be affected, particularly in schools and colleges. Through tests made at Fort Monmouth and Penn State and elsewhere, it has been established that television has vast possibilities as an audio-visual aid and a potential teaching medium. Already, it is possible to eliminate projection booths at the rear of classrooms or in lecture halls by substituting a central motion-picture distribution center, from which films are shown over television. Such a system not only eliminates the cost of the projection booths and movie projectors, but also improves viewing conditions, eliminates the need for darkening a room, and lifts a burdensome duty from the teacher's shoulders. Similar facilities for live-program origination can make it possible to reach simultaneously all pupils in their classrooms, thus making it possible to eliminate auditorium facilities under certain conditions.

Structurally, the inclusion of closed-circuit TV poses no headaches for the architect. In fact, since two-way TV makes it possible to originate programs from any point in a building, a studio is frequently unnecessary. The decision regarding the exact design of the system must, of course, be made after a thorough review of the TV requirements—and preferably after discussion with a qualified supplier of closed-circuit TV systems to insure that the latest improvements are considered. Such a review will include the determination of the requirements shown (*Table I*).

Little has been said regarding the camera itself, because in most cases its operation is quite simple and does not concern the building designer. The use of vidicon cameras, instead of the image-orthicon type used by television stations, has done much to improve the life and ease of operation, as well as reducing the camera size. The slight disadvantage of the vidicon camera is the need for relatively higher light levels; in most cases, however, this imposes no real problem. A feature that may be of importance in certain specialized applications is the availability of special camera accessories, including remote pan, tilt, focus and lens changes, automatic iris control, waterproof housings, and housings for explosive atmospheres.

With these possibilities at the disposal of the imaginative mind, it is no wonder that several authorities see a long-range potential for closed-circuit TV. Already, almost every type of building or structure has some need for a closed-circuit system either of the regular master-antenna type or with full-program origination facilities (*Table II*).

Table I—Architectural Considerations

1—space;
2—lighting;
3—conduit;
4—electrical power for camera and lights at central-equipment locations and in classrooms;
5—number of receiver connection points;
6—number of camera connection points;
7—need for a studio;
8—number of channels to be distributed simultaneously over system;
9—number of channels to be simultaneously originated from remote points;
10—number of separate circuits;
11—need for connection to telephone facilities for origination or reception of other closed-circuit programs;
12—future expansion.

Table II—Closed-Circuit Applications

Industrial buildings: closed-circuit surveillance; distribution of planning information; two-way, long-range discussions of blueprints; control of difficult or dangerous operations.

Apartment buildings: master-antenna service and local program origination in conjunction with shopping facilities.

Schools and universities: master-antenna facilities plus origination of educational programs for regular scholastic purposes and training of those entering the television profession.

Hotels: master-antenna system plus local origination for announcements, publicity of public functions tie-in with intercity closed-circuit TV.

Tract housing: community antenna-system facilities to eliminate objectionable outdoor antennas.

Department stores and shopping centers: closed-circuit promotion of specials and public events.

Banks: closed-circuit signature verification and surveillance.

Hospitals: master-antenna system plus closed-circuit medical teaching.

Mental institutions: master-antenna system for entertainment (equipped with provision for eliminating undesired programs) plus closed-circuit systems for observing patients under treatment.

Office buildings: master-antenna facilities for tenants.

Churches: closed-circuit viewing from main portion of church to auditorium or Sunday-School rooms.

Theaters: provision for connection to intercity closed-circuit television networks.

Railroads and airports: closed-circuit information displays, general-message handling, and view of obstructed areas.

Traffic control on freeways and tunnels: closed-circuit surveillance of tie-ups or traffic patterns.

Prisons: closed-circuit surveillance.

reconditioning means air conditioning

by Albert Giannini*

The recently remodeled interior of the American Fore Building, 80 Maiden Lane, in New York's financial and insurance district, is one of the largest projects of its kind ever accomplished in this country. Revamped from sub-basement to roof, the building, which houses the five insurance companies of the American Fore Group, was refurbished with modern office decor and new utilities—year-round air conditioning, lighting, and elevator services. The four-year construction job was done without interrupting normal business operations. During this period, in fact, American Fore actually expanded its organization.

Constructed in 1912 and 25 stories in height, 80 Maiden Lane has 350,000 sq ft of office space. Over 2500 people use the building every work day. Few tenants occupy it, however, since most of the building is used by American Fore.

Because 80 Maiden Lane is located in the hub of the nation's insurance industry, the management decided against abandoning the 43-year-old structure. To demolish and replace the building would have been too costly. Also a new building would have required setbacks above the ninth floor—substantially reducing up per-floor work space. At this time, due to American Fore's postwar growth, maximum floor space was urgently needed.

Sturdily built and in prime structural condition, the present building required only interior modernization. With the decision to air condition as well as modernize the building, hitherto poorly ventilated interior work areas could be transformed into comfortable offices. Most important of all, perhaps, was the fact that the building still could be used during alterations; normal office routines could continue unhampered.

One illustration sums up the advantages of modernizing 80 Maiden Lane. For a five-week period dictaphone operators in American Fore's Transcribing Department transcribed 26,830 letters. The department then moved to its permanent location on a remodeled floor where employes could enjoy better seating arrangements, better lighting, more comfortable furniture, air conditioning, and music (piped through a building-wide public-address system). In a subsequent five-week period, the same group of operators transcribed 29,311 letters—an increase of 9.3 percent. Errors had been cut to almost nil and absenteeism had drastically declined.

The rebuilding program began piecemeal. Steam service from New York Steam Corporation was connected to the existing heating system, then four coal-fired boilers were ripped out to make way for two steam-powered centrifugals driven by condensing turbines. The capacities of the two machines are 575 and 775 tons respectively. Chilled water from the refrigeration plant is circulated by pumps to various cooling coils throughout the building. Condensing water for both the steam and refrigerant condensers is recirculated from two cooling towers on the roof. These towers save 95 percent of the condensing water.

The boiler room and coal-bunker areas provided space for refrigeration apparatus, air-conditioning equipment, and storage and maintenance facilities. A chimney, 10 ft square and 26-stories high, was converted into a passageway for chilled water, secondary and condenser water lines, and interior-system conditioned-air risers as well as a 10-in. steam header.

Except for part of the 2nd floor and all of the 1st, 13th, and 14th floors, the building's exterior bays are air conditioned by a high-velocity conduit system that uses individual induction window units concealed by column-to-column metal cabinets. These units replaced radiators and are set to provide a constant year-round temperature of 74 F. After passing through a sound-absorbing plenum, conditioned air mixes by induction with room air.

There are four primary air supply stations: two in roof-top penthouses, which supply air to peripheral units above the 14th floor, and two in the basement mezzanine (old boiler room), supplying all window units from the 2nd to the 12th floors.

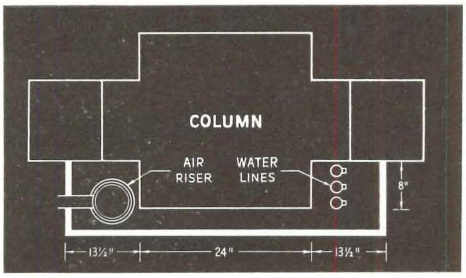
Each of approximately 1650 window units receives its supply of air under pressure through wall risers. Chilled water to each unit is supplied by piping. Wall risers, in turn, receive air from three main trunk ducts, located at each main air supply station.

At each floor there are 40 columns along the periphery of the building. Conduit providing conditioned air occurs at every other column location; at intervening columns piping for chilled and heated water has been installed (*Figures 1, 2, and 3*). After air ducts and piping were connected with the window units, the column was furred out to enclose an area of 4′-3″x13″ (*Figure 1*).

Because either hot or cool air circulates through the columnar air ducts, causing them to expand or contract, each duct lead-out was seated with glass-fiber insulation. This minimizes the possibility of the lead-out ducts cracking the plaster furring.

Interior portions of the building are air conditioned by standard low-pressure systems, which feed air to areas over 19 ft from window units. Two such systems, including steam preheaters, electrostatic and dry filters, dehumidifiers with cooling coils, steam reheaters and supply air fans, are located in the basement mezzanine and on the 24th floor. These provide cooling and dehumidification in sum-

* *Carrier Corporation, Syracuse, N. Y.*



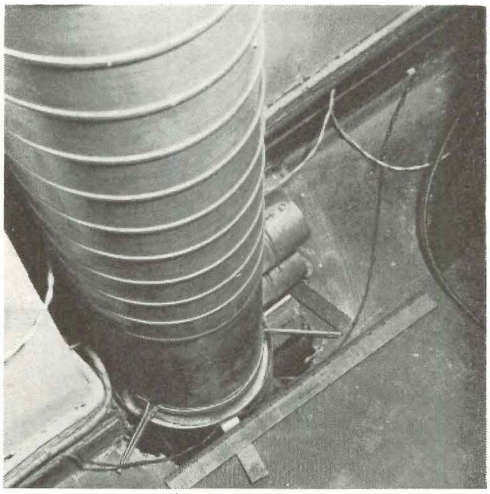
mer, tempering and humidification in cold weather.

Similar conventional systems were installed on the 13th (cafeteria and dining rooms) and 14th floors (conference and recreation areas). Equipment's purpose: to accommodate the extra heat loads built up by serving 2000 people daily.

A 30-ft deep, 25-ft wide, and 3-ft high masonry duct, extending from the Maiden Lane wall to the basement mezzanine, brings in outside air to ventilate the lower half of the building. The building's upper half receives fresh air from intakes on the roof. In principle, each primary air intake is similar; fresh air is drawn into the spray-type air conditioner through a rainproof louver and screen. Filters remove entrained dust and dirt particles. In cold weather, this air is tempered by a preheater so that it absorbs moisture when passing through the sprays. Excess moisture in the air is removed by the sprayed chilled-water coil during hot, humid periods or moisture may be added by the sprays for winter humidification. For operation during intermediate seasons a reheater warms the air enough to offset the building transmission losses before the system changes over to the winter heating cycle.

The H-shape of 80 Maiden Lane complicated solar-load effects. Rapid changes in heat gain from the sun were caused by traveling shadows. This condition was solved by the air-conditioning system's flexibility as a constant source of either heating or cooling. On the structure's east side, due to prevailing dirt conditions, extra sash locks on windows helped cut down the entry of dust particles.

Architects: Cross & Son; Consulting Engineers-Designers for all mechanical work: Meyer, Strong & Jones; Mechanical Contractors: Kerby Saunders, Inc.; General Contractor: Irons & Reynolds.



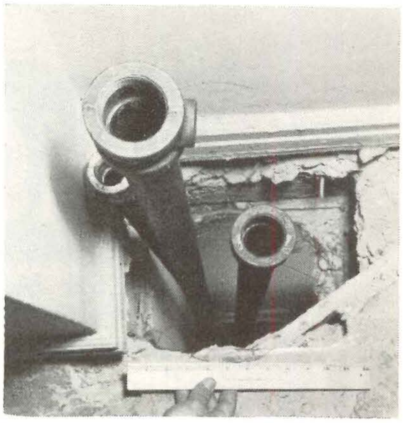


Figure 1—diagram (upper right) *indicates extent of furring and relative locations of air risers and water lines. Actually, air risers occur only at alternating columns and water lines only at intervening columns along the periphery.*

Figure 2—holes for primary-air-supply risers were cut through floors after work hours and on weekends (above).

Figure 3—chilled or heated water pipes (right).

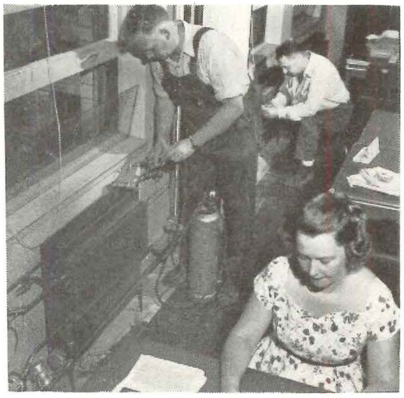


Figure 4—steam fitters prefabricated piping and tubing in basement and later soldered them to window units (right).

Figure 5—metal enclosures extending between columns conceal perimeter air-conditioning units (below).

by Ben John Small

spec small talk

he's here again!

Did I ever expose you to the current version of the first article of the General Conditions (for multiple contract projects) developed in our shop? I acknowledge readily that this Article is as windy as the last hurricane, but honestly we vent our exhaust in this Article only and then gasp through the rest of the spex. Friends, I am curious as a cat to know what you think of it. Tell you what I'll do. For every letter sent in I will return in kind with a gross of articles such as "a," "an," and "the." I happen to have a large inventory in stock accumulated over the years from operated-upon traditional specifications.

Here it is:

1. *Specifications Explanation:*

(a) Wherever reference is made to the "General Conditions" it shall mean the "General Conditions Governing All Contracts." All work of each Contract is subject to the requirements of these "General Conditions."

(b) These Specifications and General Conditions are of the brief or "streamlined" type and include incomplete sentences. Omissions of words or phrases such as "the Contractor shall," "as noted on the Drawings," "according to the plans," "a," "an," "the," "and," and "all" are intentional. Omitted words or phrases shall be supplied by inference in same manner as they are when a "note" occurs on the Drawings. Words "shall be" or "shall" shall be supplied by inference where a colon (:) is used within sentences or phrases. Words "as per" shall mean "in accordance with." Words "provide" and "work" shall mean that each Contractor shall furnish, install and connect up complete, in operative condition and use, all materials, equipment, apparatus and required appurtenances of the particular item to which it has reference. Where a manufacturer's name is mentioned, words "as manufactured by" or "as made by" shall be understood.

(c) Each Contractor shall provide all items, articles, materials, operations, or methods listed, mentioned, or scheduled on Drawings and/or herein, including all labor, materials, equipment, and incidentals required for their completion. Where reference is not made to a particular Contractor, it shall mean each Contractor for each separate Contract.

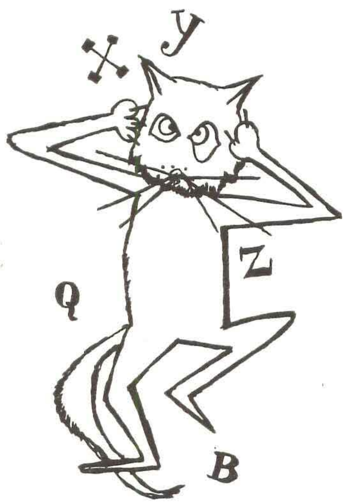
(d) Whenever words "approved," "satisfactory," "directed," "submitted," "inspected," or similar words or phrases are used, it shall be assumed that the word "Architects" follows the verb as the object of the clause, such as "approved by the Architects" and "submitted to the Architects."

(e) Reference to known standard specifications shall mean the latest edition of such specifications adopted and published at date of invitation to submit Proposals.

(f) Reference to a technical society, organization, or body is made in the Specifications in accordance with the following abbreviations:

ACI	American Concrete Institute
AIA	American Institute of Architects
AIEE	American Institute of Electrical Engineers
AISC	American Institute of Steel Construction
ASA	American Standards Association
ASTM	American Society for Testing Materials
AWSC	American Welding Society Code
FS	Federal Specification
NBFU	National Board of Fire Underwriters
NEC	National Electric Code
UL	Underwriters' Laboratories, Inc.

(g) The following examples illustrate in part "streamlining" as used in these Specifications.



EXAMPLE I (Usually employed with respect to descriptions of materials.)

Traditional Version

Portland cement shall be of American manufacture and shall conform to the requirements of the Standard Specifications of the American Society for Testing Materials, Designation C 150, Type 1, latest edition thereof.

Streamlined Version

Portland cement: standard American brand, ASTM, C 150, Type 1.

EXAMPLE II (Usually employed with respect to descriptions of workmanship.)

Traditional Version

The Contractor shall furnish and install tin-clad sliding fire doors in all sizes and thicknesses as indicated on the Drawings all in accordance with the current requirements for Class "B" label doors as promulgated by the National Board of Fire Underwriters and as approved by the Architects. Doors shall be the approved equivalent of No. 429 made with a two-ply wood core and as manufactured by the XYZ Door Manufacturing Company and be designed for a single sliding operation on an inclined track. In addition, the Contractor shall furnish and install all the necessary and required hardware accessories of the approved equivalent to the XYZ Manufacturing Company's No. 202 flat-track single-link hardware which shall include the necessary and required brackets, track, rollers, binders, door handles, weights, pulleys, etc. In accordance with the requirements of Article 6 of the General Conditions Governing All Contracts, the Contractor shall submit complete shop drawings and also include the necessary and required hardware cuts.

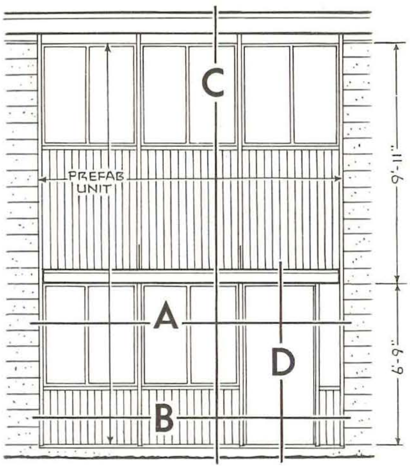
Streamlined Version

Provide approved tin-clad sliding fire doors as indicated, as per NBFU Class "B" label. Doors: equal to XYZ Door Manufacturing Company's No. 429 single sliding type, on inclined track. Provide hardware equal to above manufacturer's No. 202 assembly. Submit shop drawings, hardware cuts.

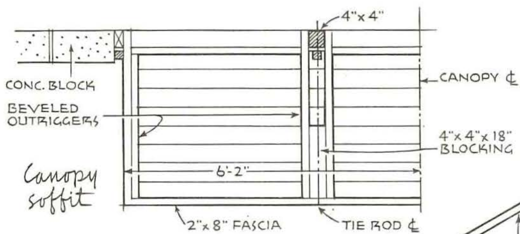
p/a selected detail

entrance facade

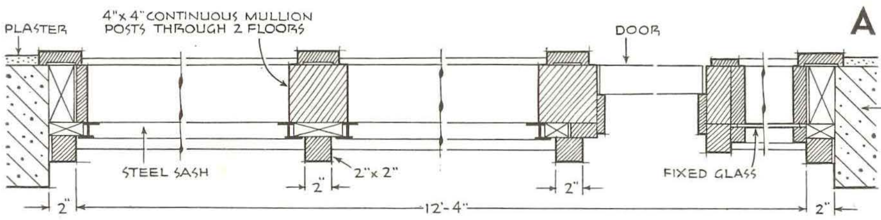
JULIUS SHULMAN



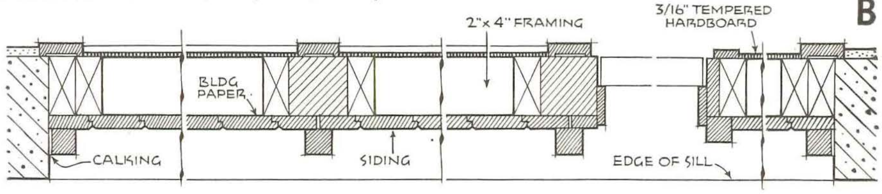
Elevation 1/8" SCALE

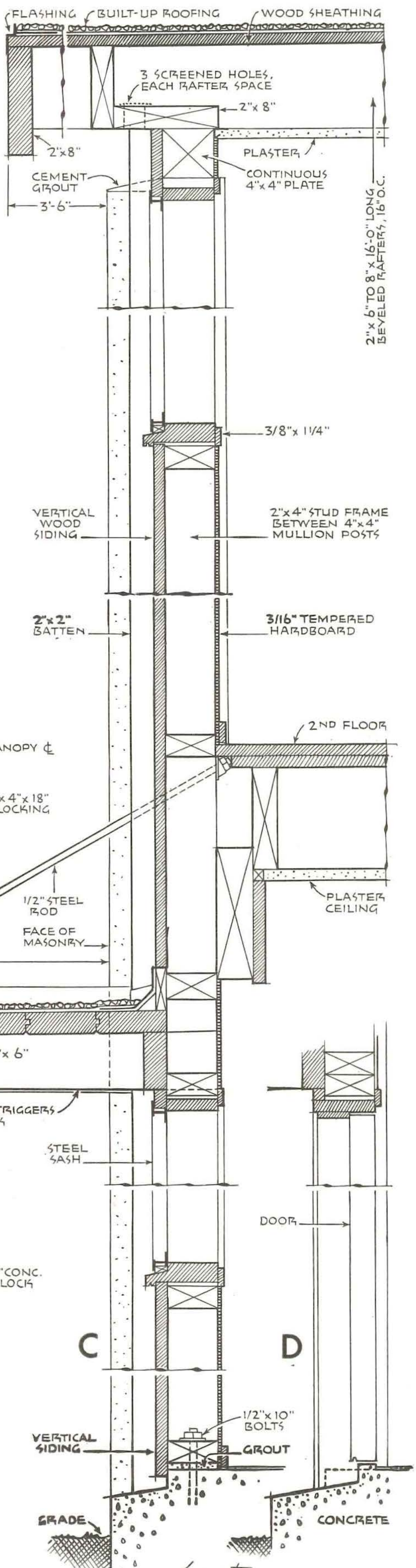


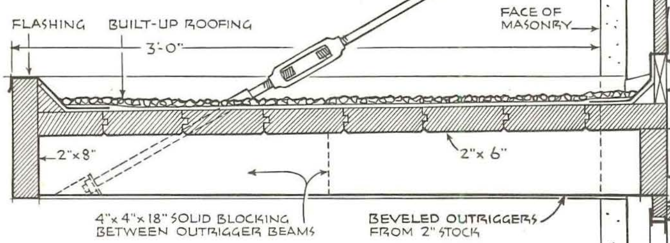
Canopy soffit



Plans 1" SCALE (2ND STORY SIMILAR)







Sections 1" SCALE

HOUSING PROJECT, Pacoima, Los Angeles, Calif.

Arthur Gallion and Victor Gruen, Associated Architects

Louise Sloane

Scandinavian Design Cavalcade

In the fall of 1955, the capitals of Denmark, Finland, Norway, and Sweden were the scene of an annual Scandinavian Design Cavalcade, arranged through the joint efforts of Scandinavia's museums, department stores, workshops, designers, art schools, and art associations. So much excellent design was shown that we have gathered a diversity of illustrations to bring you the highlights from each of the four countries. The 1956 Cavalcade will be held during September.

So that you will not be frustrated by seeing handsome objects that you can do nothing about but admire, we have requested from the four countries' Consulate Generals the names and addresses of American importers of similar merchandise, which appear below.

Denmark

William J. Milligan Imports, 2033 University Ave., P.O. Box 51, Berkeley, Calif.
Gematex Corporation, 62-64 Halstead Ave., Harrison, N.Y.
Frederik Lunning Inc., 667 Fifth Ave., New York, N.Y.
D. Stanley Corcoran, Inc., 7 W. 30 St., New York 1, N.Y.
Axel Zacho, 3157 Wilshire Blvd., Los Angeles, Calif.
Pacific Overseas Trading Co., 200 Davis St., San Francisco, Calif.
Dansk, Designs Inc., Great Neck, Long Island, N.Y.
Pacific Overseas Inc., 478 Jackson St., San Francisco, Calif.
George Tanier Inc., 521 Madison Ave., New York 22, N.Y.
Richards Morgenthau Co., 225 Fifth Ave., New York, N.Y.
Svend Jensen of Denmark Inc., 425 W. 205 St., New York, N.Y.
S. Christian of Copenhagen, 225 Post St., San Francisco, Calif.
Skandiart Inc., 30 W. 26 St., New York 10, N.Y.
H. Nils, Danish Silver, 573 Madison Ave., New York, N.Y.
Paul Wilkens, 2400 Harriet Ave., Minneapolis, Minn.
K. M. Adams Co., 275 Brannan St., San Francisco, Calif.
Hill Corporation, 725 Second St., San Francisco, Calif.
John Stuart Inc., 470 Fourth Ave., New York 16, N.Y.
Mills-Denmark, 1144 Second Ave., New York, N.Y.
Erslev Trading Co., 89 Booth Ave., Englewood, N.J.
Selig Manufacturing Co., Leominster, Mass.
Hagen & Strandgaard, Jackson Sq., 326 Jackson St., San Francisco, Calif.
Mogensen/Combs of Brentwood Village, 11708 Barrington Court, Los Angeles 49, Calif.
Gunnar Schwartz Company, 103 North Western Ave., Los Angeles, 4, Calif.
Carlo Harder, 1562 Cypress Ave., Burlingame, Calif.

Sweden

Swedish Crystal Co., 217 E. 60 St., N.Y.
Weiss & Biheller Merchandise Corp., 584 Broadway, New York, N.Y.
Bonnier's Inc., 605 Madison Ave., New York 22, N.Y.
Wilfin Associates, Inc., 13 E. 53 St., New York 22, N.Y.
F. Schumacher & Co., 535 Madison Ave., New York, N.Y.
Arcadia Export-Import Corp., 5 W. 20 St., New York, N.Y.
D. Stanley Corcoran, Inc., 7 W. 30 St., New York, N.Y.
R. F. Brodegaard & Co., Inc., 225 Fifth Ave., New York, N.Y.
Enright-LeCarboulec, Inc., 160 Fifth Ave., New York, N.Y.
Skandiart, Inc., 30 W. 26 St., New York, N.Y.
Ebeling & Reuss Co., 225 Fifth Ave., New York, N.Y.
Zacho Company, 3157 Wilshire Blvd., Los Angeles, Calif.
Sandvik Steel, Inc., 1702 Nevins Rd., Fairlawn, N.J.
Johaneson, Wales & Sparre, Inc., 250 Park Ave., New York, N.Y.
A. Johnsson & Co., Inc., 21 West St., New York 6, N.Y.
Swedish Metalcraft, Inc., 387 Kinderkamack Rd., Oradell, N.J.
Dux Company, 390 Ninth St., San Francisco, Calif.
Dux, Inc., 31-15 Vernon Blvd., Long Island City 6, N.Y.
Form and Function, Inc., 730 Fifth Ave., New York, N.Y.
Bruno Mathason Furniture, 20 E. 58 St., New York 22, N.Y.
George Tanier, Inc., 521 Madison Ave., New York 22, N.Y.
Berg, Hedstrom & Co., Inc., 1170 Broadway, New York 1, N.Y.
Dalkullan Import Co., 3252 No. Clark St., Chicago, Ill.
Fausta's, 471 Castro St., San Francisco, Calif.
Fisher, Bruce & Co., 1107 Broadway, New York 10, N.Y.
Gematex Corp., 62-64 Halstead Ave., Harrison, N.Y.
Gense Import Ltd., P.O. Box 366, Branchville, N.J.
Gense of the West, Ltd., 278 Post St., San Francisco, Calif.
Eskil Halle, Long Valley, N.J.
Elizabeth Hanna Imports, 225 Fifth Ave., New York 10, N.Y.
Hanson Handicraft Corp., 12 Grafton St., Worcester, Mass.
Tora Holm Scandinavian Gifts, 225 Fifth Ave., New York 10, N.Y.
Larson Brothers, Box 46, Ossining, N.Y.
Maison Gourmet, Ltd., 15 W. 26 St., New York, N.Y.
Scan Corporation, 9 Rockefeller Plaza, New York 20, N.Y.
Scandia Specialties, 151 E. 53 St., New York 22, N.Y.
Seabon Gifts, 54 E. 54 St., New York, N.Y.
Sweden House, 12 W. 50 St., New York 20, N.Y.
Swedish Metalcraft, Inc., 387 Kinderkamack Rd., Oradell, N.J.
Swedish Products, Inc., 225 Fifth Ave., New York 10, N.Y.; Merchandise Mart, Chicago, Ill.
Georg Jensen, Inc., 667 Fifth Ave., New York 22, N.Y.
F. E. Ackerman, 7832 Greensfelder Lane, St. Louis 5, Mo.
Matts Djos, 4115 University Way, Seattle 5, Wash.
The Jacobsons, 1849 West Lunt Ave., Chicago 26, Ill.
Rorstrand, Inc., 225 Fifth Ave., New York 10, N.Y.
A. M. Strandwall, 6535 Hollywood Blvd., Los Angeles 28, Calif.

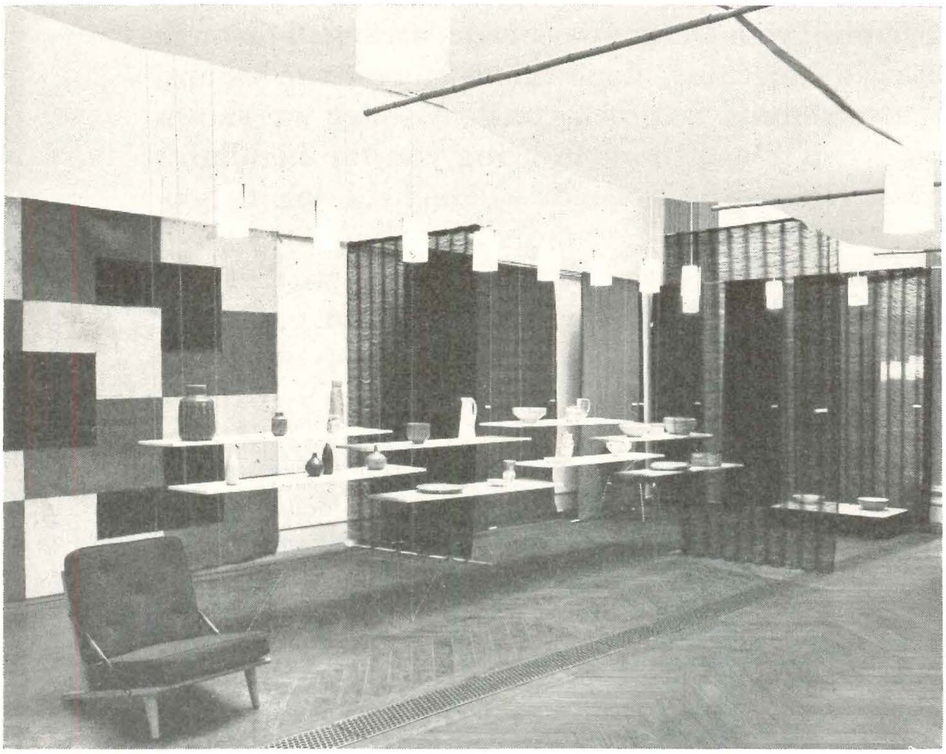
Norway

Borgquist Importing Co., 322 Avenue S., Clouet, Minn.
Axel Zacho, 3157 Wilshire Blvd., Los Angeles, Calif.
Foreign Advisory Service, Princesse Anne, Md.
Scandinavian Importing Co., 1815 Minor Ave., Seattle, Wash.
Scandinavia House, 111 East Post Road, White Plains, N.Y.
Soren Riis, 3817 El Tesoro Pl., San Pedro, Calif.
Hagstrom & Thorsen, P.O. Box 1046, New York, N.Y.
Mark Acheson, 380 Ferris Ave., White Plains, N.Y.
Scandinavia Designs, 40 Main St., Port Washington, N.Y.
Gematex, 62-64 Halsted, Harrison, N.Y.
Georg Jensen Inc., 667 Fifth Ave., New York, N.Y.
Norwegian Silver Corp., 290 Madison Ave., New York, N.Y.
Nordic Imports, 98 S. 11 St., Minneapolis, Minn.
Luxo Lamp Corporation, 102 Columbus Ave., Tuckahoe, N.Y.
Torres Export Co. Inc., 2434 W. Peterson, Chicago, Ill.
Erik Tandero Inc., Box 37, Irvington-on-Hudson, N.Y.
Edith Conrad, 2888 Jackson St., San Francisco, Calif.
Royal Viking Inc., Chicago, Ill.
Rolf Fredner Inc., 290 Madison Ave., New York, N.Y.
Porath & Magneheim, New York, N.Y.
Norway Pacific Importing Co., 924 Seaboard Blvd., Seattle, Wash.
We Moderns, 1272 Broadway, New York, N.Y.

Finland

Information may be obtained only by direct contact with the Finnish Foreign Trade Association, Etela Esplanaadikatu 18, Helsinki, Finland.

Scandinavian Design Cavalcade



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DENMARK

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Photos: *Courtesy of Danish National Travel Office*

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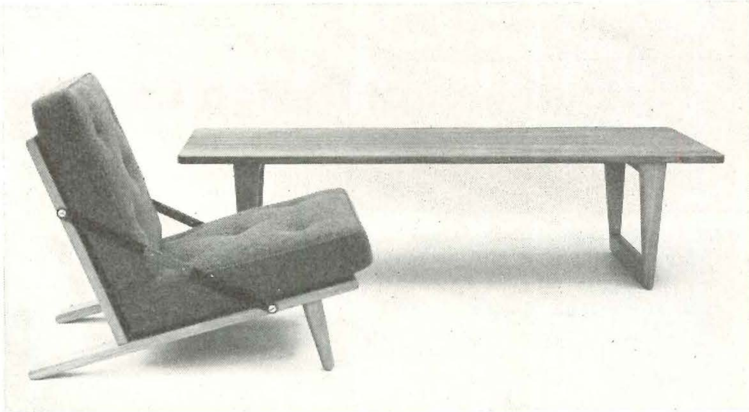

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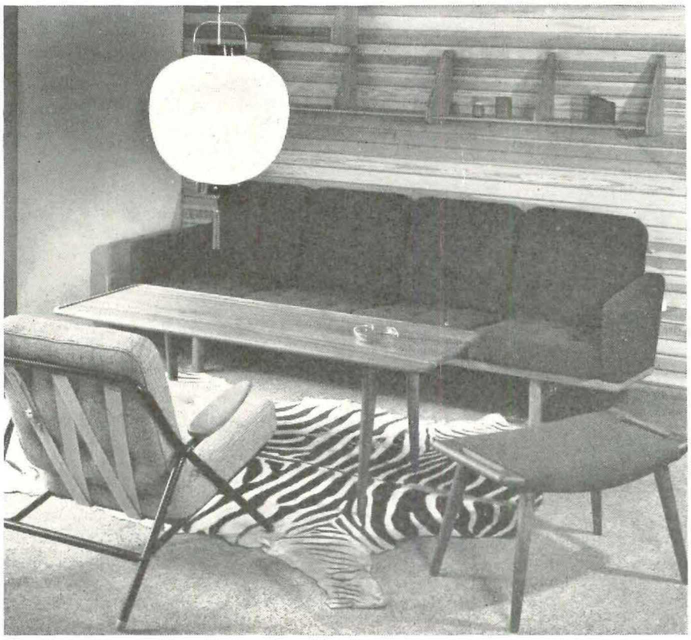

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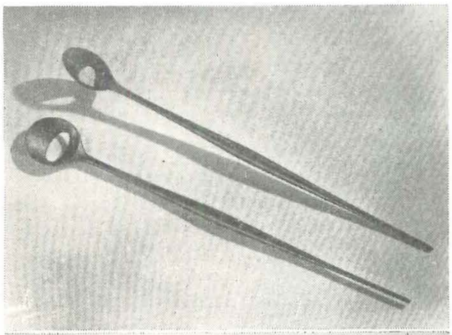

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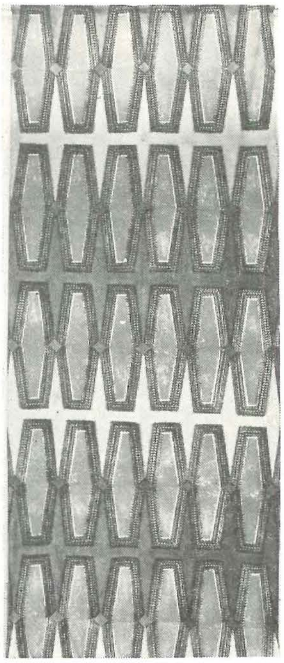

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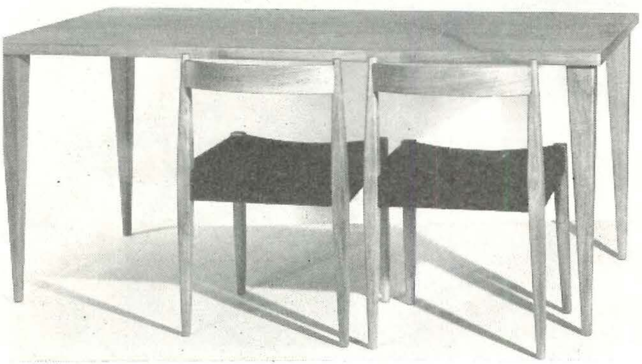


1 *Exhibit designed by Architect Vilhelm Wohlert for Danish Society of Arts and Crafts and Industrial Design/ chair designed by Borge Mogensen/ pottery by Saxbo Stentoj/ glass by Nathalie Krebs/ carpet on wall by Ea og Mogens Koch.*

2 *Entrance hall, annual exhibit of The Danish Society of Arts and Crafts and Industrial Design/ arranged by Architect Vilhelm Wohlert.*

3 *Exhibition at Bovirke, Copenhagen/ furniture designed by Architect Finn Juhl.*

4 *Exhibition at Aksel Sorensen, Copenhagen/ furniture designed by Architect Hans J. Wegener/ produced by A/S Getama, Gjedsted, Jutland.*

5 *Chair and bench in oak or teak/ designed by Borge Mogensen/ produced by Fredericia Stole-og Polstermobelfabrik.*

6 *Salad set in rosewood/ designed by Kari og Johan de Neergaard.*

7 *Kitchenware of enameled steel, ovenproof/ in red, yellow, turquoise, green/ designed by Jens H. Quistgaard/ produced by Glud og Marstrands Fabriker for "Dansk Design, Inc.," U.S.A.*

8 *Handprinted tapestry/ produced and designed by Ruth Christensen/ pastel pink, green, and yellow on pale blue ground.*

9 *Table and chairs in oak or teak/ designed by Nanna & Jorgen Ditzel/ produced by A/S Kolds Savvaerk.*

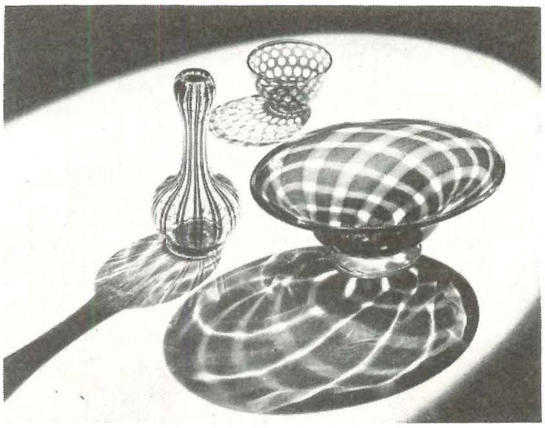
p/a interior design data

Scandinavian Design Cavalcade

SWEDEN

Photos: Courtesy of Swedish National Travel Office

Display in co-operative department store (top) *in Stockholm. Residential interior* (above) *at "Friluftstaden" Malmo. Glass bowls and vase* (right) *by Orrefors.*



NORWAY

1 *Living room designed by Architect Alf Sture of Oslo/ furniture executed by Hiorth & Ostlyngen and Hans Sundt-Monrad.*
2 *Lamp in brass and aluminum/ designed by Birger Dahl/ produced by Sonnico of Oslo.*
3 *Coffee-pots for restaurant use/ designed by Tias Eckhoff/ made by Porsgrund Porcelain Factory.*
4 *Plated silver/ designed by Arne Korsmo/ executed by J. Tostrup.*
5 *Vases designed by Willy Johansson/ produced by Hadelands Glassverk.*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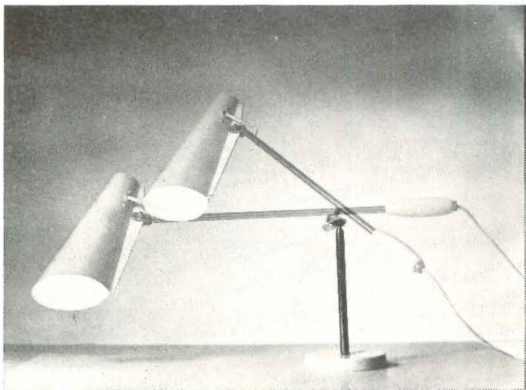

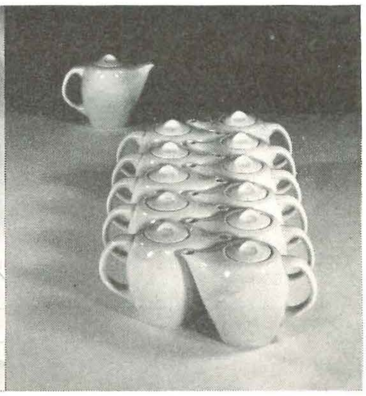
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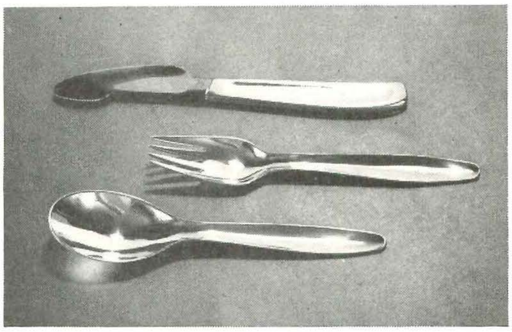
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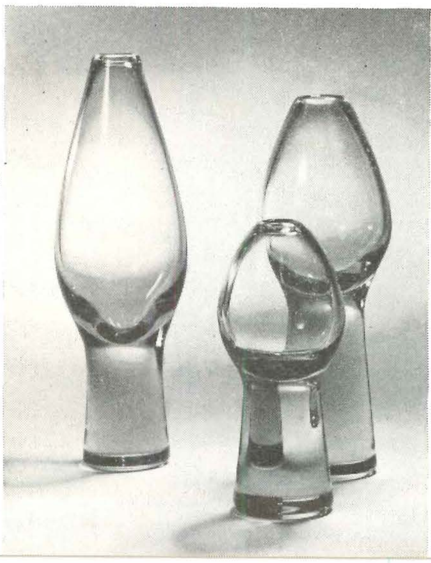
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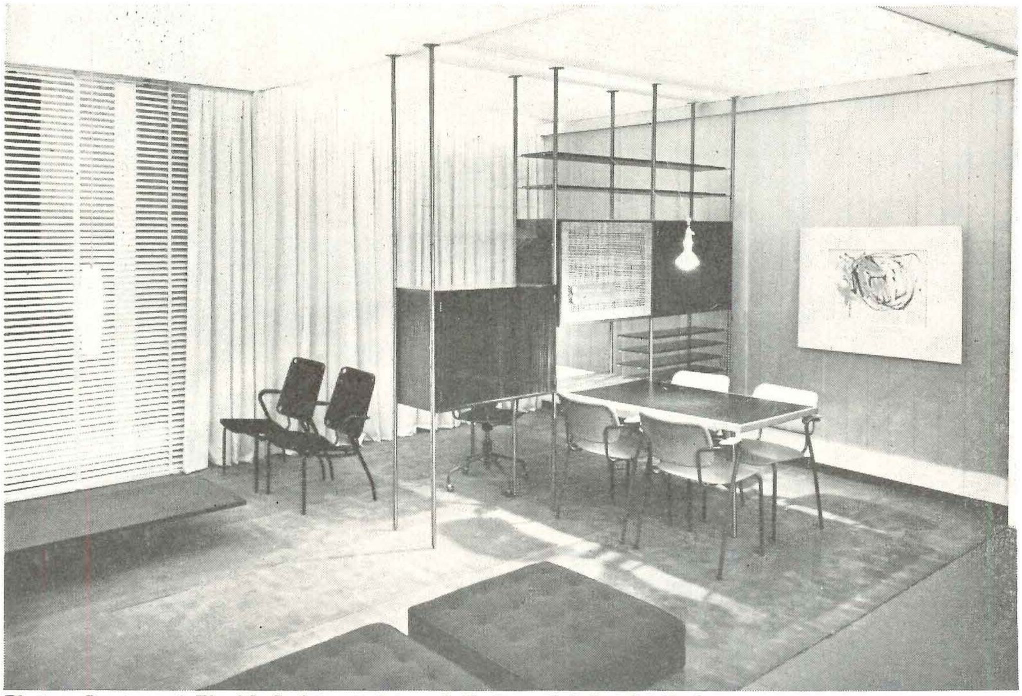
hotos: Courtesy of Norwegian Travel Office p/a interior design data

Scandinavian Design Cavalcade

FINLAND



Photos: Courtesy of Finnish Society of Arts and Crafts and Industrial Design

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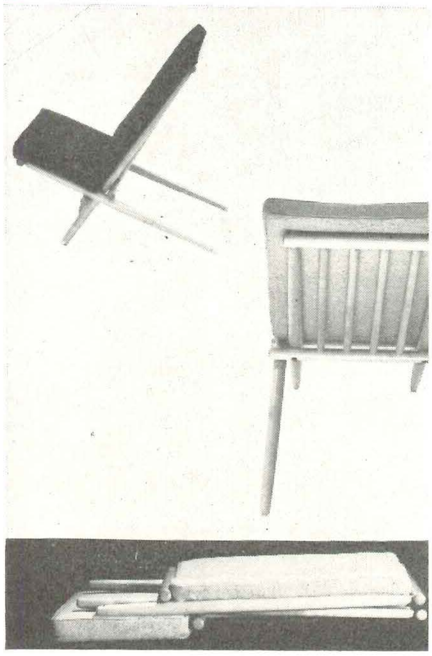

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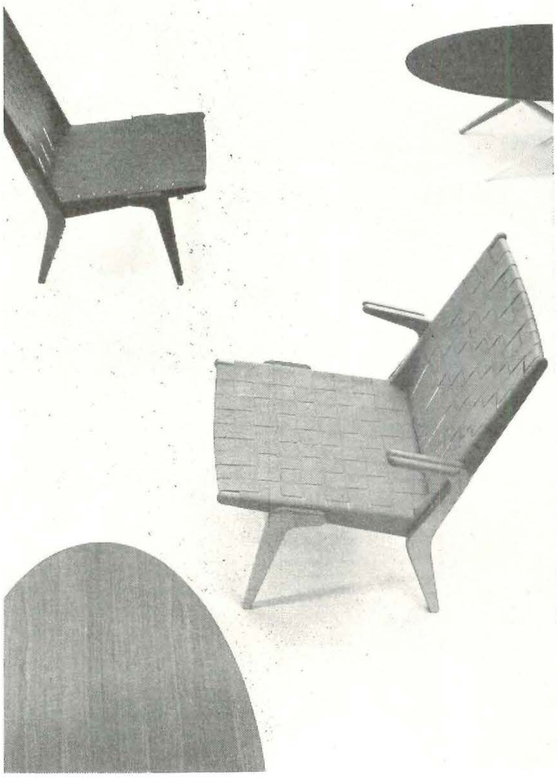

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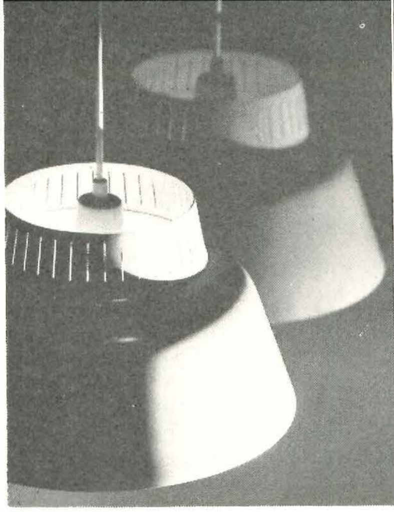

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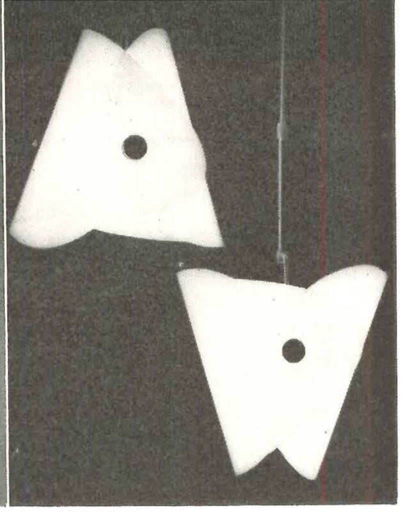

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1 *Interior, Skanno Oy/ designed by Ilmari Tapiovaara*

2 *"Congo Chair"/ designed by Ilmari Tapiovaara, Designers S.I.O., Helsinki/ manufactured by Askon Tehtaat Oy.*

3 *Chairs and table/ designed and produced by Artek.*

4 *"Colette" Easychair I and II/ designed by Ilmari Tapiovaara/ manufactured by Askon Tehtaat Oy.*

5 *Lighting fixture, sprayed aluminum/ designed and produced by Lisa Johansson Pape.*

6 *Plastic reading lamps/ designed by Yki Nummi/ produced by Stockmann-Orno.*

7 *Glasses/ designed by Tapio Wirkkala/ produced by Karhula-Iittala.*

8 *Glass vases/ designed by Kaj Franck/ produced by Waertsila-Notsjo Glassworks.*

9 *Serving forks, tea strainer, cake server/ in sterling silver and Brazil rosewood/ designed and produced by Bertel Gardberg.*

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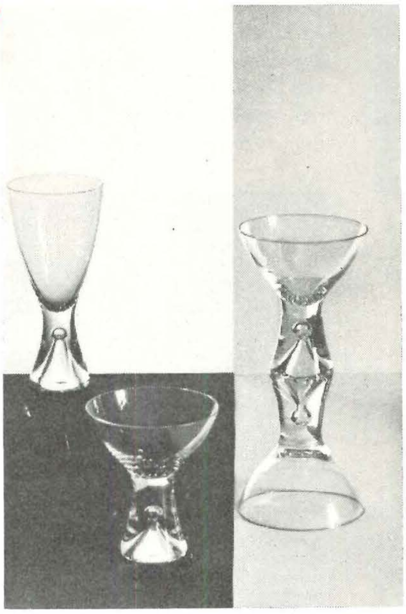

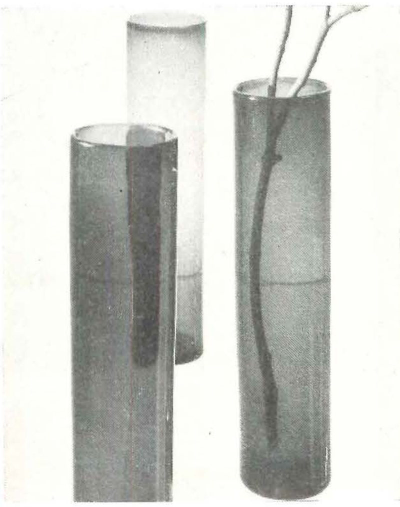

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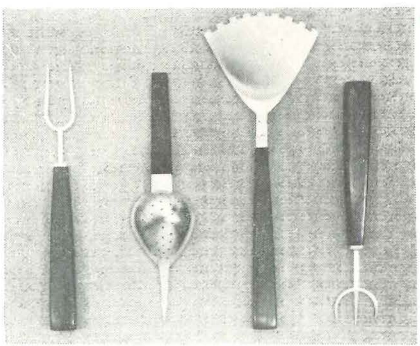

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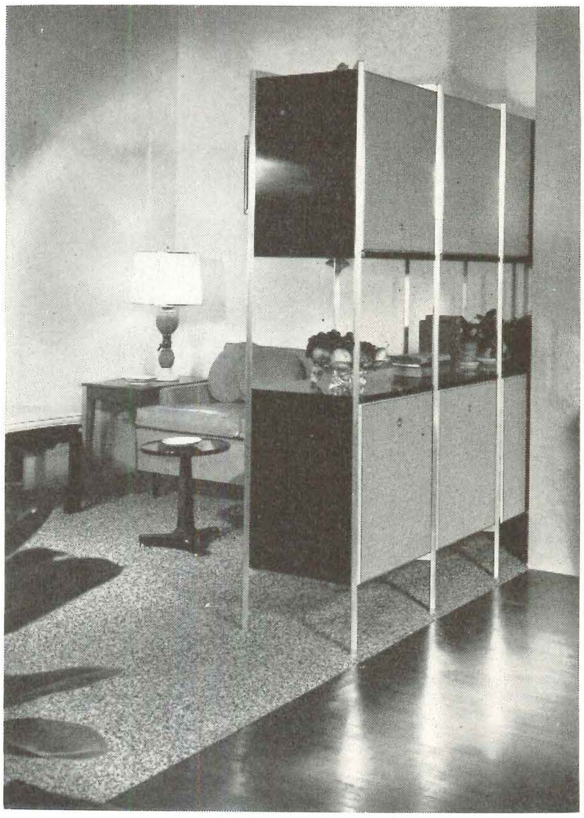
p/a interior design products

Living-Dining Area: sliding doors (on cabinet) of woven leather in Bolivian Peacock, Baghdad purple, Gulf Stream blue/sofas upholstered in Bolivian Peacock tropical leather, new mildew-proof, indoor-outdoor leather/hemisphere card table centered in Gulf Stream blue tropical leather/handwoven rug of wool, interlaced with leather/furniture by The Dunbar Furniture Co./interior designed by **Edward Wormley.**

Reception Area: first prize-winner in architectural classification of The Upholstery Leather Group's design competition/wall panels in five leather colors: Suez gray, Sampan beige, Grasse gold, Managua red, black/cantilevered desk and suspended lighting fixture also leather covered/chairs designed by Raymond Loewy for Do/More Chair Company/interior designed by **Paul Laszlo.**

Living Room: room divider-storage unit, designed by Eugene Torrent, covered in Florentine-embossed Burmese brown leather/sofa in Blue Grotto blue and Sorrento blue, repeated on ebony benches and chair cushions/furniture by Kittinger Co., Inc./interior designed by **John Ullman.**



Split-Level Room: floor and hearth in natural cowhide/room divider screen of walnut and Jade Tulip shadow leather/sofas in Cambodian olive green leather/revolving-top walnut cocktail table/furniture by Jens Risom Designs, Inc./interior designed by **Alice Beck.**

All settings from 1956 Leather in Decoration Show, presented by The Upholstery Leather Group, 141 E. 44 St., New York 17, N. Y.

GOLD SEAL SEQUIN* INLAID LINOLEUM 1/8" GAUGE IN RICH DARK BROWN. "CONTINENTAL FURNITURE" BY STANDARD.

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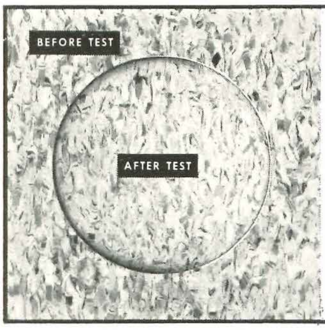
This rugged product is highly resilient . . . quiet and comfortable underfoot. Its satin smooth surface seals out dirt and resists stains which means maintenance will be easy. Give *your* clients all these extra advantages—specify new Gold Seal "Sequin" 1/8" Inlaid Linoleum.



Abrasive Wheel Test proves "Sequin" "looks like new" through long service life!

The circular "After Test" area is the result of applying the abrasive wheel to the "Sequin" sample. See how it *has worn well through the linoleum*—and yet the pattern is still there, as clear and sharp as ever! Compare it with the "Before Test" area. *You can't tell the difference!* Write to Architects' Service Department, Congoleum-Nairn Inc., Kearny, N. J., for further information and samples.

SPECIFICATIONS

6-ft. wide yard goods. 1/8" gauge, burlap backed. Install over suspended wood or concrete subfloors. Available in: grey, green, dark brown, white multi, grey mix, taupe, beige. Also made in standard gauge for residential use—in 16 colors.

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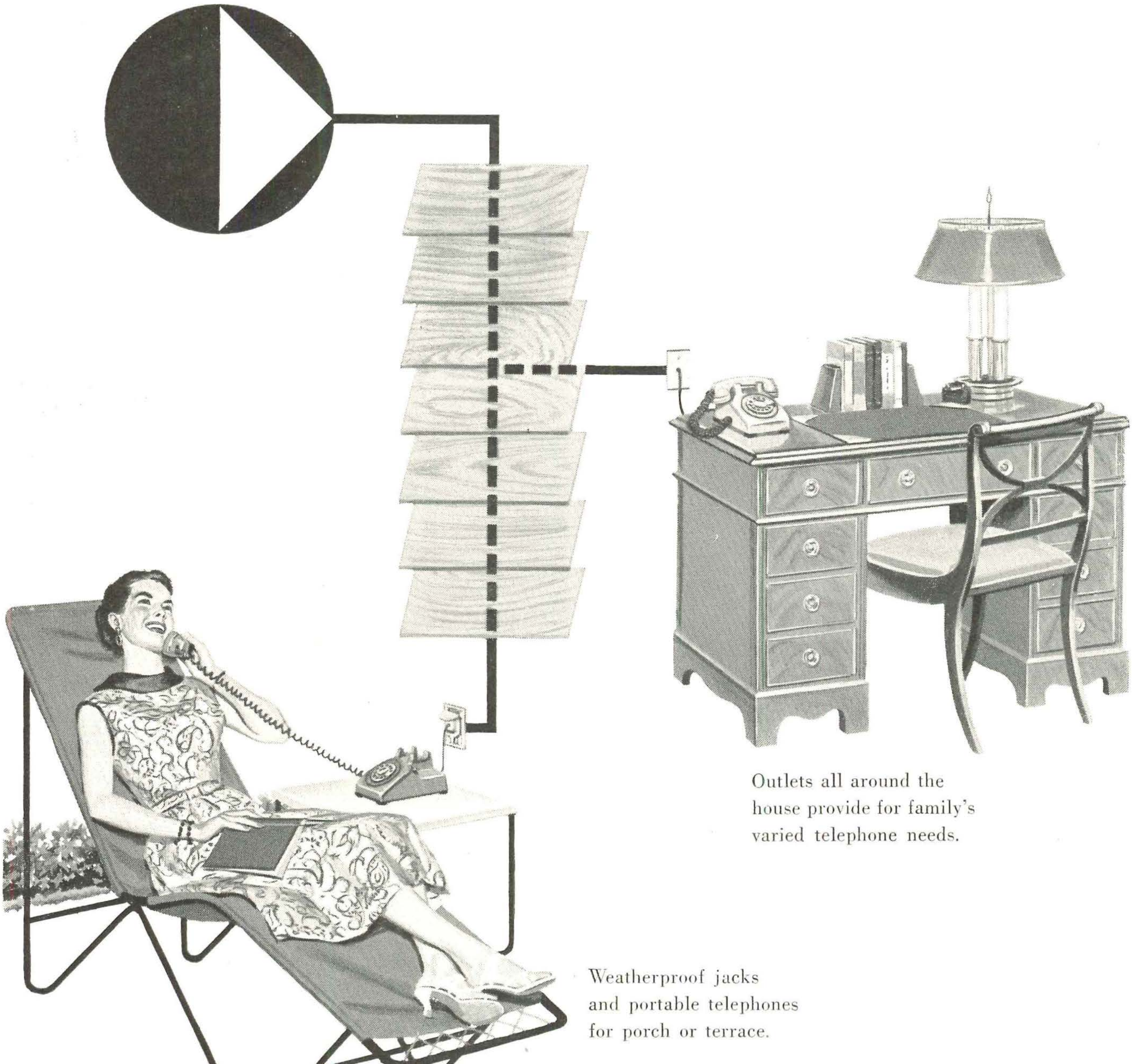

Outlets all around the house provide for family's varied telephone needs.

Weatherproof jacks and portable telephones for porch or terrace.

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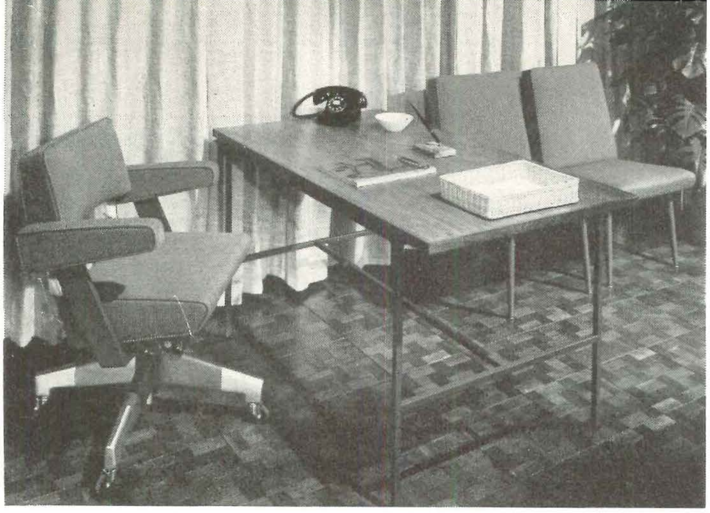
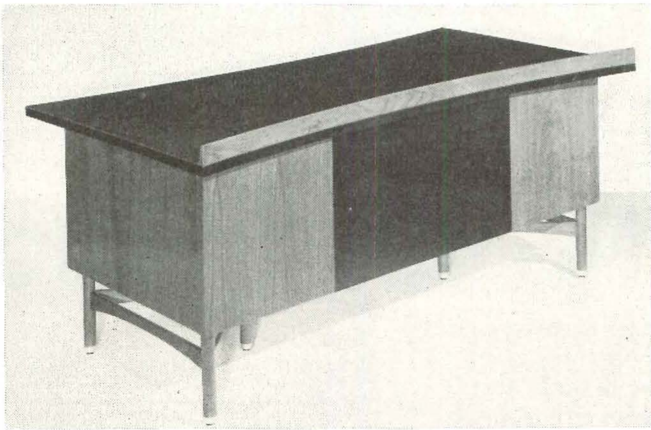
Your Bell telephone company will be glad to help you plan economical concealed wiring installations. Just call the nearest business office and ask for *"Architects and Builders Service."* For details on home telephone wiring, see Sweet's Light Construction File, 8i/Be. For commercial installations, Sweet's Architectural File, 32a/Be.



p/a interior design products

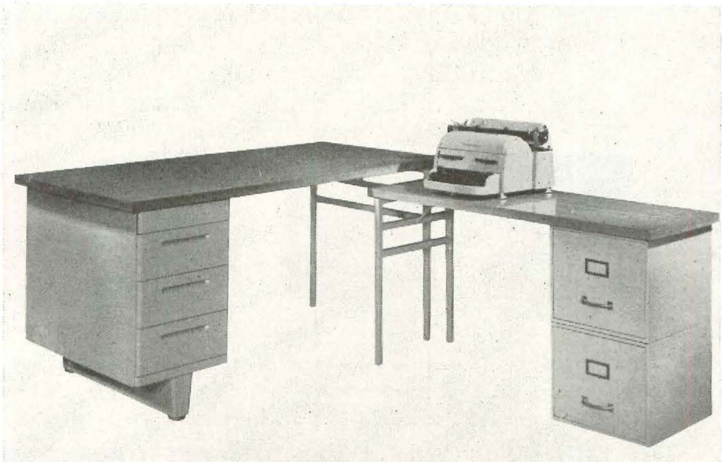
Executive Posture Chair: new design for patented chair, fully adjustable and custom fitted for posture support and comfort/in 8 exclusive leather colors, 8 textured fabrics, 9 Naugahyde colors/ **retail:** $225; **Side Chairs:** available in same diversity of coverings/**retail:** $125; line includes eleven additional seating styles, all designed by Raymond Loewy Associates/**Do-More Chair Company, Inc., Elkhart, Indiana.**

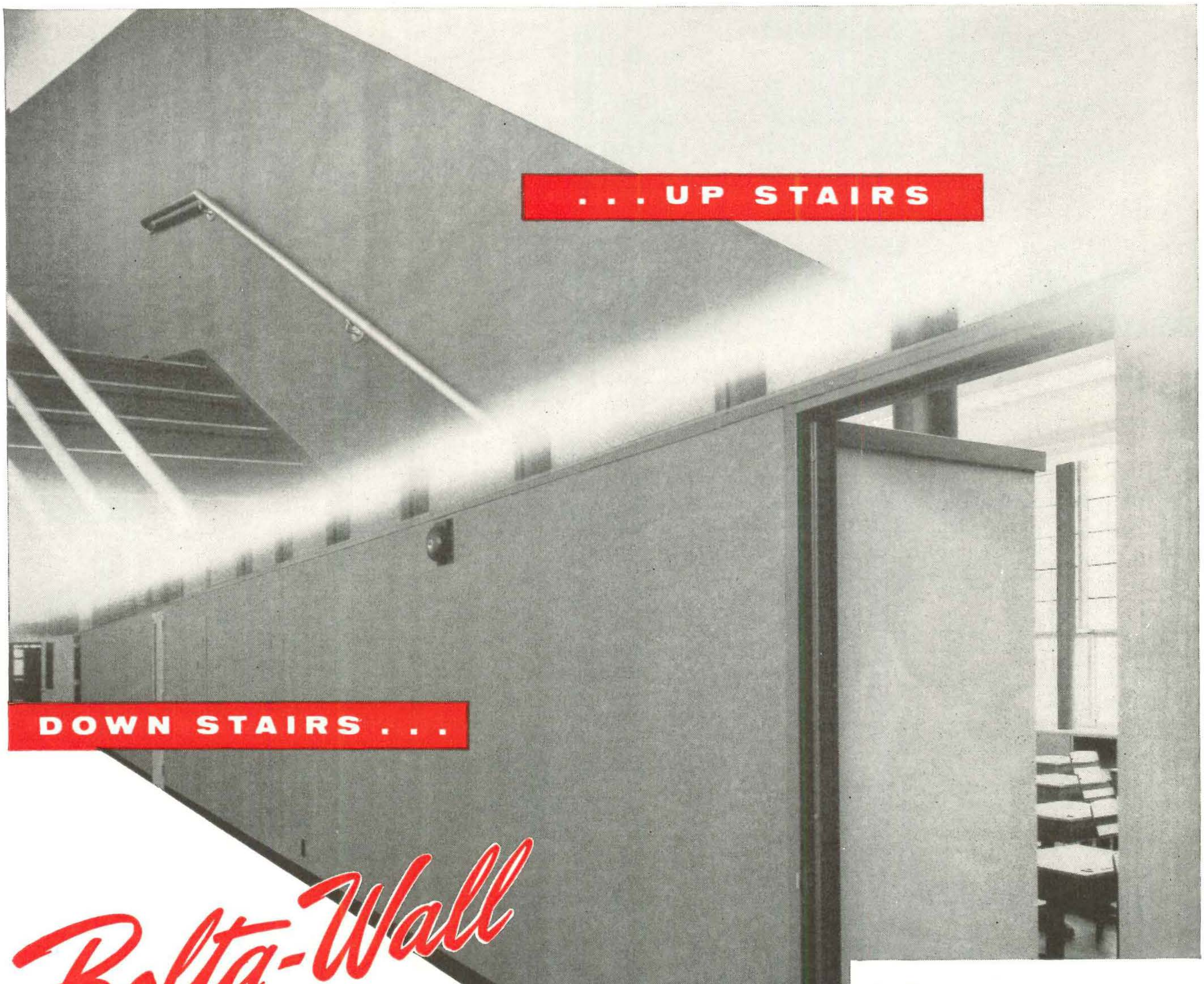


Executive Office Furniture: group includes 13 multipurpose units, all based on various size desk tops and work areas/basic storage pieces may be used as desk pedestals, for wall storage groupings, drawer and file sections, typewriter units, integrated with separate tops/structural supports of square, satin-finish aluminum/cases in quarter-grain walnut/tops of plasticized walnut/designed by Paul McCobb for H. Sacks & Sons/distributed by **B. G. Mesberg National Sales, 201 E. 57 St., New York, N.Y.**

"Executive Group" Desk: (above) concave curve front and back, gallery framing back edge/tripod legs are founded, brass-tipped/available in single- and double-pedestal units, 5', 6', 11' long/in natural teak, walnut with black Formica, white Formica with walnut in linseed-oil finish.

"Office Planner Group": (right) steel-and-Formica modular desks, completely custom-designed both in color and in unit-assembly/Formica tops in any solid color, wood-grain or pattern, any shape or size/pedestals available with two or three drawers or typewriter compartment/all metal parts available in wide range of chip-resistant colors or in any color to match sample/**Westcort Company, 4 E. 52 St., New York 22, N.Y.**





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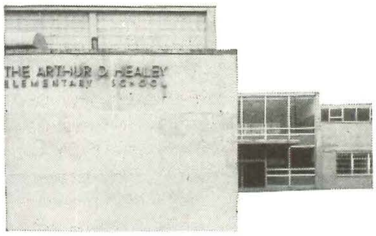

Bolta-Wall *Leathergrain* used as wainscot throughout the Arthur D. Healey Elementary School at Somerville, Massachusetts. Architects: Perley Gilbert Associates, Inc., Lowell, Massachusetts—Mr. Herbert H. Glassman, AIA.

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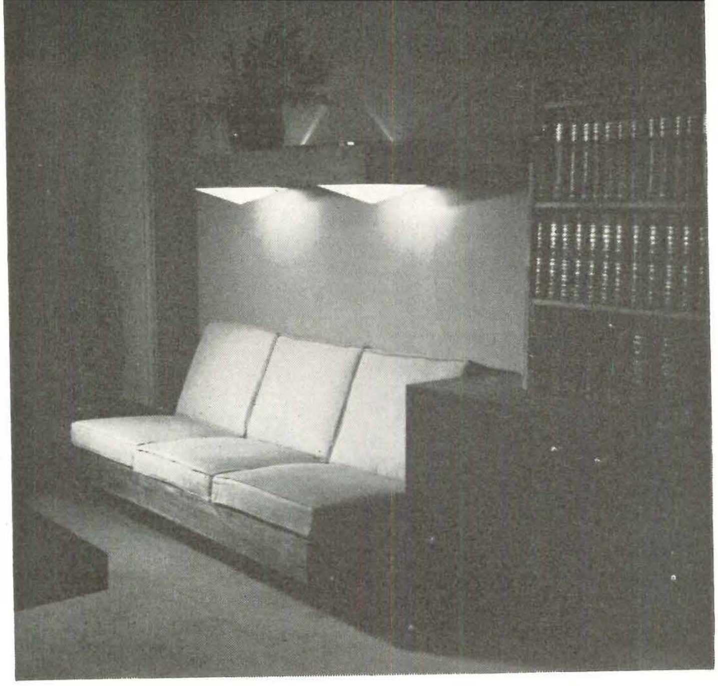
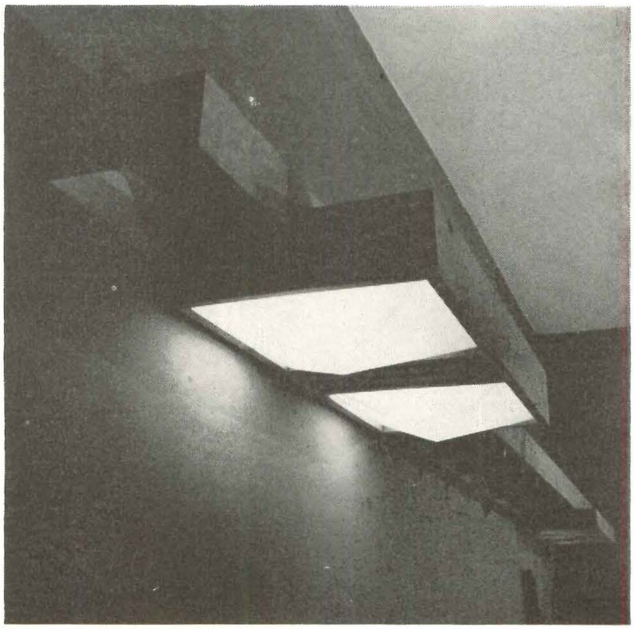
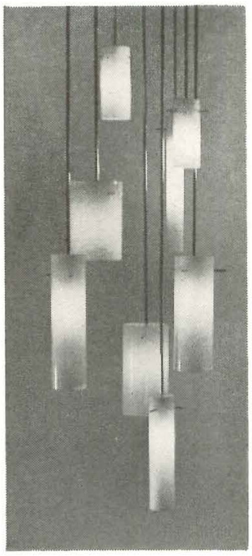


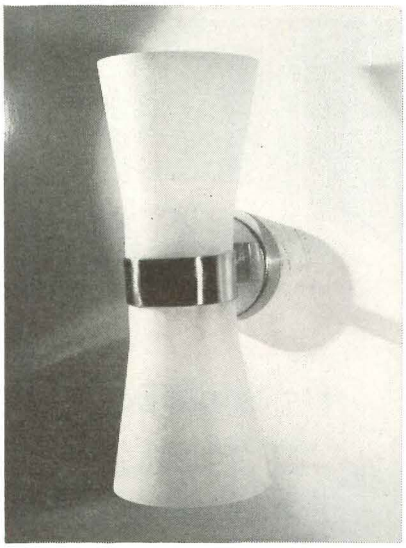
Custom-Designed Light Shelf: of walnut and Fibreglas/7 ft long, 15 in. wide, 5 in. thick/contains two 100-watt incandescent bulbs/unit provides grillwork above and holes in front for patterned light in addition to direct light downward from shallow fibreglas pyramids/**Leslie Larson, 56 E. 66 St., New York 21, N.Y.**

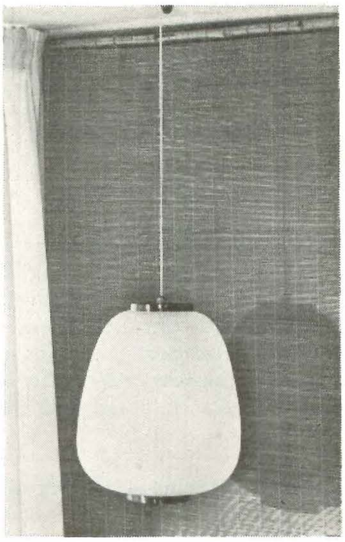




Ceiling Fixtures: eight basic shapes/forms handblown of specially developed pure white illuminating glass/diameters range from 3" to 8", lengths from 10" to 24", special sizes available/rods of polished chrome or sprayed white/designed by Paul Mayen/**retail:** from $18 to $36/**Habitat Associates, 235 E. 58 St., New York 22, N.Y.**

Wall Fixture: direct-indirect/opal-glass bullet globe 16" high/brass-band wall bracket/designed by Paavo Tynell/**retail:** $54/**Finland House Lighting, 41 E. 50 St., New York 22, N.Y.**





Ceiling Lamp: lantern with opaque vinyl-plastic shade rimmed with polished brass/lamp plugs into baseboard outlet, hangs from ceiling by means of small decorative fittings screwed into ceiling/plastic cord runs through fittings down wall to outlet/**retail:** $13.95/**Lightolier, Inc., 346 Claremont Ave., Jersey City, N.J.**

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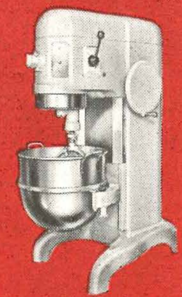
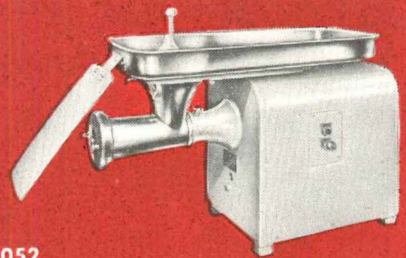
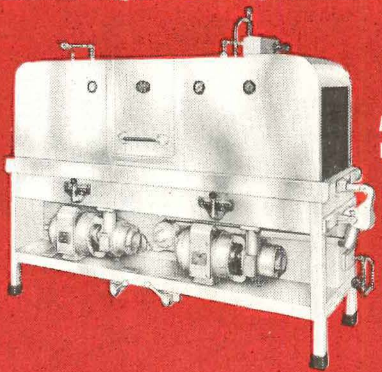
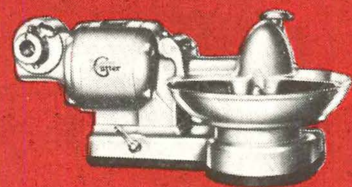

Model H-600 MIXER


Model 400 STEAKMASTER


Model 4052 MEAT CHOPPER


Model XXM-4 DISHWASHER


Model UM-2P DISHWASHER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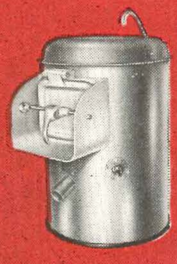
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Food Waste Disposers

THE PRODUCTS No commercial kitchen is more efficient than its time and money saving installations of food, kitchen, bakery and dishwashing machines. In over half-a-century of field-tested experience, Hobart products have won a name for the utmost in design, manufacturing and performance standards—for year-after-year, day-in and day-out reliability. See Hobart—clean in design and clean in performance.

THE COMPLETE LINE Specify Hobart—and consolidate planning, purchasing and service. Plan on the added economy of attachment interchangeability among Hobart products. Choose from the greatest range of products—in a wide range of capacities and sizes for utmost efficiency.

THE GUARANTEE AND SERVICE All products carry the long-respected Hobart guarantee—backed by the most extensive sales and service organization in the industry. Local representation is important—they're as near as your phone . . .

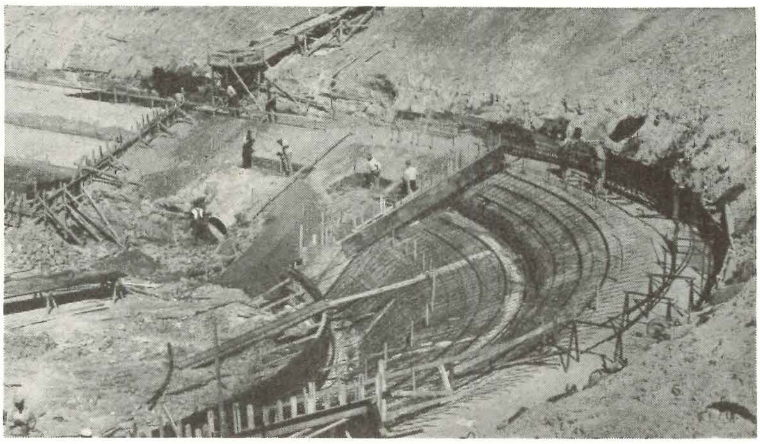
The Hobart Manufacturing Company, Troy, Ohio.

Trademark of Quality for over 55 years

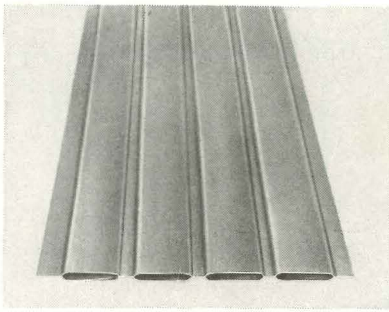
Hobart machines

The World's Largest Manufacturer of Food, Kitchen and Dishwashing Machines

Photo: Robert C. Lautman

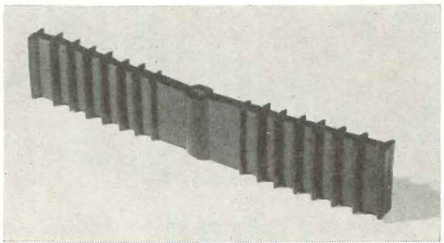


Recently completed Student Activities Building at University of Maryland is of rigid-steel-frame construction with Tectum wood-fiber decking laid over roof purlins (above). *Unlike many other similar structures, it has a radiant-heating system. Heated water is circulated through wrought-iron piping embedded in 30" concrete treads supporting 26 rows of terrace type seating* (right). *Piping under straight runs of seats is in form of simple grids while semigrids were installed in curved sections at either end of auditorium. A. M. Byers Co., 1801 Clark Bldg., Pittsburgh 22, Pa.*



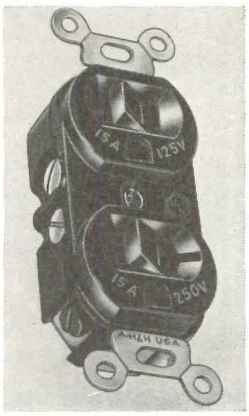
New mill product—in form of single strip or sheet of solid copper, brass, or aluminum—has tubes which can be inflated to desired running lengths in a variety of shapes or sizes (left). *Except for expandable portions, the metal is a solid strip and does not consist of two pieces of metal brazed, welded, and rolled together. Sent to consumer uninflated. Revere Copper and Brass Inc., 230 Park Ave., New York 17, N.Y.*

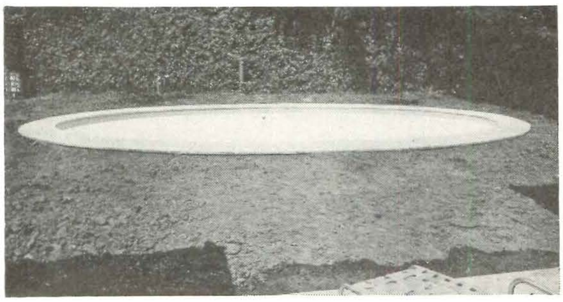
All-aluminum roof exhauster, built entirely of heavy-wall, extruded sections (above); *all joints are welded. Because weight is less than one-third that of galvanized-steel ventilator, it can easily be installed by two men. Low silhouette is only 21" high. Iron Lung Ventilator Co., 5403 Prospect Ave., Cleveland 3, Ohio.*



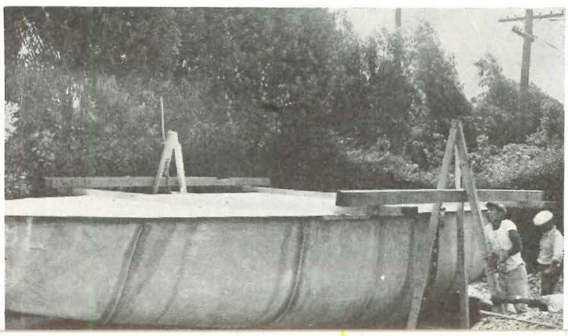
Durajoint and Duraseal, thermo-plastic polyvinylchloride waterstops, are noncorrosive, withstand water pressure up to 350' plus head of water, withstand -80F to 180F temperatures, will not become brittle with cold, have unlimited life expectancy, and are 100% waterproof. Electrovert Inc., 489 Fifth Ave., New York 17, N.Y.

New 3-wire, 2-wire combination duplex grounding receptacle (right) *provides for two separate circuits with common ground. Supplies current from same outlet to operate window air-conditioning unit and any appliance requiring conventional service. The Arrow-Hart & Hegeman Electric Co., Hartford, Conn.*





Oval swimming pool constructed of laminated glass fibers has over-all size of 15'x30' with depth from 3' to 5'. This 10,000 gal pool is assembled from four sections which are joined together before lowering into excavation (right). *Cinderella Glass Pool Co., 9400 Santa Monica Blvd., Los Angeles 46, Calif.*



(Continued from page 173)

air and temperature control

"Central" Air-Conditioning System: self-contained, centralized conditioner simplifies installation of residential air-conditioning system. Air-cooled unit, which requires no refrigerant lines, water-pipe connections, or remote condenser, may be placed in attic, basement, utility space, or even outside home; unit can also be connected to existing warm-air duct system. Low-voltage thermostatic control is standard equipment; diffusers, return-air grills, and prefab glass-fiber ducts are furnished separately. Two-hp unit will cool 1500-sq-ft home; 3½-hp unit will cool 2200 sq ft. Amana Refrigeration, Inc., Amana, Iowa.

Modular Weathermaster Units: room units for high-velocity air-conditioning system have been redesigned for more attractive appearance and better performance. Modular units, for placement under large glass walls, are one-ft high; intake louvers are located on front panels while conditioned air is discharged through adjustable plastic grills on top surface. New engineering features include polyethylene discharge nozzles to provide greater air circulation with less fan hp and sound-attenuating chamber completely lined with absorbent material. Two other units have also been added, for new and existing buildings having less window area. Carrier Corp., Syracuse 1, N. Y.

Deflector-Top Glassheaters: electric glass-panel heaters feature metal deflector to prevent wall streakage. Units, constructed of specially tempered glass, fused with aluminum strips, project radiant heat; units are claimed to insure humidity above 30 percent and temperature variance from floor to ceiling of less than five degrees. Frames, with 2¼"-wide deflector top, may be painted to match walls; sizes range from baseboard strips, 9⅜"x47½", to large wall panels, 19"x26⅝". Continental Radiant Glass Heating Corp., 1 E. 35 St., New York 16, N. Y.

construction

Holostud Partition: new metal partition framing, developed for hollow nonload-bearing walls, is suitable for homes as well as for schools, office buildings, and apartments. Open-web design of studs permits horizontal or vertical installation of electrical conduits and pipes; web members may be cut to accommodate large ducts. Framing with metal or gypsum lath, gives fire rating up to 2 hr; lightweight studs are made in 2½", 3¼", 4" and 6" widths, up to 26' high. National Gypsum Co., 325 Delaware Ave., Buffalo 2, N. Y.

doors and windows

PD17 Calking Compound: plastic-base calking compound is claimed to remain workable even under most-adverse working conditions. Nonstaining, polymerized-plastic-base material is especially recommended for use with fiber-board and decorative products; calking may be used with metals, slate, masonry, and wood as well. Elastic skin, which forms shortly after application, enables compound to remain watertight, airtight, and unshrinkable. Armstrong Cork Co., Lancaster, Pa.

Yale & Towne Sliding-Door Hardware: two new series of sliding-door hardware were developed to accommodate growing trend toward sliding doors. Sets include heavy-gage-aluminum tracks, heavy-gage-steel hangers, floor guide, nylon wheels, and door pulls; tracks contain built-in ridges to prevent derailment of wheels and hangers adjust to variations in height. Cost-saver series is for doors of 75 lb max weight; Deluxe series accommodates doors up to 100 lb. Yale & Towne Mfg. Co., Chrysler Bldg., New York 17, N. Y.

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