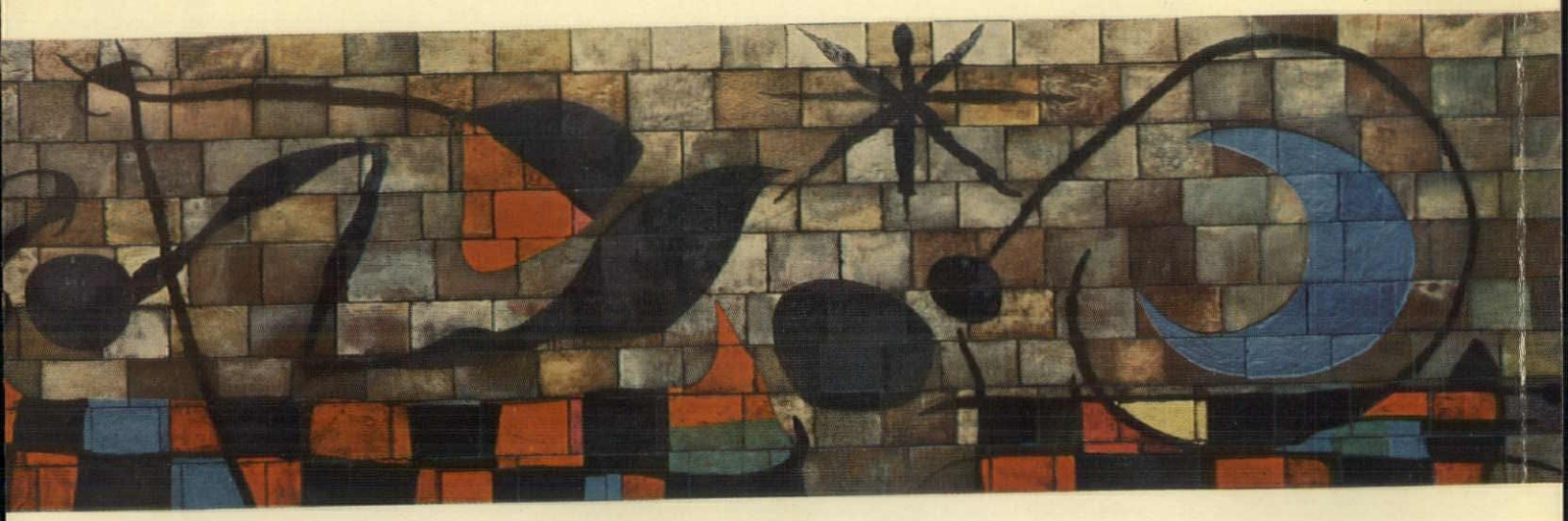
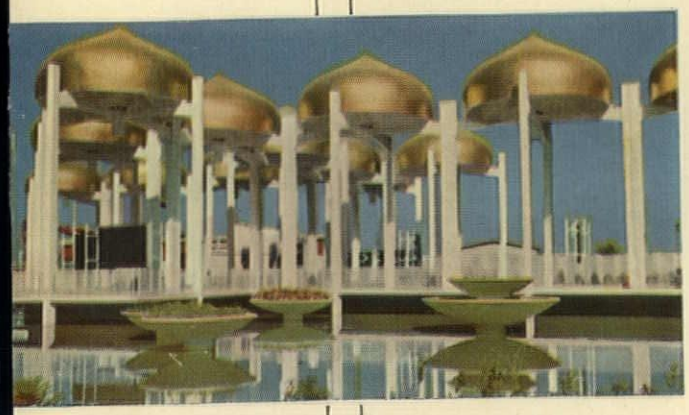




ARCHITECTURAL RECORD

5 *May 1960*

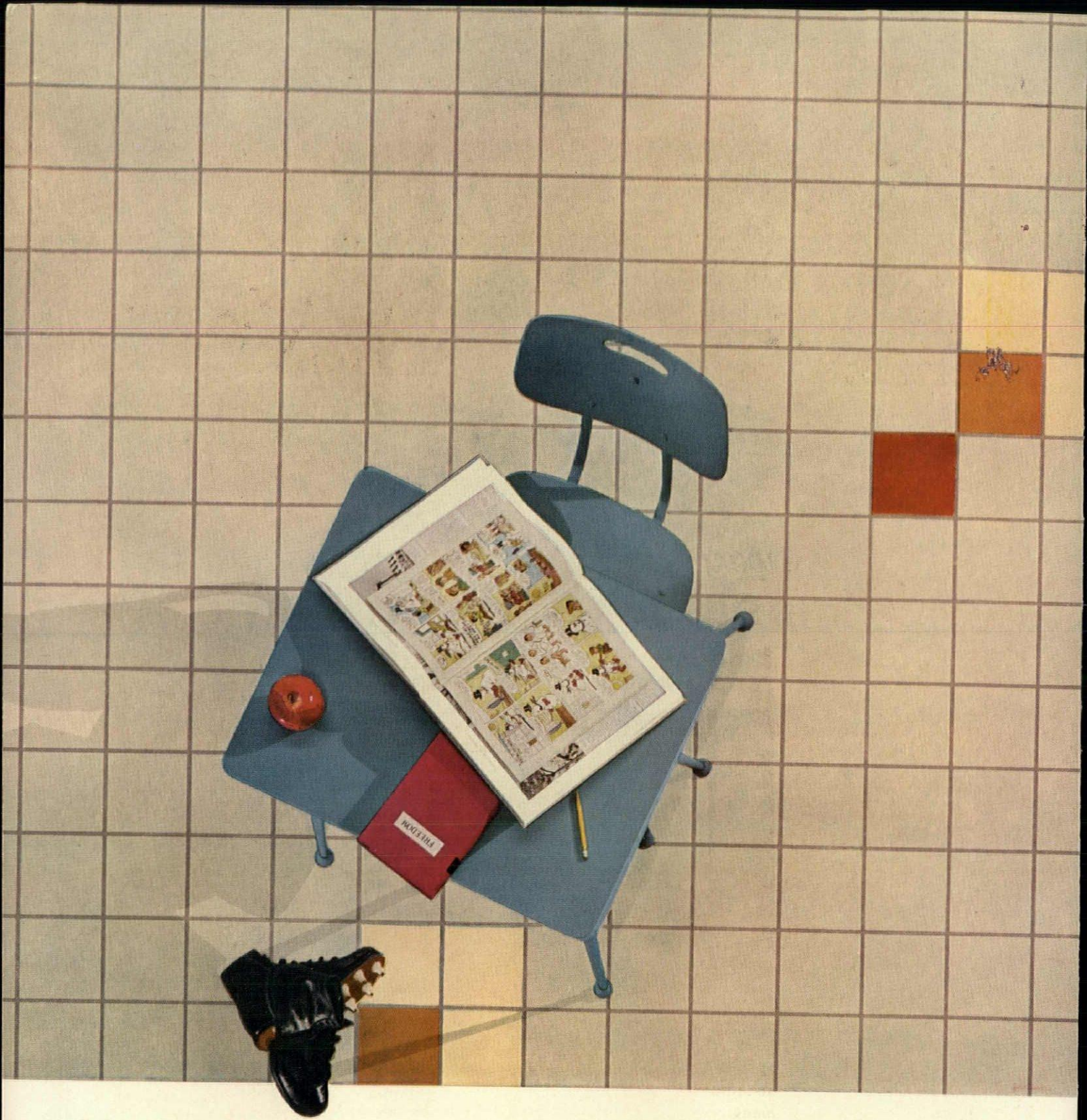
Building Types Study: Schools

An Appraisal of Unesco House by John E. Burchard

Yamasaki designs U.S. Fair in India

Office Buildings and Banks

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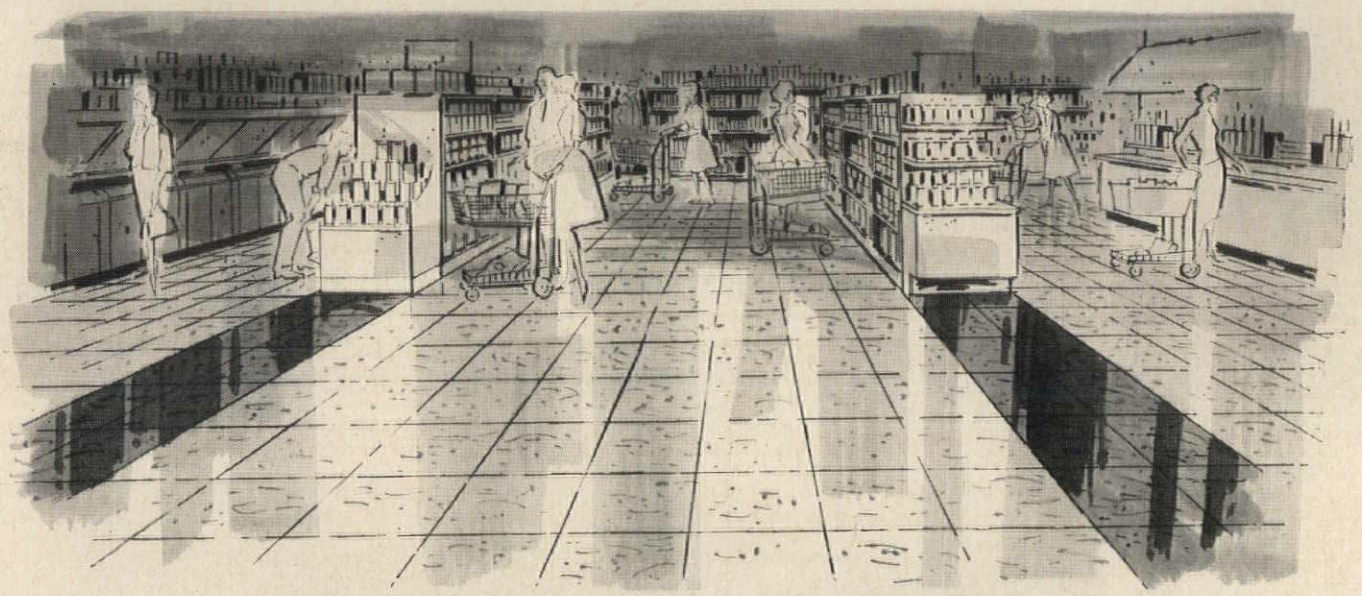
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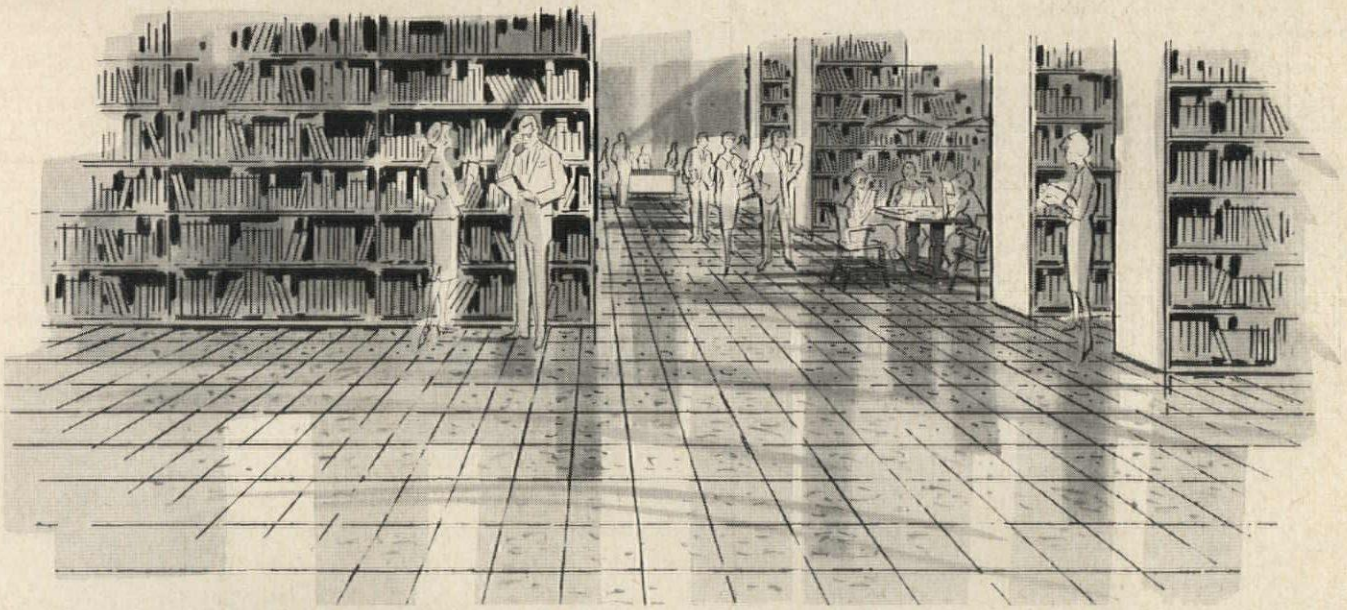


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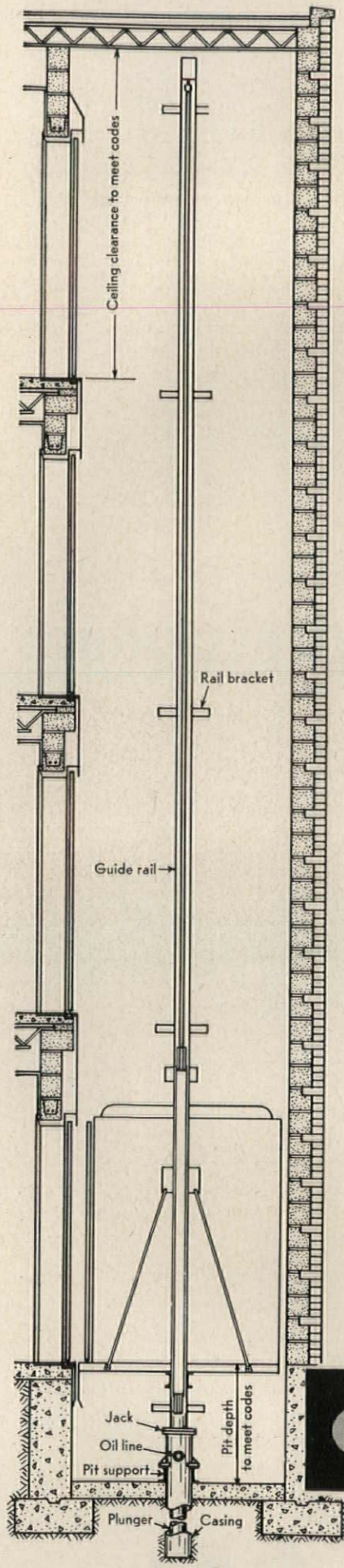
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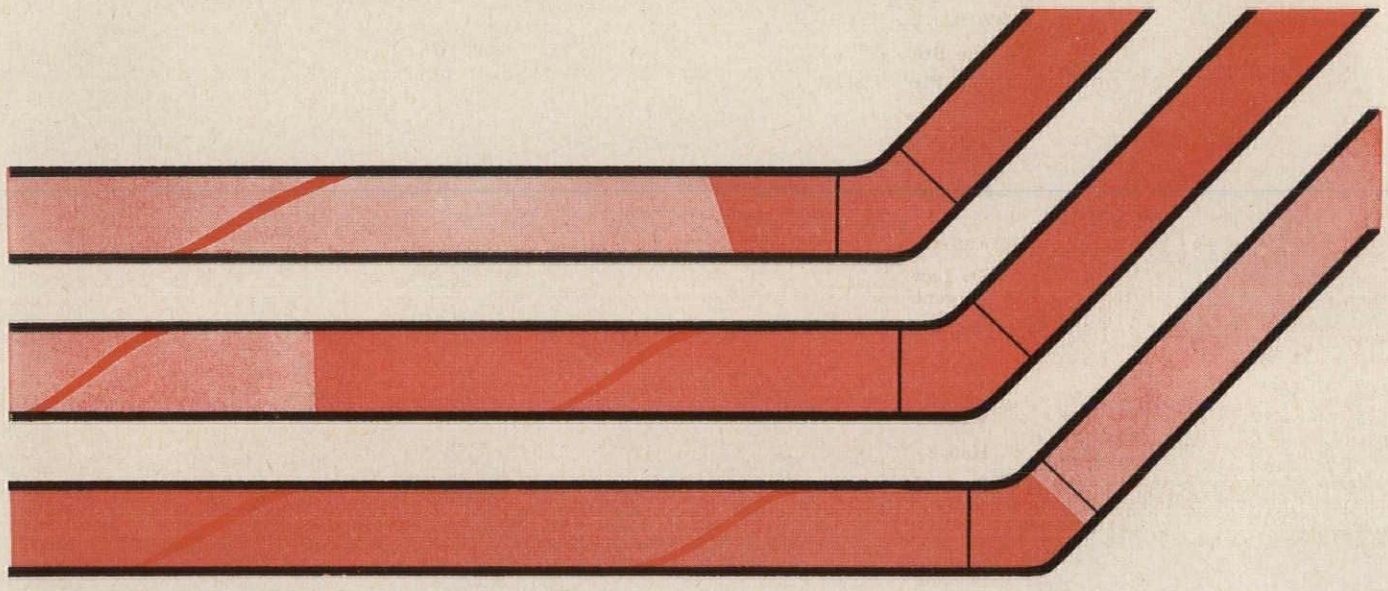
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Top: "The Wall of the Moon," Unesco House, Paris. By Joan Miró and Llorens Artegas.
Bottom: U.S. Pavilion, World Agricultural Fair, New Delhi, India. Minoru Yamasaki & Associates, Architects and Engineers. Photo by Minoru Yamasaki.

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May 1960
Vol. 127 No. 5

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BUILDING TYPES STUDY: CHURCHES

The postwar years have seen a great renaissance of church building in France, and perhaps the greatest opportunity in modern times for so many architects in any country to make simultaneous statements in religious architecture. The study will examine the results, both in a critical article and in photographs of some of the most significant new churches.

SEMI-ANNUAL INDEX

Indexes to RECORD *content are published semi-annually in the magazine, and next month's issue will have the index for the first six months of 1960. Publication of the semi-annual index was resumed in June 1958 after a lapse of two and a half years. Indexes for this period were published separately in 1958 and are available on request.*

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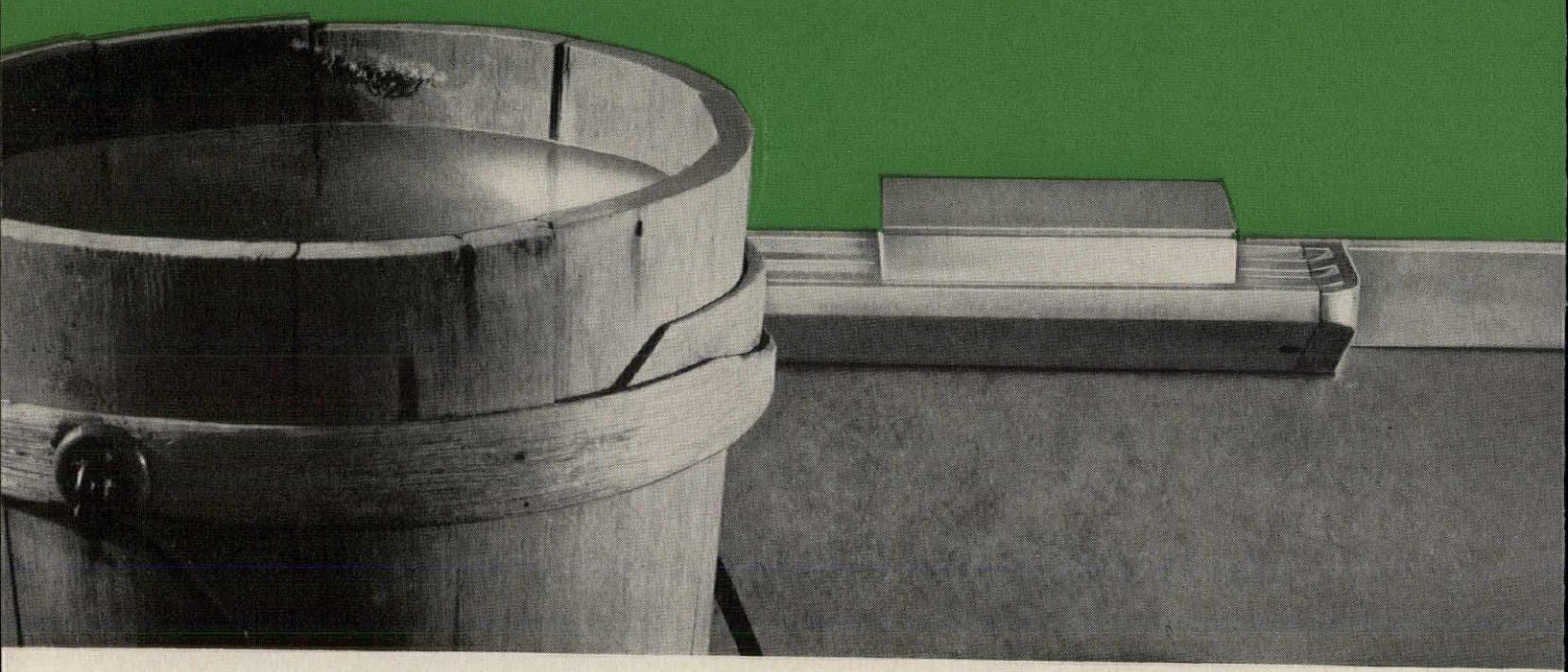
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Town Planning Troubles

We have received a request for information from a young man in a town which shall remain nameless. "Our city," the young man writes, "is in the mist of a redevelopment program. . . ."

Responsibility—and Faith

If our cities are ugly and our buildings fine-art-less, it is not, says John Noble Richards, because we have no means or talents to make them otherwise. What is missing is a sense of responsibility, and a faith in our capacities. Speaking at the Gold Medal Inaugural Dinner of New York's Architectural League last month, Mr. Richards said: "It is this word, responsibility, I believe, which is still lacking, or at least not sufficiently strong, in the vocabulary of the building arts today. As we moved out of the eclectically over-decorated beaux-arts salons into the functional glass and steel space of the international style, we resolved that art was no longer to be for art's sake alone. For a short period, art was to be a matter of social significance. . . . I would say neither the work of the individual architect or artist nor the support of the public can wait for some noble social goal to descend from heaven and wave a flag in front of us to lure us on. I would say art *is* a social goal *in itself*. It is a matter of our responsibility to society. The exalted, isolated genius cannot discharge this responsibility alone. The building arts require the collaboration between the master builder, the artist and the public. This collaboration is as much a matter of responsibility as the joint efforts of numerous experts on behalf of public health, or mental health, or the maintenance of law and order. This sense of responsibility . . . is awakening. It has, I believe, but one requirement. . . . We must have faith in our time—the faith that our efforts on behalf of the building arts and a more beautiful man-made America can be as successful and as great as any in the periods before us. Quite possibly they are."

"Fairest Cities"

The New York Times not long ago conducted an informal poll among five architects to determine "the fairest city of them all." There was no doubt after the ballots were counted that the winner, in a landslide, was Venice: not one of the five failed to mention her. Her only real competition was Paris, with three mentions, followed by Rome and New York with two each. Individual ballots showed that: Sir Hugh Casson has three equally lovely favorites—Peiping, Jaipur and Venice; Wallace K. Harrison also has three favorites—"New York at sunset, New York at noon, New York at night"—though he admits to liking Isfahan, Athens, Venice and Istanbul; Philip Johnson rates New York first, then Venice and Rome; Jose Luis Sert is torn between Paris, Venice and San Francisco; and Edward D. Stone loves Rome above all, then Venice and Paris, and still cherishes an affection for Leningrad and Bath.

The Townhouse Rides Again

The townhouse—not the townhouse as the city dwelling of a man with a country house, but the townhouse as a "low-rise, row type of building with a common wall between individual houses, in which the family occupies most of the land within its own property lines"—appears to be making a come-back. In Chicago, at least, the come-back seemed clear enough to Morton Bodfish, chairman and president of the First Federal Savings and Loan Association of Chicago, to cause him to take a banker's look at this building type. The advantages for the owner, Mr. Bodfish concluded, include an end to commuting for the suburbanite, increased privacy for the apartment dweller, and financial savings for both. For the community, townhouses may be a solution to overcrowding urban land available for residential building, if used with high-rise housing; and they should help to stabilize the tax base by encouraging middle-income families to remain, or move back to, the city. Meanwhile, whatever happened to the lowly row house?

Robie House: A Progress Report

Sighs of relief were heard in the architectural world a couple of years ago when Webb & Knapp saved Frank Lloyd Wright's Robie house from the demolition crew, and announced its intention to use the house as its offices. A recent report from Chicago indicates that the new owners are giving the house the kind of loving care and practical attention a treasure deserves. So far, the brick work has been inspected and tuckpointed; the roof and gutters have been repaired, and downspouts added; and heating units have been repaired, and new ones added. Further repairs are projected.

Tastemakers Organize

The Joneses are making it easier for the rest of the world to keep up with them. The American Institute of Approval has been formed to see that the American housewife at least knows whether or not the product she buys is in "good taste." The Institute is the brain child of Lady Malcolm Douglas-Hamilton, who found, when she moved from her native Boston to London, that European women thought American products *not* in good taste. The Institute will eventually consist of a panel of 75 members described vaguely in one newspaper account as "society women," and described by Lady Douglas-Hamilton as women who have "led cultivated gracious lives"; most of the members have been selected. Upon request, panel members will consult with manufacturers, for a fee; if the panel considers that the product in question deserves it, it will receive an "Award of Approval."

A Record Special Report

Annual Reynolds Award Goes, Again, To an Entry From Abroad

For the fourth time in its four-year history, the R. S. Reynolds Memorial Award, given for "the most significant contribution to the use of aluminum, esthetically or structurally, in the building field," has gone to a building abroad. The American Institute of Architects, which administers the award program, has announced that the 1960 prize of $25,000 has been taken by Swiss architect Jean Tschumi, for his design of the offices of Nestlé's International Headquarters at Vevey, Switzerland (see photographs, pp. 12-13).

The jury, which was composed of Walter Gropius, F.A.I.A., as chairman, Philip Will Jr., F.A.I.A., Arthur Fehr, F.A.I.A., James M. Hunter, F.A.I.A., and C. E. Pratt, F.R.A.I.C., was particulary impressed by Mr. Tschumi's "sensitive" and imaginative use of aluminum, and had this to say of the building in its official report:

"The entire building is enriched by the relief effect of its various components, causing ever-changing shadows, particularly by the varying depth of the profiling. The silhouette of the building is enhanced by the transparent first floor and the deeply undercut penthouse under the roof. The building respects its site in which it is at home. The sensitive sculptural handling of the concrete supports harmonizes remarkably with the profiles of the aluminum canopies and sun shades.

"Jean Tschumi has made sensitive use of aluminum in a previously little explored manner. This is particularly true of the entrance canopies which make use of a combination of extrusions and aluminum sheets, uniquely an aluminum accomplishment. By use of very delicately designed and restrained vertical baffles and sun shades which vary according to the different orientation, he breaks up the monotony of usual fenestration. It is interesting to note that the unity of this design is not impaired by the variation and intensity of use of sun-control devices on different elevations. The sun shades never obstruct the view from within.

"Tschumi relieves the monotony of rectangular geometrics with curved façades. The end walls of his Y-shaped building are witty and convincing. The round, aluminum-sheathed double staircase is also worthy of mention for its excellent design. . . .

"Jean Tschumi's design has utilized aluminum consistently throughout the building. The novelty of its usage is not of a sensational quality, but one of quietness and serenity which enhances his architectural conception."

Most of the jury members took advantage of an opportunity to add their own comments to their joint report. Dr. Gropius' addendum dwelt mainly on Mr. Tschumi's accomplishment. Although other entries, including U. S. entries, had displayed first-rate design, "the jury's main task," he said, "was to find something creative in aluminum." The Nestlé headquarters is a building which does display a new use of aluminum, he said, and which could only have been done with that material. He added that Mr. Tschumi is a "real, new discovery," who had found imaginative, rich and interesting solutions on all sides of his building.

Where Was The U. S.?

The jury also felt constrained to comment, both together and severally, on the conspicuous absence of the United States winners in a competition based on the uses of aluminum in architecture. In the three earlier competitions, the award went to Australia (to architects Yuncken, Freeman Brothers, Griffiths and Simpson for the Sidney Myer Music Bowl at Melbourne—AR, June 1959, p. 12), to Belgium (to architects T. and F. Hoet-Segers, H. Montoies, R. Courtois, J. Goossens-Bara and R. Moens de Hase for the Transportation Pavilion at the Brussels World's Fair—AR, June 1958, p. 16), and to Spain (to architects Cesar Ortiz-Echague, Manuel Barbero and Rafael de la Joya for the visitors' center of the S.E.A.T. automobile factory at Barcelona—AR, May 1957, p. 16).

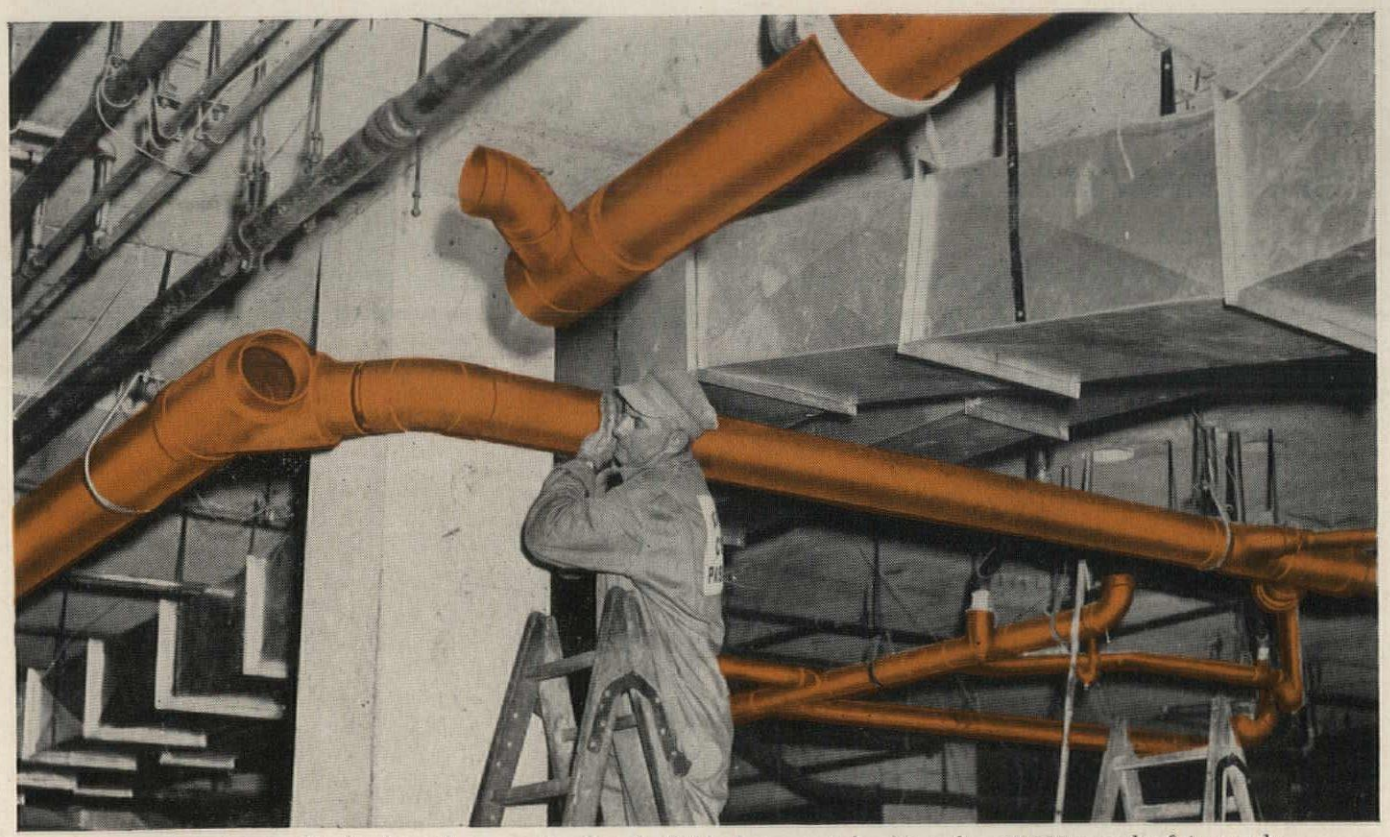
The United States is, after all, the country where Hall discovered the electrolytic process of extracting aluminum; it leads the world in the production of aluminum, and about a quarter of its production goes into building and construction. On its failure so far to take an award in the Reynolds program, the report remarked: "The jury was favorably impressed by the general high standard of design of most entries, some of which were elegant and well-proportioned. However, the jury feels that the use of aluminum for curtain walls or as sheathing material is well established and of itself not sufficient to qualify under the terms of the award. The jury assumes that the lack of imaginative use and sensitive detail in some U. S. entries may reflect the ready availability of standard and pre-engineered building components in the United States and the restraints imposed by U. S. building codes and insurance requirements."

In the additional comments made by the individual jury members, Mr. Will, Mr. Hunter and Mr. Fehr all said flatly that U. S. building codes lag considerably behind technical advances. Mr. Will also pointed out that the European architect must invent much of his detailing, while here most of the inventing is done by manufacturers; "more and more buildings in the U.S. are becoming assemblies of cataloged items."

continued on page 12

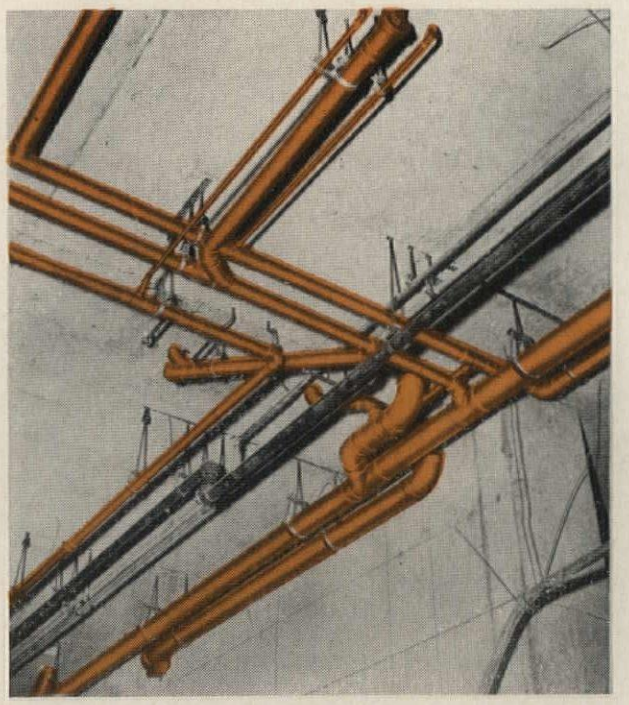


In addition to the $25,000 which the award carries, Mr. Tschumi received this aluminum sculpture, especially commissioned from William Zorach for the 1960 winner. It is called "Ascension"



EASY TO HANDLE. Mechanic easily connects a length of 6-inch copper tube. More than 16,000 pounds of Anaconda Copper Tube, Type M, in sizes up to 8 inches, was used for the sanitary drainage systems. Architect and Engineer: California State Division of Architecture. Mechanical Engineer: Division of Architecture. General Contractor: Robert E. McKee, Inc., Los Angeles. Plumbing Contractor: E. O. Nay, Inc., Pasadena.

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CLOSE WORK LIKE THIS is possible only with copper tube. Water and drainage lines hug the ceiling, giving ample basement headroom. Even in tight quarters, connections are easy to make. Sizes in this photo range from ¾" water lines to 4" for drain and vent lines.

Copper tube sanitary drainage lines in the hospital building and administration wing of the new Fairview State Hospital at Costa Mesa, California, eliminated wasted space in furred areas and allowed ample headroom in the basement. Equally important to the project owners, however, was the fact that copper tube drainage systems are easier to install, are long lasting, require less maintenance than other materials.

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REYNOLDS AWARD: NESTLÉ HEADQUARTERS continued

". . . the end walls are witty and convincing . . ."



In designing the Nestlé building, the architect aimed at an impression of lightness, and a structure which would reflect, figuratively and literally, the near-by lake and mountains. He also sought an expression of the rigid module.

The Y-shaped plan developed out of a desire to give all offices the benefit of the superb view towards the mountains and Lake Geneva. The "transparent" ground floor also takes advantage of the view by allowing motorists on the highway in front of the building to see through.

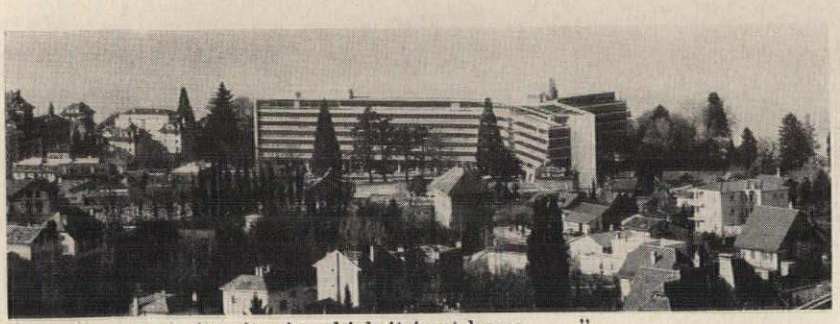
Besides being equipped with a high-velocity air conditioning system, the building shows particular care given to sun shields; on the west façade, vertical louvers (aluminum) fastened to each mullion are movable, while on the east side they are fixed; on the south façade, the louvers support horizontal sun-breaks. Further temperature control is effected by the double-glazed fixed windows; aluminum Venetian blinds can be lowered between the inside and blue-tinted outside panels.

The spandrels were specially fabricated for the building of an aluminum-silicium alloy, which becomes gray through oxidation. The structure is of reinforced concrete in the basement and ground floor, welded steel in the upper floors.

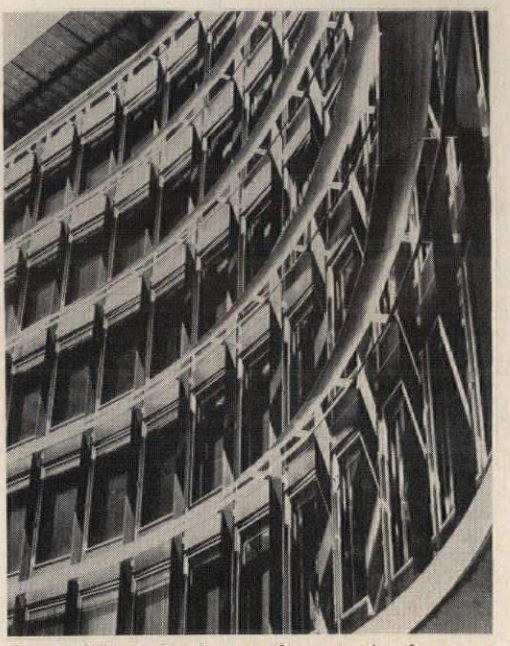




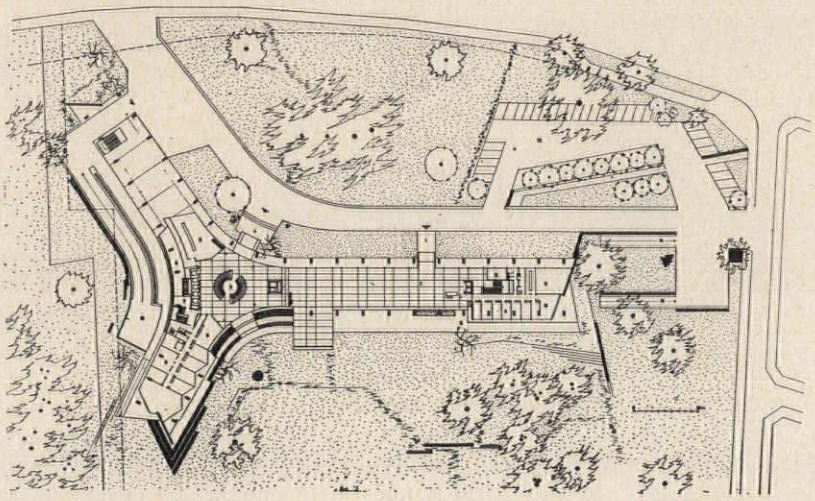
". . . the canopies, uniquely an aluminum accomplishment . . ."



". . . it respects its site, in which it is at home . . ."

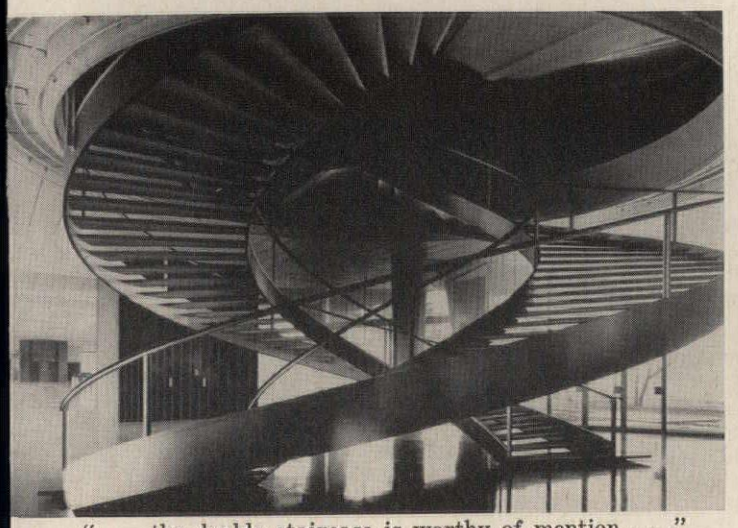


". . . delicately designed, restrained baffles . . ."

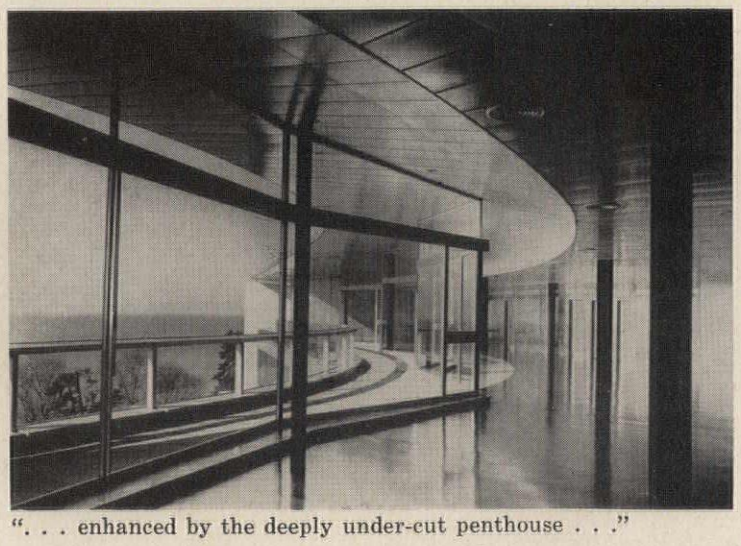




". . . sensitive handling of concrete supports . . ."



". . . the double staircase is worthy of mention . . ."



". . . enhanced by the deeply under-cut penthouse . . ."

Recent Work of van den Broek and Bakema

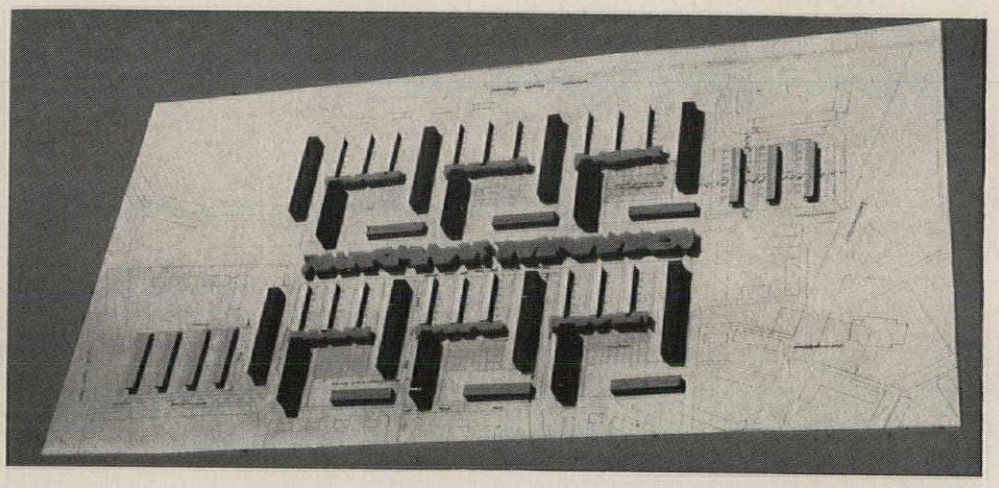
The firm of van den Broek and Bakema is one of The Netherlands' busiest and most successful architectural offices, with many large scale projects to its credit in recent years—including the Lijnbaan, the shopping street that forms the heart of reconstructed Rotterdam. At the same time, the work of this office might serve as a textbook demonstration of a consistent and highly intellectual approach to all of their problems of design.

In all of their work, the architects seek to establish a systematic pattern of organization, within which they can retain a considerable degree of freedom in arranging the individual elements of the design; and it is these freely-disposed individual elements which determine the expressive and ornamental aspect of their architecture. In this way van den Broek and Bakema are attempting to reconcile the type of abstract order found in the *De Stijl* movement with the concept that a modern building should be able to satisfy its functional requirements with efficiency and formal integrity.

Thus we find a firm of architects rigorously and logically trying to put into practice the doctrines that the apologists for modern architecture have traditionally preached.

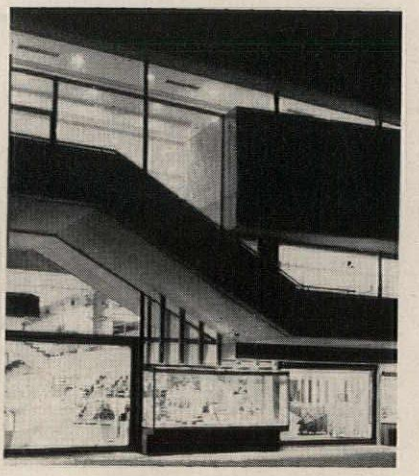
—*Jonathan Barnett*



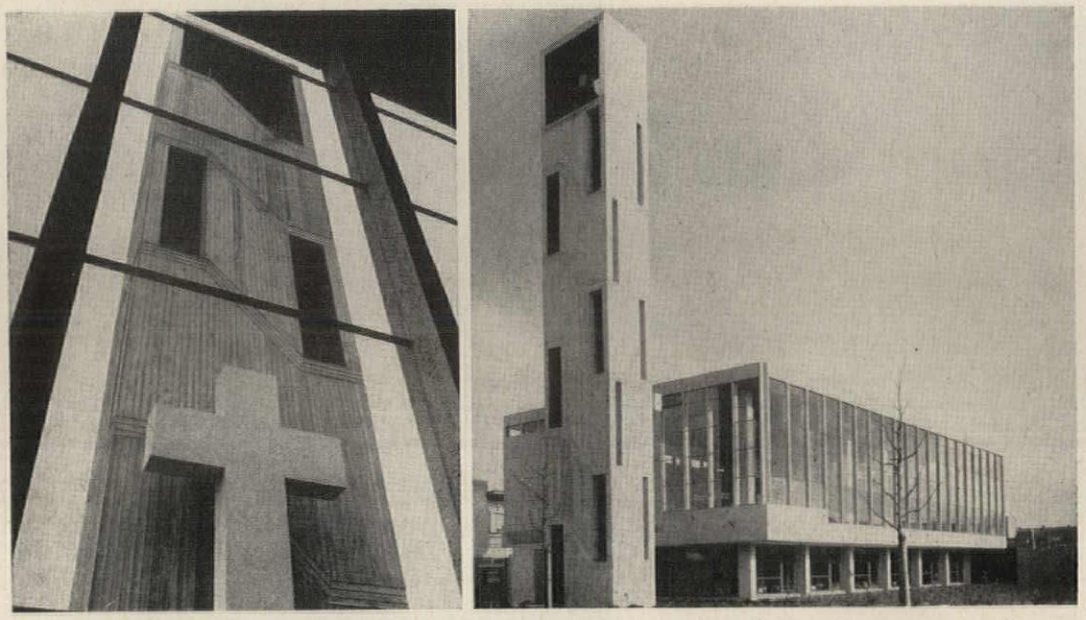


The layout of this housing project at Hengelo in northern Holland is as abstract as any *De Stijl* painting, but the elevations of the individual buildings are the direct expression of the requirements of the plan

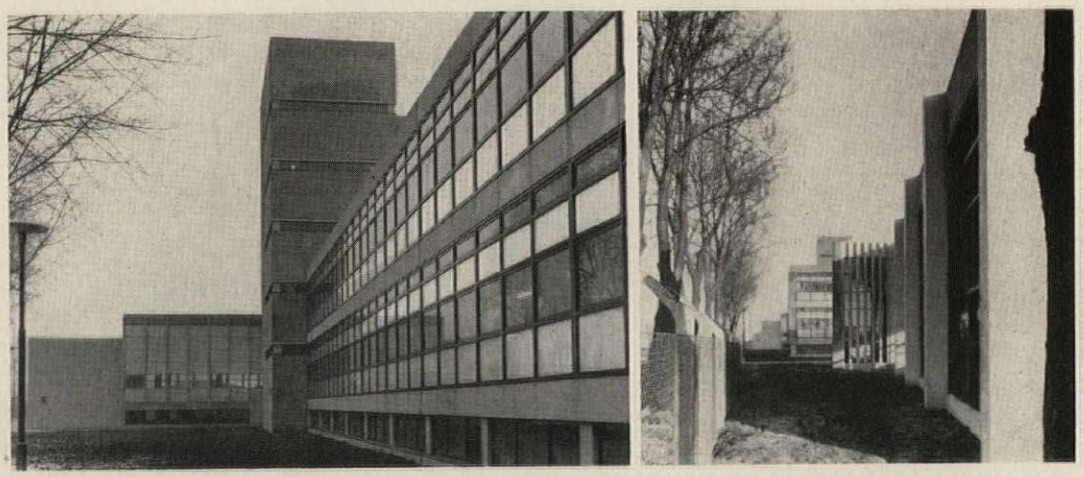




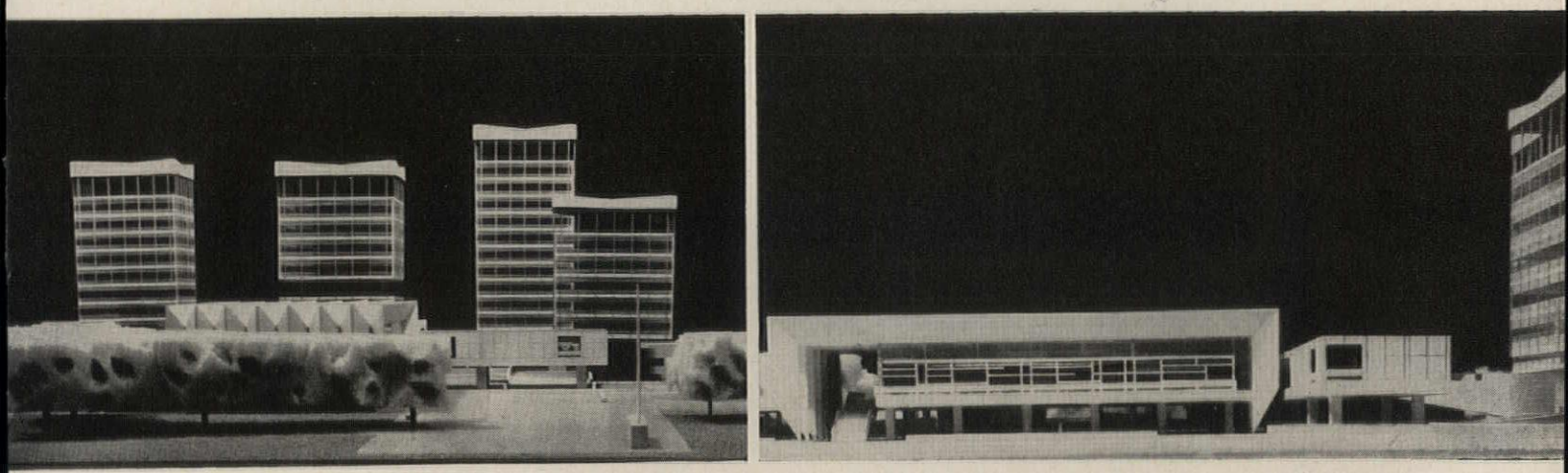
In this group of stores at Rotterdam, a display case, a stairway, and a balcony provide a vigorous interplay of masses within a simple rectilinear composition



The stairway in the bell tower becomes the dominant expressive element in this church at Schiedam



Careful detailing gives a human scale to this large school building in Rotterdam



In this model of the Town Center for Marl, West Germany, now under construction, the same dual relationship can be seen: a rigid overall system governing the disposition of the primary masses set off against individual details arranged to provide a decorative pattern

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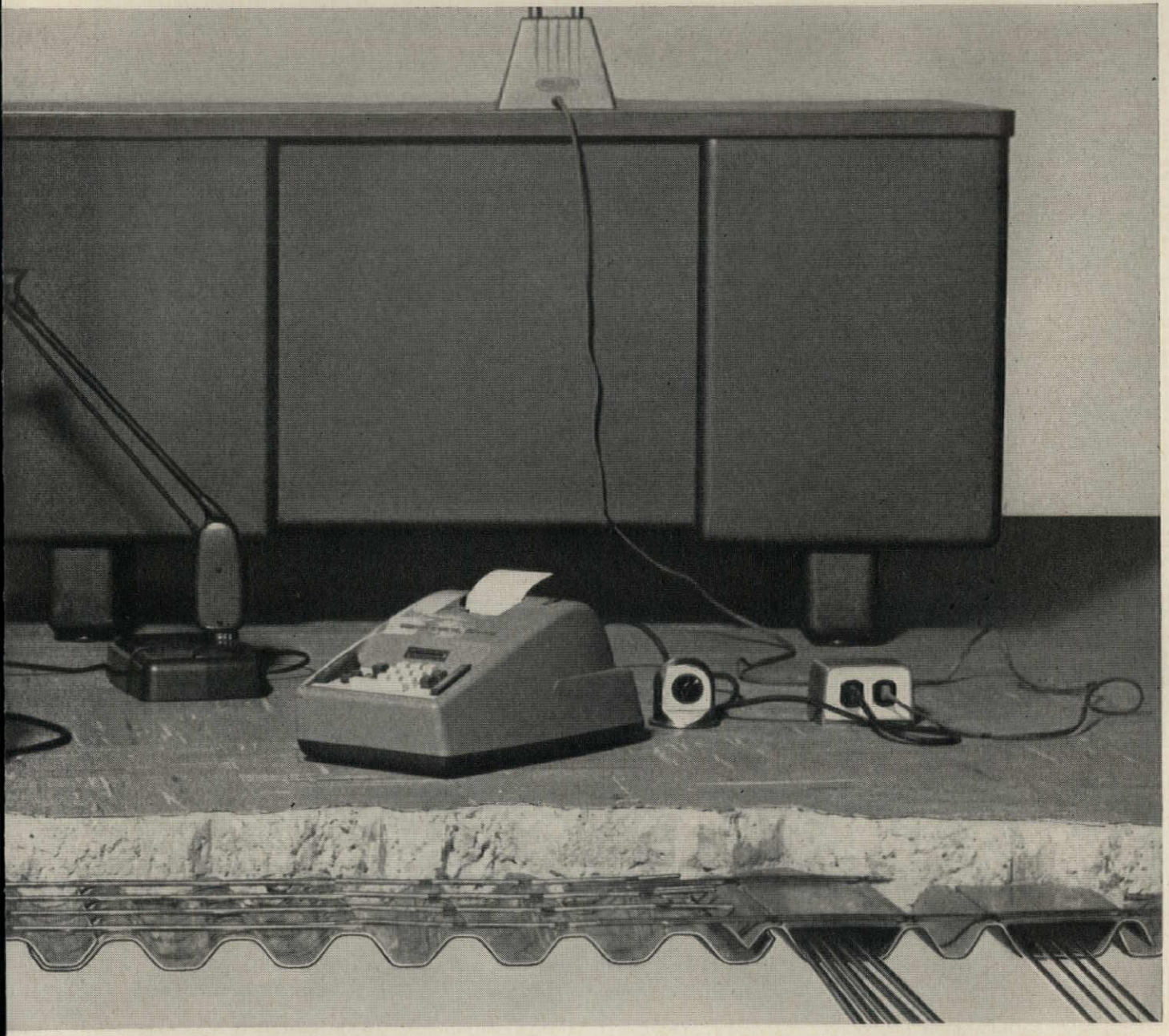
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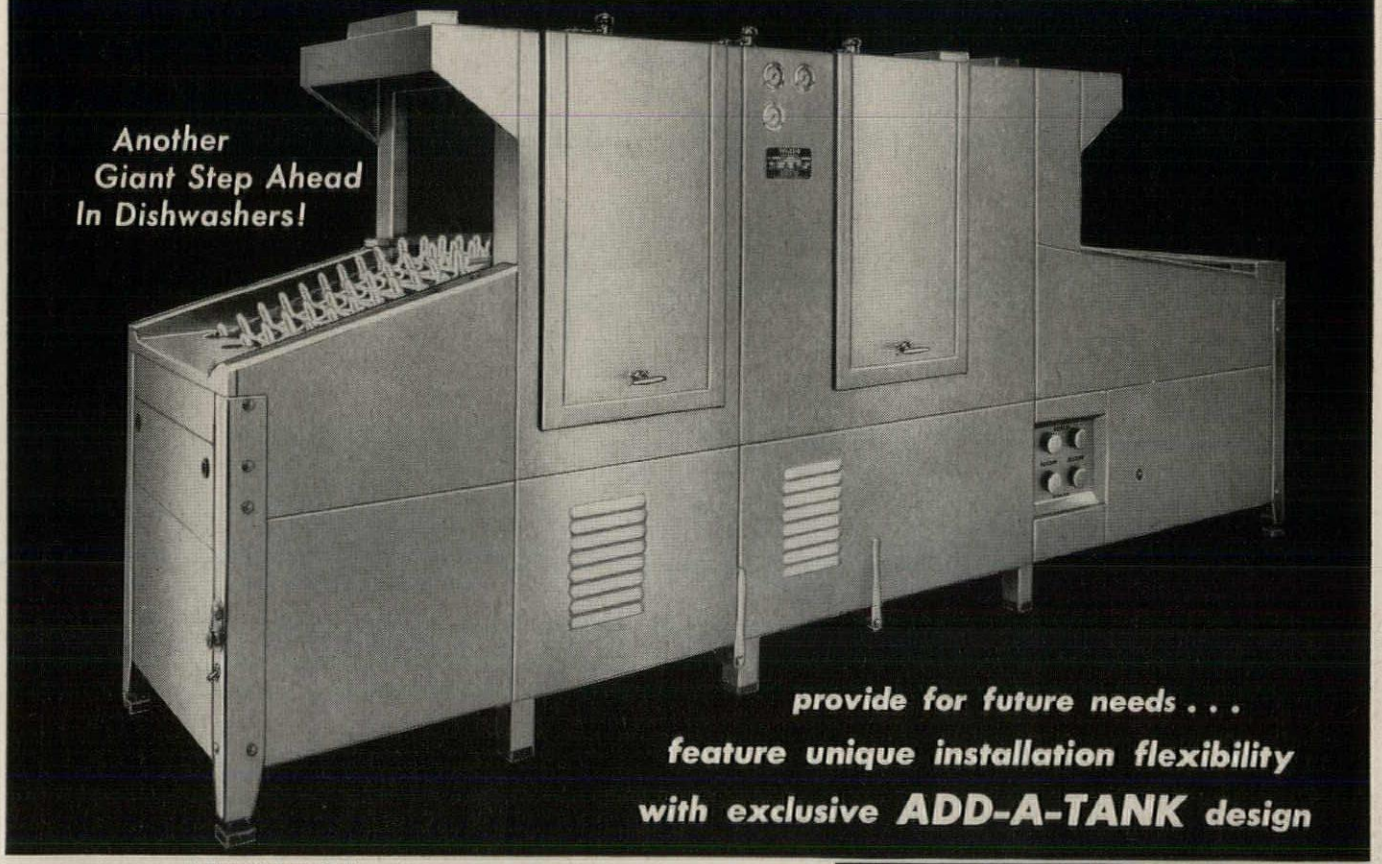
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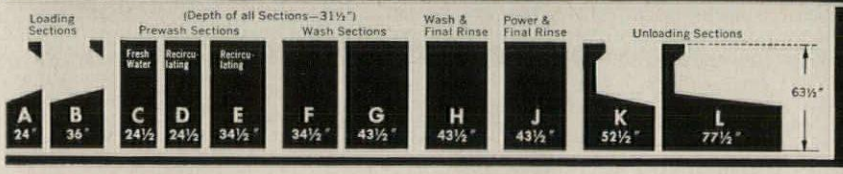
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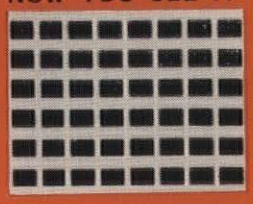


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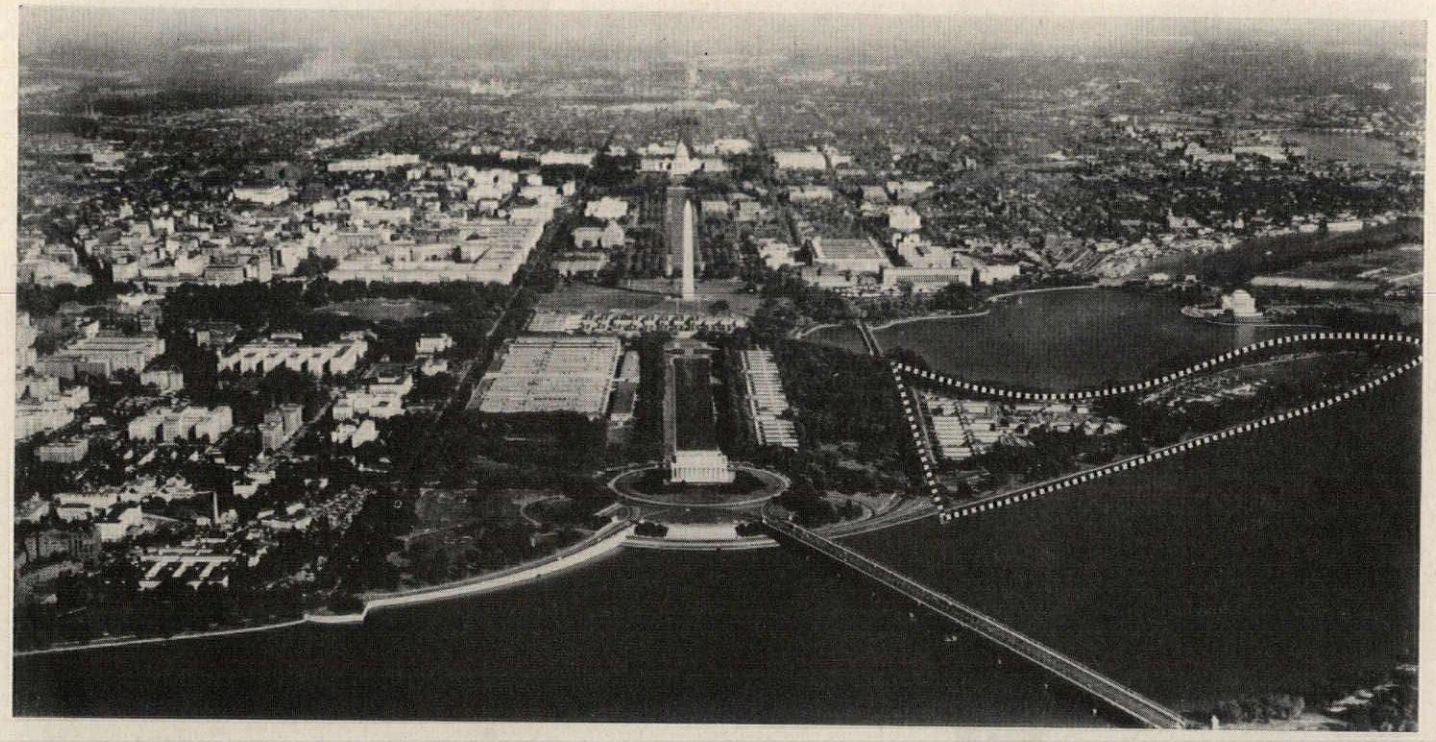
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FDR Memorial Competition Has Hands-Off-the-Artist Policy

The competition for a design for the Franklin Delano Roosevelt Memorial is undoubtedly Washington's most important architectural competition since the Jefferson Memorial was built, in terms both of its eventual place in the list of sights to be seen and of its site. It is also a competition deliberately designed to give competitors maximum freedom as well as maximum challenge.

The Roosevelt Memorial Commission, which is headed by Francis Biddle, began by appointing a distinguished advisory committee, most of whose members had already had considerable experience on competition committees and juries: architect Pietro Belluschi as chairman, architect Samuel Glaser, Philadelphia museum director R. Sturgis Ingersoll, critic Lewis Mumford, landscape architect Hideo Sasaki, and architect Jay S. Unger.

One of the responsibilities of the advisory committee was to recommend a site for the memorial—three were available. They recommended the Tidal Basin site, near the Jefferson Memorial. Congress has voted to accept this recommendation as "fulfilling the postwar goal and dream of the late President that the temporary buildings erected on the Mall and adjacent parklands . . . would be removed as soon as possible after the conclusion of World War II."

The committee's central recommendation, however, was more nearly a non-recommendation: the committee declined to suggest the form which the memorial might take. In its report to the commission, the committee said:

"In our discussions it became evident that the most important thing in creating a suitable memorial, besides the selection of the right person or persons to execute the work, is the discovery of a theme that will bring forth in such artist the fullest kind of response, so that he will create something that will far exceed any specifications that the Committee might—if it were unwise—try to lay down. In drawing up a program for the Roosevelt Memorial therefore, it will be well to cast aside, at the beginning, any previous building or work of art as a model to be directly imitated. We may admire the purity of the Washington Monument and see in this isolated, lofty column a true image of the Father of our Country, but we know that such a symbol cannot be used a second time. The same applies to monuments as effective as the Farragut Monument in New York or the Lincoln Memorial. We must look rather to the character and work of Franklin Roosevelt to give us the theme of a memorial that will do him the honor he deserves and transmit his living image to future generations. . . .

"It would stultify the mind of the designer, perhaps paralyze him, if the Committee were to indicate beforehand whether the appropriate form would be a building, a garden, a fountain, a pool, a whole landscape, or all of these wrought together in some fresh, surprising, and appropriate form. Our one thought would be that Roosevelt, the essential Roosevelt, must be the focus of an appropriate memorial; it is surely not enough to inscribe his name over the entrance of a building conceived for some quite different use and purpose."

The committee did go so far as to give its thoughts on the characteristics of "the essential Roosevelt" which might effect the design of his memorial: first, his "warm feeling for people," suggesting that the memorial "be accessible, and the visitor not put at a great distance from the man by reason of his eminence"; second, the good neighbor policy, which "tries to establish a sense of common needs and common aims"; and, third, his "vital sense of the unity of all mankind—to create a fitting memorial for Roosevelt, not merely must his native soil and his American heritage be brought into the picture—the rest of mankind must be vividly present, in some

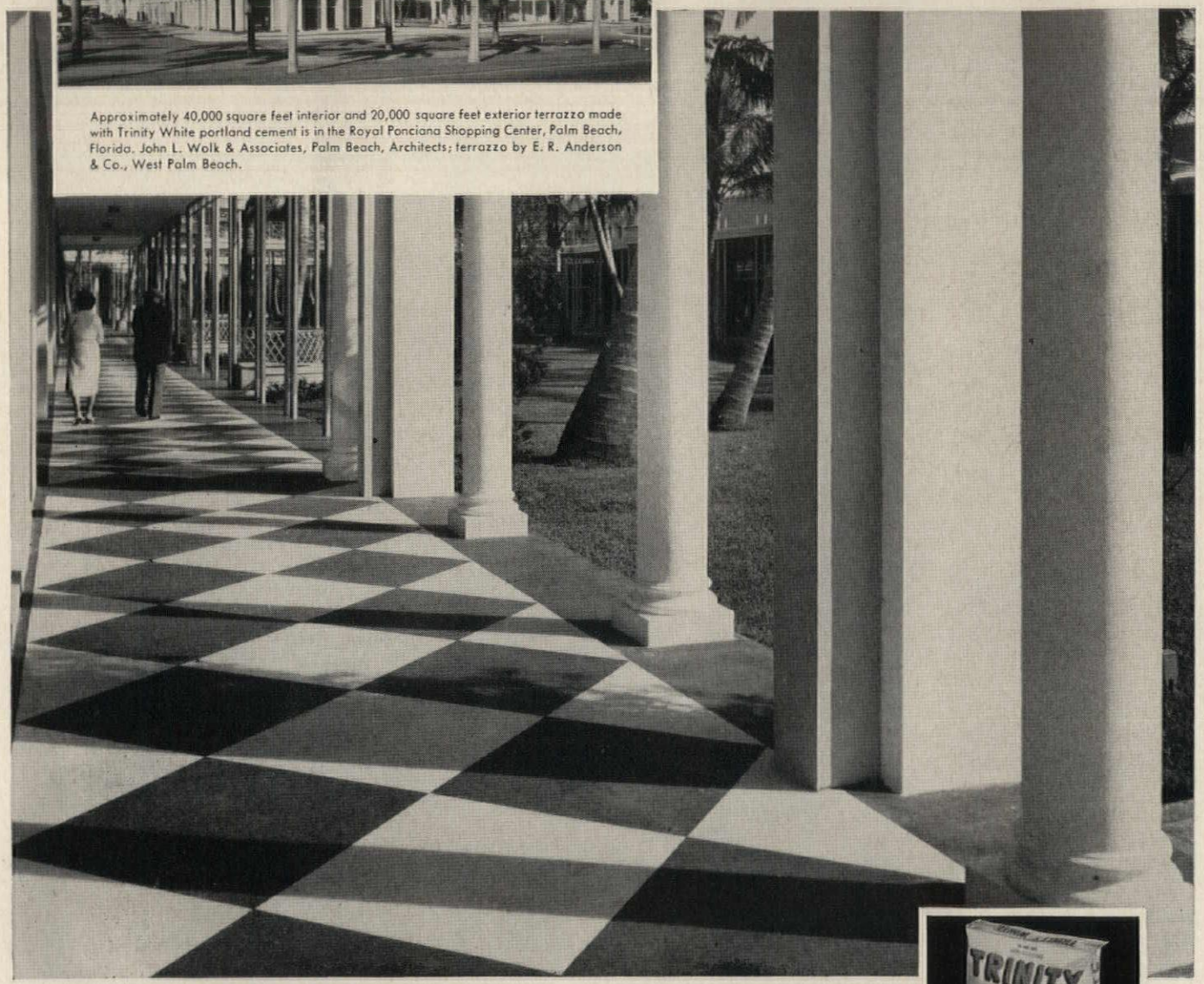
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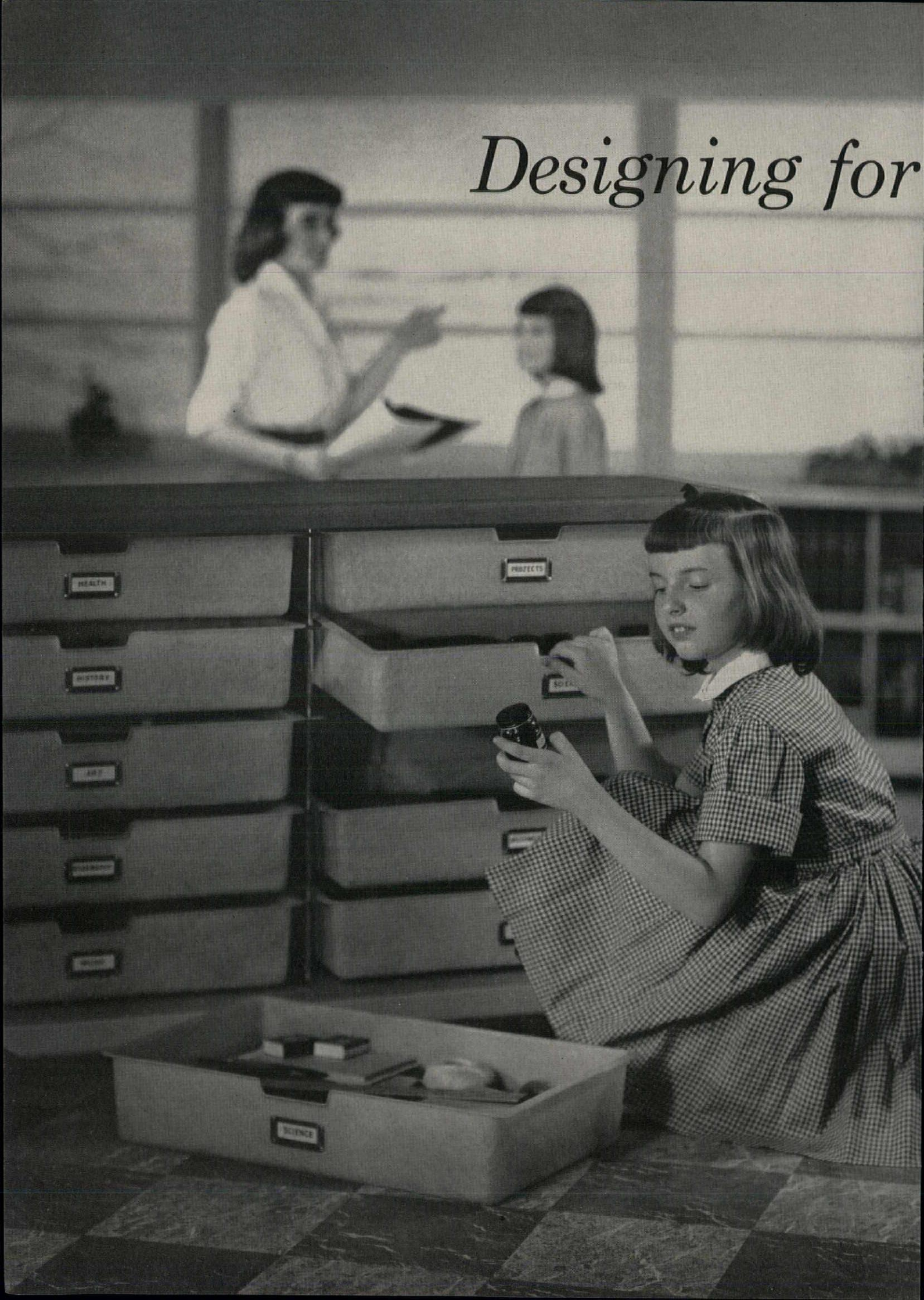


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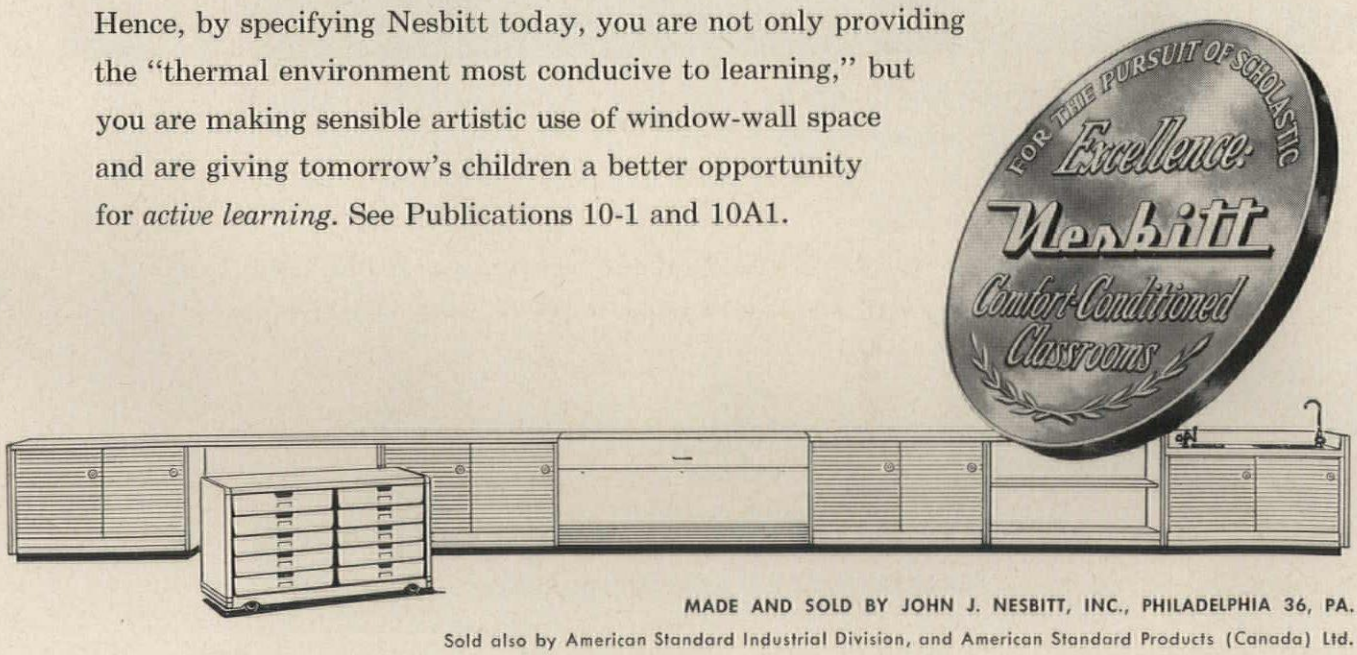
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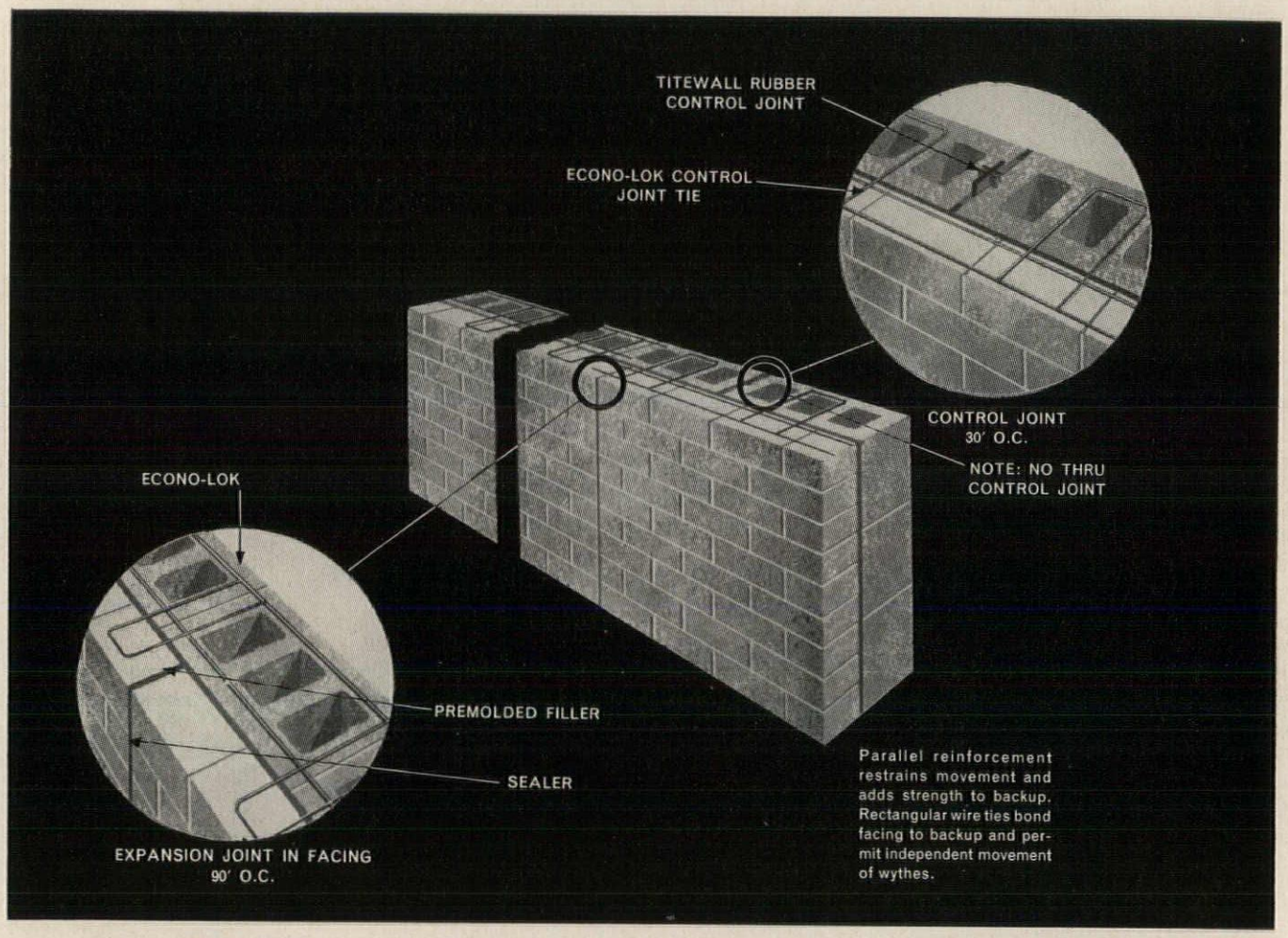
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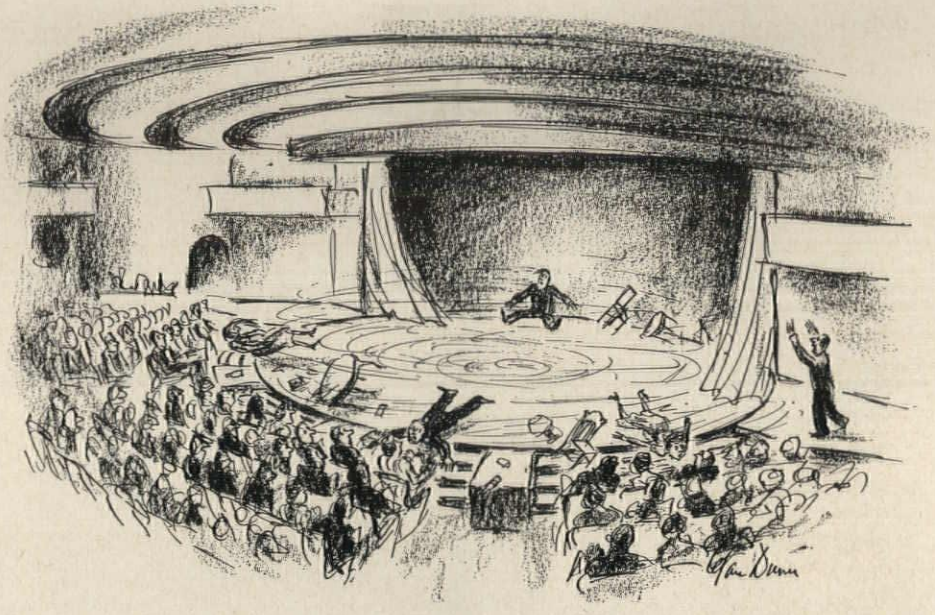
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"Hey, slow it down!"

Louis Kahn Honored

The National Institute of Arts and Letters has announced that this year's Brunner Award has been given to architect Louis I. Kahn of Philadelphia. The award, bestowed yearly on "an architect who has contributed to architecture as an art," carries with it a citation and a $1000 prize. Since the Institute initiated the award in 1955 in honor of architect and Institute member Arnold W. Brunner, it has been conferred on Gordon Bunshaft, John Yeon, John Carl Warnecke, Paul Rudolph and Edward Larrabee Barnes; Minoru Yamasaki received an honorable mention in 1955. The award will be presented to Mr. Kahn on May 25 at the Joint Annual Ceremonial of the National Institute and the American Academy of Arts and Letters.

A.I.A. Journalism Awards

The American Institute of Architects has announced the winners in its seventh annual Journalism Awards Competition, held to give recognition to articles, appearing in newspapers and magazines of general circulation, which "further public understanding of architecture and the architect." First prizes, of $500 each, went to George McCue of the *St. Louis Post-Dispatch*, in the newspaper category, for a critical article on architecture (this was Mr. McCue's second consecutive award); and to Grady Clay, in the magazine category, for his article "Metropolis Regained" in *Horizon* magazine. Second prizes, of $250 each, went to Brooks Martin, in the newspaper category, for an article on the lift-slab system for San Antonio's *La Prensa;* and to James Britton, in the magazine category, for his article "Downtown Tomorrow," published in *San Diego and Point* magazine. Honorable mentions went to *Time* magazine, *The Nation* magazine, and Robert J. Lewis, real estate editor of *The Washington Star.*

The Cultural Community

Two architects are included in the list of newly elected members of the National Institute of Arts and Letters: Gordon Bunshaft and Wallace K. Harrison. Other representatives of the arts admitted as members of the Institute include sculptor Alexander Calder, painters Marcel Duchamp, Willem De Kooning, Rico Lebrun and Francis Speight. The Institute has also announced that Pietro Belluschi has been elected a vice president, along with Peggy Bacon, graphic artist.

Election Returns

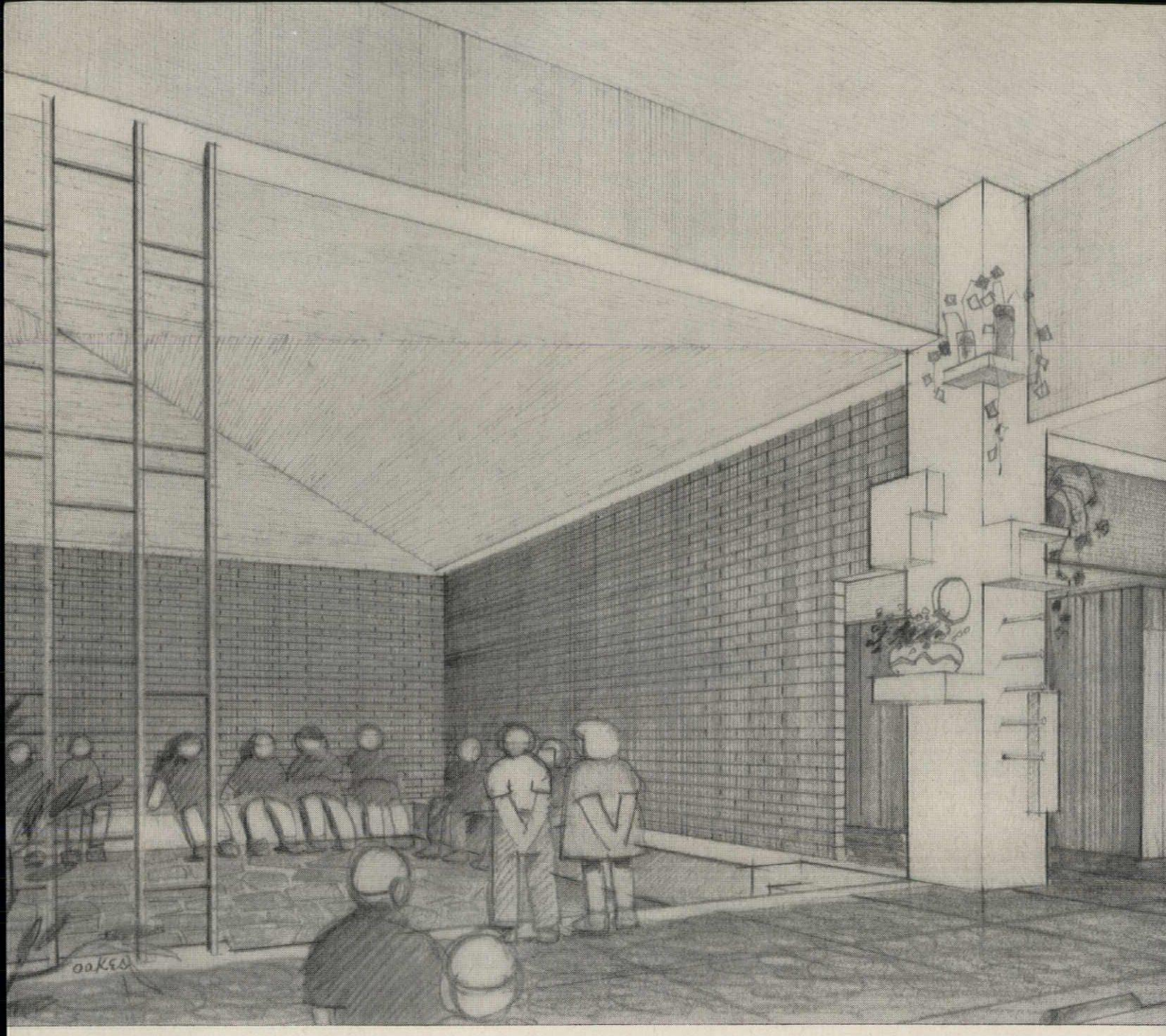
The Architectural League of New York has elected Robert W. Cutler, a partner in Skidmore, Owings & Merrill, to serve as its president for the coming year. Other officers elected by the League include: Seymour Fogel, vice president, painting; Gwen Lux, vice president, sculpture; Richard C. Guthridge, vice president, landscape architecture; Jens Risom, vice president, design and craftsmanship; Ira Hooper, vice president, engineering; Giorgio Cavaglieri, vice president, architects; Cope B. Walbridge, secretary; and Alfred Geiffert III, treasurer. Morris Ketchum Jr., the retiring president, and Nembhard N. Culin and Michael Radoslovich were named to two-year terms on the executive board.

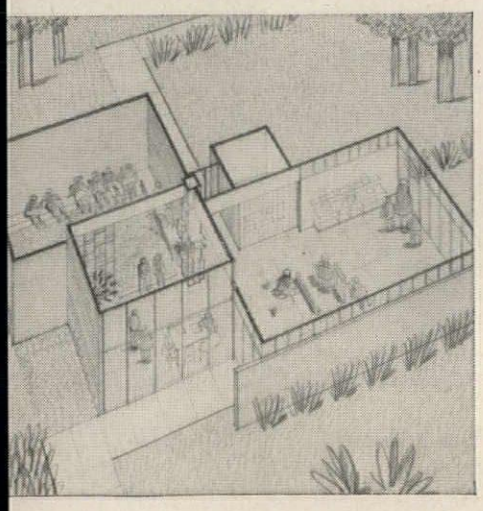
Wayne S. Hertzka, of the San Francisco firm Hertzka & Knowles, has been elected by the California Council of the American Institute of Architects to serve as its president during 1960. The Council also elected Frank L. Hope of San Diego as vice president, Edward D. Davies of Pasadena as secretary, Joseph J. Jozens of Sacramento as treasurer, and Maynard Lyndon, F.A.I.A., of Los Angeles as member-at-large.

With the Schools

The recently issued roster of members of the Association of Collegiate Schools of Architecture shows no major changes in the membership—

continued on page 28





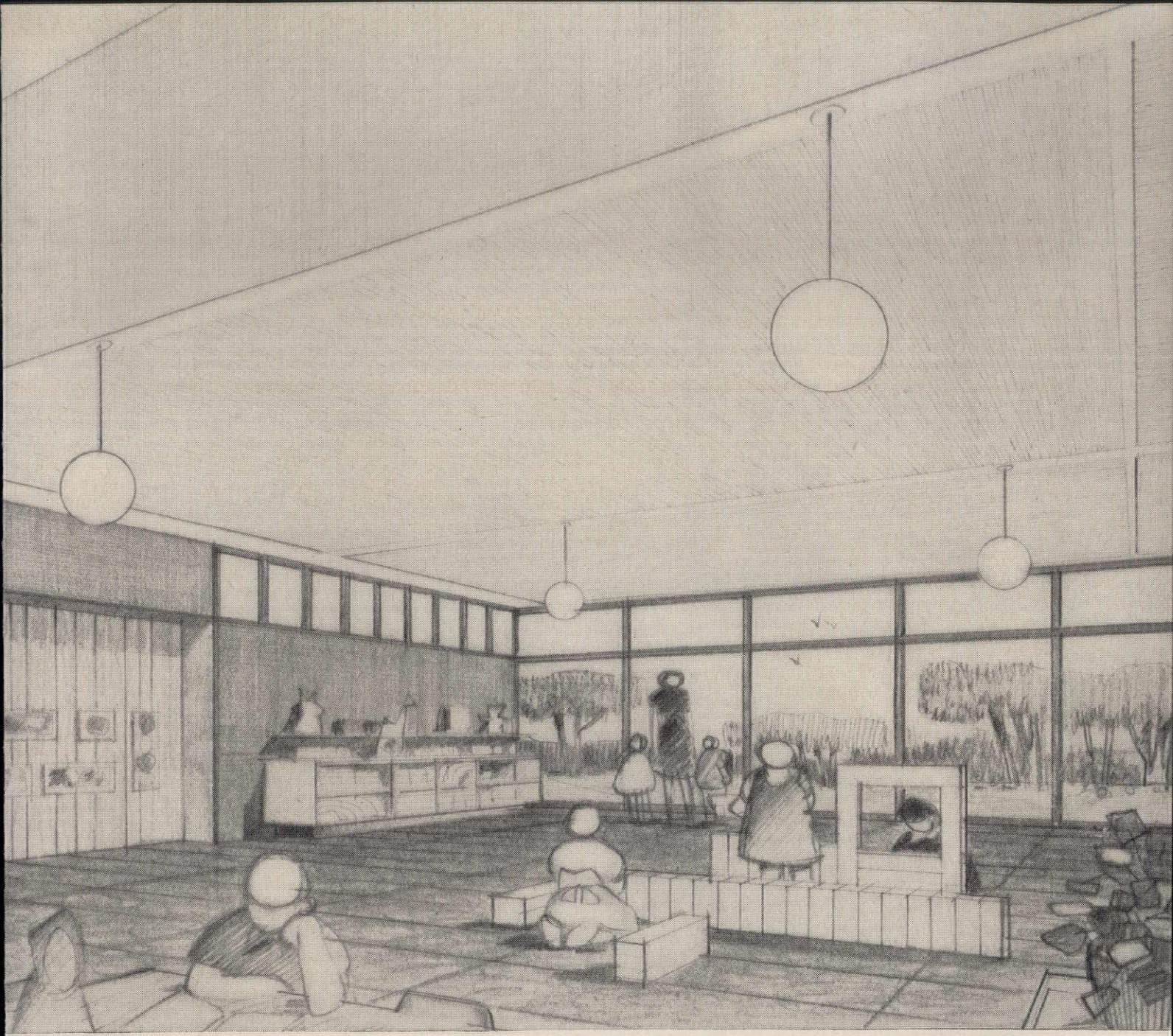
How a strongly directional acoustical ceiling adds variety to this nursery school

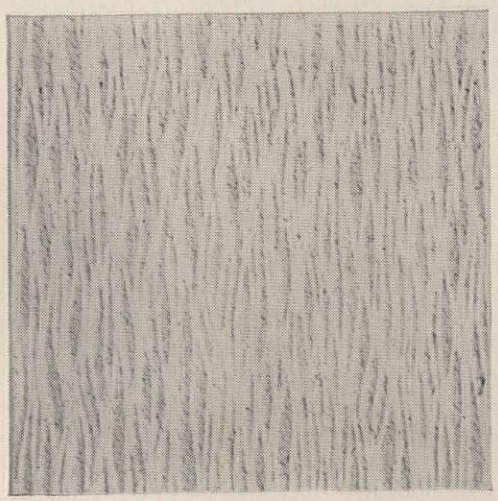
Plan by George M. Ewing Co.
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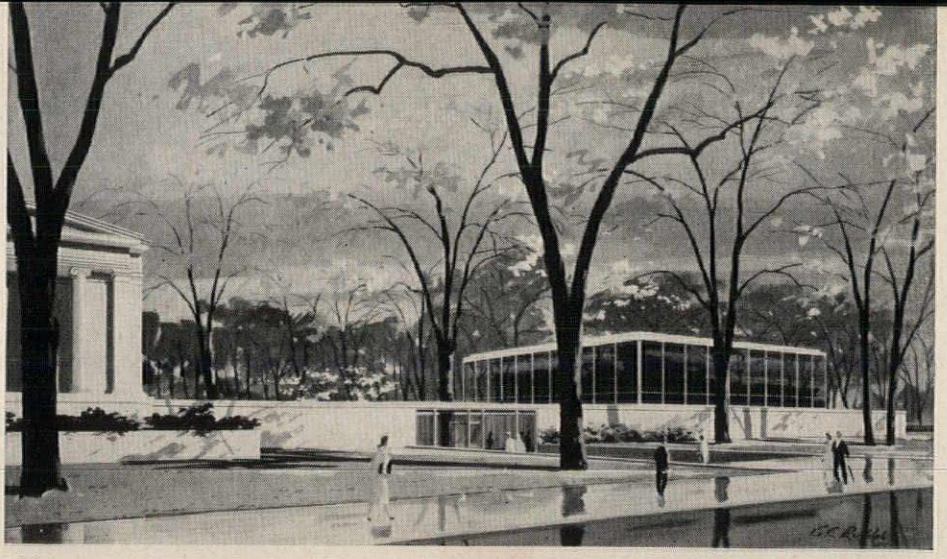


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This year's Birch Burdett Long prize for architectural rendering was awarded to George Cooper Rudolph for this rendering of Skidmore, Owings & Merrill's design of the addition to the Albright Museum in Buffalo. From the record 63 submissions in the annual Architectural Rendering Show sponsored by the Architectural League of New York, three were selected as "outstanding"; these were the submissions of Mr. Rudolph, Robert Schwartz and Harry N. Wijk

no schools have been dropped since 1959, nor have any been added. There have, however, been changes within the roster. Four of the colleges having schools of architecture have become universities: Iowa State University (formerly Iowa State College), Kansas State University (formerly Kansas State College), Oklahoma State University (formerly Oklahoma State College), and Washington State University (formerly the State College of Washington); and one college has changed its name altogether: Auburn University (formerly Alabama Polytechnic Institute). There were also a number of changes in the designations of departments and schools: at the University of California, the curriculum is now part of the College of Environmental Design (William W. Wurster remains Dean); at the University of Houston, the School has become the College of Architecture; and at Montana State College, the Department has become the School of Architecture (H. C. Cheever is now its Director). And there were a number of new names among the heads and deans: Dr. Paul Goettelmann, Acting Head, Department of Architecture, Catholic University of America; De Von M. Carlson, Acting Head, Department of Architecture and Architectural Engineering, University of Colorado; Charles R. Colbert, Dean, School of Architecture, Columbia University; George E. Danforth, Director, Department of Architecture, Illinois Institute of Technology; John W. Lawrence, Acting Dean, School of Architecture, Tulane University; and Raymond P. Chaty, Acting Chairman, Department of Architecture, Western Reserve University.

Figures released by the A.C.S.A. show continuing expansion of enrollment in both the member schools and associate members. In 1958-59, the total enrollment for both of these groups was 14,014; this year, the total is 15,479. Last year, the schools expected to confer a total of 1573 B. Arch. degrees, 182 M. Arch. degrees; this year the respective figures are 1778 and 256.

Contractors' Convention

Delegates to the 41st annual convention of the Associated General Contractors of America, held in San Francisco in March, installed John A. Volpe, Malden, Mass., as their 1960 president, considered controversial issues concerned with bid-shopping and bid-peddling and the highway construction program, and heard John Noble Richards, then president of the American Institute of Architects, discuss mutual problems.

Nearly 2500 attended the San Francisco conclave, which was held but a few weeks before the annual A.I.A. convention in the same location—the Masonic Memorial Temple atop Nob Hill.

In his speech to the contractors, Richards noted that the A.I.A. board of directors was about to recommend to the Institute's membership specific measures by which the scope of the architectural services and the competence of architects can be increased. Some of the basic A.I.A. documents may have to be revised to accomplish the former, he said.

The new measure for professional scope and competence has been recommended by a committee on the profession headed by James M. Hunter, F.A.I.A., Boulder, Colorado.

Richards spoke also of the new organizational structure proposed for the Institute and headquarters staff reorganization already effected at the Octagon.

On changing needs for architectural services today, the A.I.A. president told A.G.C. members, "We have to face the fact that our clients want a far more comprehensive service than many of us are prepared to render. If this were not so, the package dealers would not be in business.

"We have to face the fact that architecture is no longer a matter of individual buildings, but of whole building complexes, of neighborhoods, communities, technical and cultural centers, and the renewal and rehabilitation of entire cities, or certainly large parts thereof."

After prolonged debate both in private and open sessions on the bid handling question, the A.G.C. membership represented at San Francisco voted approval of a modified plan eliminating completely an earlier proposal to seek the aid of the national A.I.A. in its efforts to remove unethical practices. As finally passed, the resolution stated definitely the contractors would not recommend any plan at all to the architects nationally. The official action now recommends that "any effective plan be adopted by local chapters of the A.G.C. only in those cases in which the local mechanical specialty subcontractor groups have demonstrated and agreed to continue their wholehearted support for the single contract system of construction."

As first suggested and tabled by the association's governing board, the plan would have required principal contractors to list their choices for mechanical specialty subs for each major category of work. The subs would have submitted their intentions to bid to the prime contractor in writing at least a day before bid openings.

The delegates installed M. Clare Miller, McPherson, Kansas, as 1960 vice president, and the board renamed Arthur S. Horner, Denver, Colo., to serve as secretary-treasurer.

The organization's 1961 convention will be held in Boston.

—Ernest Mickel



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What is its purpose?

The Steel Joist Institute is a nonprofit organization made up of manufacturers actively engaged in the fabrication and distribution of open web steel joists. It was organized to place the industry on a sound engineering basis. Its objectives are to establish methods of design and construction for open web steel joists, to provide test and research data for public dissemination, to assist in the development of appropriate building code regulations, and to publish information relative to the proper use of steel joists in the interest of safety and the public welfare.

What are its accomplishments?

The Institute has made substantial practical contributions to the building construction industry. It has developed and published a comprehensive manual of standard specifications, load tables, and technical bulletins to assist the architect, engineer, and contractor; conducted research and testing of open web steel joists, bridging and cantilever members; initiated a thorough, effective quality verification program for "S" Series joists and a recommended Code of Standard Practice applicable to steel joists.

Inquiries concerning the Steel Joist Institute should be sent to the Managing Director, Steel Joist Institute.

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FITTINGS

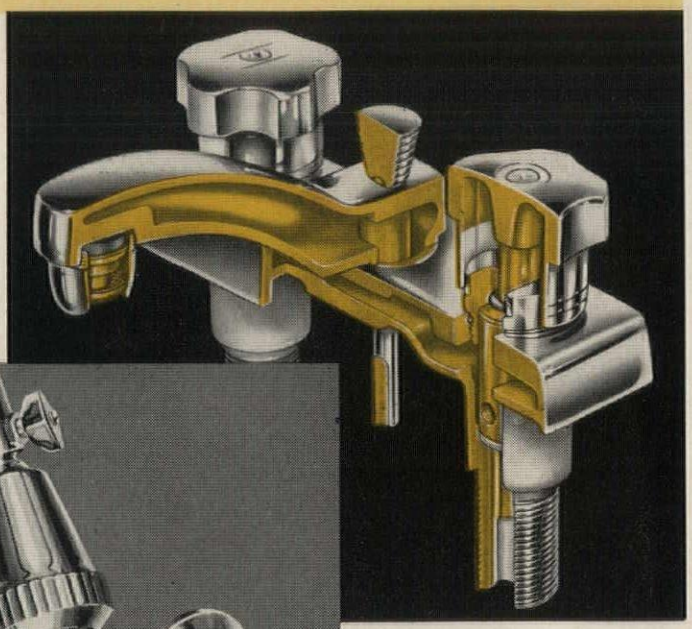
All-Brass

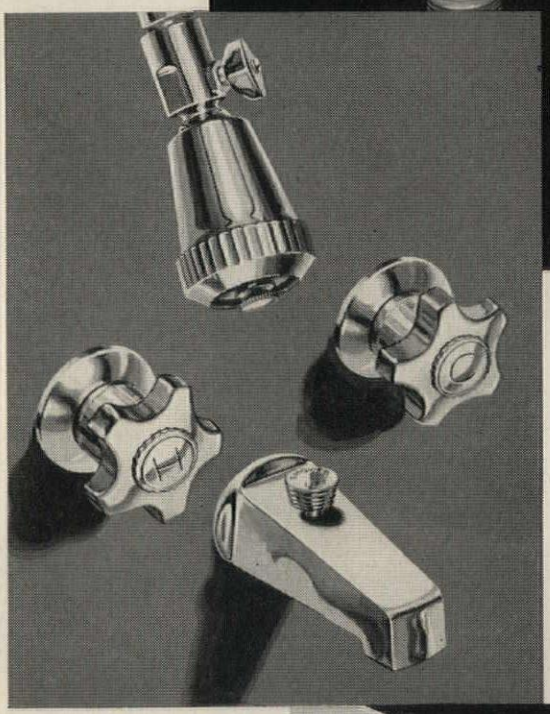
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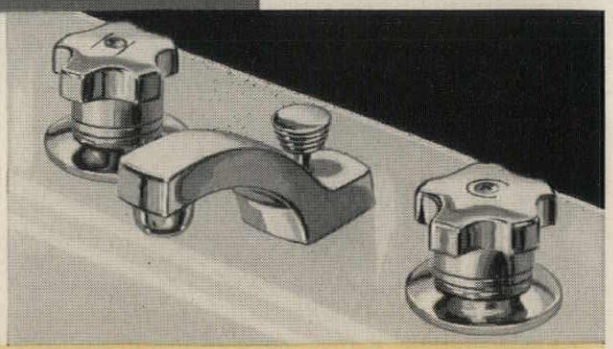




CENTRA, Constellation series lavatory fitting, cut away to show the all-brass construction, K-7400.

DALTON, Galaxy series, shower and bath fitting, K-6927.

BANCROFT, Constellation series, shelf-back lavatory fitting, K-7416.



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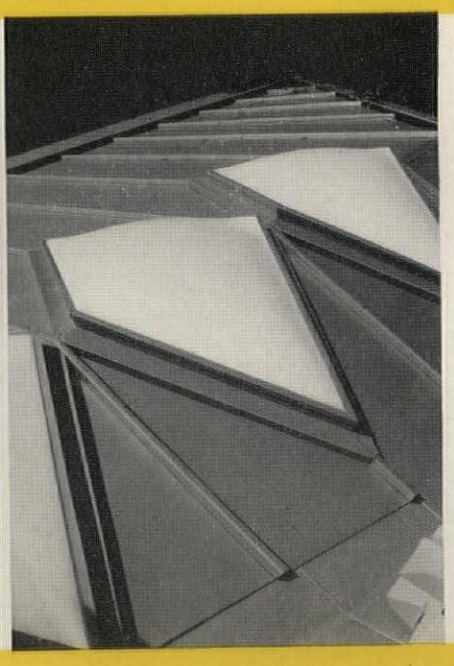
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GOOD DAYLIGHTING DESIGN STARTS WITH

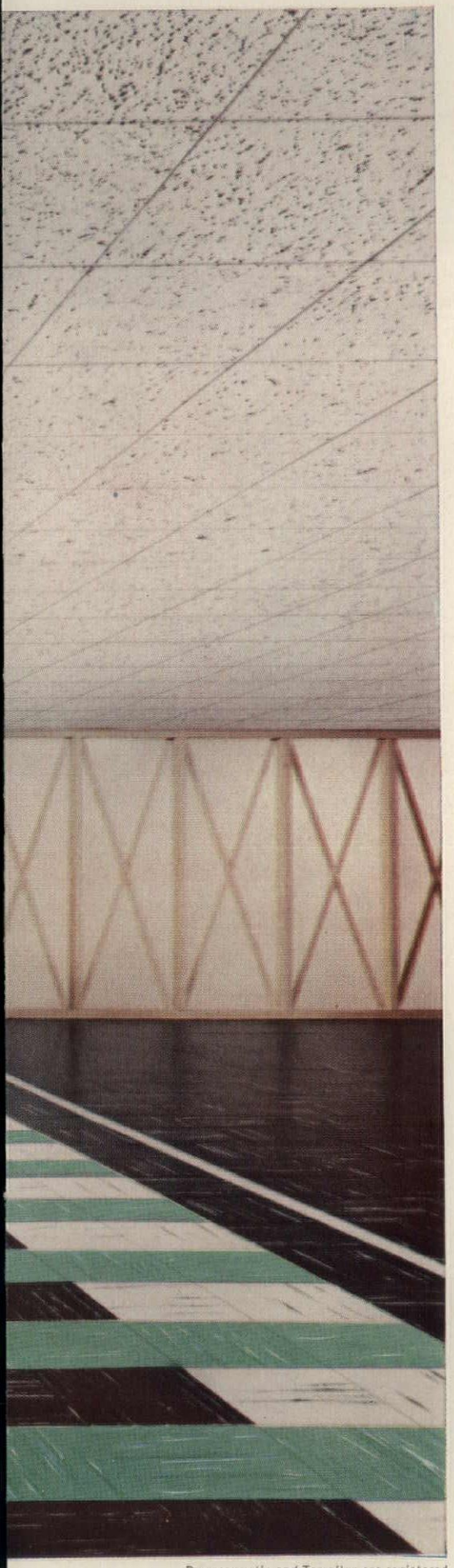
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Double Recreation Areas, Wirth Advises Planners

Director Conrad K. Wirth of the National Park Service, in a recent discussion of social pressures stemming from the desire of people to escape from suburbia, said that towns, cities and states need to double their present recreational acreages immediately if future needs are to be met.

A portion of his remarks formed an interesting commentary on land planning problems. He said:

"In the past, some planners have recommended 10 acres of park and playground for every 1000 people in a city; more recently they have suggested that this should be increased to possibly 15 acres, with an additional 10 acres per 1000 for outlying metropolitan parks and beaches; or a total of say 25 acres serving every 1000 people in a metropolitan area. Up to now, the planners have not had a generally accepted standard for desirable amounts of space for recreation beyond the metropolitan area.

"But what about this metropolitan standard? The majority of metropolitan areas in the United States have not approached this standard and not enough is actually being accomplished to come to anywhere near this standard as urban development spreads out over the country.

"Are these standards too high? As I said, it depends on the values we place upon the importance of open space and the preservation of forests and streams and all that makes up our country.

"Recently I noted that in Paris, and the area immediately surrounding it, there is no less than 385,000 acres of publicly owned and privately owned park lands open to all the people. The population of the Paris metropolitan area in 1955 was 4,951,000. This means that they have 77 acres of park land per 1000 population. It makes the 25-acre standard seem a little low by comparison, to say the least.

"I am sure that the open space that has been maintained in and around Paris is one of the important reasons why people love Paris."

Towns, cities and states need to acquire recreation land, the parks director said. He estimated that in the eastern half of the country several times the present acreage are needed and local communities and states should, in his opinion, acquire most of it. He went so far as to say that a major portion of the forested Applachian range should eventually be managed primarily for recreation, assuring that these mountains would continue to serve the equally important purpose of watershed protection.

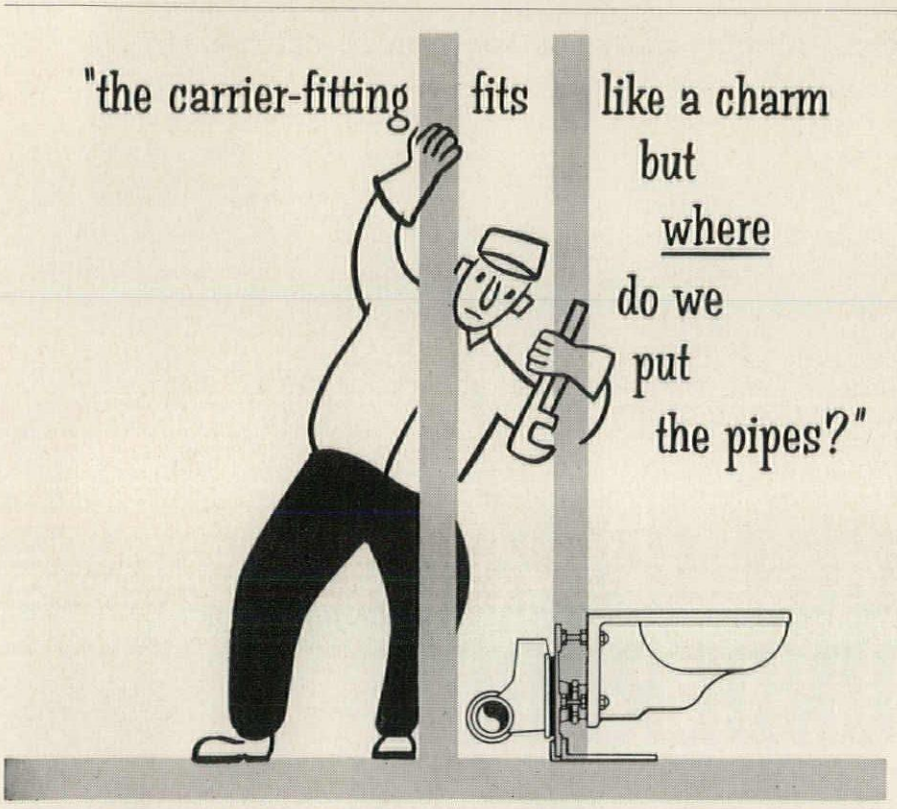
Urban Sections Called Vital To National Highway Program

The nation's beleagered highway construction program continues to spark new criticisms as it undergoes study at various government levels. Among the latest is a booklet released by the American Municipal Association and the Port of New York Authority. This is the text of an address by S. Sloan Colt, chairman of the Authority, and a former member of the President's advisory committee on a national highway program.

Expressing concern over reports that cost of the big interstate system program may be lowered through deemphasis of urban sections, it says this:

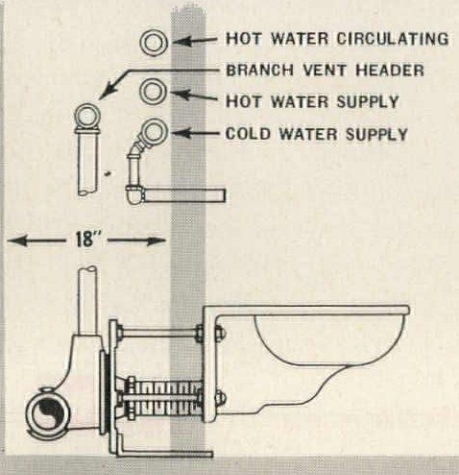
"Any new highways built without adequate access to the traffic-gener-

continued on page 44



THE ANSWER:

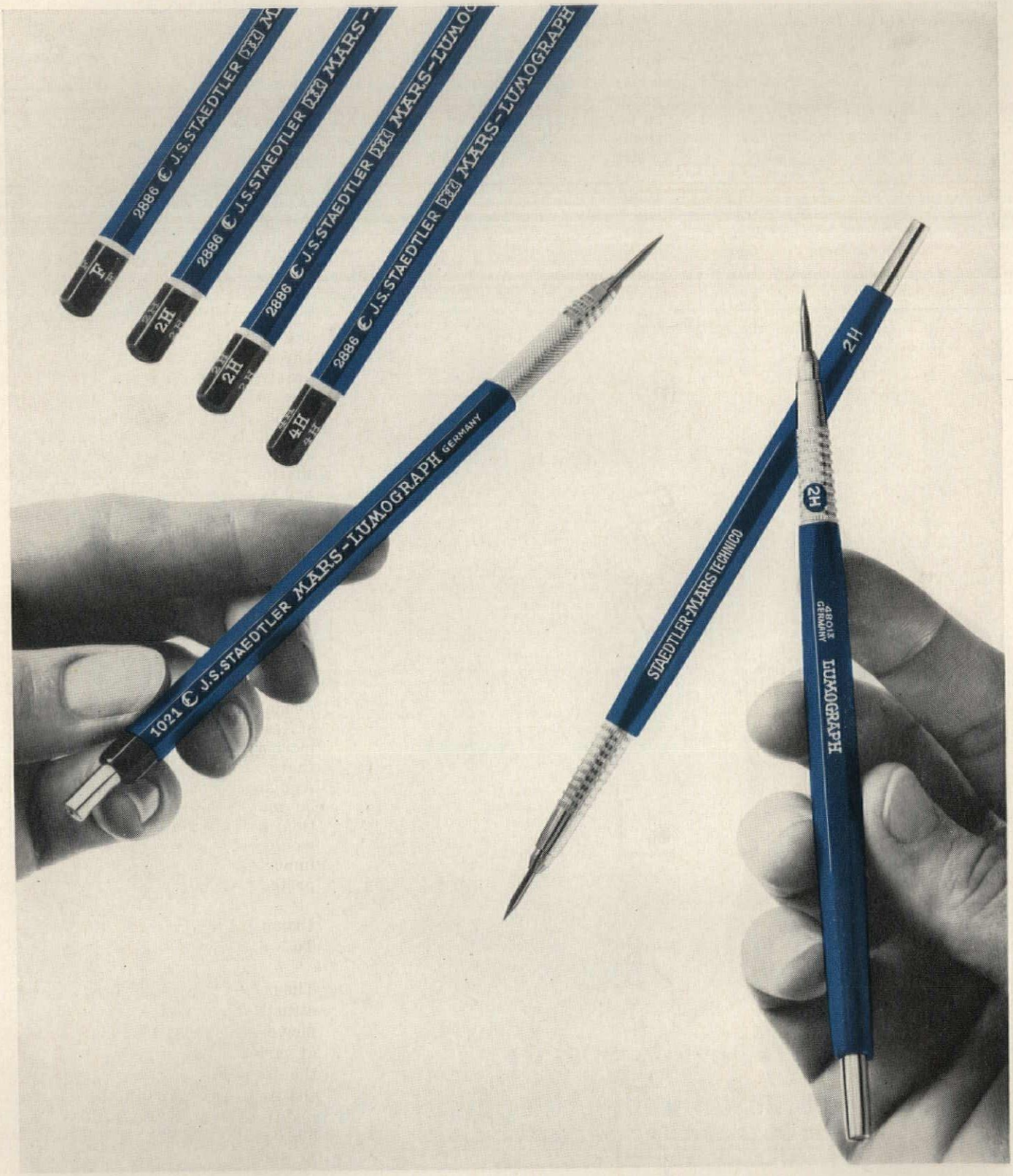
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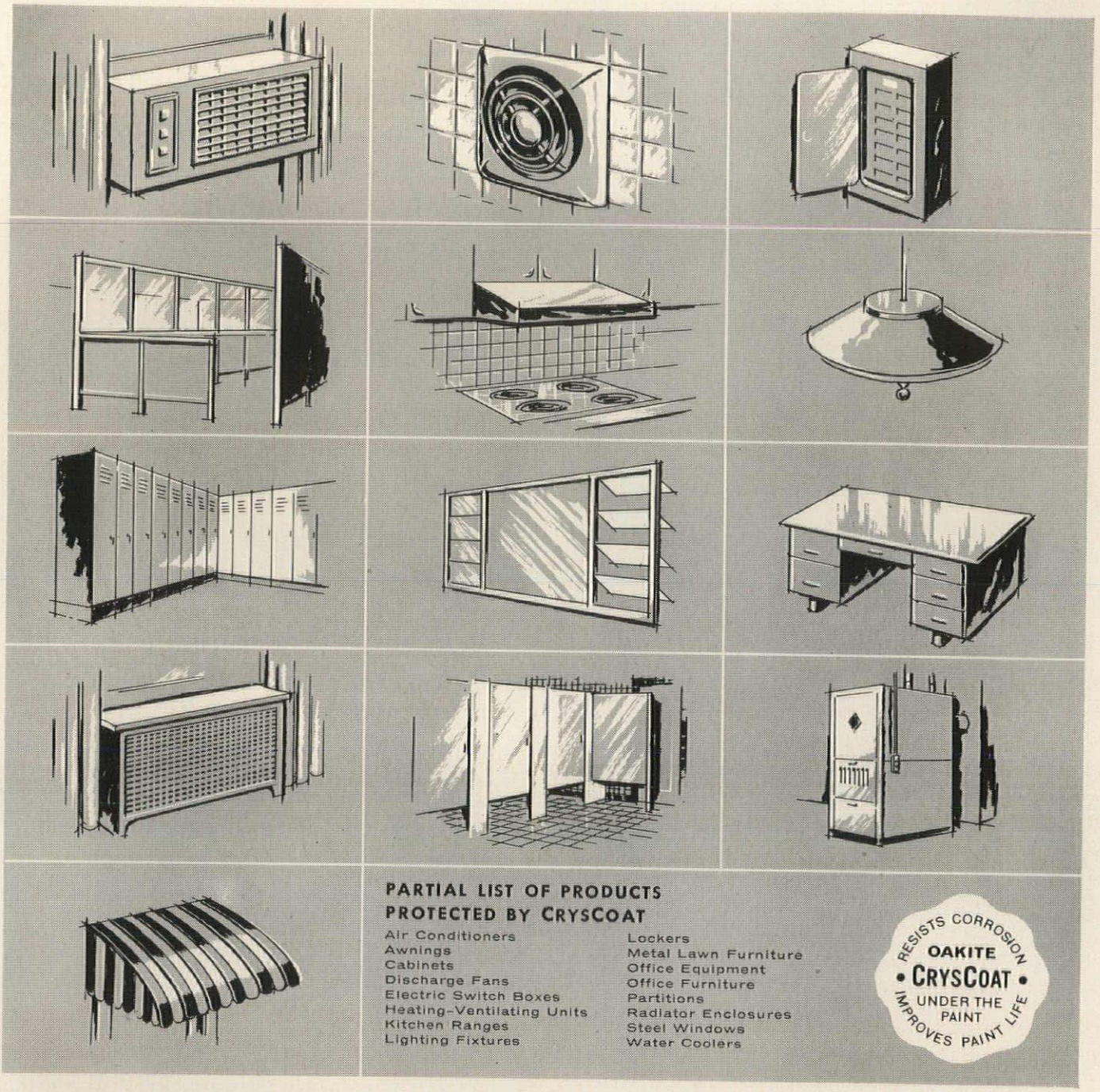
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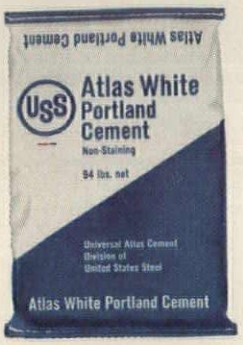
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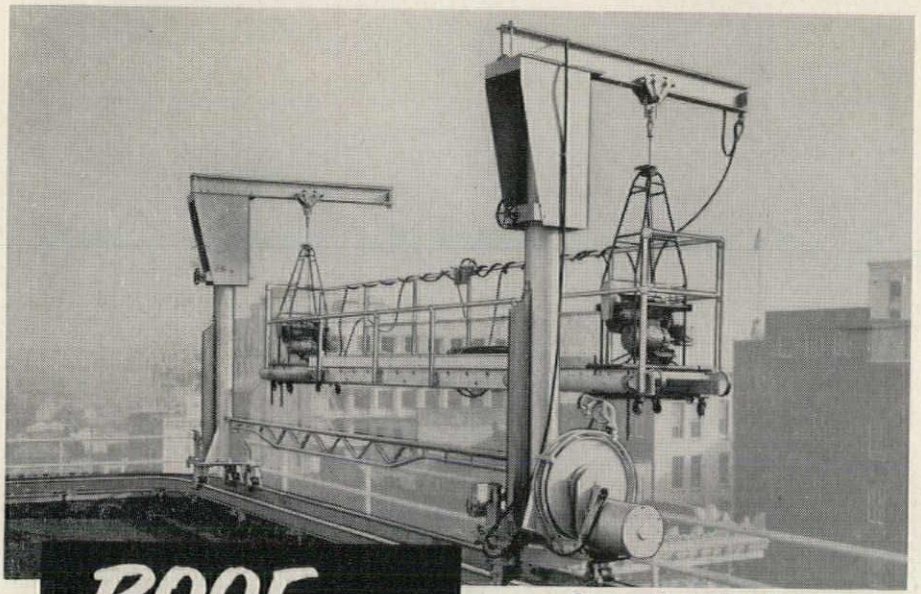


FIRST NATIONAL BANK BUILDING, DENVER, COLORADO—Architect: Raymond Harry Ervin & Assoc., Denver; **Engineer:** Phillips-Carter-Osborn, Inc. and Rhuel A. Andersen; **Gen'l Contractor:** Mead & Mount Construction Co., Denver; **Concrete Panels:** Otto Buehner & Co., Salt Lake City.

ating urban areas would be useless and an economic waste. Indeed, any such plan would be compounding the expensive, hazardous bottlenecks which the President specifically aimed at eliminating in formulating his highway program."

The publication called attention to the fact that the nation is becoming increasingly an urban nation, and that in these city areas the most serious problems of traffic congestion are developing.

During 1959, all units of government invested approximately $6.8 billion in highway capital expenditures of all types. This was an increase of some $600 million over the 1958 totals. Forecast for 1960—a decline in outlays to about $6.7 billion.



Operating Position

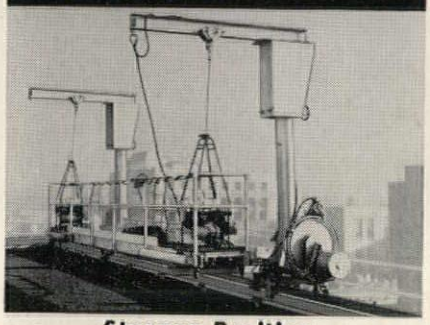
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1959-1975 Need Estimated for Sewer Pipe and Fittings

One indication of the tremendous construction potential facing the nation between now and 1975 occurs in the Commerce Department's translation of present estimates into needs for sewer pipe and fittings.

In a new report in its series aimed at helping manufacturers plan for future demands, the Water and Sewerage Industry and Utilities Division of the Commerce Business and Defense Services Administration, placed at two billion ft the quantity of sewer pipe and fittings that will be required for new construction, maintenance and repair between this year of 1959 and 1975. This vast amount will be needed, it said, to provide adequate public sewerage facilities during those years.

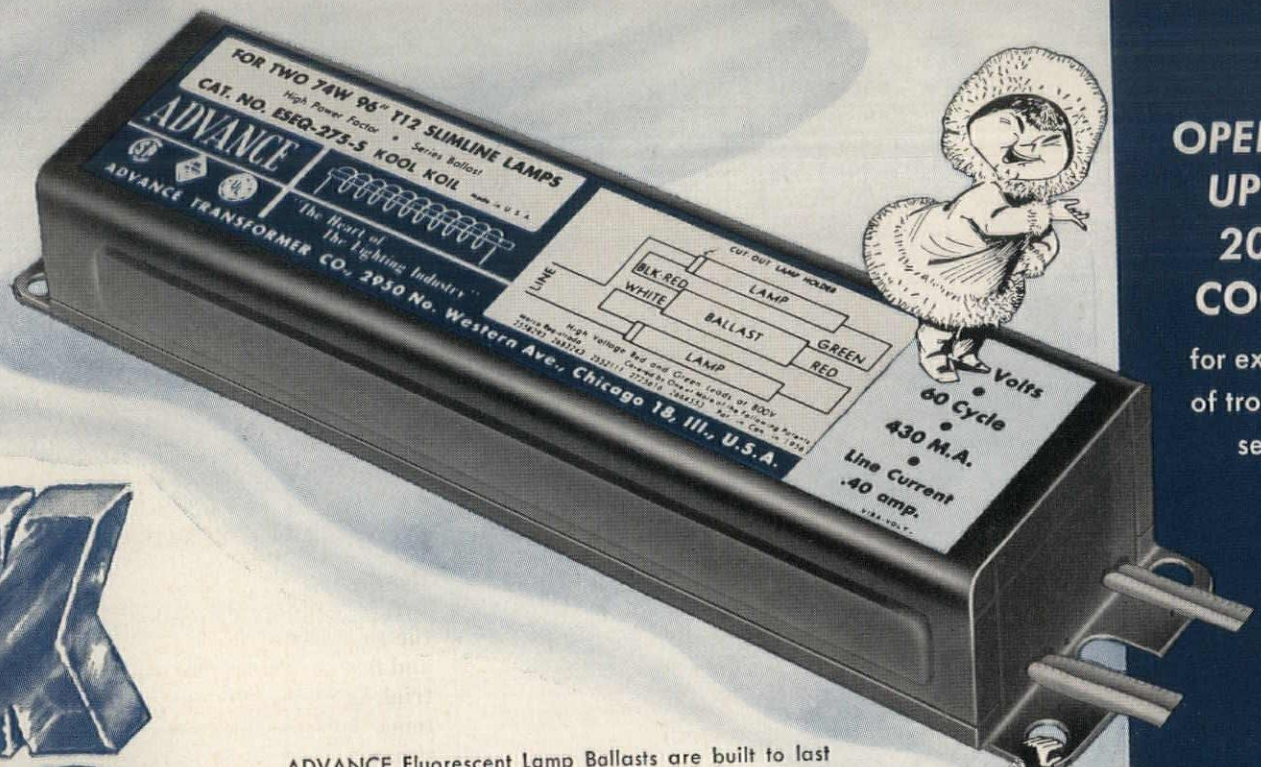
A study by the Division covered the future requirements of sewerpipe and fittings for public utilities, industrial, military and other Federal systems. Past trends were reviewed. Estimated requirements did not include sewer pipe for transporting industrial fluids other than liquid wastes; house connections to street mains; culverts, drainage pipe, and storm sewers included in street paving construction for which statistics are not available.

The report covered three principal types of pipe for sanitary and storm sewerage collection and disposal—vitrified clay, concrete, and asbestos-cement. For correlation with end use the pipe requirements were grouped into three sizes: eight-in. to 12-in., 15-in. to 24-in., and over 24-in.

The Division emphasized the greater-than-average need for sewerage facilities and improvements created during World War II when construction was minimized. The projections were based on adequate maintenance and repair, needed system improvements, and construction of new facilities to keep pace with normal growth of sewerage services to satisfy adequately the nation's needs by the end of 1975, it was explained.

(Report title: Sewerage Utilities, Sewer Pipe Requirements for Mains, 1920-1958-1975. The document is for sale at the U.S. Government printing office, Washington, D. C., at five cents per copy.)

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The Record Reports

continued from page 20

form, to give the full circle of his influence."

In discussing the site, the committee also suggested that this might affect the design, as the location seems to call for "a more reflective expression and a less dominant form than the Lincoln, Jefferson and Washington Monuments."

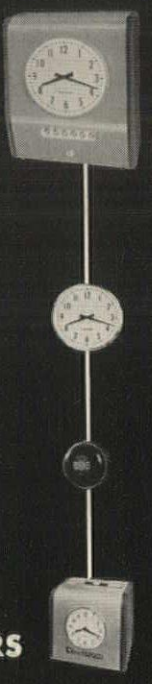
As for the mechanics of the competition, these are being handled in the way the advisory committee recommended. The competition will be held in two stages; winners of the first stage will each receive a $10,000 award, and will develop their entry for the second stage. The winner of this stage will receive a $50,000 award, and first consideration for the commission to design and supervise construction of the memorial. The only major change made by Congress in the committee's plan was to restrict entrance to residents of the United States, though the committee had recommended an international competition.

The Roosevelt Memorial Commission has appointed as the professional advisor of the competition Edmund N. Bacon, executive director of the Philadelphia City Planning Commission. The jury will be composed of: Mr. Belluschi as chairman; landscape architect Thomas D. Church; Bartlett Hayes Jr., director of the Addison Gallery of American Art at Phillips Academy; Joseph Hudnut, Professor of Architecture Emeritus at Harvard University; and Paul Rudolph, chairman of the Department of Architecture at Yale University.

Inquiries and requests for registration forms should be addressed to Mr. Edmund N. Bacon, Professional Advisor, Franklin Delano Roosevelt Memorial Competition, Room 108, Tariff Commission Building, Seventh and E Street, N.W., Washington 25, D. C.

Registrations will be accepted until May 16. The competition is open to all architects residing in the United States and to teams of landscape architects, sculptors, and painters, providing such teams also include an architect; all names of members contemplating such an association need not be recorded in the initial registration, although the architect's name must be.

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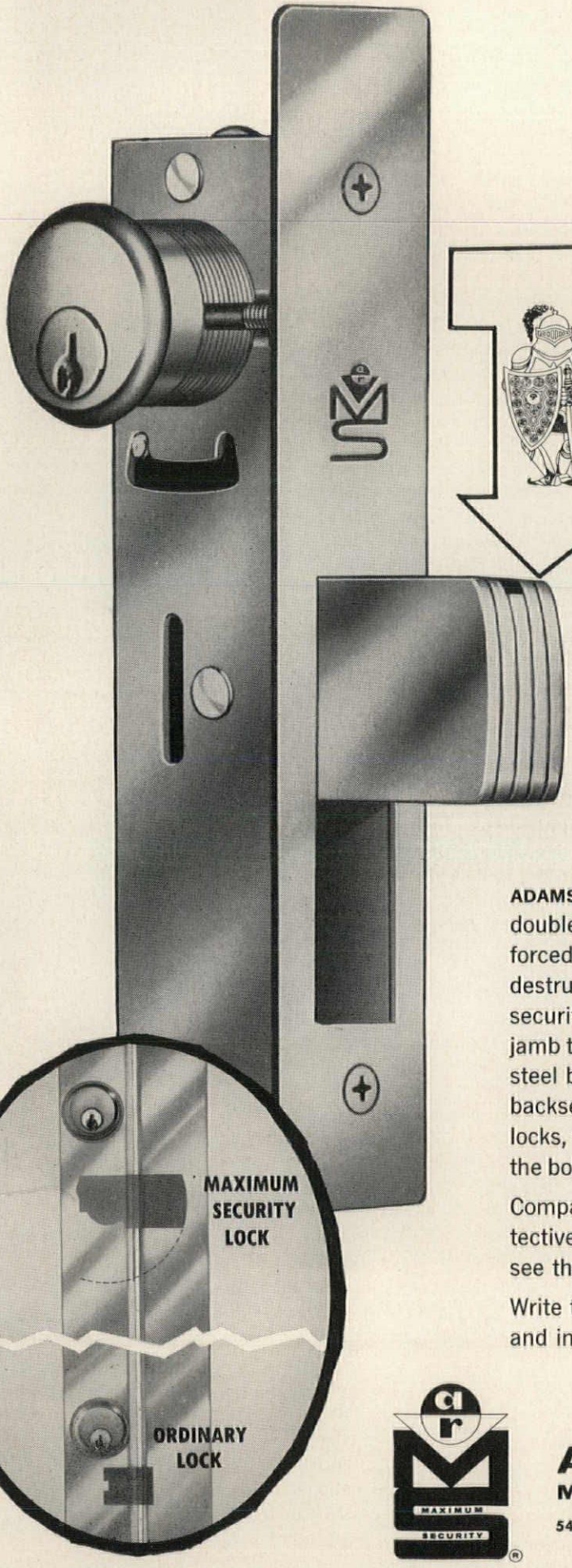
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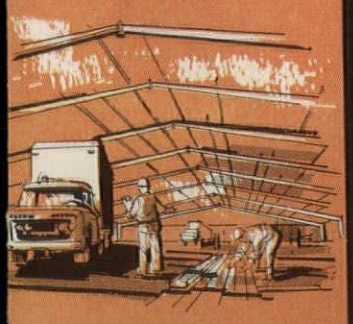
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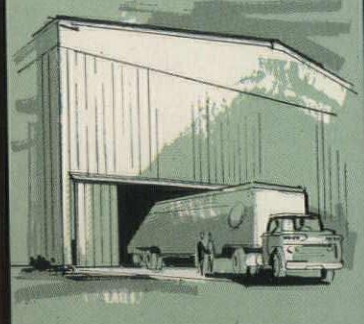
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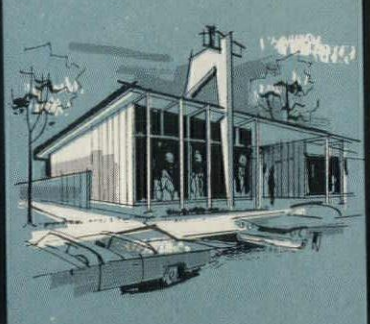
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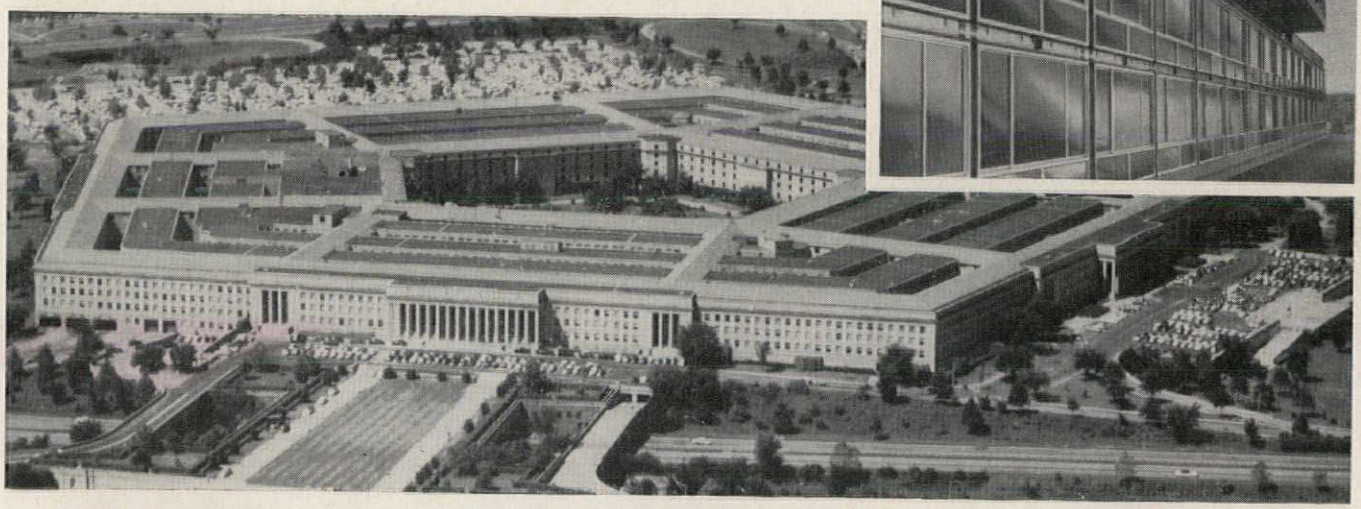
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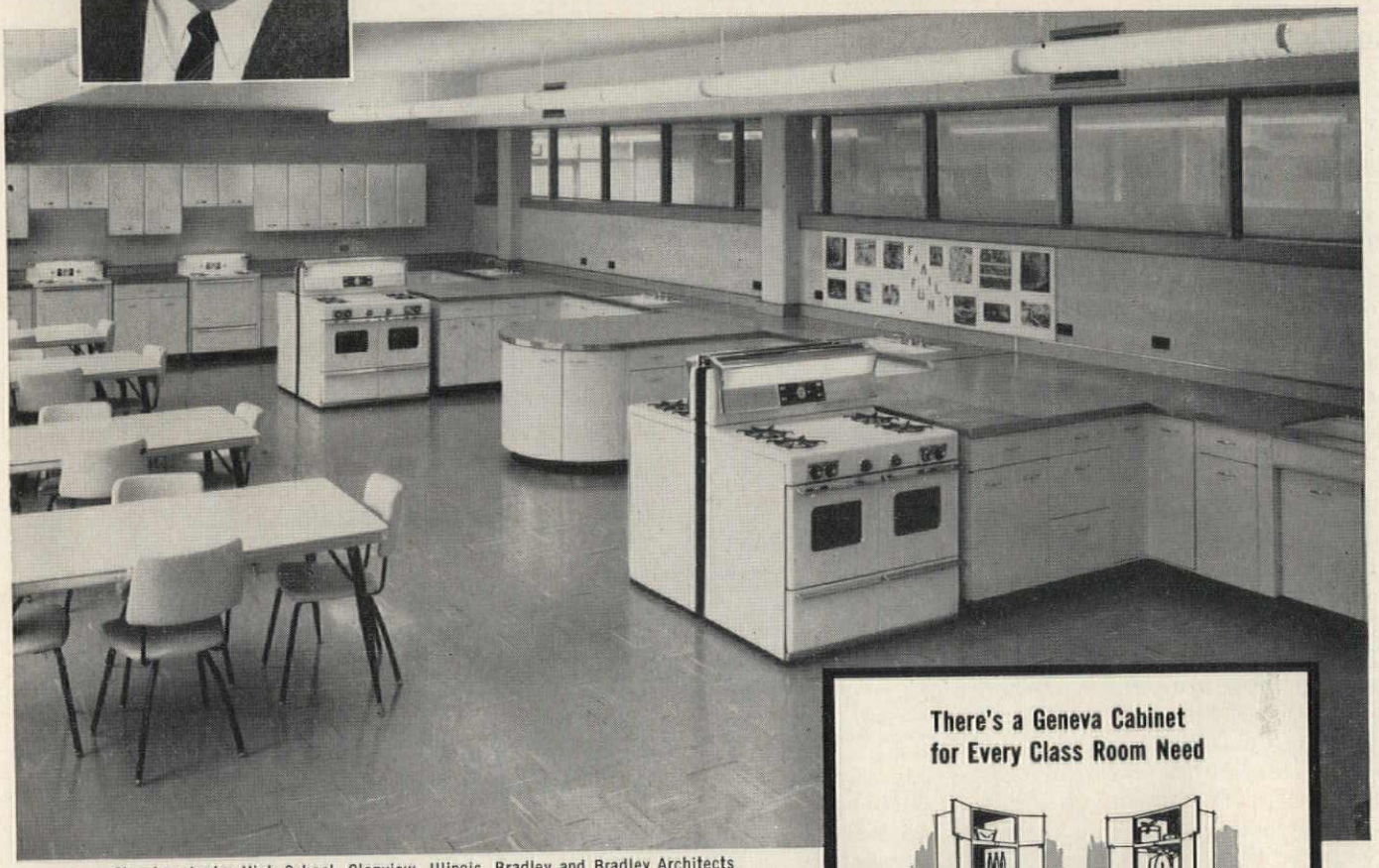
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White House Conference Hears Latest on Fallout Shelters

The feasibility of fallout shelter standards, and relation of fallout shelter to radiological defense, evacuation, and recovery, were defined in new detail by Leo A. Hoegh, director of the Office of Civil and Defense Mobilization, at the White House conference on fallout protection early this year.

While there were no changes voiced in the Federal policy regarding protection for nuclear attack, Director Hoegh at that time gave the Governors' Committee on Civil Defense a complete rundown on these matters.

It now is nearly two years since the National Policy on Shelters was announced by the President. In the intervening months OCDM and other agencies of government have conducted extensive research in the general field of fallout protection, and OCDM has issued several guides to help in construction of simple shelters, largely on a do-it-yourself basis.

The 1961 budget seeks $11.5 million for incorporation of fallout shelters in all new civilian Federal structures determined to be suitable, and the OCDM is proceeding with its program of prototype design and construction, which it calls a program of both research and demonstration.

(The agency now has distributed more than 15 million copies of its publication, "The Family Fallout Shelter," and holds that the building of home units is progressing at a rate greater than is generally realized.)

The principal requirement is that there be a mass of material between the shelter occupants and the radioactive fallout, Director Hoegh told the state governors at the White House. The more dense the materials, the more effective the protection. Of the dense materials, earth is the most readily available and the cheapest.

An underground shelter is shielded by the earth around it, Mr. Hoegh continued. An above-ground shelter covered with earth provides good shielding. And earth banked around exposed portions of basement walls increases their protective qualities.

Other construction materials mentioned by Mr. Hoegh as being relatively inexpensive and of excellent shielding quality: poured concrete, concrete block, brick, clay tile filled with sand, and steel and fiber-glass-reinforced plastics, as well as treated wood covered with earth.

Designs for dual-purpose shelters in schools, garages, hospitals, apartments, and office buildings, are available now or are nearing completion, the director said. Further designs for shelters beneath streets, in dome forms, in industrial plants, and in subways are being developed.

"We are stimulating shelter design by the various materials manufacturers," Mr. Hoegh continued. "We seek to develop the most practical and economical dual-purpose shelters for both the home and community. . . . We have also given technical guidance to many individuals and firms who have developed shelter designs, some for their own use and others for inclusion in housing developments or for general sale."

The governors were told that adequate fallout shelter can be constructed at a cost of from $25 to $150 per person. The lower figure applies to do-it-yourself types. Where separate independent structures are required for shelter, the cost may run up to $150 per person or more. The cost for most shelters will fall between these two extremes. Cost tends to be lower, the OCDM director said, when the shelter can be incorporated in new buildings at the time of design.

The more elaborate do-it-yourself basement concrete block shelter, costing from $150 to $200 altogether, can reduce radiation exposure to about 1200th. OCDM says these would provide adequate fallout shelter in most of the nation.

"The success of a program of fallout protection would be dependent upon other emergency services and, in particular, upon the effectiveness of radiological monitoring and upon adequate communications," Mr. Hoegh observed.

Turning to the national policy on evacuation, the civil defense official said it was one that was constantly misunderstood or misrepresented. This policy states:

"Governments and the public will take such action on receipt of warning as is prescribed by the government involved.

1. "Evacuation or dispersal—target cities and other areas near assumed targets will, if time and conditions permit, execute plans for evacuation or dispersal to prepared reception areas.

2. "Shelter—if time and conditions do not permit evacuation, full advantage will be taken of existing shelter, and fallout protection will be improvised.

3. "The action to be taken is a local decision."

All states, 240 target areas and 2200 counties now have developed survival plans.

In this connection, Director Hoegh observed, "We are placing great emphasis on the construction of family fallout shelter. Evacuation plans should emphasize movement home to these shelters wherever possible. Sometimes it could be desirable to evacuate an area of intense radiation after an attack."

Later the governors were told, "We cannot say too bluntly that in the first two weeks after attack every individual family and every city and state government is likely to be on its own."

The Federal role to date has included these actions—

1. Education, with emphasis on facts about fallout and steps which can be taken to minimize its effects.

2. Survey of existing shelter, on a sampling basis, to demonstrate the value of existing structures in providing fallout protection.

3. Research, to show how fallout shelters can be incorporated in existing, as well as new, buildings.

4. Prototype design and construction; a program of both research and demonstration.

5. Leadership and example, by incorporating fallout shelters in appropriate new buildings.

6. Incorporation of shelters in existing Federal buildings (not yet funded.)







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Washington Topics by Ernest Mickel

PBS Sees Saving in Spending On New Building Program

The Federal government is hurrying its 10-year building program in the District of Columbia and vicinity to save money on maintenance. A by-product of the forced-draft program, and a welcome one, will be the removal of the not-so-temporary structures that have cluttered the Mall area for years.

Detailing the building program and its progress recently, Public Buildings Commissioner Karl E. Wallace said the savings to be effected through housing government personnel in modern structures constituted one of the strong motives for his office to push the program as rapidly as possible.

For example, it costs the Public Buildings Service $552 per occupant per year to maintain the older executive offices building just west of the White House on Pennsylvania Avenue. This structure was put up in 1870. In the decade-old General Accounting Office building, on the other hand, the maintenance cost is only $152 per occupant per year.

The 10-year PBS plan is about 20 per cent along at the present time. When completed in 1970, it will house all the 180,000 workers in this area in modern office structures. Right now, an estimated 63,000 Federal employees go to work daily in buildings classed as insufficient and substandard. This condition, said Commissioner Wallace, hampers the work of people so housed, and many government operations suffer from it.

Eighteen per cent of the District of Columbia Federal force is housed in the so-called "temporaries." Some of these buildings date from World War I.

The PBS 10-year effort calls for construction of approximately 12 million sq ft of floor area. One of the more welcome results will be the consolidation of agency and department operations now scattered throughout the region. Altogether, Uncle Sam's workers punch the clock in 269 locations here. Of these individual office locations, only 44 are considered to be of a permanent nature. Another 52 are temporary, 64 are obsolete, and 109 are leased by the government.

Commissioner Wallace gave these statistics in illustration of the scattered and therefore less efficient office functions: The Department of Defense, despite its sprawling Pentagon across the Potomac River in Virginia, is housed in 51 different spots; State Department is in 37 but should soon be brought together in its new huge "annex" which wraps around the older State Department building; Commerce is housed in 22 different places; Treasury, Health, Education and Welfare, and Interior, in 21 each; Housing and Home Finance Agency (with its 3100 employees) in 11.

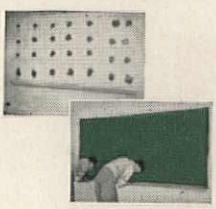
In all, the PBS is responsible for 110.9 million sq ft of floor area, of which 34.4 million sq ft is in the Washington, D. C., area. So far, PBS has been successful in removing only eight temporary structures and nine obsolete buildings since 1935, but the current program, if its head of steam can be maintained, will bring the long hoped for removals by 1970.

continued on page 328

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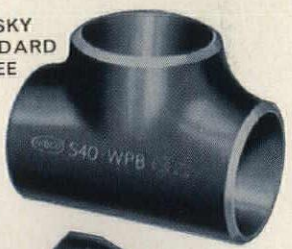
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Construction Cost Indexes

Presented by Clyde Shute, Director of Statistical Policy, Construction News Div., F. W. Dodge Corp., from data compiled by E. H. Boeckh & Assoc., Inc.

Labor and Materials: U.S. average 1926-1929=100

NEW YORK

PERIOD	RESIDENTIAL Brick	RESIDENTIAL Frame	APTS., HOTELS, OFFICE BLDGS. Brick and Concrete	COMMERCIAL AND FACTORY BLDGS. Brick and Concrete	COMMERCIAL AND FACTORY BLDGS. Brick and Steel
1930	127.0	126.7	124.1	128.0	123.6
1935	93.8	91.3	104.7	108.5	105.5
1939	123.5	122.4	130.7	133.4	130.1
1948	250.1	251.6	239.4	242.2	235.6
1949	243.7	240.8	242.8	246.6	240.0
1950	256.2	254.5	249.5	251.5	248.0
1951	273.2	271.3	263.7	274.9	271.8
1952	278.2	274.8	271.9	265.2	262.2
1953	281.3	277.2	281.0	286.0	282.0
1954	285.0	278.2	293.0	300.6	295.4
1955	293.1	286.0	300.0	308.3	302.4
1956	310.8	302.2	320.1	328.6	324.5
1957	318.5	308.3	333.1	345.2	339.8
1958	328.0	315.1	348.6	365.4	357.3
1959	342.7	329.0	367.7	386.8	374.1
Dec. 1959	346.9	333.9	372.6	389.8	378.3
Jan. 1960	346.9	333.9	372.6	389.8	378.3
Feb. 1960	348.8	335.1	374.0	391.1	379.7
	% increase over 1939				
Feb. 1960	182.4	173.8	186.1	193.2	191.8

ATLANTA

PERIOD	RESIDENTIAL Brick	RESIDENTIAL Frame	APTS., HOTELS, OFFICE BLDGS. Brick and Concrete	COMMERCIAL AND FACTORY BLDGS. Brick and Concrete	COMMERCIAL AND FACTORY BLDGS. Brick and Steel
1930	82.1	80.9	84.5	86.1	83.6
1935	72.3	67.9	84.0	87.1	85.1
1939	86.3	83.1	95.1	97.4	94.7
1948	199.2	202.5	178.8	178.8	178.8
1949	189.3	189.9	180.6	180.8	177.5
1950	194.3	196.2	185.4	183.7	185.0
1951	212.8	214.6	204.2	202.8	205.0
1952	218.8	221.0	212.8	210.1	214.3
1953	223.0	224.6	221.3	221.8	223.0
1954	219.6	219.1	233.5	225.2	225.4
1955	225.3	225.1	229.0	231.5	231.8
1956	237.2	235.7	241.7	244.4	246.4
1957	241.2	239.0	248.7	252.1	254.7
1958	243.9	239.8	255.7	261.9	262.0
1959	252.2	247.7	266.1	272.7	273.1
Dec. 1959	255.3	250.3	270.1	276.4	276.4
Jan. 1960	256.8	252.0	272.2	279.0	278.6
Feb. 1960	259.5	254.2	274.9	281.3	281.0
	% increase over 1939				
Feb. 1960	200.7	205.9	189.1	188.8	196.7

ST. LOUIS

PERIOD	RESIDENTIAL Brick	RESIDENTIAL Frame	APTS., HOTELS, OFFICE BLDGS. Brick and Concrete	COMMERCIAL AND FACTORY BLDGS. Brick and Concrete	COMMERCIAL AND FACTORY BLDGS. Brick and Steel
1930	108.9	108.3	112.4	115.3	111.3
1935	95.1	90.1	104.1	108.3	105.4
1939	110.2	107.0	118.7	119.8	119.0
1948	227.9	231.2	207.7	210.0	208.1
1949	221.4	220.7	212.8	215.7	213.6
1950	232.8	230.7	221.9	225.3	222.8
1951	252.0	248.3	238.5	240.9	239.0
1952	259.1	253.2	249.7	255.0	249.6
1953	263.4	256.4	259.0	267.0	259.2
1954	266.6	260.2	263.7	273.3	266.2
1955	273.3	266.5	272.2	281.3	276.5
1956	288.7	280.3	287.9	299.2	293.3
1957	292.0	283.4	295.2	307.1	302.9
1958	297.0	278.9	304.9	318.4	313.8
1959	305.4	296.4	315.0	329.8	323.9
Dec. 1959	308.0	298.9	318.4	333.4	327.6
Jan. 1960	308.0	298.9	318.4	333.4	327.6
Feb. 1960	310.9	300.6	320.8	335.5	330.5
	% increase over 1939				
Feb. 1960	182.1	180.9	170.3	180.0	177.7

SAN FRANCISCO

PERIOD	RESIDENTIAL Brick	RESIDENTIAL Frame	APTS., HOTELS, OFFICE BLDGS. Brick and Concrete	COMMERCIAL AND FACTORY BLDGS. Brick and Concrete	COMMERCIAL AND FACTORY BLDGS. Brick and Steel
1930	90.8	86.8	100.6	104.9	100.4
1935	89.5	84.5	96.4	103.7	99.7
1939	105.6	99.3	117.4	121.9	116.5
1948	218.9	216.6	208.3	214.7	211.1
1949	213.0	207.1	214.0	219.8	216.1
1950	227.0	223.1	222.4	224.5	222.6
1951	245.2	240.4	239.6	243.1	243.1
1952	250.2	245.0	245.6	248.7	249.6
1953	255.2	257.2	256.6	261.0	259.7
1954	257.4	249.2	264.1	272.5	267.2
1955	268.0	259.0	275.0	284.4	279.6
1956	279.0	270.0	288.9	298.6	295.8
1957	286.3	274.4	302.9	315.2	310.7
1958	289.8	274.9	311.5	326.7	320.8
1959	299.2	284.4	322.7	338.1	330.1
Dec. 1959	304.7	289.2	329.5	345.6	335.7
Jan. 1960	304.7	289.2	329.5	345.6	335.7
Feb. 1960	306.1	290.6	332.7	347.8	339.9
	% increase over 1939				
Feb. 1960	189.9	192.6	183.4	185.3	191.7

Cost comparisons, as percentage differences, for any particular type of construction, are possible between localities, or periods of time within the same city, by dividing the difference between the two index numbers by one of them; i.e.:

index for city A = 110
index for city B = 95

(both indexes must be for the same type of construction).

Then: costs in A are approximately 16 per cent higher than in B.

$$\frac{110-95}{95} = 0.158$$

Conversely: costs in B are approximately 14 per cent lower than in A.

$$\frac{110-95}{110} = 0.136$$

Cost comparisons cannot be made between different types of construction because the index numbers for each type relate to a different U. S. average for 1926-29.

Material prices and wage rates used in the current indexes make no allowance for payments in excess of published list prices, thus indexes reflect minimum costs and not necessarily actual costs.



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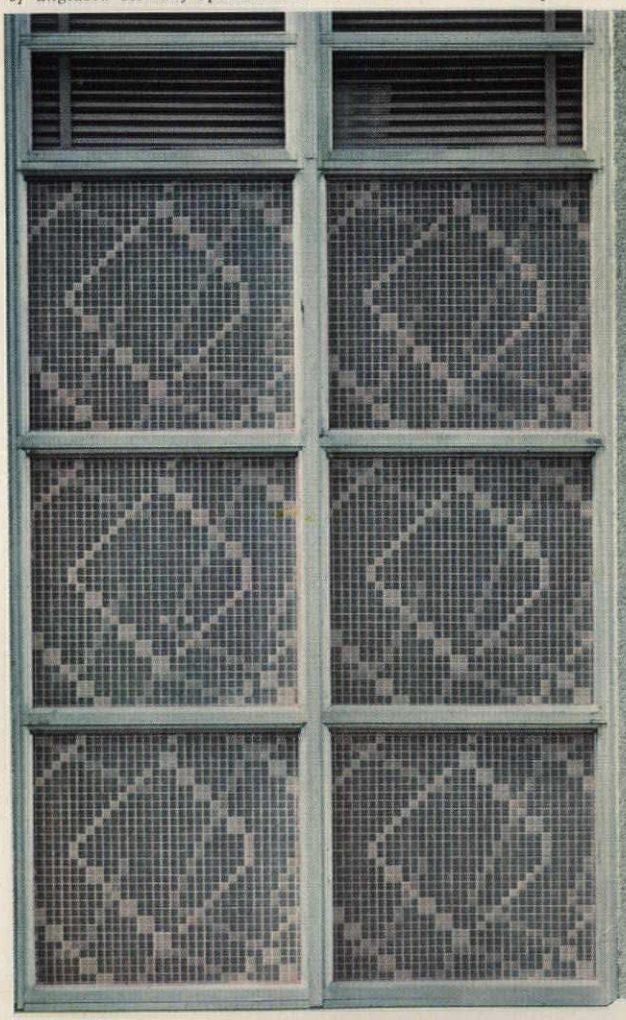
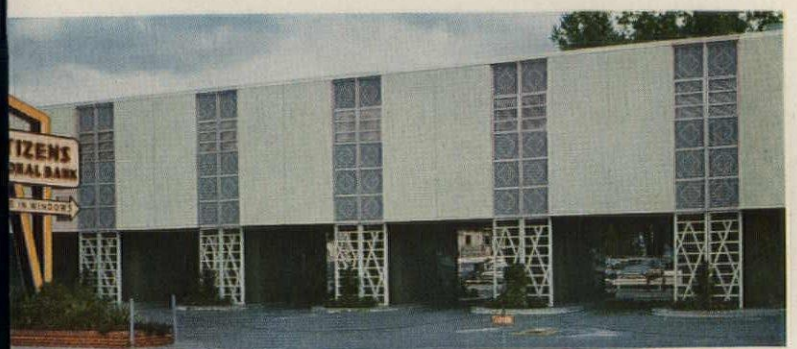


Plate No. 1090



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Required Reading

New Life of Sullivan

LOUIS SULLIVAN AS HE LIVED. *By Willard Connely. Horizon Press, Inc., 220 W. 42nd St., New York 36, 322 pp., illus. $6.50.*

Although he has subtitled his book *The Shaping of American Architecture,* Mr. Connely does not stake his claim as an architectural historian but rather as a competent biographer. The standard text on Sullivan the Architect remains Hugh Morrison's *Louis Sullivan;* but on the subject of Louis the Man, Mr. Connely has provided new evidence, and proved his claim.

Sullivan, of course, left his *Autobiography,* but aside from his early years, it was an impersonal account of, as the title said, the life of an idea of architecture. Nor were his associates a great deal of help in describing Sullivan as an individual; both Wright and Elmslie, from whose writings and conversations a good deal of information came, agreed with Sullivan that it was his works and words that counted, not his personal life. By diligence, Mr. Connely has succeeded in unearthing letters and notebooks, and in interviewing remaining members of Sullivan's family and circle of friends.

The picture that emerges is of a personal life which did little to mitigate the central tragedy of Sullivan's blighted career. By all testimony, he was a naturally solitary man in his maturity, though he seems to have had a normal share of chums as a young man. His misfortune was to see almost all of his few close personal and professional attachments fall away—wife, brother, partner, colleagues. His one comfort toward the end of his life would seem to be his reconciliation with Frank Lloyd Wright.

It would be impossible, of course, to write a biography of an architect without covering his work. Mr. Connely does this mostly by reporting on the commissions (including an interesting letter from Sullivan on the subject of the Auditorium), and on the reactions of contemporaries. He concludes that Sullivan's decline was due not so much to his break-up with Adler but rather, as others have also concluded, to the performance of the Eastern architects at the World's Fair (aided by the untimely death of John Root, Sullivan's only ally on the committee), and equally by the failure of the Fraternal Templars to erect the "setback" skyscraper Sullivan had designed for them. If the Templars had gone ahead with the plans, Mr. Connely contends, Sullivan's reputation might have been saved regardless of the country's whole-hearted embracing of the Fair's classicism, and the results might even have restrained the trend toward eclecticism. But with events coming in tandem as they did, what followed was inevitable.

Unless there is a trove of Sullivan correspondence and journals lying somewhere undiscovered, Mr. Connely would seem to have had the last word on Louis the Man.



" . . . he had snatched a drink and gulped it."
—by Alan Dunn (see review)

Urban Utopia

THE IDEAL CITY. *By Helen Rosenau. Routledge & Kegan Paul, Ltd., London; Boston book and Art Shop, Boston. 168 pp., illus. 30s.*

This book is an historical survey of the concept of the ideal city from the time of Plato to the present day. It was undertaken with a view towards defining and setting in historical perspective ideas which, although often unacknowledged, lie behind much contemporary architectural and

continued on page 68

A Mars'-Eye View

IS THERE INTELLIGENT LIFE ON EARTH? *A story in words and pictures by Alan Dunn. Simon and Schuster, Inc., 630 Fifth Ave., New York 20, 118 pp., illus. $3.50.*

Alan Dunn, one of ARCHITECTURAL RECORD's most popular contributors for over twenty years, has done it again. (Pun absolutely unavoidable; sorry.)

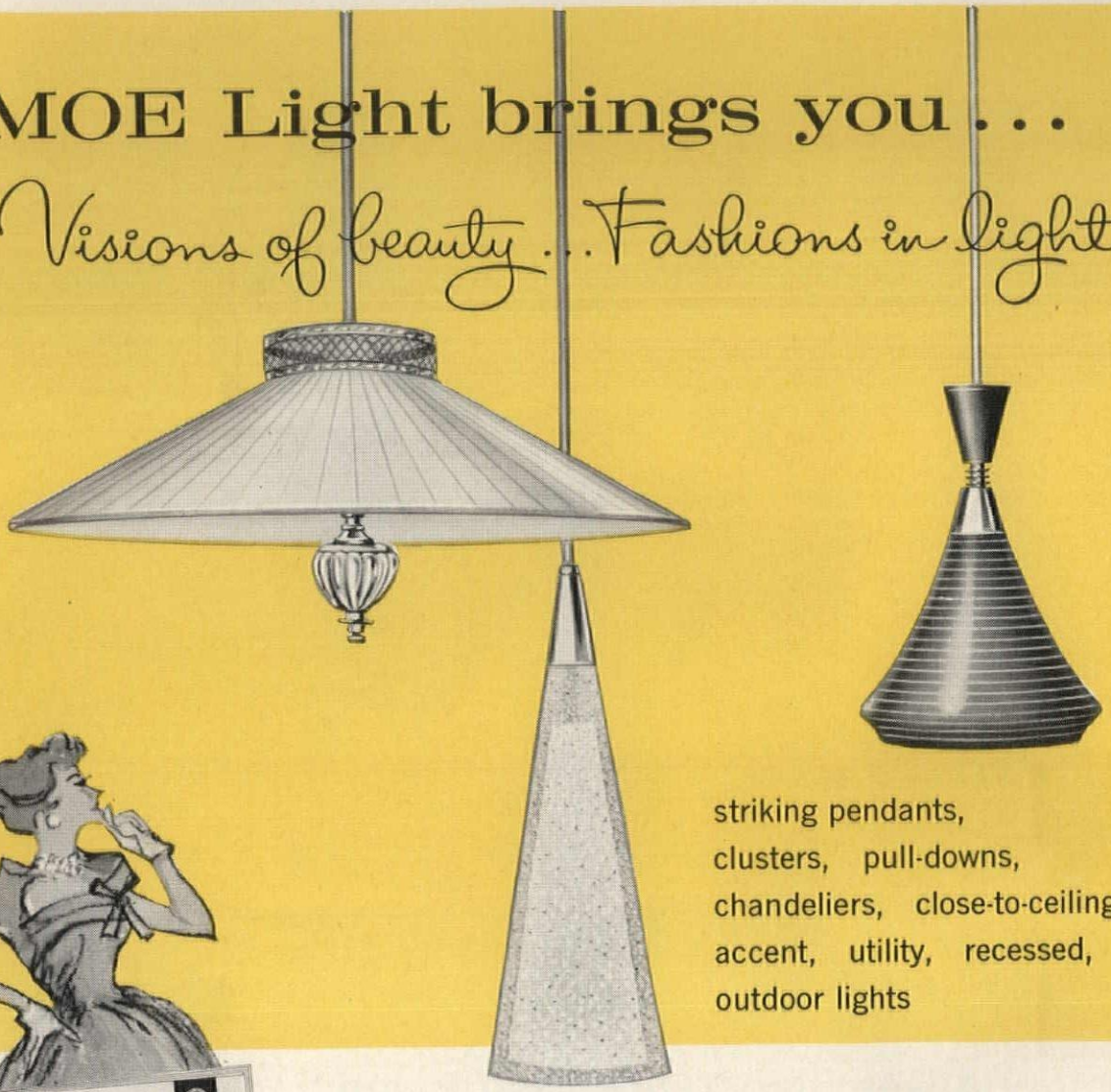
His latest book is not just another collection of cartoons, however—he is emphatic about that—but a social satire with a continuing text illustrated, naturally, in his familiar style. His men from outer space are *very* real characters on a very real mission. From the moment they take off from Mars in their 1,001,961-model space ship to the final countdown on earth, the pear-headed little adventurers are more canny than any Scotsman who ever lived.

The Martians, says Mr. Dunn, consider the level of one's intelligence evidenced "by the extent of the individual's happiness, by an attitude of love for one's fellows and by the absence of hostility, distress and conflict." They discover that earthlings "come in assorted colors and tend to separate according to hue . . . They are of ample girth and they come in a most extraordinary variety of shapes and sizes."

continued on page 374

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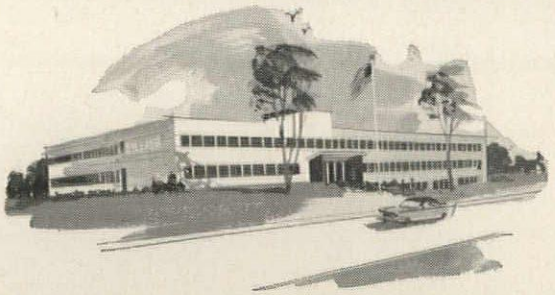
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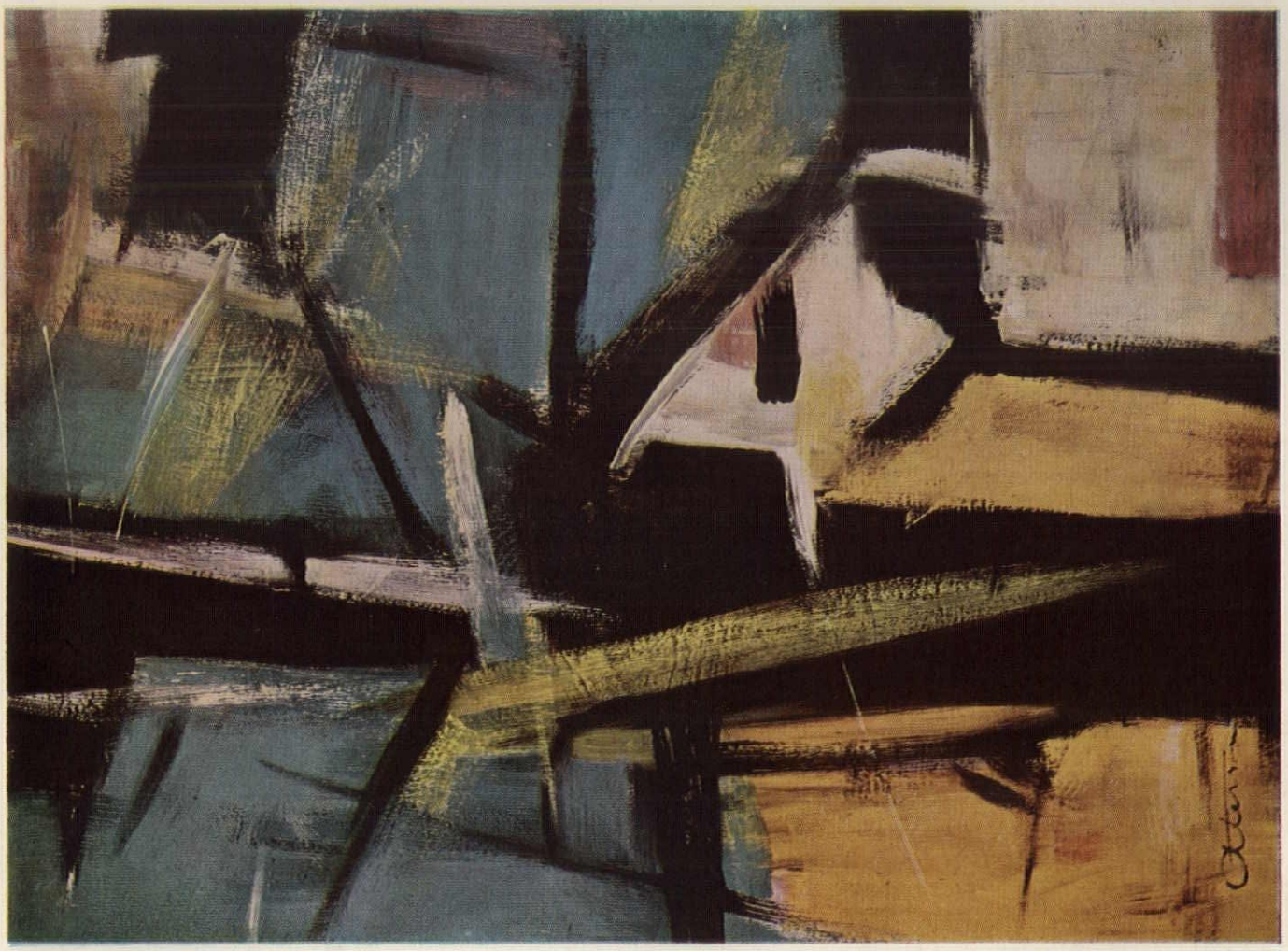
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Required Reading

continued from page 64

Urban. . .

planning theory. There is a definite need for studies of this type, and Dr. Rosenau's book provides a clear and reliable introduction to a world of scholarship that is all but inaccessible to the general reader.

There do seem to be difficulties, however, in considering the ideal city in isolation from architecture on the one hand, and practical city planning on the other. The author seems, in fact, to draw on almost purely architectural matters in discussing the image of the city during the 18th and early 19th centuries. While the discussion of the relationship between English and French architectural theories of this period is of considerable value, one wonders why the frame of reference should have been enlarged at this point and not at others.

Conversely, by waiting until the final chapter to analyze the difference between an ideal city and a utopia and the relationship of both to practical planning problems, the author has sacrificed much of the authority that her conclusions would otherwise have possessed. This deliberate decision to analyze may be necessary in a study of this kind, but much of the material presented seems to cry aloud for some sort of discussion.

Take, for example, the description of the House of Vice and Virtue in the imaginary city of Sforzinda created by the Renaissance theorist Filarete. This building "served a truly comprehensive purpose, consisting of a ring of ten stories, on a square base, erected on a socle, and crowned by the statue of virtue. The structure was to contain lecture rooms, a brothel at the bottom and an academy of learning in the higher stories, culminating in provision for the study of astrology at the top." This remarkable concept, which epitomizes so neatly the contradictions inherent in ideal planning, is passed over without comment.

Nevertheless, such comment apparently lies outside the limits of the study, and within its limitations this remains a useful book indeed.

—Jonathan Barnett

more books on page 374



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reinforced paper, foil and plastics for construction, industrial packaging and agriculture



Not only does this saw-textured redwood have a charming, natural beauty but it will hold its finish far longer than most woods. Another advantage of using saw-textured redwood is the fact that it will sustain knocks and dents without showing wear.

CRA®

How Redwood Adds to the Beauty

It is not surprising that so many of the homes that architects themselves most admire, were designed to be made of California Redwood. Of all available building materials, Certified Kiln Dried redwood unquestionably comes closest to meeting all the requirements, aesthetic and practical, of both architect and owner. When used for siding, decks, and in the garden, redwood beautifully and naturally helps relate the dwelling to its setting. Inside the home, redwood's rich color tones and interesting grain patterns create a feeling of warmth and an atmosphere that is casual yet elegant. Write Dept. 3 for your copy of "REDWOOD HOMES — Ideas from Architects' Own Homes".

All the wonderful warmth of wood is best expressed in redwood.

CALIFORNIA REDWOOD ASSOCIATION • 576 SACRAMENTO STREET • SAN FRANCISCO • CERTIFIED KILN DRIED REDWOOD

Architect: Marquis & Stoller

By the careful, imaginative selection of the lumber used for this handsome paneling, the architect has effectively taken advantage of the interesting natural variations in redwood's color tones. Another reason Certified Kiln Dried redwood is so often used for fine paneling is its exceptional dimensional stability.

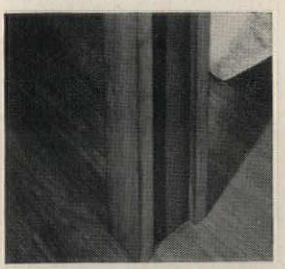
Here an unusual redwood divider was continued indoors to help make the deck a visual extension of the living area.





# of this Well-Designed Home

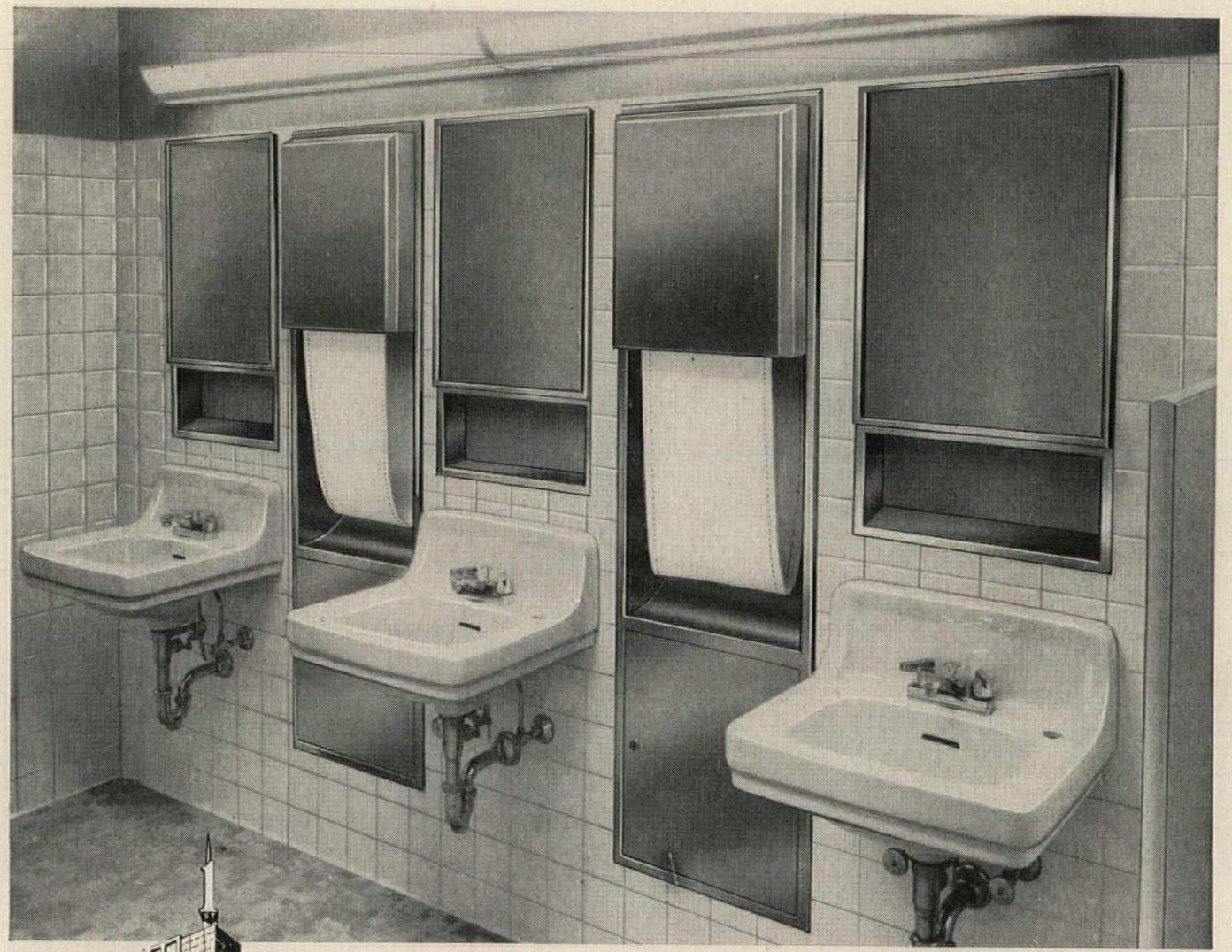


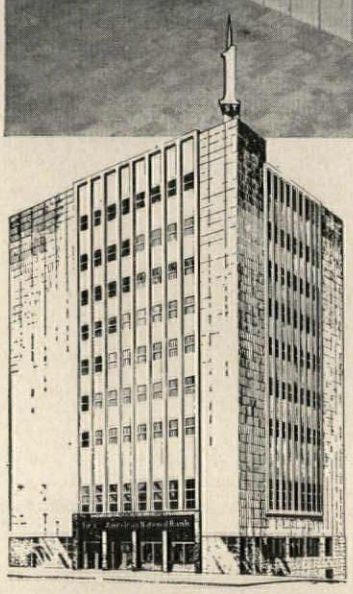


Here the architect specified redwood facing for this central steel pier to preserve the striking effect gained by the dramatic use of redwood throughout the interior.

Whether redwood paneling is left in its natural state or given some type of stain treatment, its warmth and depth of color provide a handsome background for the owner's furnishings, contemporary or traditional.

functional beauty and "linen" luxury with Continuous Cotton Towels





New First American National Bank Building, Duluth, Minn. Architect Thomas J. Shefchik, A.I.A., Duluth. Contractor: Fowler-Veranth Construction Company and Klippen-Holm Company, Duluth.

Recessed continuous towel cabinets with base storage units. End clutter of waste receptacles. Integrate with the modern design of the wash room. (This installation serviced by: American Linen Supply Company, Duluth.)

You provide the finest in hand drying facilities AND MORE when you specify continuous towel cabinets.

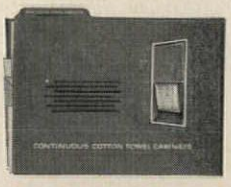
Low cost installation and service by a linen supplier . . . Reduced maintenance and janitorial costs . . . Elimination of litter, storage and disposal problems . . . Limits fire hazard and plumbing repairs.

Add to this, the fact that you do not obligate the owner to any particular service, *even* when you specify recessed cabinets like the ones pictured above. (Recesses are designed to accept any of a wide variety of cabinets.)

So, why not make sure your clients get the best? Specify the luxury and quality of cotton toweling . . . include continuous towel cabinets in your design.

Send for this free Planning-for-Cloth kit

Illustrated, includes specifications for recessed unit and continuous cloth towel cabinets. ***Write****—to Linen Supply Association on your letterhead.*



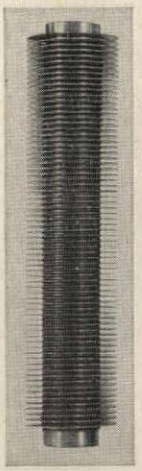
Linen Supply Association of America
and National Cotton Council • 22 West Monroe Street, Chicago, Ill.

NEW LOW SILHOUETTE FANDAIRE AIR-COOLED CONDENSERS

ALWAYS FACED RIGHT —NO MATTER WHAT THE WIND DIRECTION



No need to position circular Fandaire Air-Cooled Condensers to meet prevailing winds. Just set it anywhere for easiest piping.



Exclusive Aimco fintube design provides high-heat dissipating efficiency for circular Fandaire condensers.

Here's the newest, most advanced air-cooled condenser on the market—Fandaire! This modern low silhouette condenser is engineered around a new high-heat dissipating fintube of exclusive design and manufacture. In operation, the entire spiral of fintubing is surrounded with a circle of swiftly moving cool air for highest cooling efficiency. Every degree in temperature drop is fully utilized as this circular design captures the wind from *any* direction, regardless of placement or location. A powerful fan pulls cool air in and pushes warm used air up and away. Fandaire's constant gravity tube drainage gives continuous movement to condensate.

With its low, clean-lined silhouette, Fandaire does not detract from the general architectural effect of the building. And weighing ⅓ less than conventional installations, the Fandaire usually can be positioned where needed, without guy wires or extra bracing. Savings in piping and installation alone may be considerable.

Where there is a problem of architectural compatibility, or of cost or performance, chances are the new Fandaire Air-Cooled Condenser is the best solution. Engineered in sizes from 3 to 120 tons per unit, there is a Fandaire model for practically all single or multiple installations. Get complete information today.

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specialists in circular air-cooled condensers

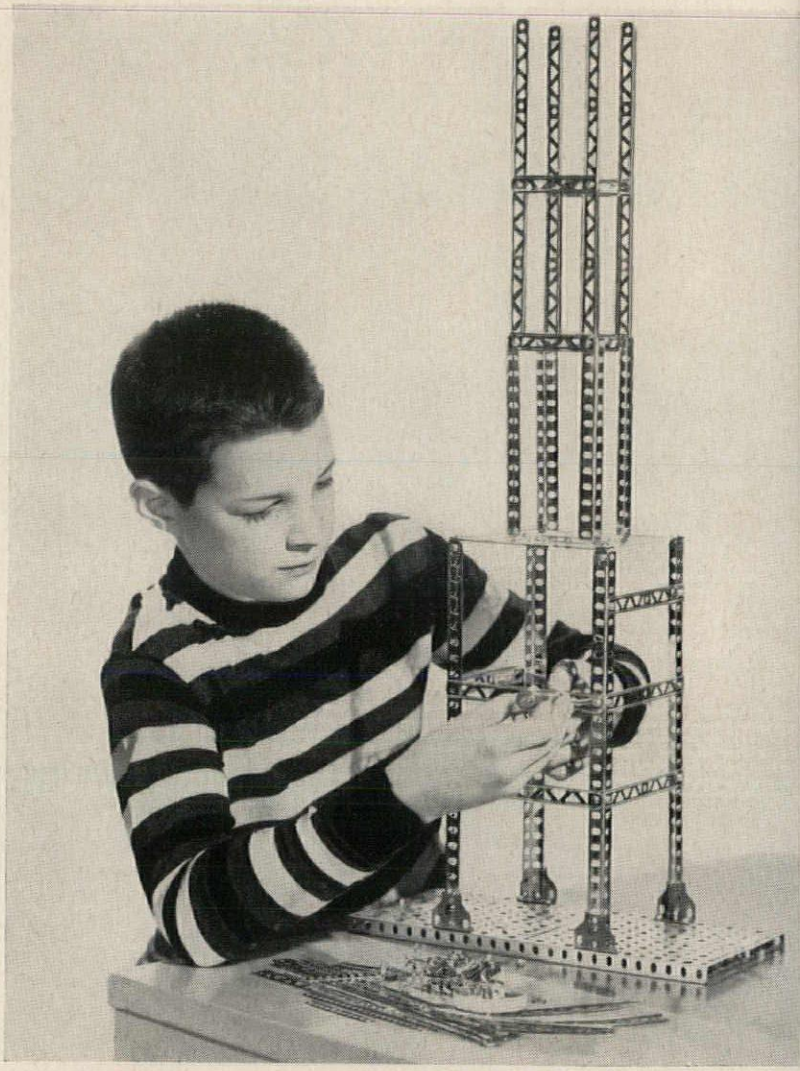
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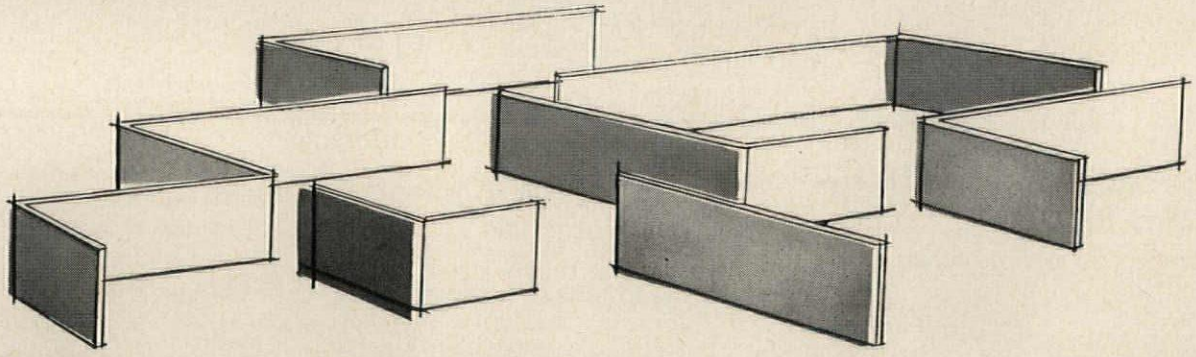
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arrives at the site ready to go up fast!

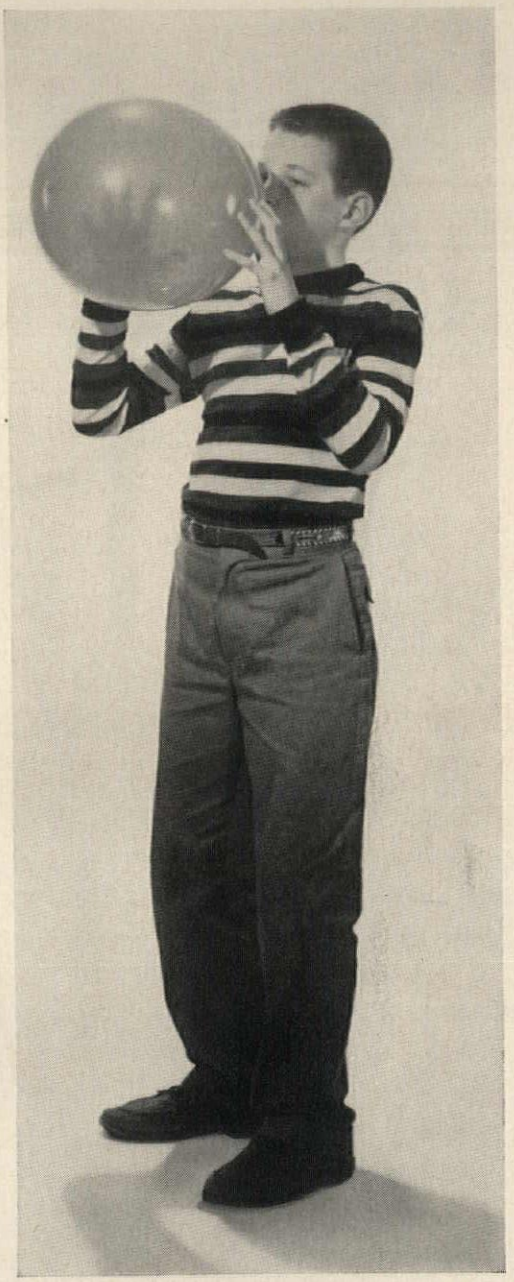




adapts to many fire-resistant constructions!



costs less per pound than a loaf of bread!



lends itself to easy expansion!

STRUCTURAL STEEL, OF COURSE!

All these advantages hold true not only for schools, but also for plant and office buildings, bridges, churches, houses, shopping centers. Remember, too, that both steel producers and steel fabricators have expanded facilities. That means you can get all the fabricated structural shapes you need—when you need them.

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BETHLEHEM STEEL

Architects' choice... 2 to 1



Recently an independent research organization asked architects: "What brand of flush veneered doors is your first choice preference?" More than twice as many chose Roddis than the next leading brand! Why this great vote of confidence?

These architects know the Roddis name represents a standard of quality and craftsmanship unmatched in the industry. A standard maintained through more than 60 years of manufacturing and design leadership.

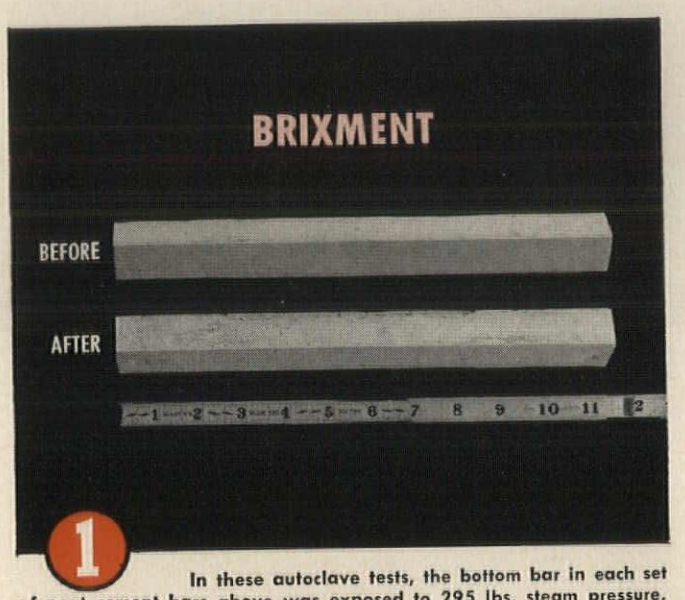
Today, more and more architects are specifying Roddis Doors. In the nation's offices and commercial buildings, for example. Managements are vitally concerned that their new buildings be built of quality products for greatest long-run economy. They insist on doors that will assure proper function, low maintenance and safety, for decades to come.

Roddis now offers the most complete wood door line wholly designed and produced by a single manufacturer. May we send you our latest brochure?

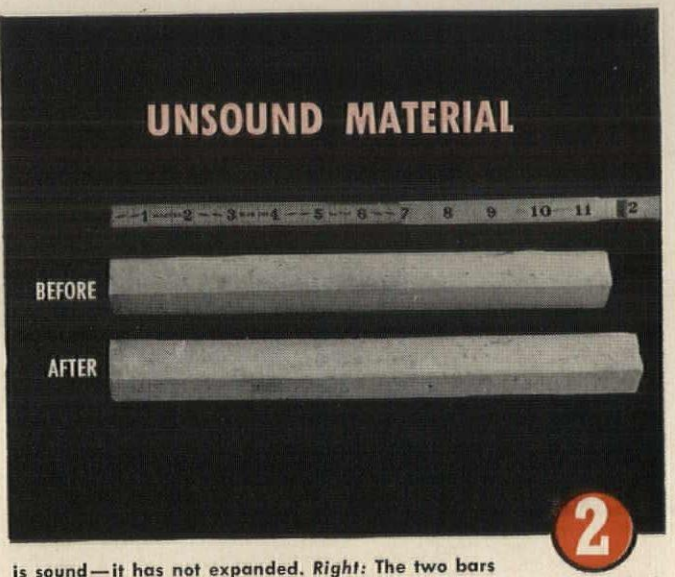
Roddis doors

RODDIS PLYWOOD CORPORATION

Marshfield, Wisconsin



In these autoclave tests, the bottom bar in each set of neat cement bars above was exposed to 295 lbs. steam pressure, 420° F., for 3 hours. *Left:* The two bars are both Brixment. Note that it is sound—it has not expanded. *Right:* The two bars were made of one part portland cement and one part of a lime which does not meet autoclave test. Note expansion—proof of unsoundness.



BRIXMENT meets the Autoclave Test for SOUNDNESS!

Sound mortar is essential for strong, durable brickwork. To be sound, mortar must be free of constituents which may cause abnormal expansion after long exposure to weather.

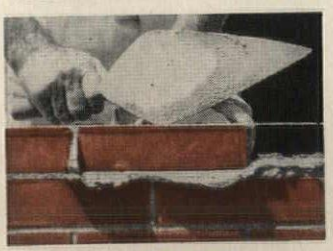
Unsoundness in mortar material is readily detected by the autoclave test. This severe test rapidly accelerates the chemical reaction of mortar materials, and the slightest unsoundness is immediately revealed by excessive expansion.

Brixment easily meets the autoclave test requirements of the Federal and ASTM specifications. It also complies with the strength requirements of both specifications for Type II masonry cement. Therefore, when Brixment is used, sound, strong, durable mortar is assured.

But soundness is only *one* of the characteristics in mortar necessary to produce top-quality masonry at lowest cost. Several others are listed below—and *no other mortar combines ALL these characteristics to such a high degree as Brixment mortar.* It is this combination of advantages that makes Brixment superior to any mixture of portland cement and lime—and which also accounts for the fact that Brixment has been the leading masonry cement for over 40 years.

Louisville Cement Company, Louisville 2, Ky.

BRIXMENT MORTAR ALSO COMBINES THESE 8 OTHER ESSENTIAL CHARACTERISTICS



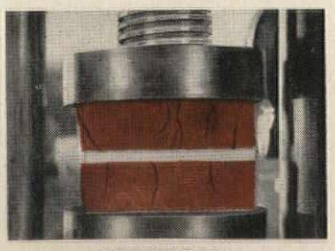
PLASTICITY



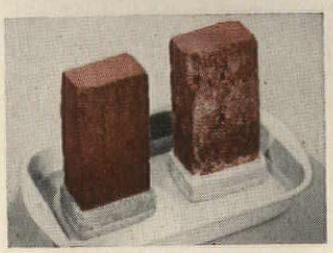
WATER RETENTION



BOND



STRENGTH



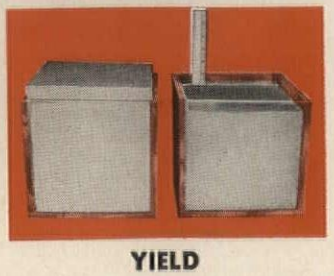
LOW EFFLORESCENCE



IMPERMEABILITY



DURABILITY



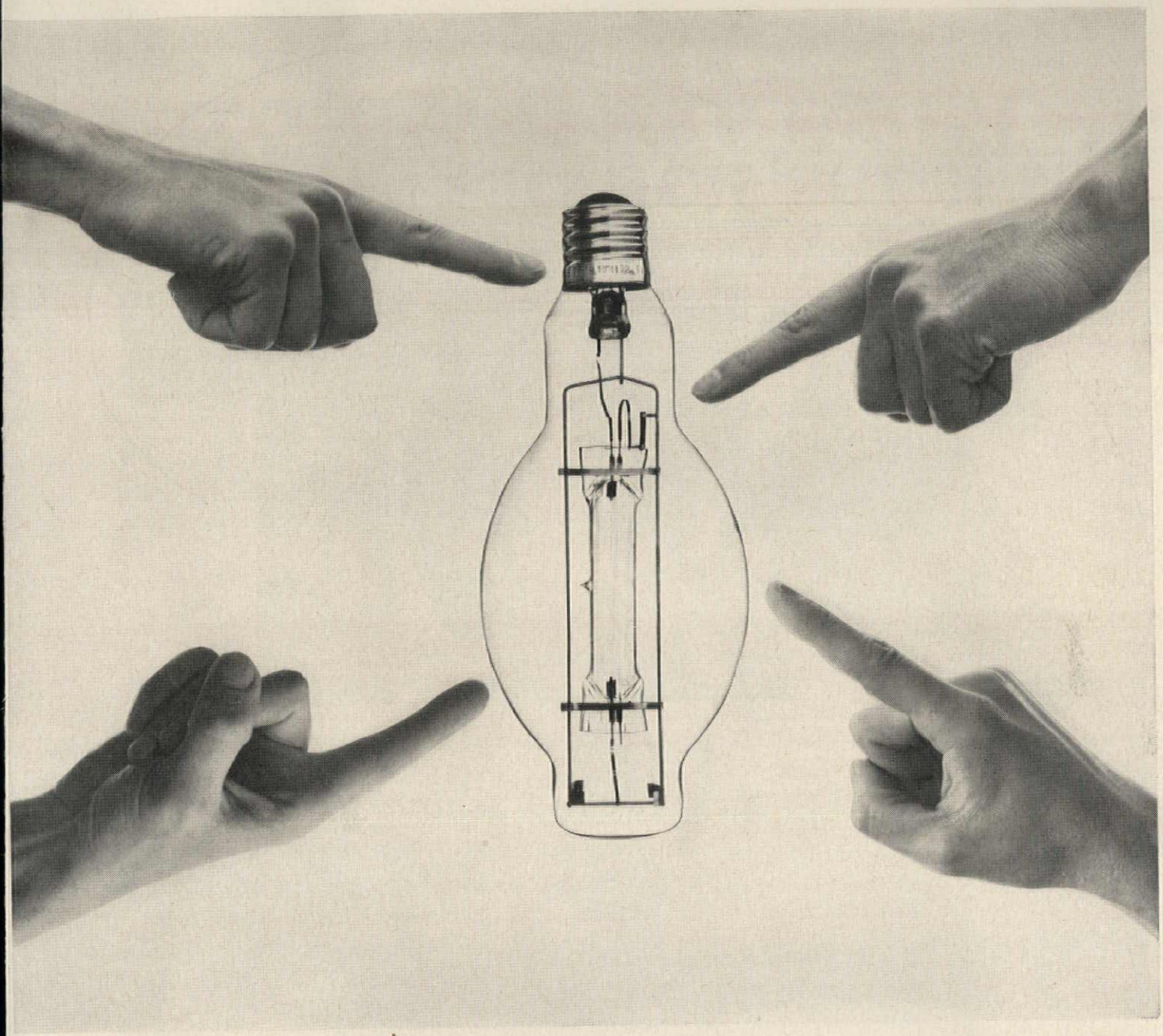
YIELD



Mercury lamps may look alike

These Mercury lamps look alike and cost about the same, but one—the Westinghouse Lamp—will deliver more light initially and maintain this high light output longer. It is your most economical choice for industrial and commercial lighting and incorporates all 4 outstanding improvements listed below.

1. Lifeguard™ arc tube to improve lumen maintenance. Even after 10,000 hours of use, these lamps will still give 85% of their initial light output. *This means that 2½ years after you install Westinghouse Mercury Lamps, your plant or streets will have almost the same high level of light as when the lamps were new!*



. . . but four differences make one a better buy!

2. New design electrodes lock in the emission material and insure long life and easier starting.

3. Weather Duty™ construction. Special glass is resistant to thermal shock and corrosive fumes. Moisture, industrial fumes, even snow and rain can't harm these Westinghouse Mercury Lamps.

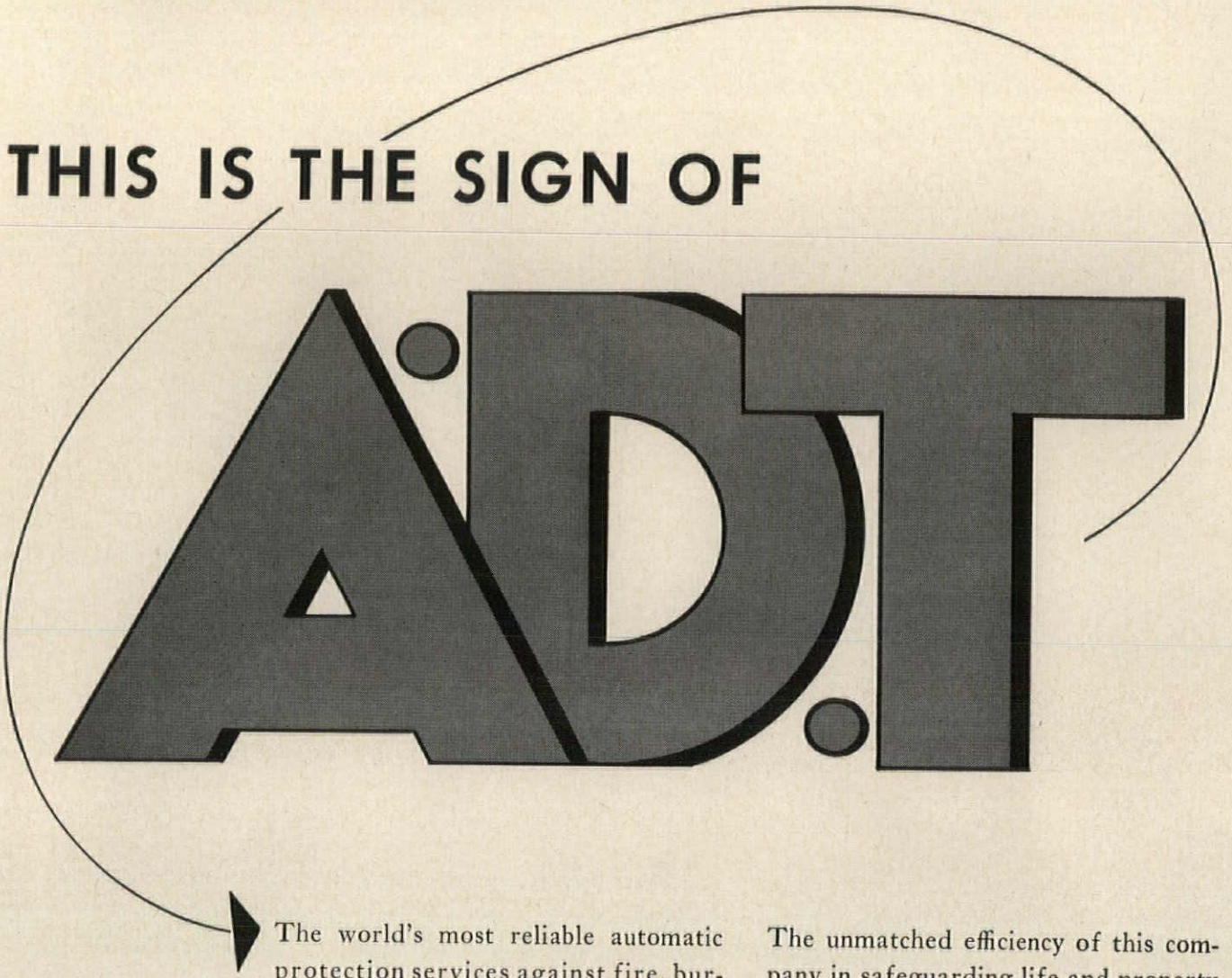
4. Hi-temp silicone cement holds bases tight for life . . . actually gets stronger as the lamps burn. No drop-outs. Westinghouse even date-codes its mercury lamps so you can check performance.

No matter what type or wattage of mercury lamps you use, you will get more value and light for your money—plus longer, trouble-free service—by specifying and insisting on Westinghouse Mercury Lamps. Westinghouse makes the most complete line of mercury lamps in the industry . . . 100 to 3000 watt sizes . . . in clear, color-corrected and reflector types. Contact your authorized Westinghouse lamp agent or nearest Westinghouse sales office.

YOU CAN BE SURE...IF IT'S Westinghouse

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The world's most reliable automatic protection services against fire, burglary, holdup and other hazards.

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The reputation of this symbol stems from the organization behind it, the American District Telegraph Company.

The unmatched efficiency of this company in safeguarding life and property is attained through everlasting attention to maintenance. It is the leader in its field, not only because of its superior detection and signaling devices, but because all ADT systems are regularly inspected, tested and always ready for reliable operation.

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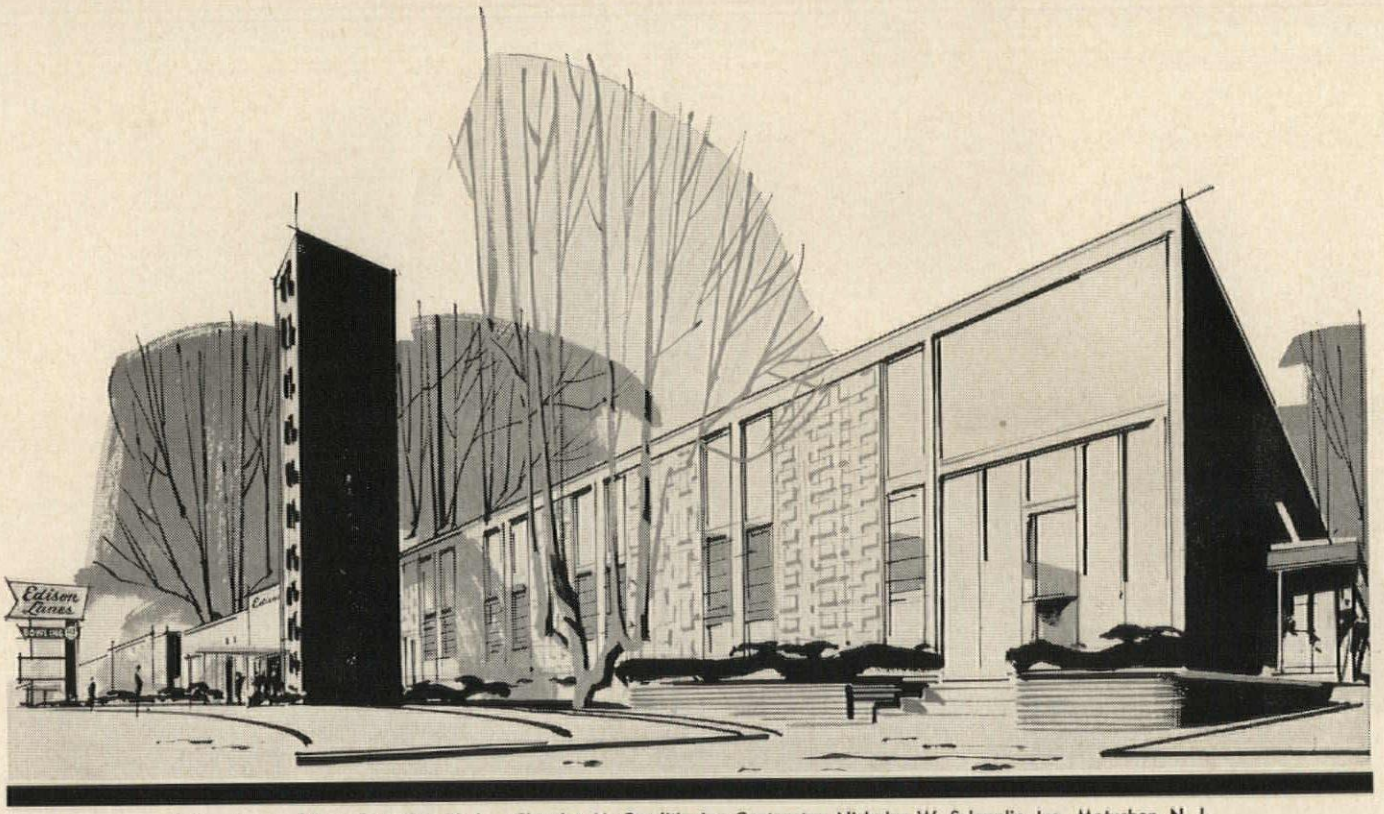
AMERICAN DISTRICT TELEGRAPH COMPANY

A NATIONWIDE ORGANIZATION

Executive Office: 155 Sixth Avenue, New York 13, N. Y.



Climate by Chrysler



Edison Lanes, Edison Township, N. J. Chrysler Air Conditioning Contractor: Nicholas W. Schwalje, Inc., Metuchen, N. J.

World's largest bowling lanes cooled by Chrysler Packaged Air Conditioning

Almost a quarter of a mile separates Lane No. 1 from Lane No. 112 at Edison Lanes, Edison Township, N. J. If a bowler ever made the trek, then Chrysler Packaged Air Conditioning units would be keeping him cool and comfortable every step of the way.

It takes 340 tons of air conditioning to cool bowlers behind the foul lines and in the service areas. Since it is not necessary to cool the lanes themselves, the diffusers and air returns are concentrated at the foul lines to create a "curtain wall" effect. This prevents cool air from spilling out of the conditioned areas.

The 20- and 30-ton Chrysler Air Conditioners are self-contained evaporative condenser units with dual compressors. They're specially arranged to provide zone control, so only the lanes in use need be cooled.

Chrysler equipment was selected for this job because it offered the owners the twin advantages of flexible installation and most economical operation. For more information, or the technical cooperation of a Chrysler air conditioning engineer, write today.

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Airtemp Division, Chrysler Corporation, Dept. M-50, Dayton 1, Ohio
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anywhere

for a **DONLEY INCINERATOR!**

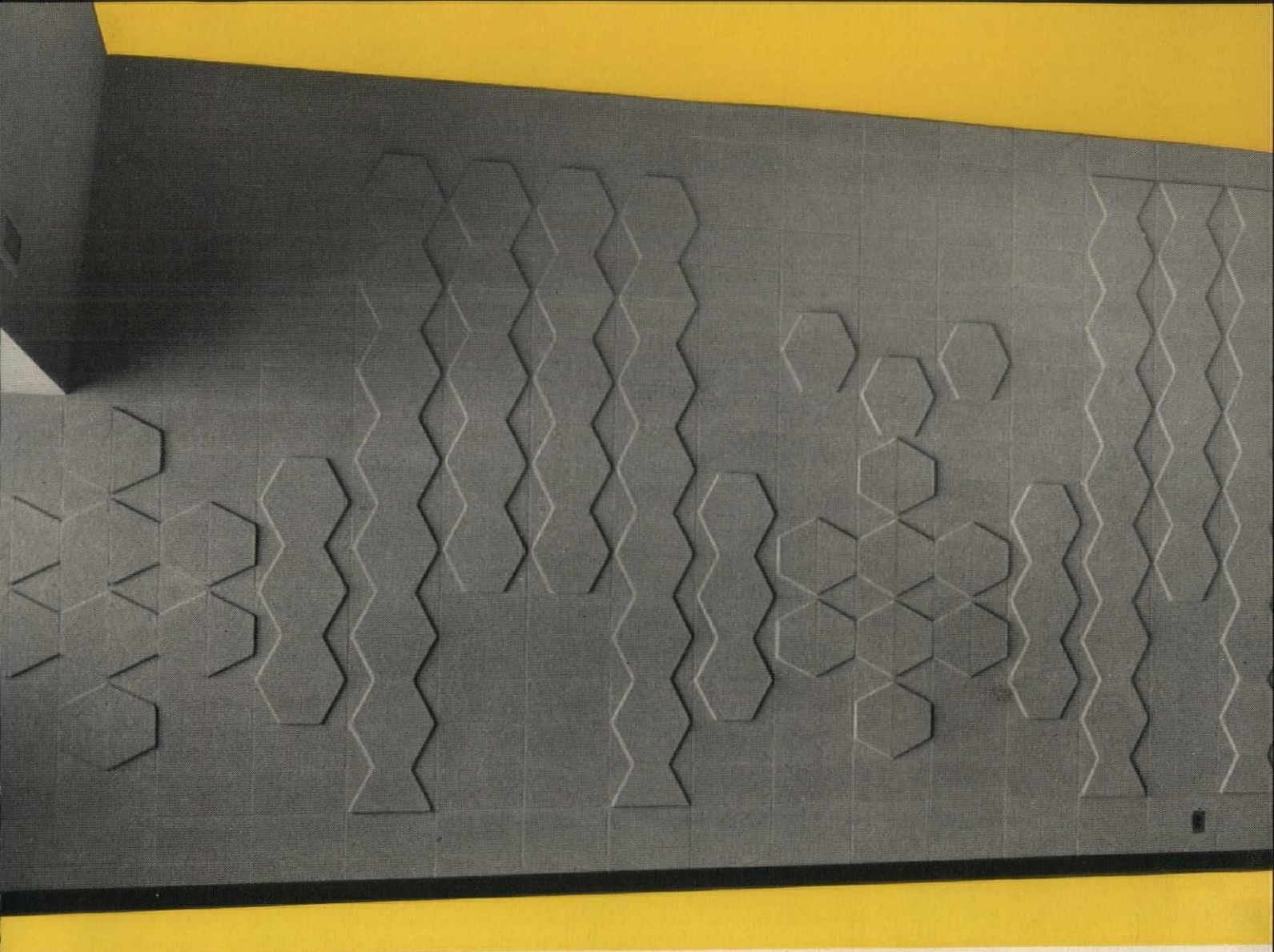
Get complete and rapid burning of refuse . . . without lighting a match . . . with the fully automatic Donley Safety Burner that provides frequent small fires at regular intervals. Complete protection against flame failure is afforded by the special Donley Safety Pilot. Full use of the grate area for maximum burning efficiency is assured by Donley's exclusive Heat Spreader.

For safety and efficiency, specify a Donley Incinerator. All parts and detailed drawings are available through Donley Dealers everywhere for installation by local contractors.

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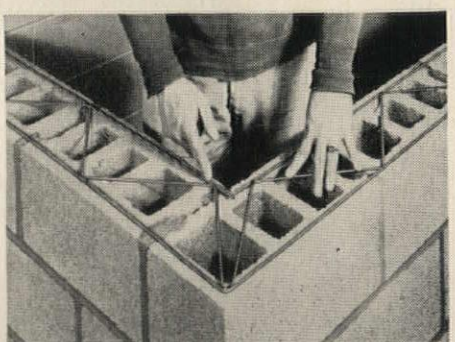
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more than twice as strong!

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Those are solid facts, established by independent engineering tests and research.

Builders everywhere are relying on Dur-o-wal's trussed design, butt-welded construction, scientifically deformed rods, to give good-looking modern masonry extra years of life. Nationally wanted, Dur-o-wal is nationally distributed. Wherever you build a masonry wall, you can get Dur-o-wal. See us in Sweet's.



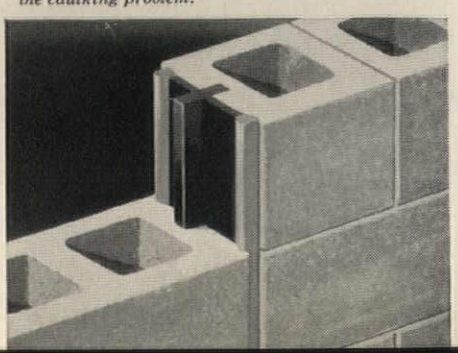
Two engineered products that meet a need. Dur-o-wal reinforcement, shown above, and Rapid Control Joints, below. Weatherproof neoprene flanges on the latter flex with the joint, simplify the caulking problem.

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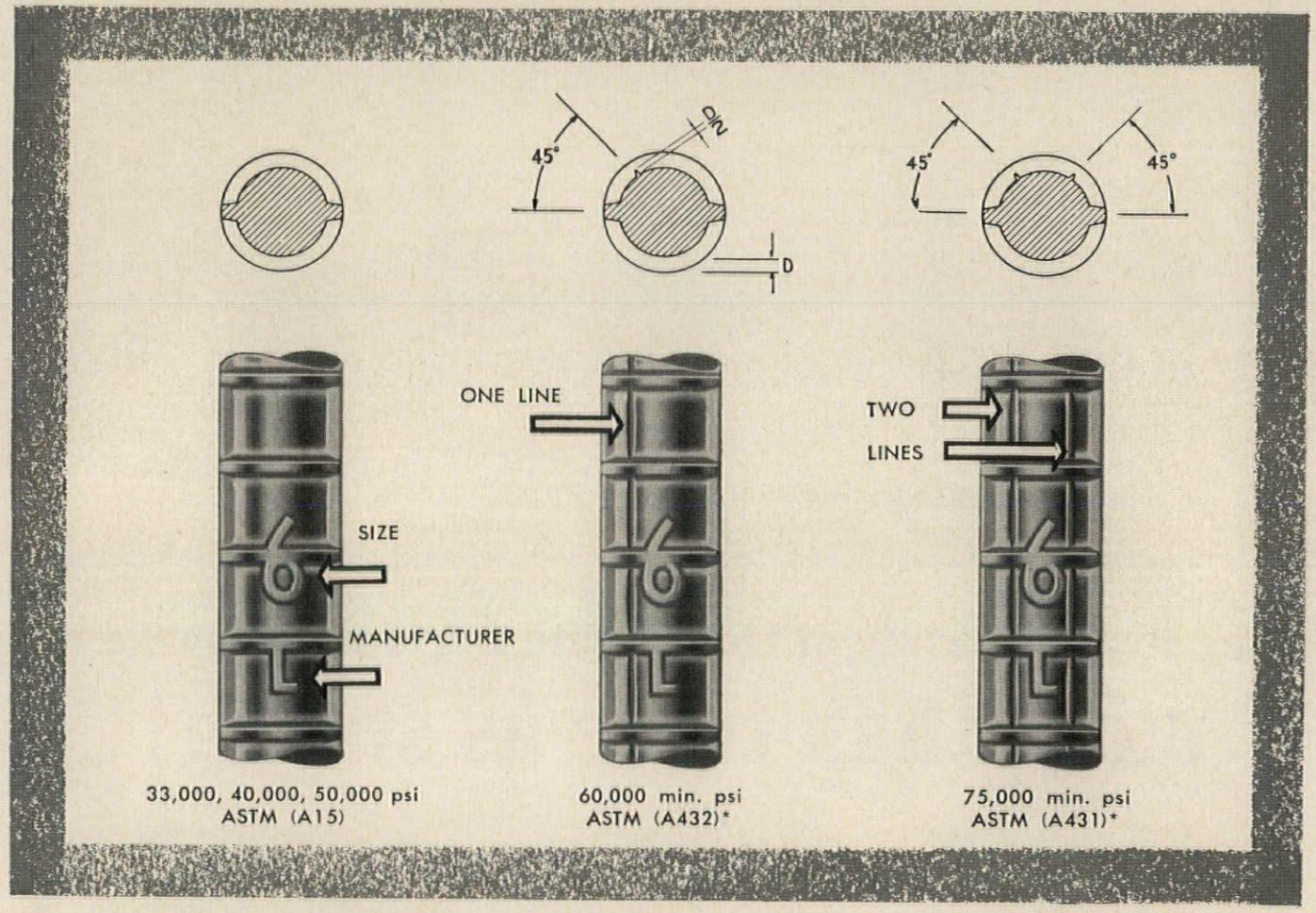
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Demand these new time-saving Laclede bars for your next construction job.

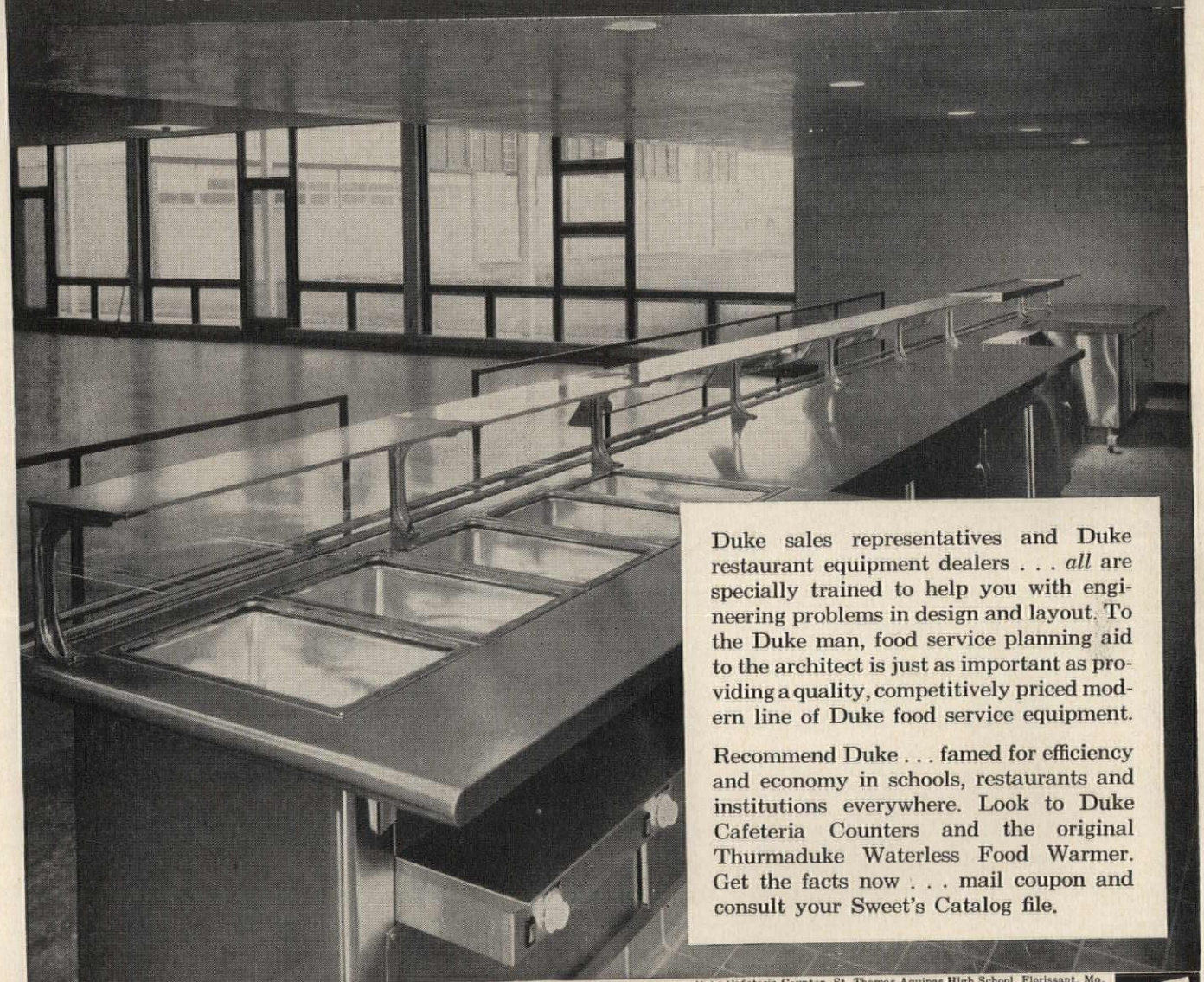
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☐ Thurmaduke Waterless Food Warmers and Portable Food Warmers ☐ Service Tables
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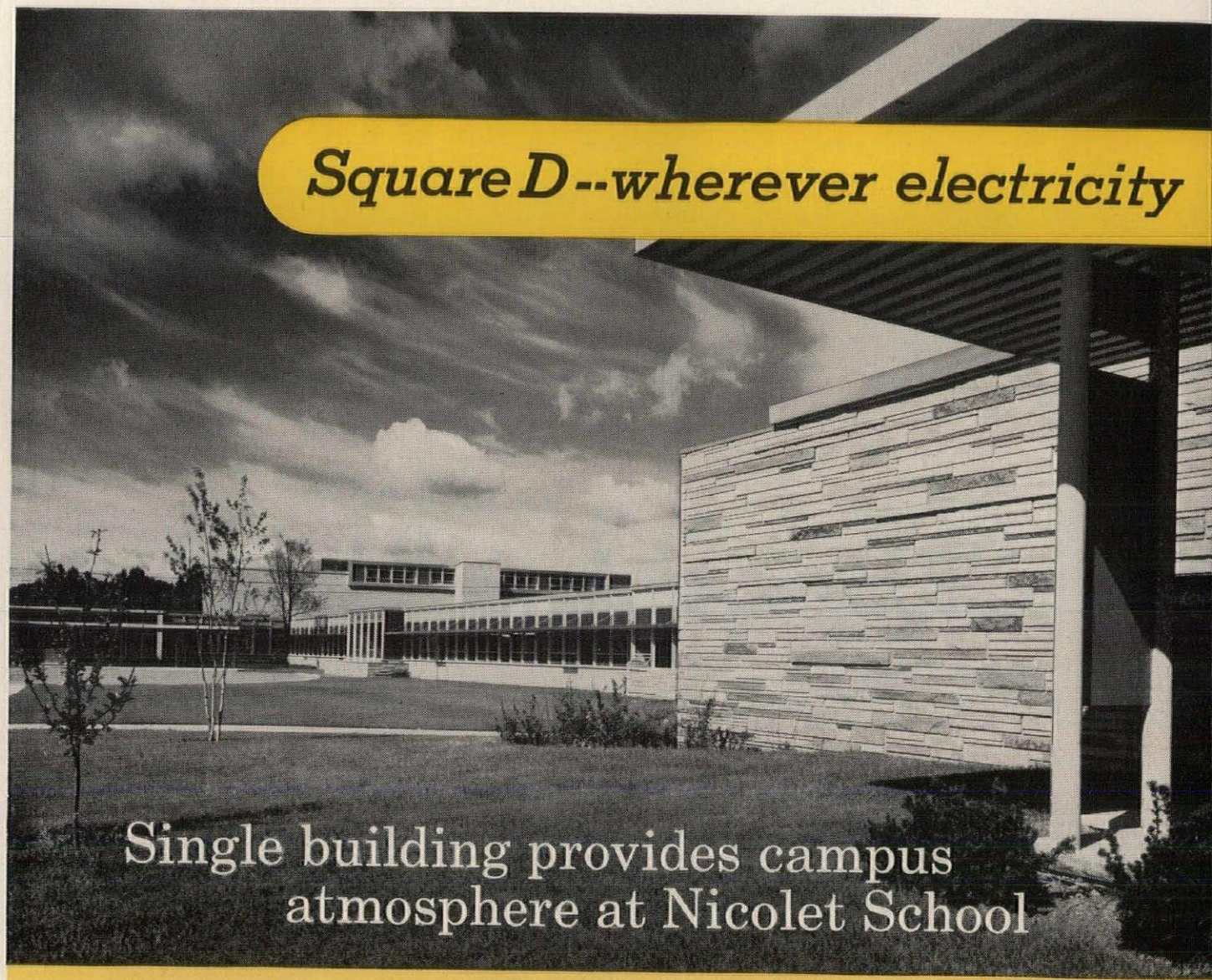
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Single building provides campus atmosphere at Nicolet School

NICOLET HIGH SCHOOL in suburban Milwaukee is "environment-controlled," achieving the open vistas of a campus with a single-unit building. Various school functions are located along the legs of an irregular "H"—an arrangement having no enclosed courts to interfere with the light, air and natural beauty of the 48-acre site. Horizontal aluminum sun shades and colored plastic louvres eliminate inside shades and venetian blinds—leave classroom views unobstructed.

School activities are grouped by related types, with athletic and shop facilities well removed from teaching areas. Isolation from highways and roads provides the environmental safety of a park. Community use is extensive. Swimming and many other recreational activities make Nicolet an important community center. *Square D electrical equipment is on duty throughout this impressive school plant...further evidence that you'll see the familiar* D *wherever electricity is distributed and controlled.*

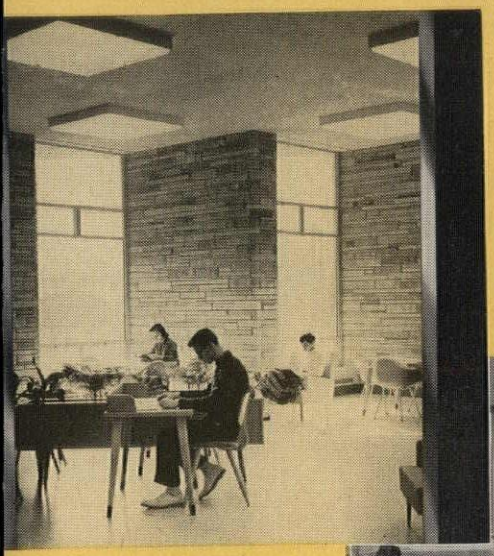
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SQUARE D COMPANY

ARCHITECT: *Office of von Grossmann, AIA*
CONSULTING ENGINEER: *Wanty and Associates*
ELECTRICAL CONTRACTOR: *Reliance Electric Company*

is distributed and controlled



There are no study halls in Nicolet • Instead, the Student Center (*left*) Library, Cafeteria and various classrooms are well located and equipped for study-hall purposes. With its adjoining outdoor terrace, the Student Center provides a quiet, relaxing atmosphere in keeping with the concept of a campus.



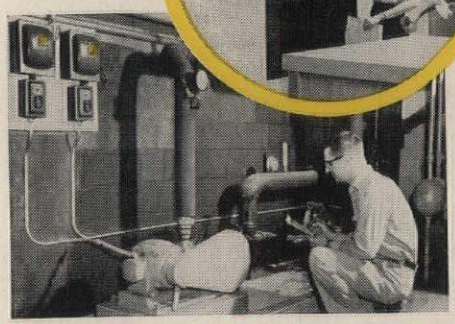
Indoor-outdoor swimming pool is on sunny side of building with adjacent sunbathing terrace. Window wall has double sliding glass doors with heated space between, adapts the pool to both summer and winter use.



One section of the main electrical distribution system utilizing Square D QMB panelboards



Typical Square D lighting panelboard of which there are many throughout the building



Square D switches and starters are used in the control of the various operating functions throughout the building

A *Complete* LINE OF ELECTRICAL DISTRIBUTION AND CONTROL EQUIPMENT

ADJUSTABLE SPEED DRIVES
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LIGHTING AND POWER PANELBOARDS
LIGHTING CONTROL—LOW VOLTAGE
LIMIT AND FOOT SWITCHES
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MAGNETIC BRAKES
METER MOUNTINGS
MOTOR STARTERS
PRESS CONTROL
PRESSURE, FLOAT, & VACUUM SWITCHES
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STAGE DIMMERBOARDS
STEEL MILL CONTROL
SWITCHGEAR & UNIT SUBSTATIONS
SYNCHRONOUS MOTOR CONTROL
TERMINAL BLOCKS
TEXTILE MACHINE CONTROL
TIMERS
VOLTAGE TESTERS
WELDER CONTROL

DAILY DOUBLE
AT THE BIG

A AQUEDUCT... *for thoroughbred racing*

AGITAIR... *for perfect air distribution*

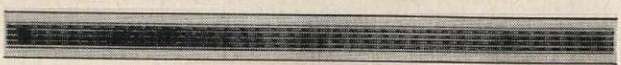


Aqueduct Race Track, New York City, N. Y.

AQUEDUCT, the most beautiful racetrack in the world, offers entertainment before, during and after the races. In the elaborately decorated Club House, dozens of color schemes have been astutely blended into a vast mural with individual appeal.

AGITAIR Stripline slot-type and custom-designed square and rectangular diffusers blend in unobtrusively with the architectural treatment and provide perfect indoor climatic conditions.

Millions of the big "A"—AGITAIR diffusers are today and everyday supplying noiseless . . . draftless air distribution on thousands of applications. For technical information on these products ask your local AGITAIR representative or write direct to Air Devices Inc.



STRIPLINE – Slot Type Diffusers



Square and Rectangular Diffusers

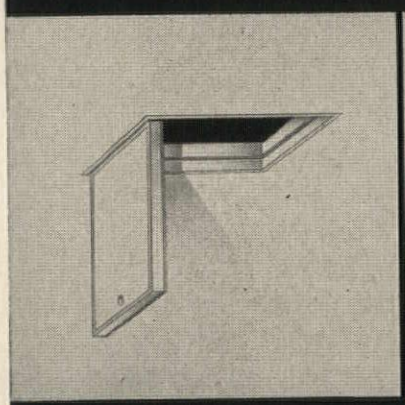
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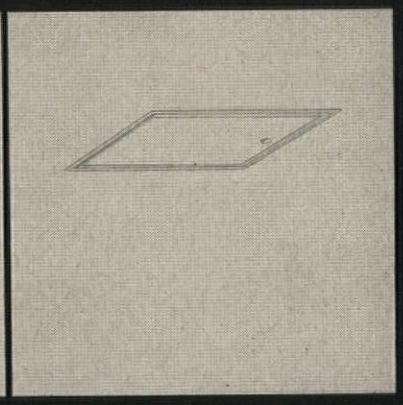
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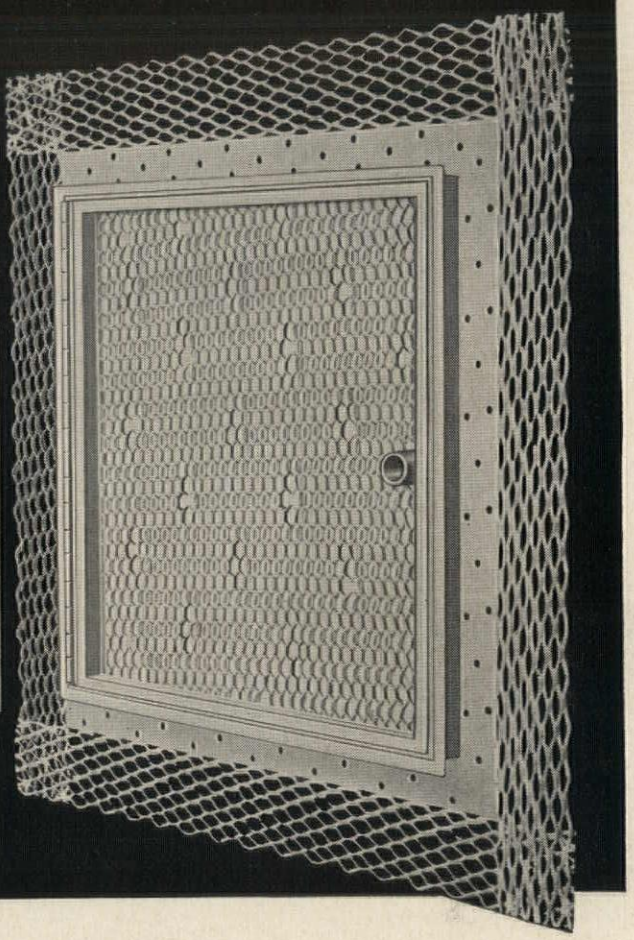
NOW you see it ...now you don't!



door open



door closed



NEW...for acoustical plaster

MILCOR STYLE B ACCESS DOOR

Acoustical plaster is troweled over the recessed door panel and finished flush with the surrounding plaster. When the job is done, you can hardly tell an access door is there. There is no exposed door panel to break the ceiling surface or impair acoustical efficiency.

The plaster is securely bonded to the door by self-furring Milcor Furlath welded to the panel. Plaster edges are protected by Milcor No. 66 Casing Bead around the panel's perimeter. The same bead on the outer frame enables the plasterer to get a neat, clean finish with the surrounding plaster area.

Three sizes are available, 12″ x 12″, 12″ x 24″, 24″ x 24″ — for 1″, 1⅛″, and 1¼″ grounds. Catalog 210 describes them. Write for your copy.

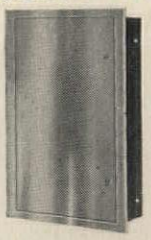
ML-42

MILCOR®

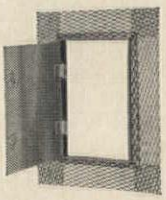
the industry's most complete line of access doors



Style A for standard acoustical tile up to one inch thick.



Style M for masonry, brick, stone, tile, etc. With overlapping flange.



Style K for plastered walls. With expansion wings. Style L, without expansion wings.

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"Only KEYMESH® for stucco

says A. L. BRANDEN of Branden Enterprises, developer of 10,000 home



"We don't buy cheap materials. What you save in first cost, you often lose—and then some—on extra labor and callbacks. That's why I insist that subcontractors working for me use Keymesh as a stucco reinforcing material," reports Alec Lee Branden, Hayward, California.

Mr. Branden finds stucco a quality feature for exterior walls. At Tropicana Village, his latest development, stucco is applied over Keymesh reinforcement. This wall construction helps him maintain a 35-house a day schedule (final plans call for 10,000 homes)—and assures the strength, durability, and fire-safety that owners of Branden-built homes expect. Low initial cost plus highest quality are trademarks of all Branden-built homes.

"I've found that Keymesh gives with the wall, taking up the stretch and contraction that any new home goes through as it settles. With Keymesh, stucco walls show no signs of exterior cracking. Require no callbacks to repair settling cracks. And, being easy to work with, my subcontractors appreciate the way it handles."

Other use and test-proved products in the Keymesh family of quality plaster reinforcements . . . Keycorner for almost double the crack resistance of plaster corners . . . Keystrip for extra strength at points of maximum stress where flat strip reinforcement is needed.

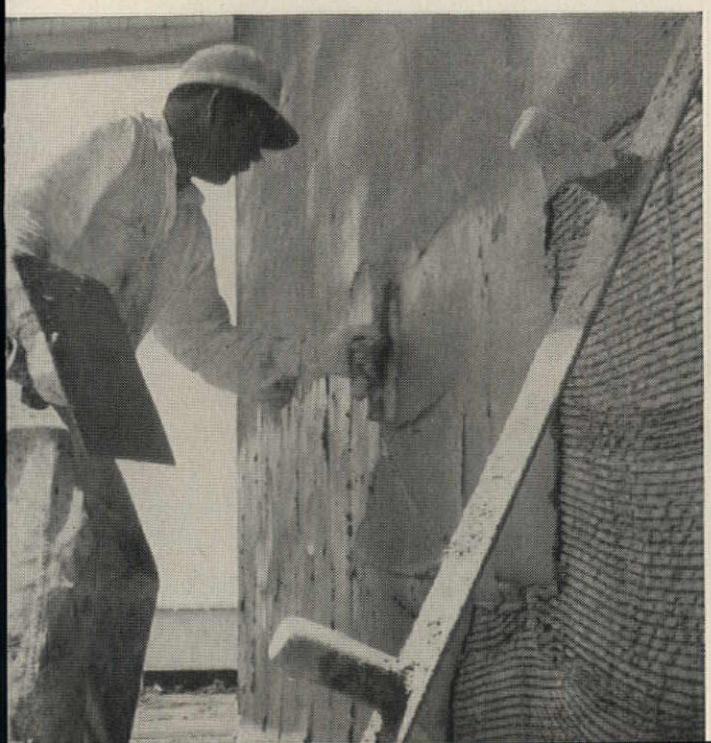
Frank A. Schiro, Plastering Subcontractor, uses 18-gauge Keymesh. Mr. Schiro reports, "I like to use Keymesh because it permits rapid troweling. My workmen easily keep up with construction schedules."

reinforcement"

Tropicana Village, San Jose, California







Send for complete information. Write

KEYSTONE STEEL & WIRE COMPANY

Peoria 7, Illinois

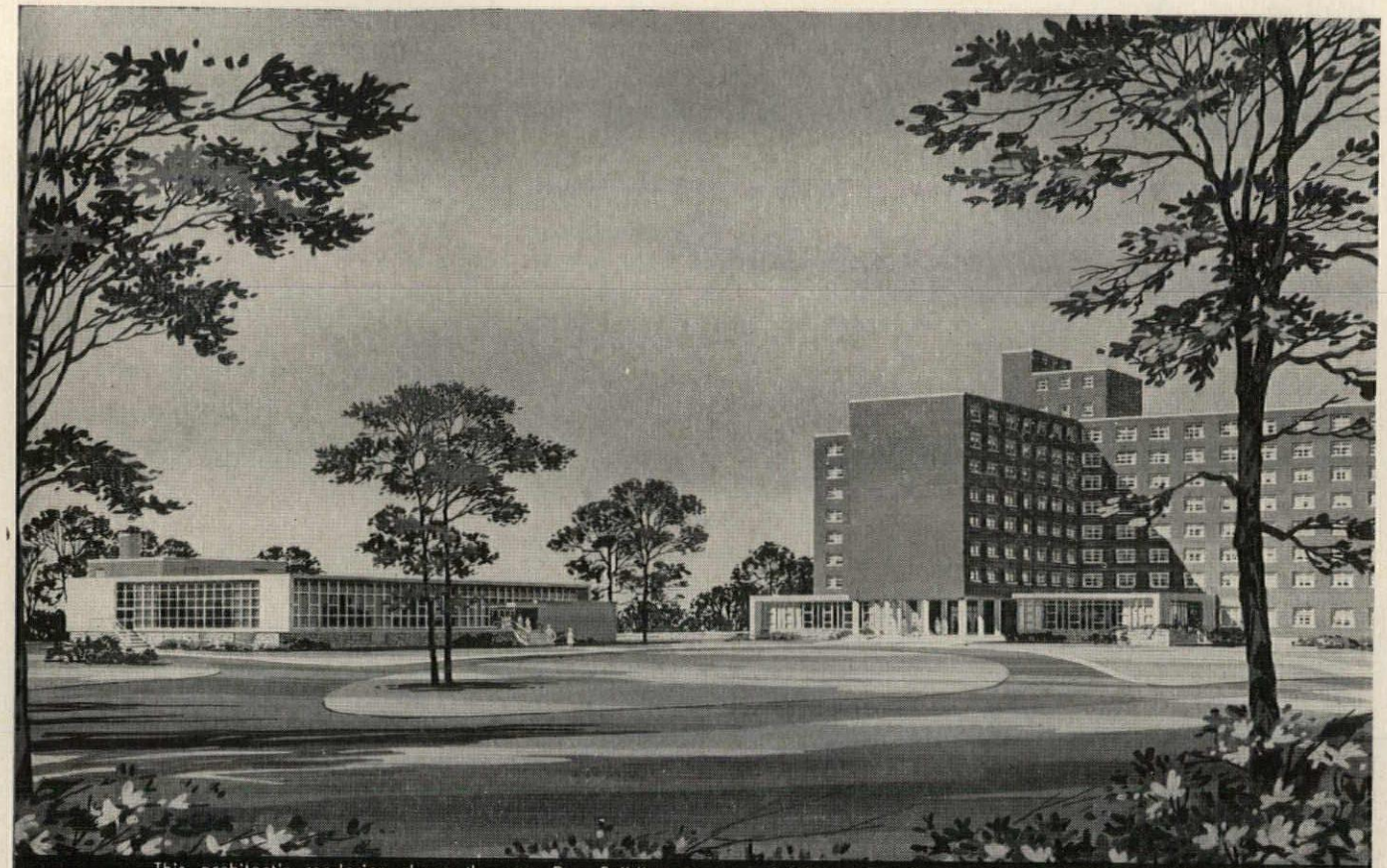
Yes, I would like to learn more about the effective crack resistant qualities of Keymesh, Keycorner and Keystrip reinforcement. Please send me complete test reports and more complete information.

*Name*_____

*Company*_____

*Address*_____

*City*_____ *State*_____



This architect's rendering shows the new Day Building on Mt. Olympus, Syracuse University. Economical heating comfort is maintained in this, and two other new Syracuse dormitory multi-zone units controlled by Sarcotherm hot water control systems. Architects: King & King, Syracuse. Engineers: Robson & Woese, Inc. Superintendent of Buildings & Grounds, Syracuse University: E. J. Gibbons. Mechanical Contractors: (on the Day Building, above, and Sadler Hall) Edward Joy Company, Syracuse, N. Y.; (on the women's dormitory) Mechanical Installations Inc., Ozone Park, N. Y.

FOUR-YEAR PERFORMANCE RECORD LEADS TO 15-ZONE INSTALLATION OF SARCOTHERM HEATING CONTROLS

In 1956 Syracuse University installed a Sarcotherm hot water heating control system in an 8-zone dormitory project. Now four years of flawless operation have demonstrated the ability of the Sarcotherm system to deliver complete control of heating comfort – without any maintenance or repair of any kind. As a result, two new Syracuse dormitories have been built with Sarcotherm systems for a total of 15 zones Sarcotherm-regulated.

In each zone, Sarcotherm provides precise temperature control, fully allowing for occupancy and exposure, obviating the need for costly individual room control. The Sarcotherm system features a three-way valve controlled by an outdoor thermostat, which is highly responsive to temperature changes, solar radiation and wind load. In addition to this method of anticipating weather before it makes its effect felt indoors, the Sarcotherm system utilizes a master indoor control in each zone, which starts to cool the system as correct temperature is being reached.

This absolutely prevents overheating and prevents wasting fuel. All controls are sealed and are tamper-proof. 2702

* *FOR COMPLETE CONTROL SYSTEM CATALOG* write Sarcotherm Controls, Inc., 635 Madison Ave., New York 22, N. Y.

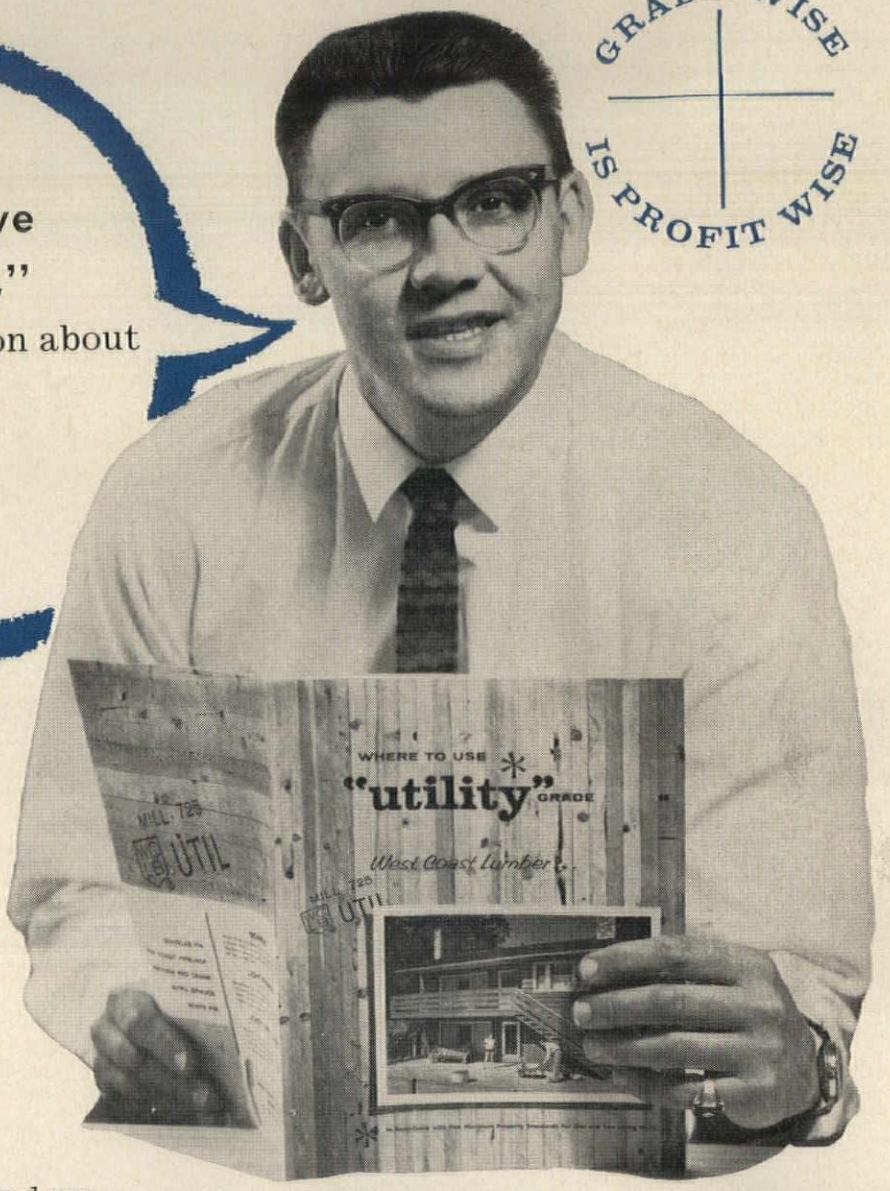
SARCOTHERM CONTROLS

Sarcotherm Controls, Inc., an affiliate of Sarco Company, Inc.

635 Madison Avenue, New York 22, N. Y. • Plant: Bethlehem, Pa.

GRADE WISE IS PROFIT WISE

"Easiest Way to Save Money I Ever Saw," says Donald Eilertson about "Utility" grade West Coast framing lumber.*



"It's good management to specify and use Utility grade framing lumber," says Builder Donald Eilertson. "By taking advantage of the economies offered by Utility dimension and boards, I save a minimum of $200.00 on every house job and maintain my reputation for quality construction."

Here is another builder of distinctive homes who depends upon the consistent quality of West Coast "Utility" grade lumber for a profit. You, too, will find "Utility" grade saves money in applications such as these:

Douglas Fir		West Coast Hemlock	
		30 lb. live load*	40 lb. live load†
* Floor Joists			
2x6	16" o.c.	7'-2"	6'-4"
2x8	16" o.c.	10'-8"	9'-6"
2x10	16" o.c.	14'-8"	13'-0"
2x12	16" o.c.	17'-0"	15'-4"

*sleeping rooms only
†other than sleeping rooms

Other specific applications for "Utility" grade: rafters for light roofing*, flat roof joists*, ceiling joists*, floor joists* and boards* for sheathing, sub-floors and solid roof boarding.

***** *When used in accordance with FHA Minimum Property Standards for One and Two Living Units, FHA Bulletin No. 300.*

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Aetna Steel Products Corporation, 730 Fifth Avenue, New York 19.



CONTRACTOR: R. A. CIVITELLO COMPANY • ARCHITECT: LESTER J. A. JULIANELLE

70-foot-long smoke screen-stairwell enclosure shown above, Aetna Steel delivered frame sections, doors and hardware within a week. No special engineering drawings or custom production were required.

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Please send free catalog of AETNAPAK custom-quality, in-stock steel doors, frames and hardware.

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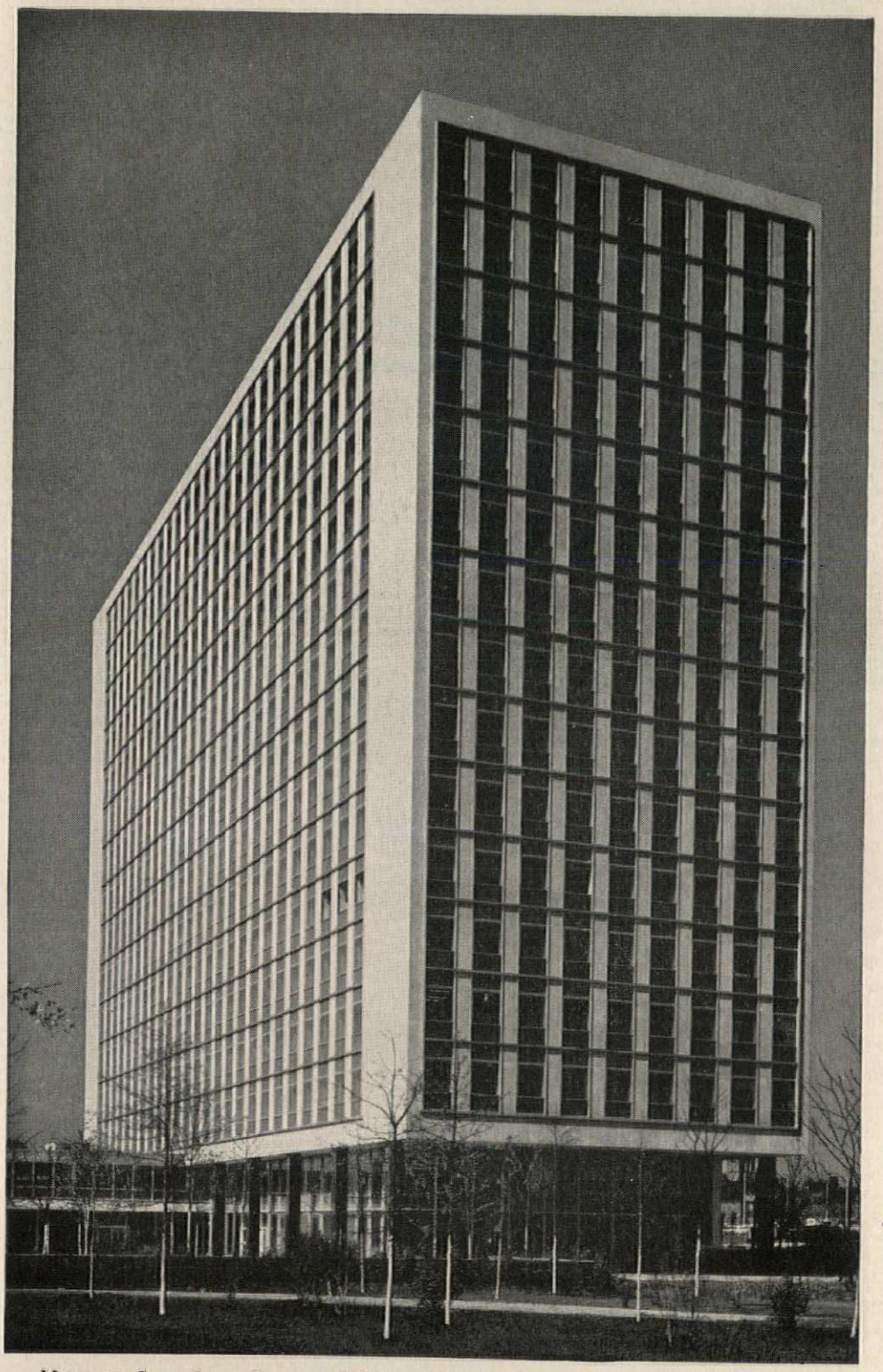
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Suspended Roof for New College Gymnasium



"Column-free on the inside" is the way the architect describes this exciting and wholly utilitarian structure. It is the Physical Education Building of the Central Washington College of Education, Ellensburg, Washington. It is 150 ft wide by 390 ft long and contains, among other things, a main gymnasium, upper gymnasium, field house, swimming pool, apparatus room, two four-wall handball courts, two classrooms, 14 offices and, locker rooms, dressing rooms, etc.

The suspended roof is actually floating, being slip-fastened to the exterior walls. There are twenty-eight 80-ft high prestressed concrete pylons. Each supports two pairs of 1-5/16 in. prestretched, galvanized bridge strands, which suspend the entire roof structure. The 56 cables, averaging 404 ft in length, were prestretched and accurately marked for all attachment points at Roebling's plant. This resulted in an easy, economical field erection procedure.



Spectacular new Health and Physical Education Building, Central Washington College of Education at Ellensburg, Washington.
Architect: Ralph Burkhard, A.I.A., Seattle
Structural Engineers: Anderson, Birkeland, Anderson, Tacoma
General Contractor: Earley Construction Company, Tacoma
Prestressed Concrete Fabricator: Concrete Technology Corp., Tacoma

Its 99,500 sq ft of floor space cost $14.15 per sq ft, including architect's fee and 4% sales tax, which is below average for a building of this size.

These basic details are indicative of the wide and varied benefits common to all suspended roof structures. Airline terminals and hangars, plants, gymnasiums, civic auditoriums – all are enjoying the free space afforded by suspended roofs.

Roebling's great experience with steel in tension leads naturally to its active role in the suspended roof field. Our findings, theories and interest in its every phase are offered to you at any time. Should you wish further details on this particular structure, or information of any nature dealing with suspended roofs, please do not hesitate to write Roebling's Bridge Division, Trenton 2, New Jersey.

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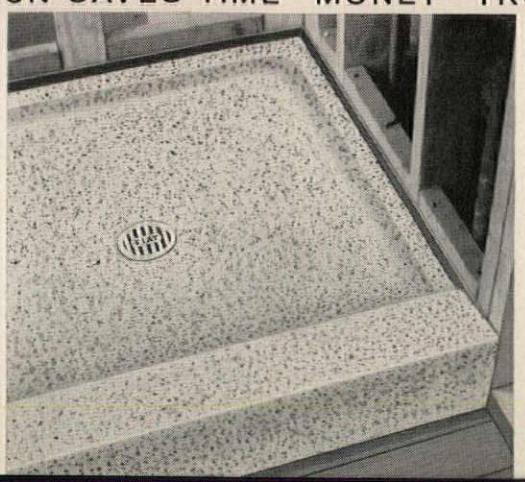
The one-piece, PreCast terrazzo slab simply slides into place. Caulk the drain . . . just one connection . . . and there you are. Since there are no joints to open . . . no possibility of the floor leaking . . . there is nothing to create call backs.

It's a one-trade installation . . . a simple plumbing job . . . so you cut costs substantially. Yet, the black and white marble chips set in the pure white cement of the terrazzo floor proclaim the fine quality of the installation.

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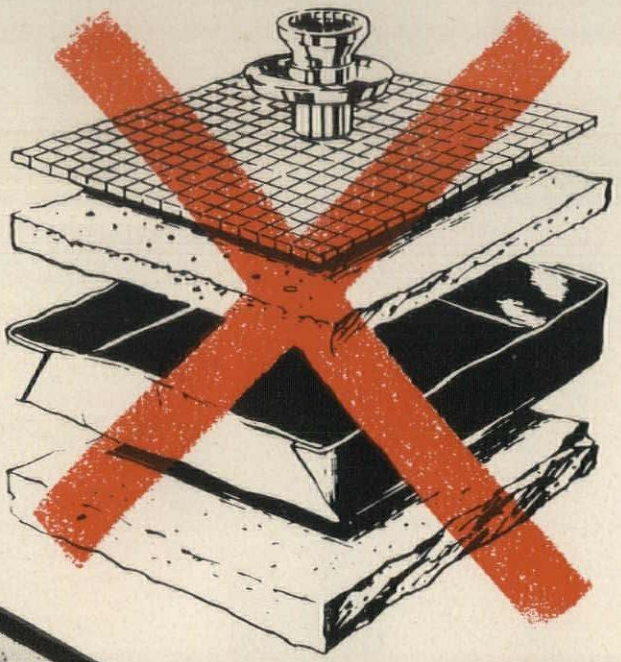
EASE OF INSTALLATION SAVES TIME—MONEY—TROUBLE







. . . and forget it!



And Forget This Too! This nightmare-sandwich of piecemeal construction not only takes three trades to install but invites future trouble . . . call backs that can sour the sale. Fiat PreCast Terrazzo Floors out-date this method . . . save trouble, expense, headaches!



This sparkling Fiat PreCast Terrazzo Shower Floor includes integral threshold and curb in a single unit. Eliminates threshold construction, the most expensive step in building showers. Guarantees a perfect floor.

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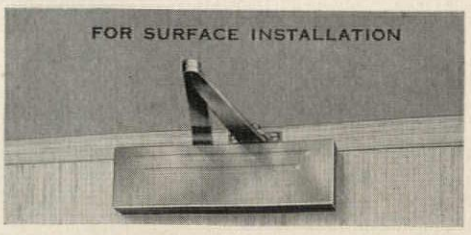
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See Sweets File for additional information.





The main corridor of a Fred Harvey Oasis Restaurant on Tri-State tollway near Chicago, illustrating a dramatic ceiling treatment possible with Steeldome construction. The exposed concrete waffle ribs are painted charcoal gray, sounding a new note in decor motif.

Architect & Engineer:
Pace Associates.
General Contractor:
Ragnar Benson, Inc.

A NEW WORLD OF DECOR OPPORTUNITY IN CONCRETE JOIST CONSTRUCTION

Ceco Steeldomes Make Possible Unusual Ceiling Treatments . . . Provide Wide Open Spaces

In many an architect's office, you'll hear talk about the exciting new effects in ceiling ornamentation now possible with Ceco Steeldomes. Not only are architects talking . . . they are *using* Steeldomes to take advantage of this new world of decor in concrete joist construction. Reason: Steeldomes create smooth surfaces in the concrete ceiling, giving an unblemished, high quality finish, because they are removed by compressed air. The decorative treatment can be applied directly to the exposed waffle ceiling. Steeldomes offer other advantages, such as wide column spacings, the rigidity of monolithic concrete, and economy. Ceco Steel Products Corporation. Sales offices, warehouses and fabricating plants in principal cities. General offices: 5601 West 26th Street, Chicago 50, Illinois. Write for full particulars pertaining to Steeldome construction.

CECO STEEL

IN CONSTRUCTION PRODUCTS CECO ENGINEERING MAKES THE BIG DIFFERENCE

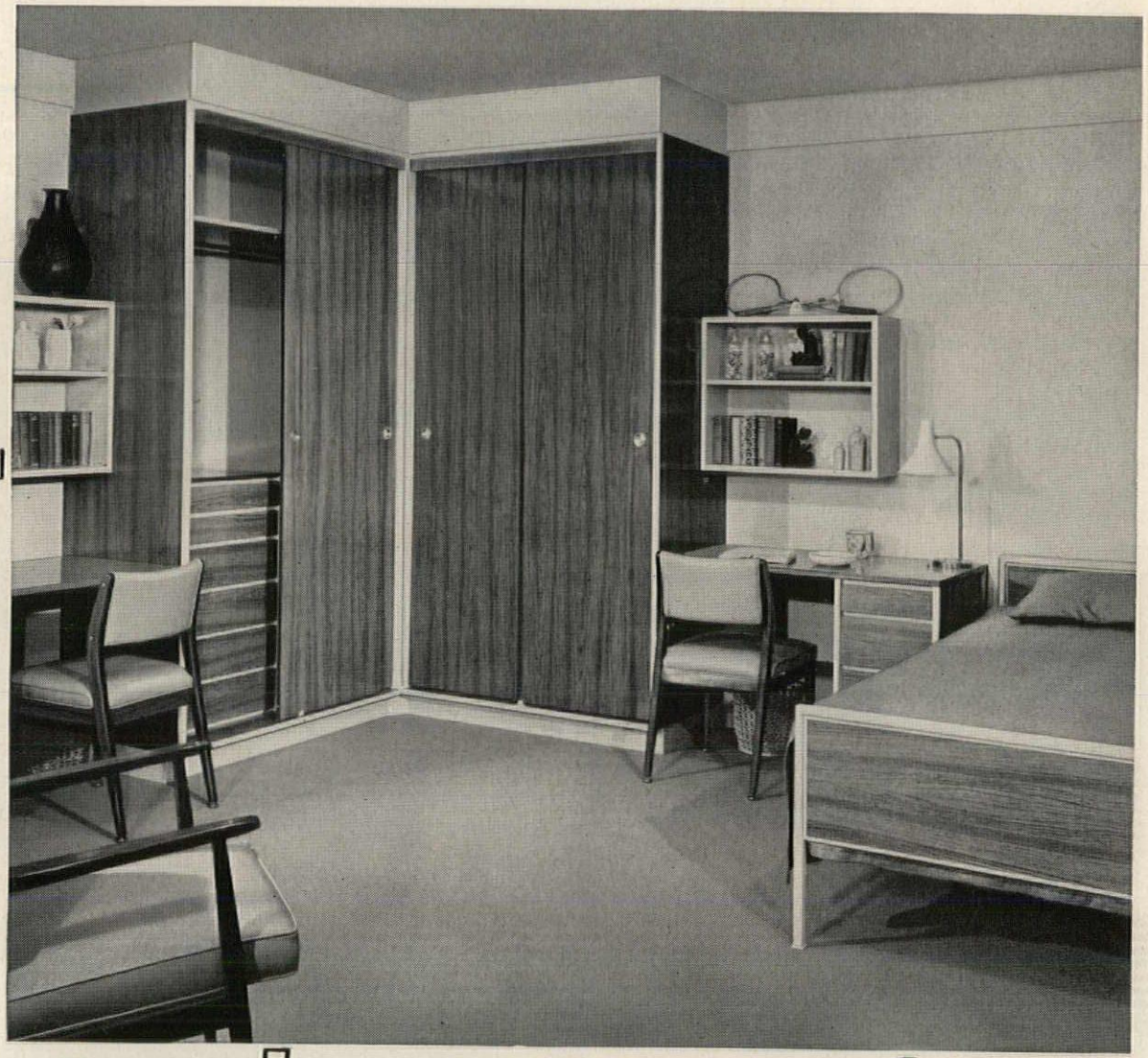
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these Dorm Line built-in wardrobes



Student high spirits meet their match in these sturdy, steel-framed Dorm Line wardrobes. They're built especially to resist rough usage. The sliding doors withstand 1500-lb. strength tests—guide channels will not twist or bend; screws will not pull out; doors can't get off the tracks when bumped or jarred.

Dorm Line built-in wardrobes safeguard your investment in other ways, too. They are easier and less expensive to install because they come as complete units that fit room plans. They stay new looking—their faces are birch or natural Novoply, sealed and lacquered. You can have them in various finishes...or painted in a choice of colors.

In addition to wardrobes, Simmons Dorm Line includes desks, bookshelves, chairs, chests and beds—all handsomely styled and built for carefree maintenance. Write us for literature... and see Dorm Line furniture soon.

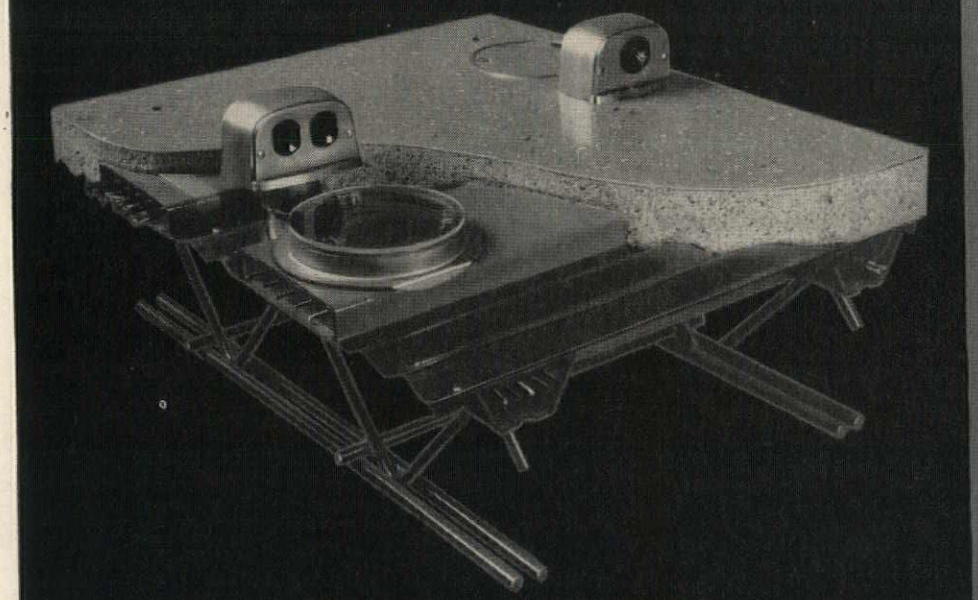
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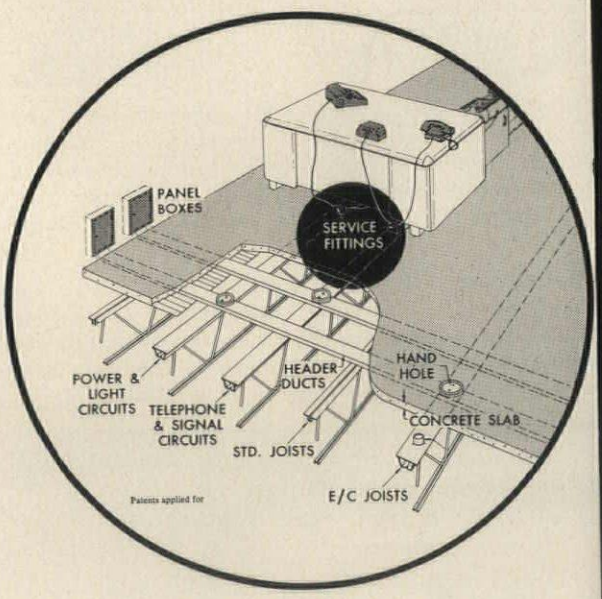
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Whenever desks are moved, electrical outlets can be installed anywhere along the E/C Joists to service the new positions. Electrical, telephone and signal wires are run down through the floor at the service fittings, through the top chord of the E/C Joist, into the header ducts and on to the service panel boxes.



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When a method of construction offers quality at a cost lower than any competing system, that's a combination hard to beat. Add to that — practicality plus design that satisfies the future . . . then you can specify with confidence. Such is Ceco's E/C Joist system of underfloor electrification. Savings are realized because Ceco's E/C Joists do two jobs: 1 — provide raceways for underfloor electrification; 2 — carry the floor load. Now any building "can afford" underfloor electrification. On your next job specify the Ceco E/C Joist system. Send for the facts now. Mail the handy coupon today. Ceco Steel Products Corporation. Sales offices, warehouses and fabricating plants in principal cities. General offices: 5601 West 26th Street, Chicago 50, Illinois.

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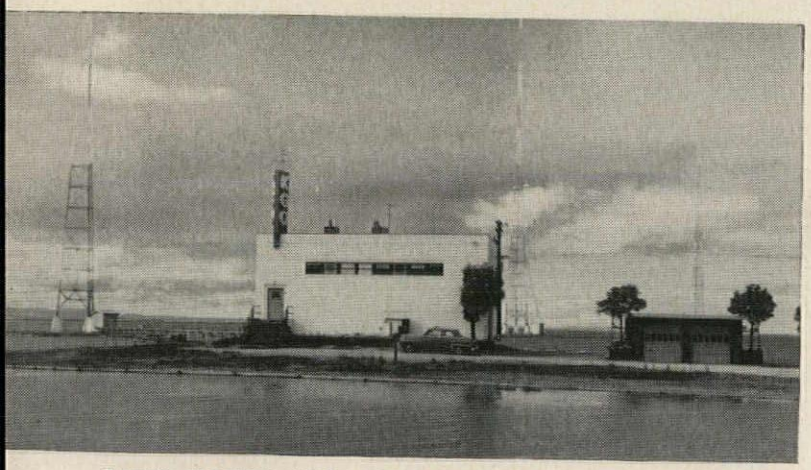
Many of your clients' businesses include the saving of lives in operating rooms, broadcasting of essential information and keeping communication lines open in a crisis.

This is why it's no longer a question of "is standby power needed?" It's "what kind of standby power is needed?" And whenever you recommend and specify Caterpillar Electric Sets, you assure your clients of dependable emergency power, and insure them against loss of production time, loss of selling time or even, in the case of hospitals, loss of life.

To get the answers on the most suitable type of emergency power for every building you design, see your Caterpillar Dealer or write to Engine Division, Caterpillar Tractor Co., Peoria, Illinois. The right Caterpillar Electric Set can be recommended to insure all types of buildings—and businesses—against electric power failure.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.



RADIO STATION KGO—This key station of the American Broadcasting System network at Newark, California, is located at east end of Dumbarton bridge across the bay from San Francisco. The station is powered 100 per cent by a Caterpillar Electric Set during emergencies, including the CAA lights on towers.

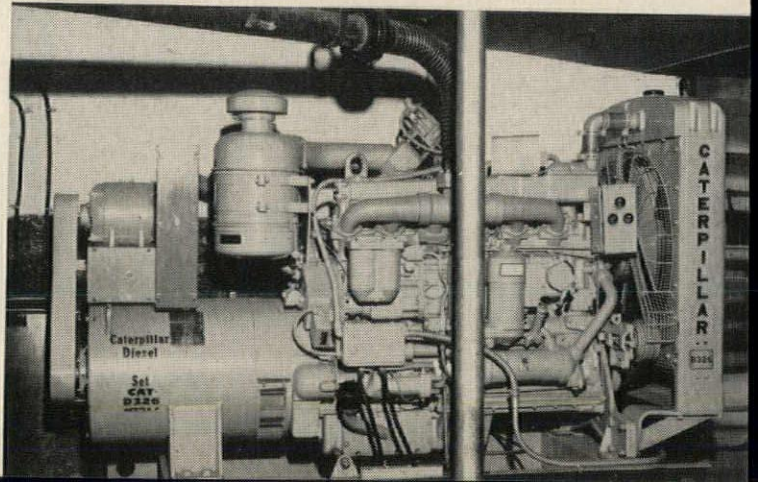


TELEPHONE EXCHANGE—General Telephone Company of Florida (Sarasota) uses Cat Electric Sets for standby power. Exchange has 30,000 dial telephones. Long distance facilities are provided by a 48-position toll board. Out-of-town connections are made through 120 microwave circuits as well as underground cables.

ST. JOSEPH'S HOSPITAL in Elgin, Illinois. A Caterpillar Electric Set furnishes emergency power for the entire hospital consisting of 153 beds, 5 operating rooms, elevators and the residence for the nurses. Hospital has had several power failures since emergency unit was installed.



This CATERPILLAR D326 ELECTRIC SET is equipped with automatic start-stop controls, so that when power fails, it assumes the load in 4 to 8 seconds. Caterpillar Diesels operate on widely available types of diesel fuel whose low combustion factor makes them a desirable safety factor, particularly in hospitals.



Medical Professional Building, San Antonio, Texas. Architects: Marmon & Mok, Jerry Rogers; Contractors: Harwell & Harwell.



THE UNUSUAL IS THE USUAL IN CECO CURTAINWALLS

. . . ENGINEERED FOR PERFECTION IN PERFORMANCE



Bloomfield Junior High School, Bloomfield Hills, Michigan. Architect: Smith, Tarapata, McMahon; Contractor: Pulte-Strang.

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Basic engineering principles developed through technical research on the job and in the laboratory provide these assurances: (1) mullions designed to meet wind loads . . . (2) proper allowance for expansion and contraction, permitting windows and caulking to move together to ensure a tight weather-seal . . . (3) no accumulative expansion of wall panels . . . (4) firm anchorage of the wall to the skeleton of the structure.

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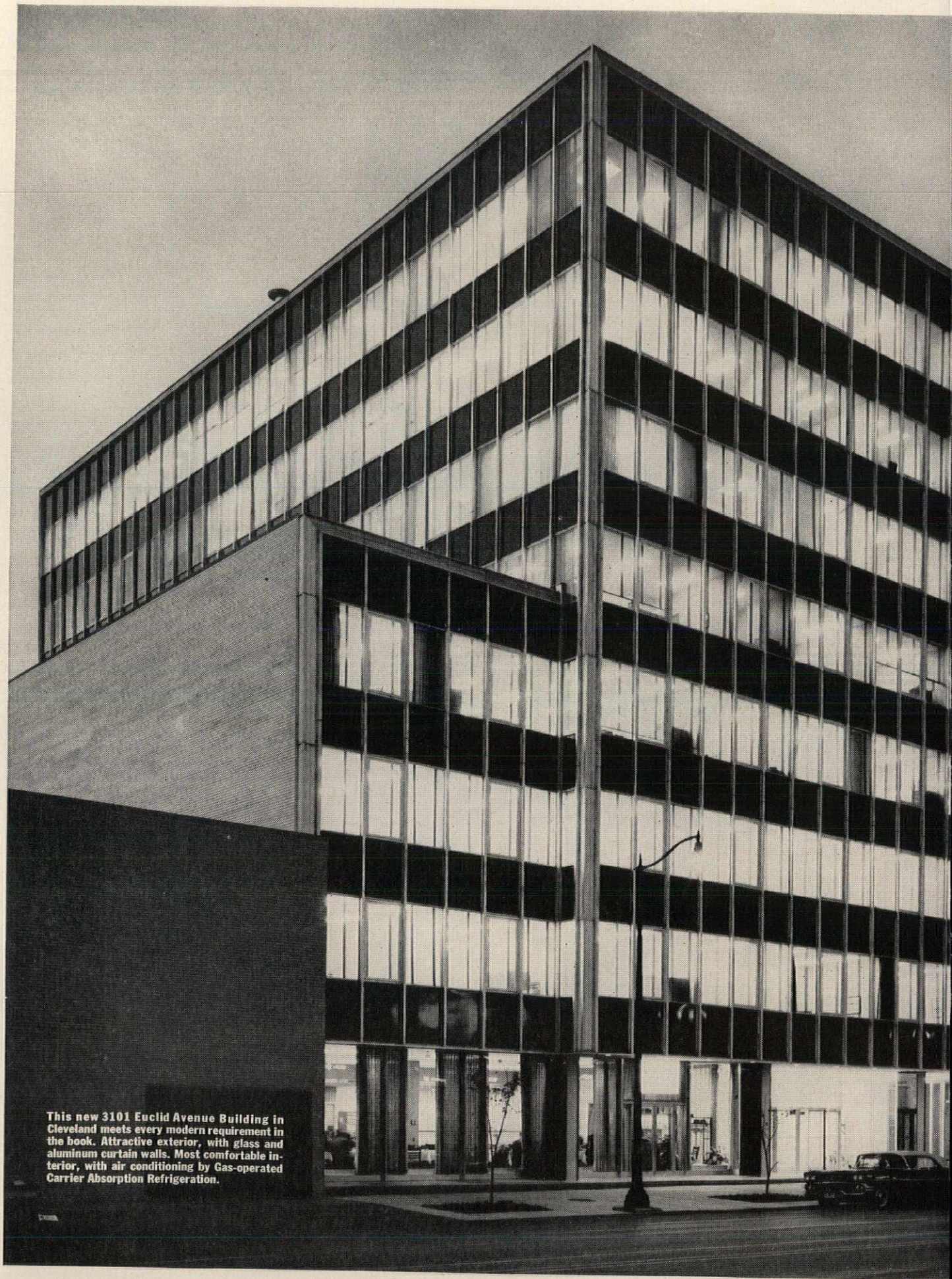
☐ Please mail me Ceco's 1960 Curtainwall Manual No. 1069-D.

name_____

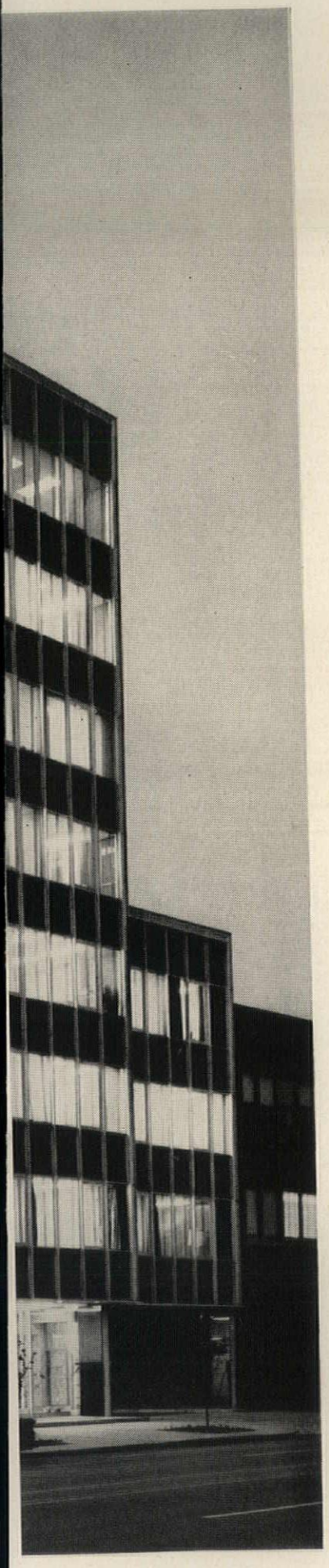
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street_____

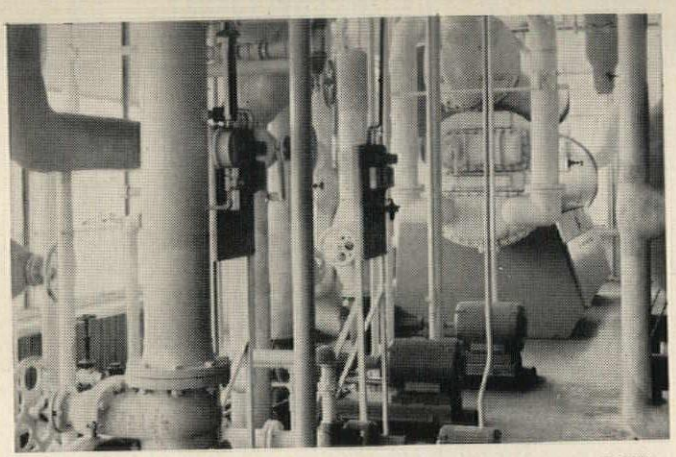
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This new 3101 Euclid Avenue Building in Cleveland meets every modern requirement in the book. Attractive exterior, with glass and aluminum curtain walls. Most comfortable interior, with air conditioning by Gas-operated Carrier Absorption Refrigeration.



Attracts tenants with comfort cooling by GAS-operated CARRIER Absorption Refrigeration



AIR CONDITIONING PENTHOUSE. This equipment in penthouse atop the building includes two gas-fired Bryant boilers, 300-ton capacity Carrier Absorption unit to chill water for the Carrier Weathermaster air conditioning system, and Carrier cooling towers, too. Roof-top installation frees basement area for other uses.

H. L. Vokes Company of Cleveland, designers and builders of the new 3101 Euclid Avenue Building in that city, are experts in two-way satisfaction. They satisfied their tenants and their own cost requirements with one of the most efficient types of modern air conditioning– Gas-operated Carrier Absorption Refrigeration.

Comfort cooling in this building starts at the same two gas-fired boilers that furnish heat in winter. The Carrier absorption unit uses low pressure steam from the boilers as the energy source for water chilling. Thus, no prime mover is needed. Boiler capacity is put to use on a year 'round basis. And thrifty gas keeps fuel costs low.

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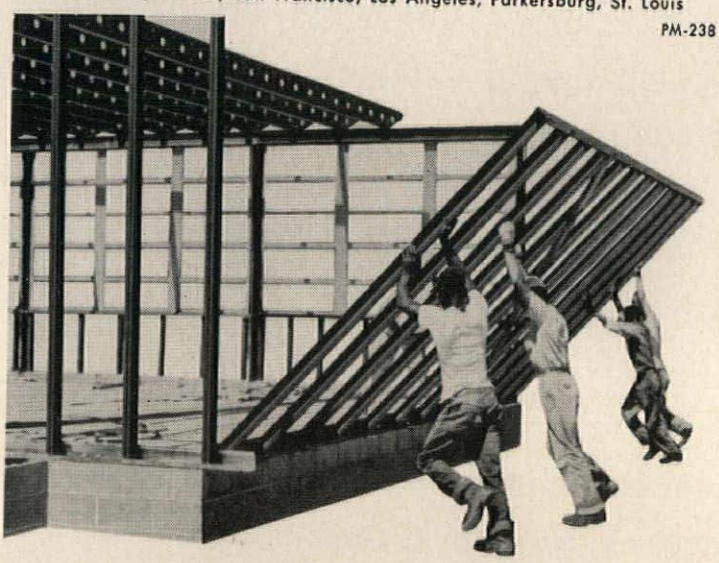
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or, if you prefer, write direct to Penn Metal Company at the address below. Catalog SS-33, shown at left, details the many advantages of the system, gives specifications, dimensions, physical and structural properties, and uniform loads for various components.

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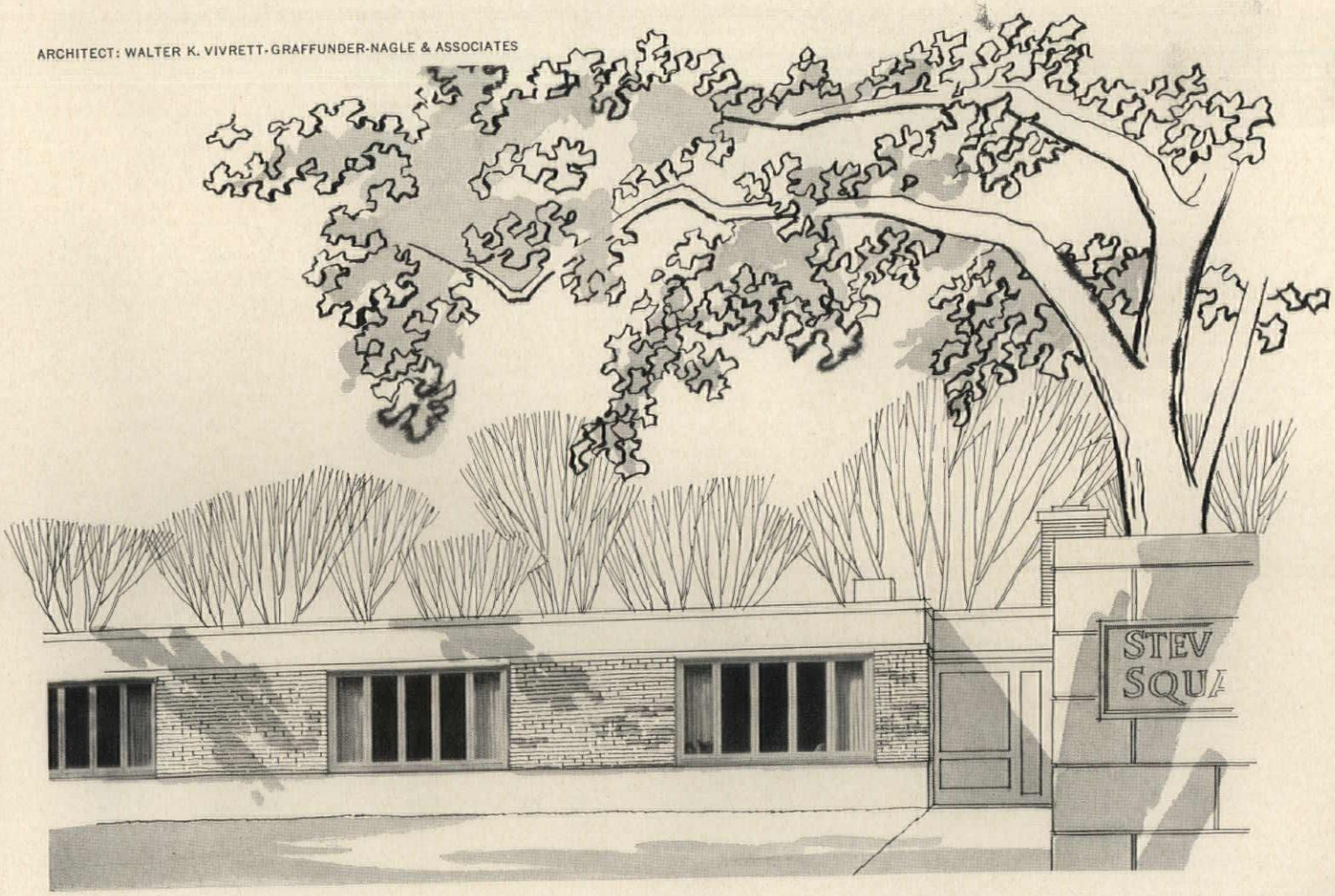
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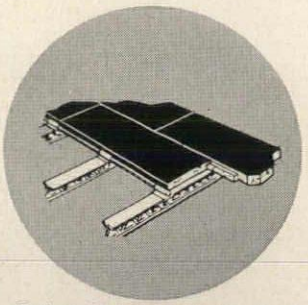
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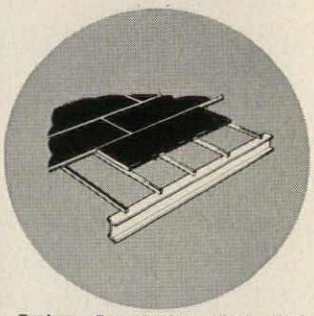


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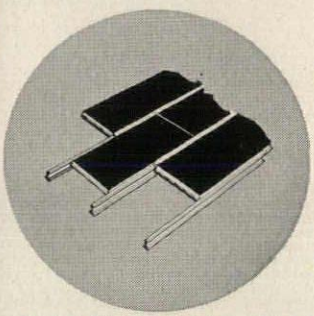




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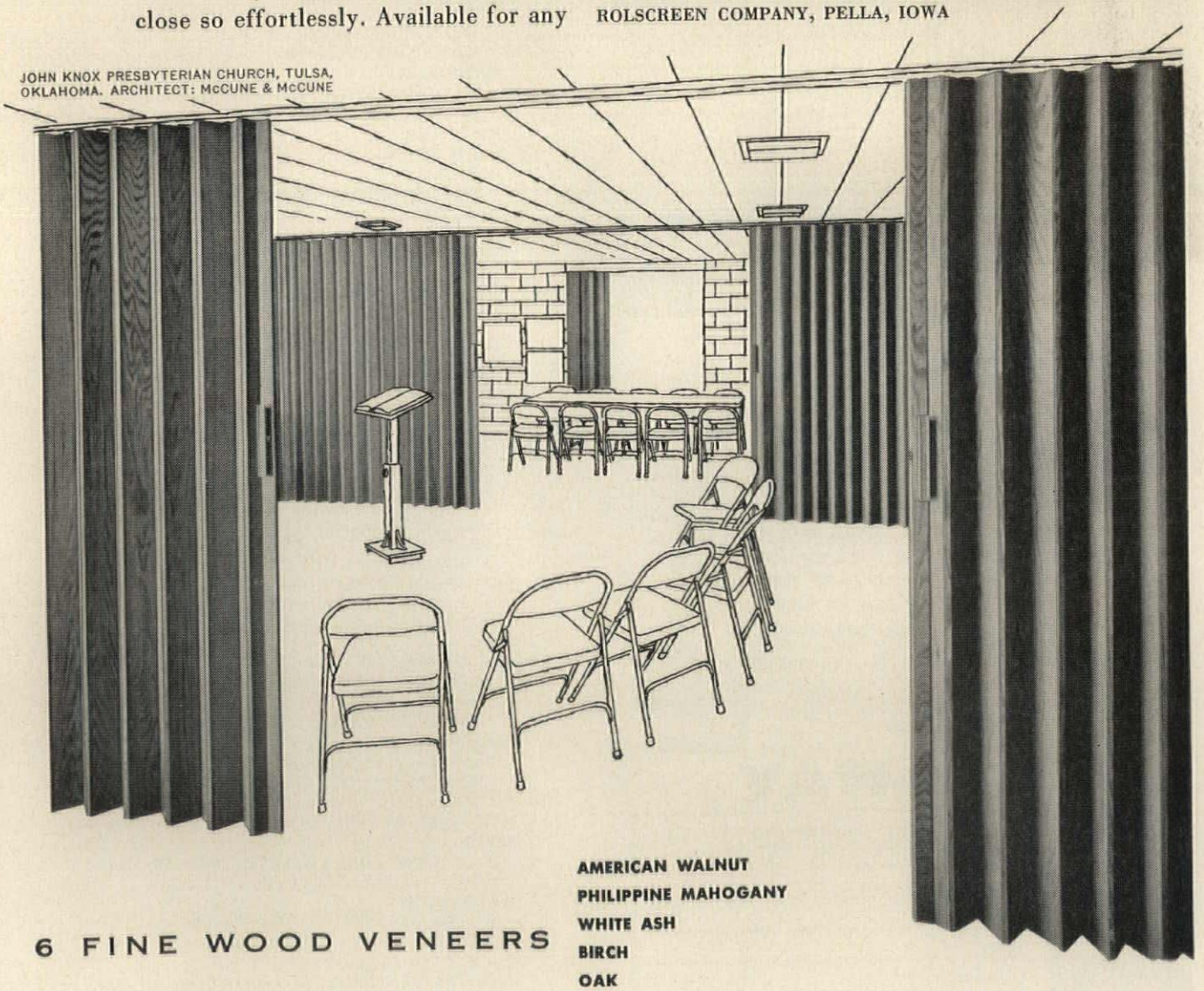
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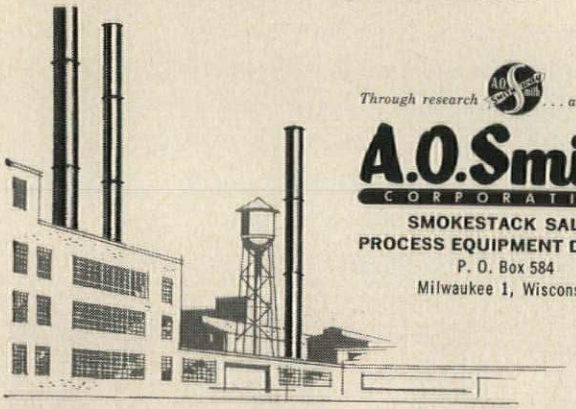
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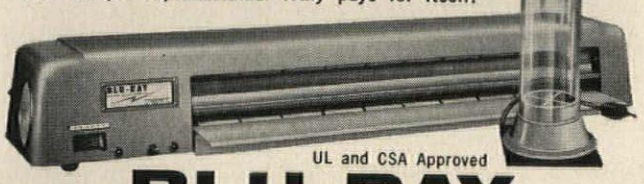
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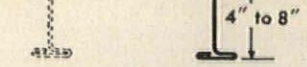
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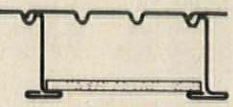
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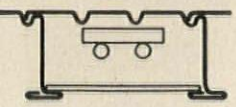


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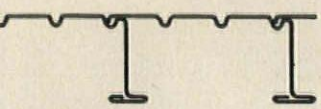
g Treatments with T-Steel Deck



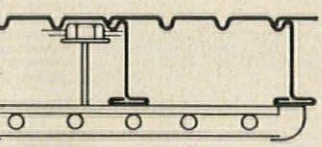
Standard Tile or Board



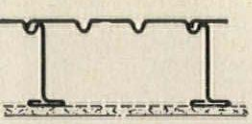
Corrugated Diffuser



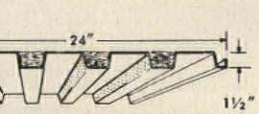
posed (Underside painted for
increased reflection)



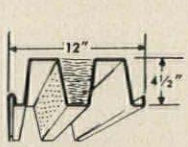
Surface-mounted Fixture



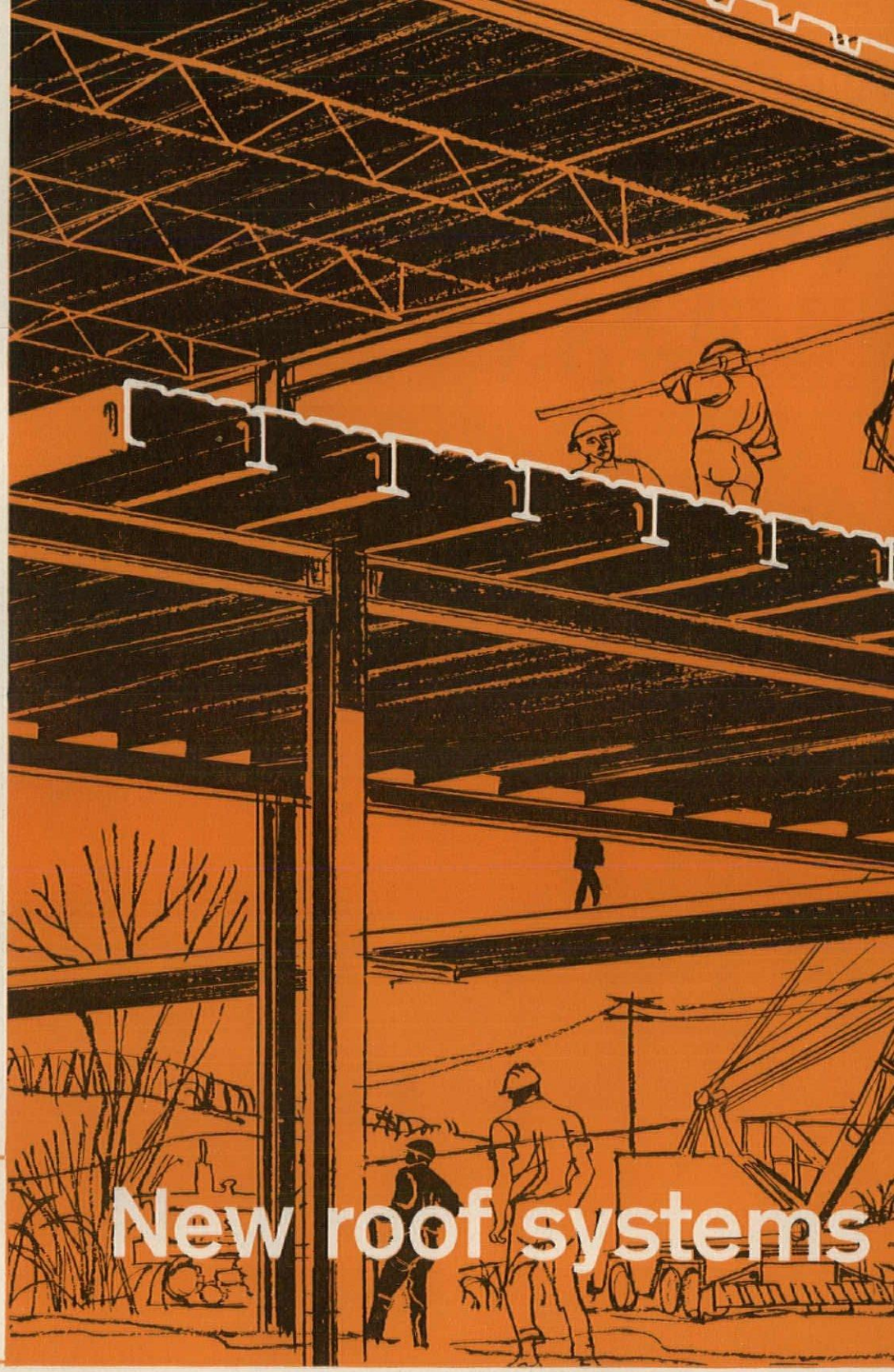
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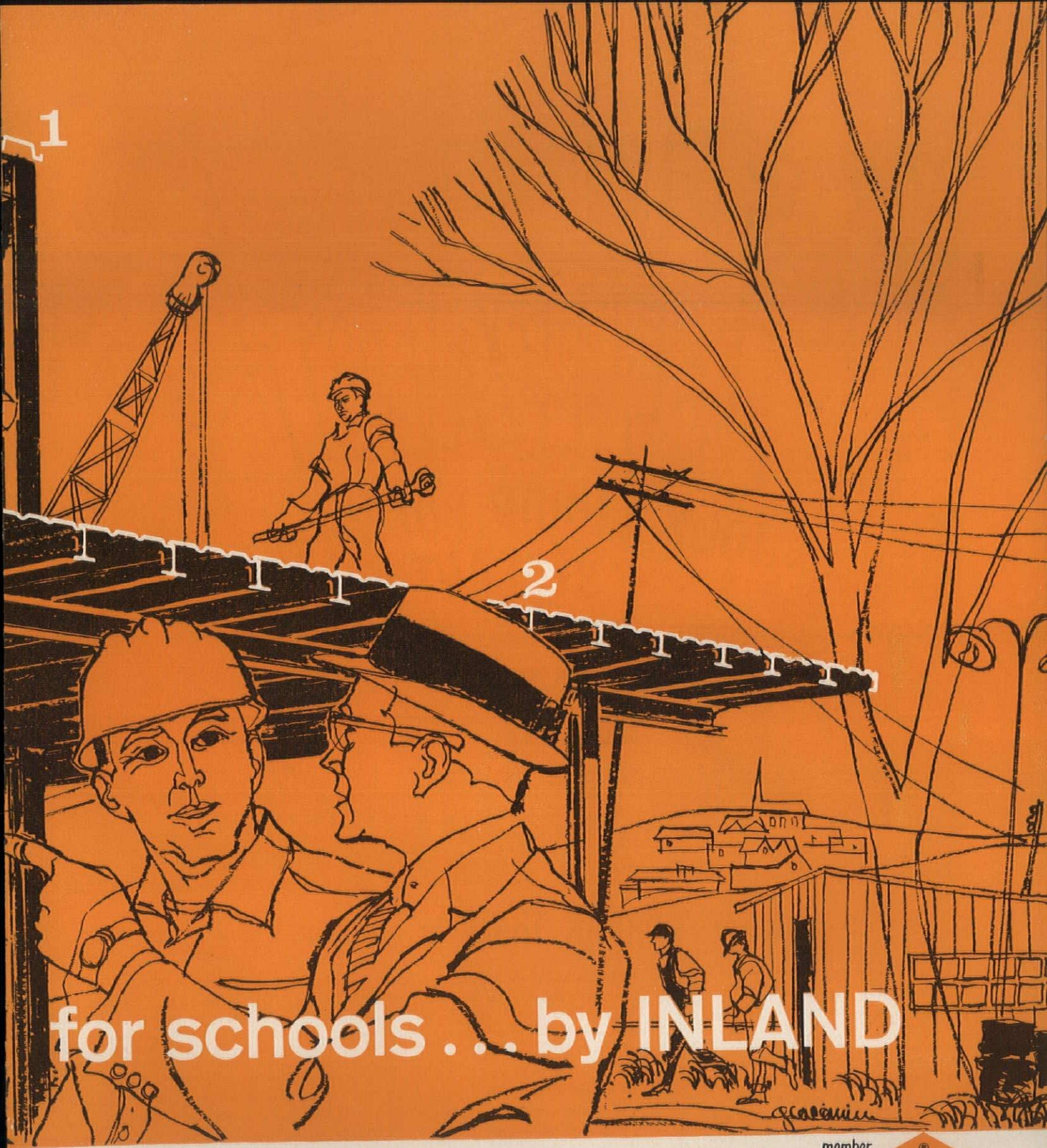
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You can provide practically any acoustical treatment — T-Steel permits installation of acoustical tile at an economy no other roof system can match. You can provide a flush, luminous ceiling — or you can leave the underside of T-Steel exposed and painted.

T-Steel deck provides a superior diaphragm to resist seismic and wind thrusts . . . as proved by full-scale shear tests conducted by independent engineering firms.

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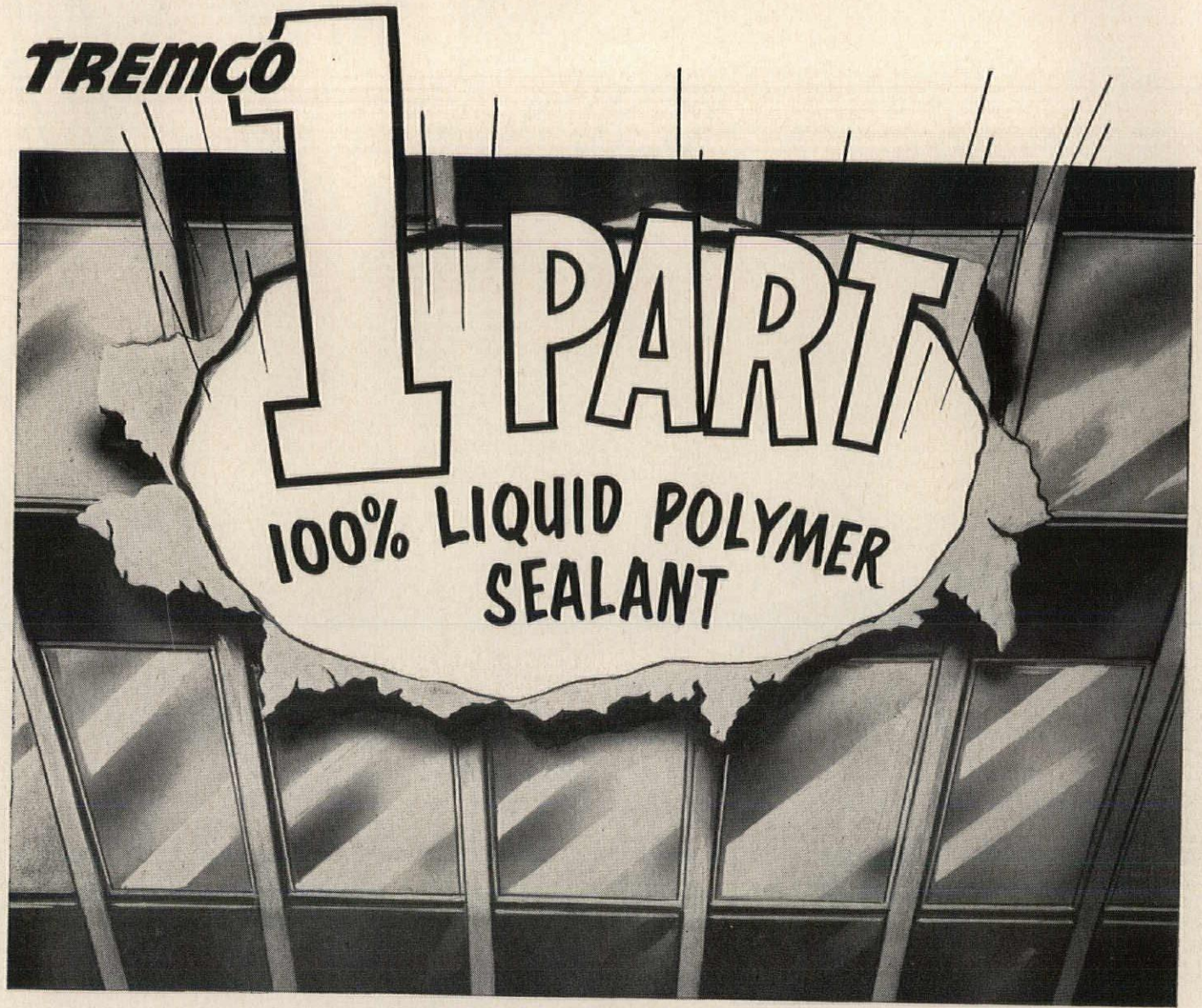
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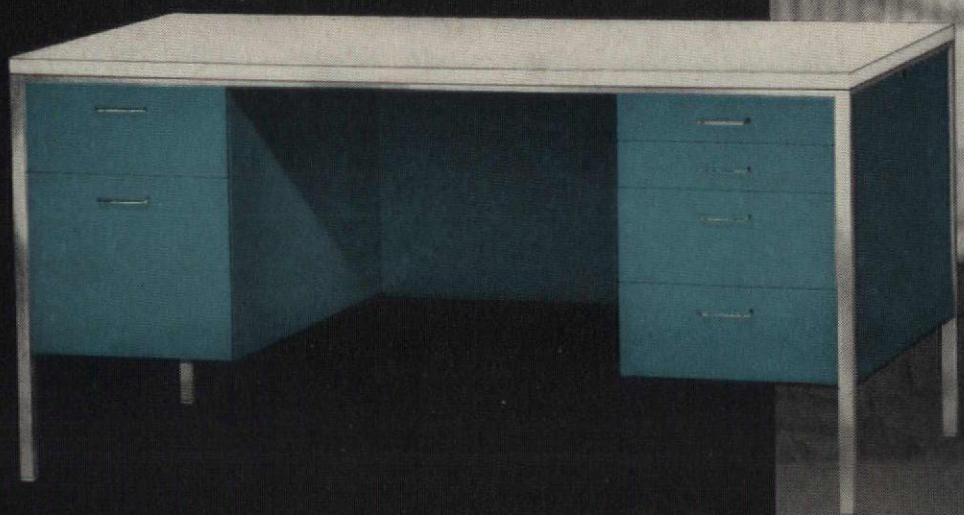
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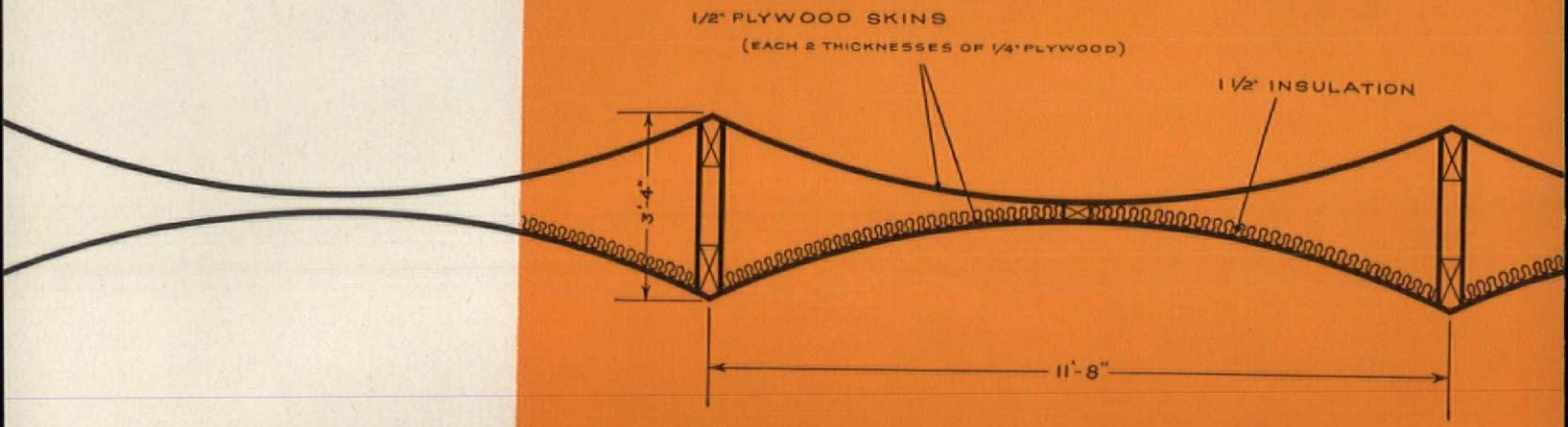
you asked for it. . .

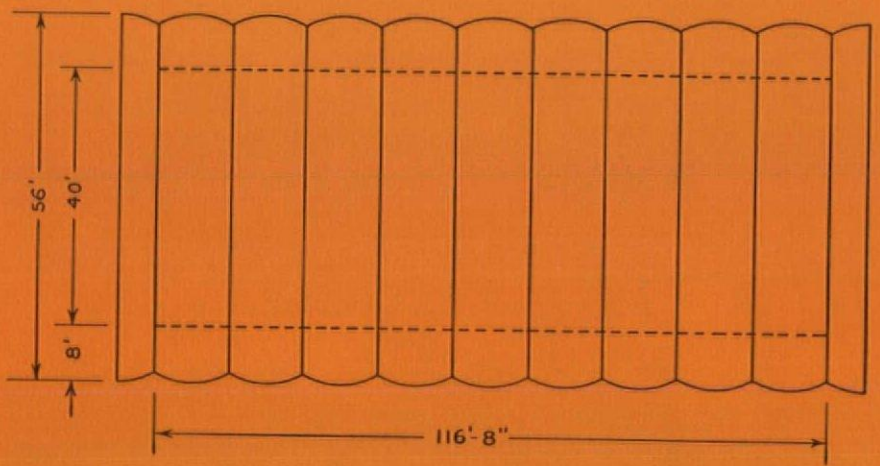
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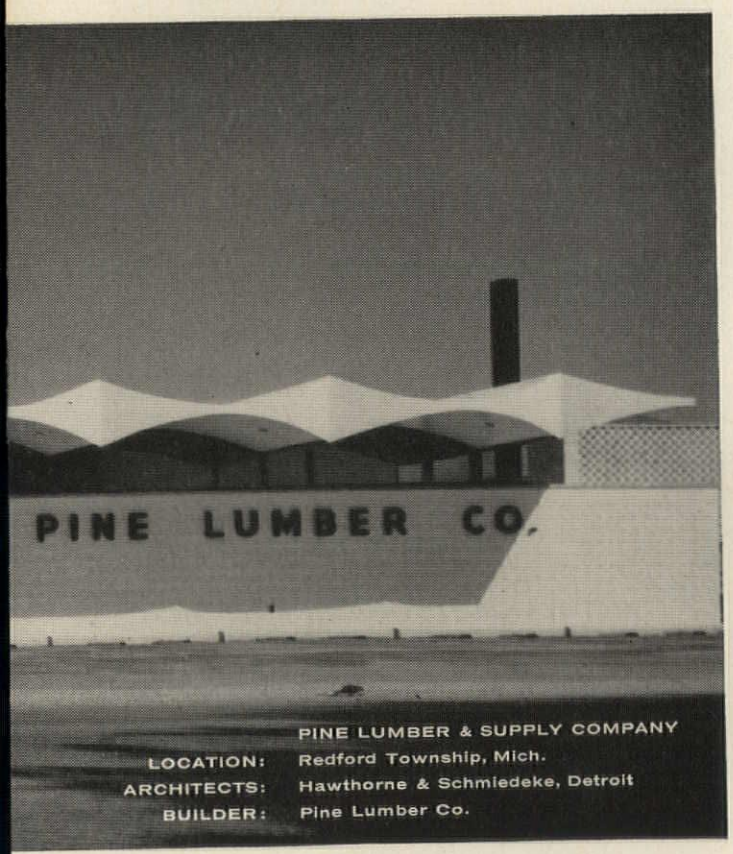
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1 1/2" INSULATION
3'-4"
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40'
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116'-8"



new approaches to structural design with fir plywood



PINE LUMBER & SUPPLY COMPANY
LOCATION: Redford Township, Mich.
ARCHITECTS: Hawthorne & Schmiedeke, Detroit
BUILDER: Pine Lumber Co.

THE AWARD-WINNING DESIGN of this retail lumber showroom is another example of the striking new architectural forms possible with fir plywood, at no sacrifice—in fact, with a gain—in structural strength and integrity.

The rippling roofline was created by a series of doubly concave plywood barrel vaults. It demonstrates the major advantages of the plywood vault for non-residential as well as home construction: design flexibility, a strong rigid roof, and economy in time and materials, due to plywood's high strength-weight ratio and extreme workability.

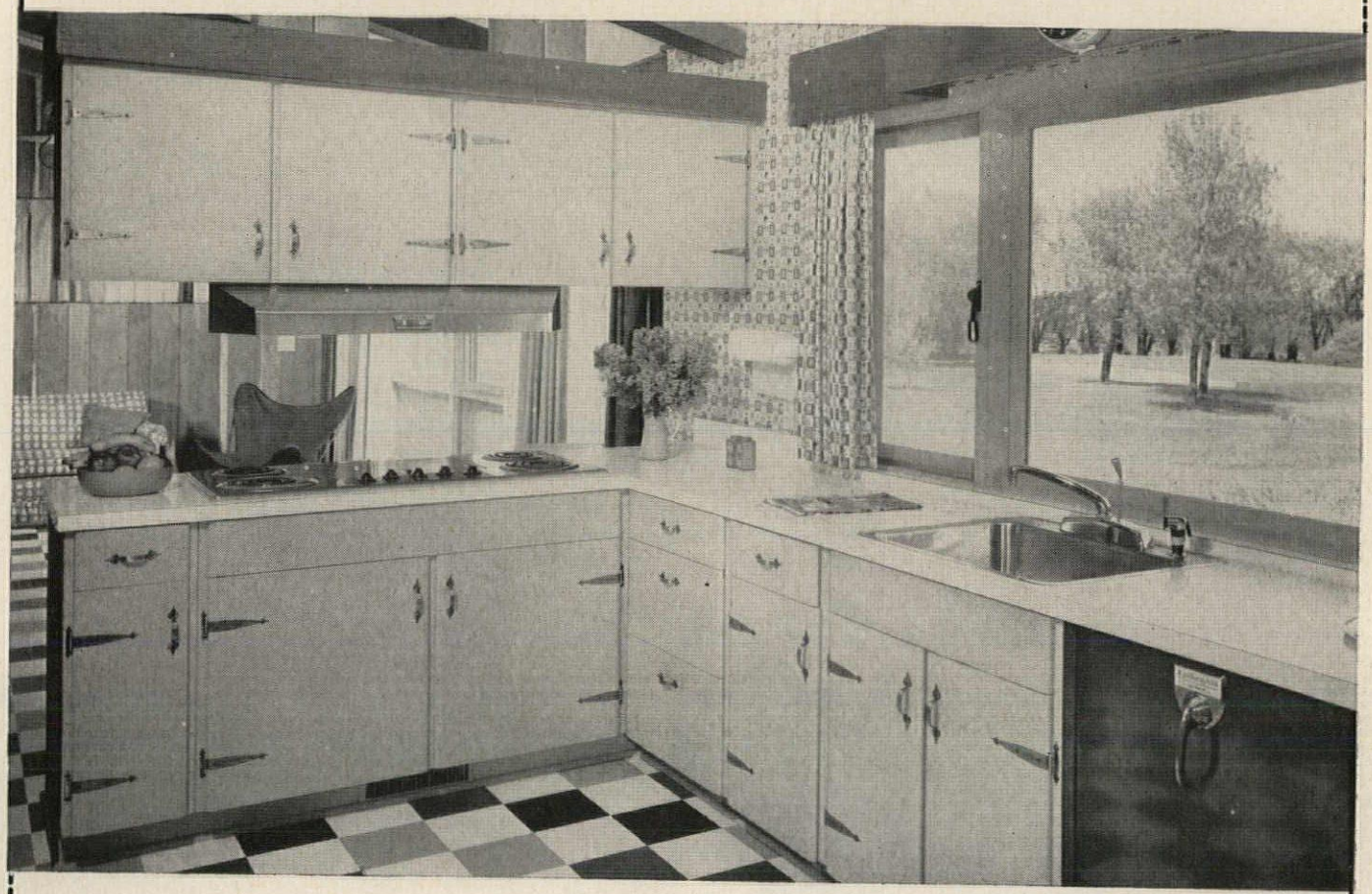
These vaults are of modified stressed skin construction, with plywood glue-stapled at edges to plywood box beams and, at mid-arc, to a continuous 2 x 4. The system provides large clear floor areas which, together with extensive use of glass for exterior walls, contribute to the remarkably light, open look.

The delicately scalloped silhouette is given a third dimension by a sheet metal fascia that caps the vault ends and bows out in plan to repeat the curve of the arches. For basic fir plywood design data, write (USA only), Douglas Fir Plywood Assn., Tacoma 2, Wash.

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There are over 100 different types and sizes of BILT-WELL Cabinets precision manufactured in 3″ modular units from 12″ to 48″ widths. There are door and drawer units to provide the right cabinet for every storage need... every floor plan.

Available with a choice of warm Ponderosa Pine or elegant Birch door and drawer fronts, BILT-WELL Cabinets can be easily stained, varnished, lacquered or enameled to match any decorating scheme.

THE BILT-WELL LINE

WINDOW UNITS, Double-hung, Awning, Casement, Basement. CABINETS, Kitchen, Multiple-use, Wardrobe, Storage, Vanity-Lavatory. DOORS, Exterior, Interior, Screen and Combination.

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For ultimate design flexibility specify

BILT WELL WOOD WORK *by Caradco*

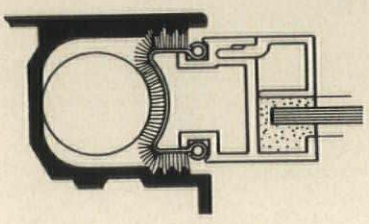
for complete catalog of non-residential aluminum windows and curtain walls, and name of Adlake representative nearest you, write The Adams & Westlake Company, Elkhart, Indiana.

double hung windows

that keep faith with tomorrow's generations, too

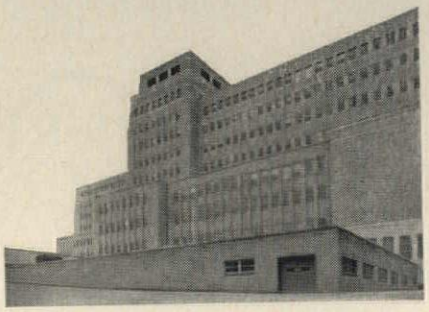
A+dlake

Adlake serrated guides penetrate into weatherstrip providing a perfect seal on all single and double hung windows. Adlake developed and pioneered use of woven-pile weatherstrip and patented serrated guides.



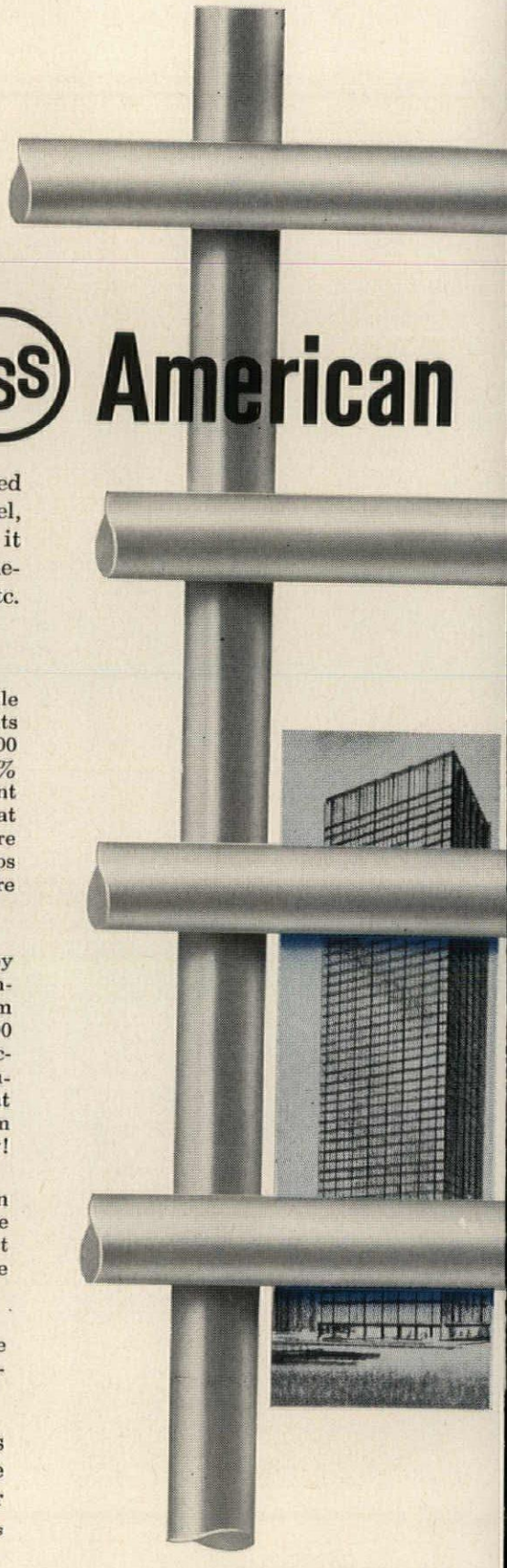
Elisha Ballantine Hall at Indiana University, Bloomington, Indiana has Adlake double hung windows.

Architects: A. M. Strauss & Assoc., Inc., Ft. Wayne, Ind.
General Contractors: Huber, Hunt & Nichols, Inc., Indianapolis, Ind.



It's new...
it's big...
it's strong...

extra-heavy 1/2 inch USS American



Welded Wire Fabric is now available with ½" diameter wires spaced as close as 2" on centers in both directions! These new areas of steel, plus the many time-tested advantages of Welded Wire Fabric, make it the ideal structural reinforcement for all types of construction—one-way slabs, two-way flat plates or flat slabs, walls, slabs on grade, etc.

Consider these advantages:

1. American Welded Wire Fabric is produced from cold-drawn high tensile steel wire. This wire is carefully produced to conform to the requirements of ASTM Specification A82-58T. The minimum tensile strength is 75,000 psi and the minimum yield point, as defined in this specification, is 80% of the tensile or 60,000 psi. Actually, cold-drawn steel wire has no yield point in the conventional sense—no sudden excessive elongation. This means that cold-drawn wire tends to resist stress practically throughout its entire strength range without revealing any sudden elongation such as develops in a typical hot-rolled bar. This physical advantage of cold-drawn wire makes it the ideal concrete reinforcement.

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3. American Welded Wire Fabric is prefabricated with greater accuracy than can normally be relied upon in field work. The wires may not vary more than ¼" center-to-center than the specified spacing. This assures correct placement and distribution of the steel. Also, the wires are drawn to the very close tolerance of 0.003".

4. American Welded Wire Fabric requires very little on-the-job tying. Large prefabricated sheets are shipped to the job and placed as a unit. This eliminates thousands of ties and results in important labor savings.

The representatives of American Steel & Wire will be pleased to discuss with you the many advantages and applications of Welded Wire Fabric. Just contact American Steel & Wire, Dept. 0199, 614 Superior Ave., N.W., Cleveland 13, Ohio. *USS and American are registered trademarks*

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Welded Wire Fabric
2"
1/2"
2"



SPRAYED "LIMPET" ASBESTOS has no "or equal." It is the *only* sprayed-on fire-proofing material with a four-hour rating for ½″ under a cellular deck—and for 1¾″ direct to beams. (Underwriters' Laboratories, Inc.) **SPRAYED "LIMPET" ASBESTOS** is 100% asbestos. It has more *approved* ratings than any other sprayed-on fire-proofing material. It achieves the best *approved* ratings with the least material. No adhesives. No multi-layer spraying or pressing. No equal in quality!



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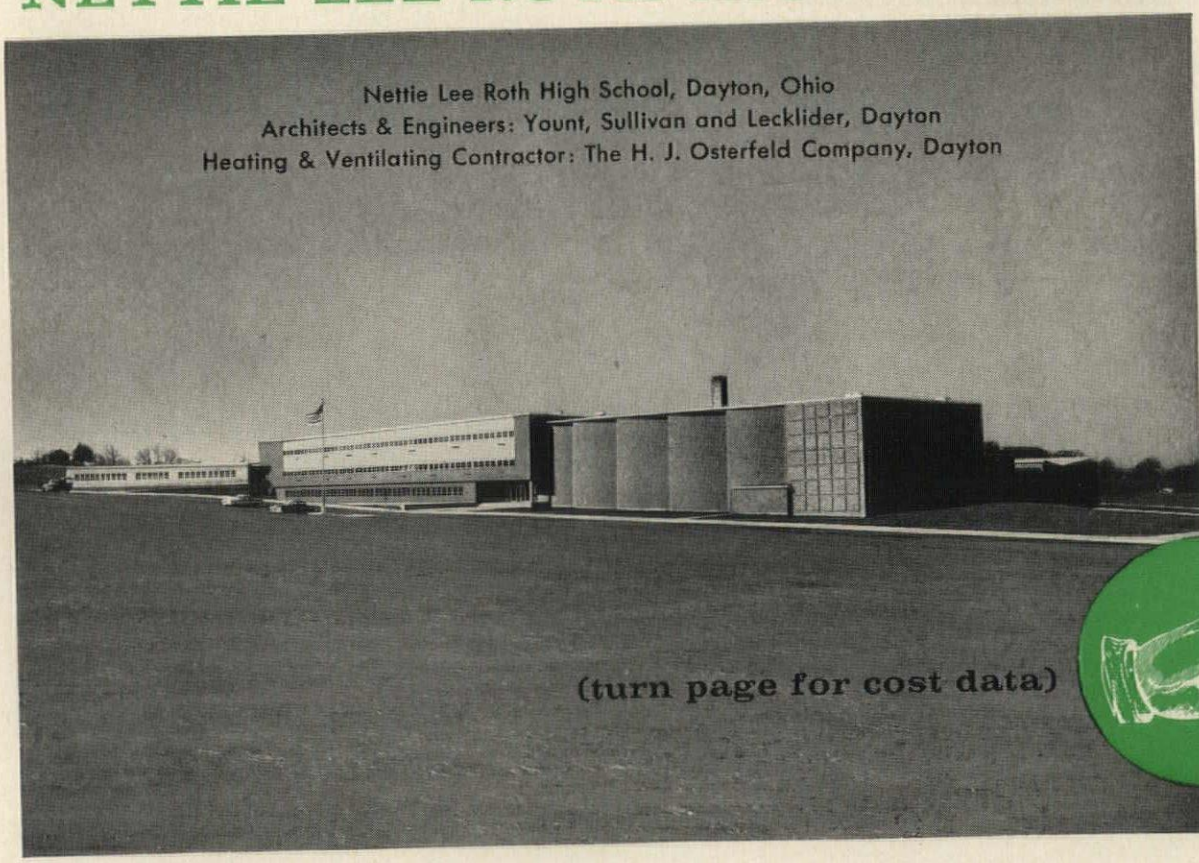
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463rd SCHOOL

selects herman nelson "now or later" air conditioning

NETTIE LEE ROTH HIGH SCHOOL



New architecturally styled *herman-cool III* offers:

OPTIONAL COLOR, OPTIONAL FUNCTION, OPTIONAL AIR CONDITIONING

and Nelson flexibility brings the cost within any school budget

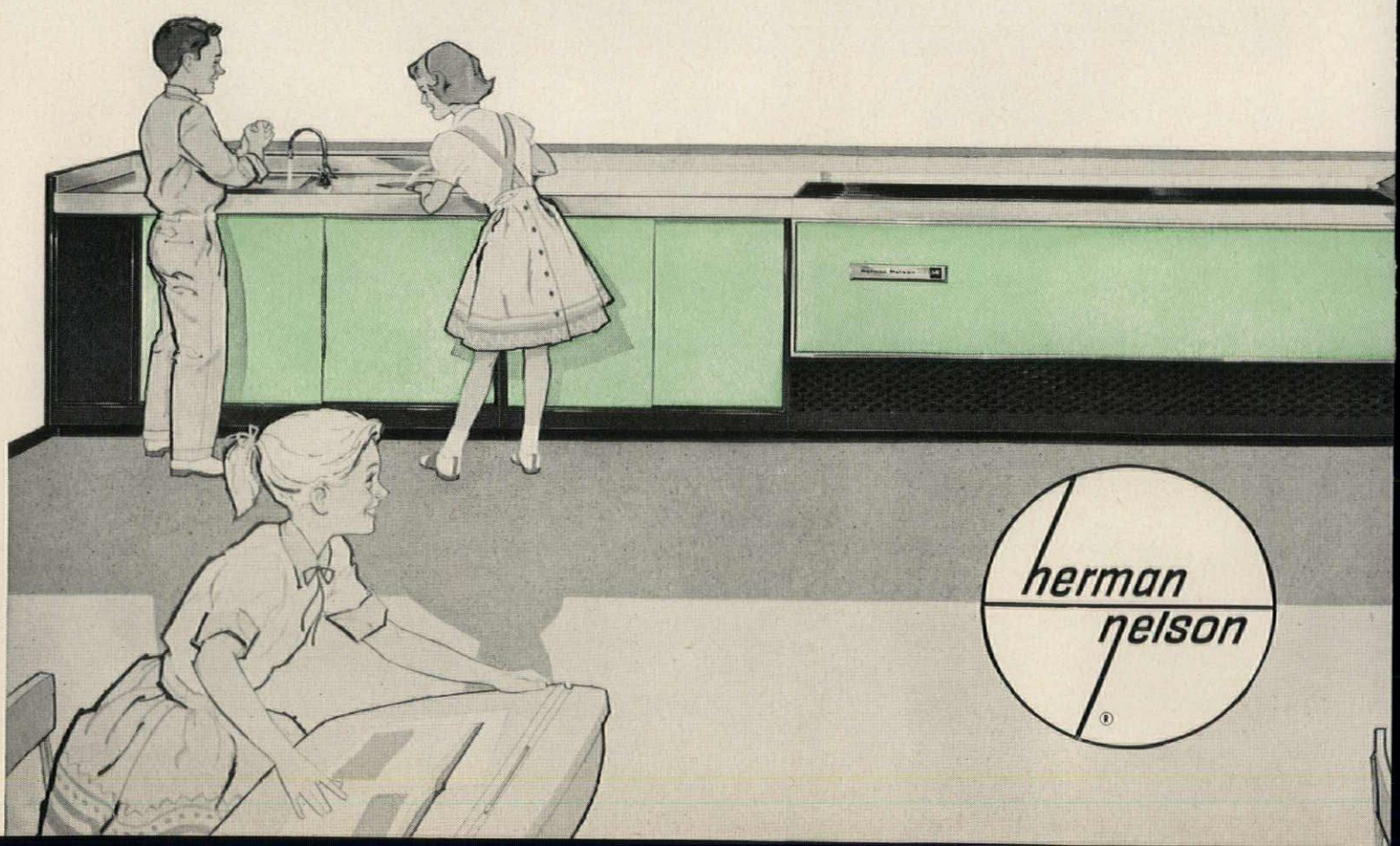
Herman Nelson—*the company that made air conditioning economically practical for schools by providing for it on an optional, "now or later" basis*—now offers brand new unit ventilator styling with *optional color* and *optional function,* too!

OPTIONAL COLOR! Your choice of unit ventilator equipment in six new decorator colors: Flame, Green, Blue, Salmon, Yellow and Neutral Gray.

OPTIONAL FUNCTION! Your unit ventilator accessory equipment can include (1) sink and bubbler unit, (2) sliding-door cabinets, (3) open cabinets, (4) magazine racks, (5) cubicle cabinets, (6) pull-out cabinets on casters, and (7) tote tray cabinets.

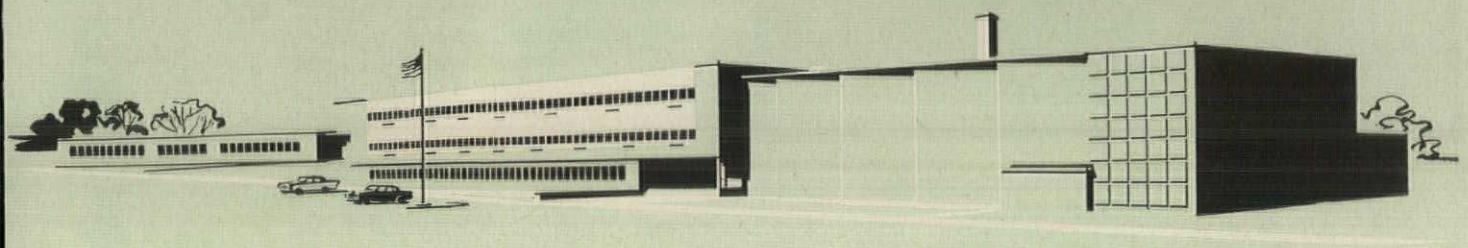
And Herman Nelson options (optional accessories, optional air conditioning) make it easy to tailor your system to fit your school budget.

This new-color, new-function, architectural styling is available on *all* Nelson unit ventilator equipment—whether the equipment provides for air conditioning or for heating, ventilating and natural cooling only.



COST DATA: NETTIE LEE ROTH HIGH SCHOOL

Nettie Lee Roth High School, Dayton, Ohio; Architects & Engineers: Yount, Sullivan and Lecklider, Dayton; Heating & Ventilating Contractor: The H. J. Osterfeld Company, Dayton.



at this price, can you afford not to provide for air conditioning?

The total heating & ventilating cost (including provision for future air conditioning) for Nettie Lee Roth school was $1.41½ per square foot. This cost is in the same range as that for schools in the area that *did not* provide for air conditioning!

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Now, 463 SCHOOLS have taken advantage of Herman Nelson's "now or later" air conditioning idea. They installed HerNel-COOL units at little or no extra cost, can air condition later at a great saving.

At this price, can you afford *not* to provide for air conditioning?





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Includes information on (1) how air conditioning affects the learning environment, (2) the cost of school air conditioning (including rule-of-thumb estimates you can use in your own planning), and, (3) the equipment for school air conditioning.

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SCHOOL AIR SYSTEMS DIVISION OF

AAF American Air Filter

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School Air Systems Division, Dept. 259
American Air Filter Co., Inc.
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☐ FACT KIT on school air conditioning.
☐ Booklet: The case for air conditioned schools.

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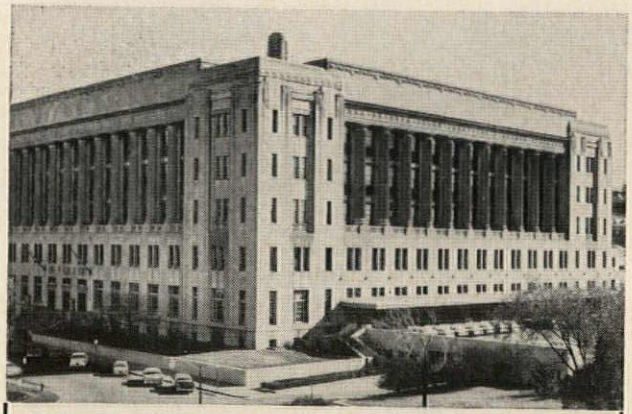
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GENERAL CONTRACTOR: Biltmore Construction Co., Belleair, Florida
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RUBEROID SPECIFICATIONS: 203-A—90 squares, 202-A—1000 squares

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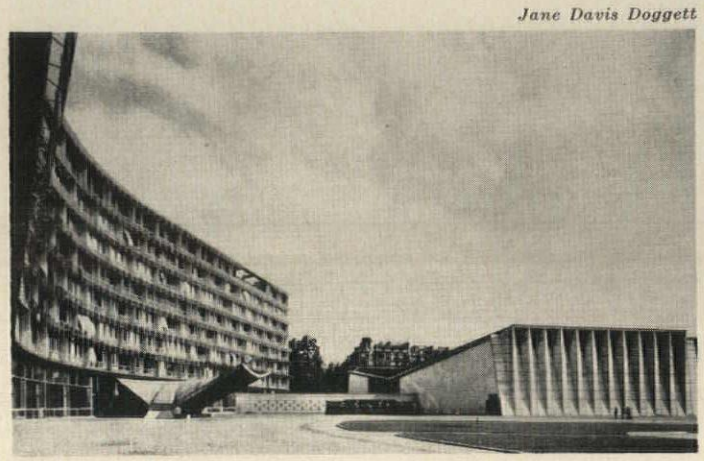
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Unesco House Appraised

by John Ely Burchard

Jane Davis Doggett



Burchard finds Unesco House successful architectural politics, successful architecture, and successful collaboration between architect, engineer and artist. It is also successful adjustment to an older and complex urban scene. As part of the RECORD'S continuing series on architectural criticism, Burchard discusses these successes, with reservations, and tells how Breuer, Nervi and Zehrfuss achieved them.

ARCHITECTURAL RECORD
MAY 1960

Unesco House on the Place de Fontenoy in Paris was officially opened November 3, 1958, in the presence of the diplomatic corps and representatives of the 79 member states. Since that day, only a year and a half ago, it has been much discussed, has received more brickbats than wreaths. It has been almost fashionable to display literary wit, if not critical acumen, at the expense of these buildings and their related art.

Many mistakes can, indeed, be found and should not be ignored. But the scolding has really to stop at the level of the details and cannot be addressed to the entire concept, as it might, for example, be addressed to the Guggenheim Museum. It is symptomatic of our times that we niggle at contemporary works. No one, except perhaps in the most scholarly groves, attempts to scrutinize the Scrovegni Chapel or the Campidoglio or Notre Dame de Chartres as closely as we scrutinize Unesco, though they too would be vulnerable to such scrutiny. It is true that we cannot do much about Michelangelo now, and no doubt we should observe the work of our own day more closely, if only to keep our contemporaries on their toes. But there are limits beyond which hypercriticism ceases to be useful and even becomes corrosive. This has been the case for Unesco House. It has concealed the fact that this work is one of the most significant of our day.

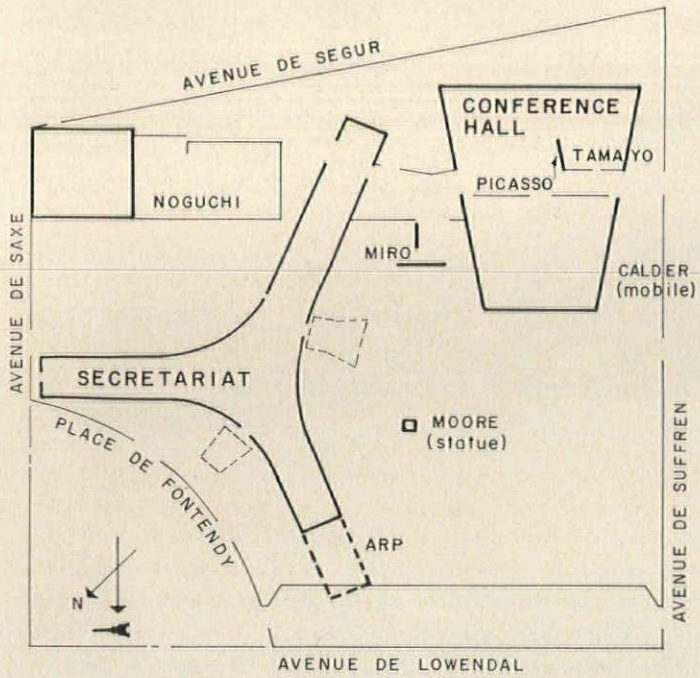
On the whole it deserves accolades, not barbs. It is a substantial success on at least five counts. After all the mistakes are scrupulously listed, the balance sheet reads clear enough. Unesco House is an inspiration to all architects and artists who seek improvement on the modern stage; it is not a witness of defeat. It aimed high, and its wings were not scorched by the sun.

It is an inspiration because it offers an outstanding example of:

a. successful architectural politics;

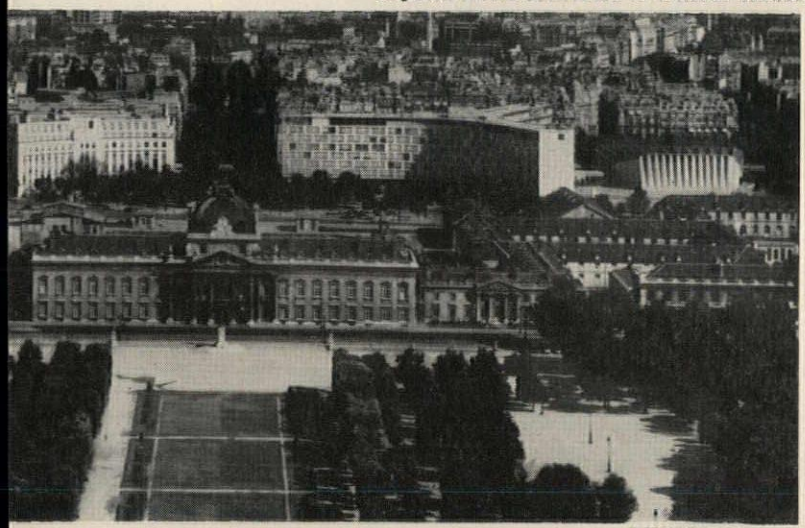
b. successful accommodation of contemporary buildings to an older urban terrain;

c. successful architecture viewed simply as architecture;



". . . It is much to the credit of Breuer and his associates that they achieved an urbane result, which spoke its own language without being disdainful of the weaker buildings on its flanks or of the noble eighteenth century one across the Avenue de Lowendal . . ."

View from Eiffel Tower across Champ de Mars beyond Ecole Militaire to Unesco House



UNESCO/Chevojon

d. successful collaboration between architect and engineer;

e. successful collaboration between architect and artist, and this under especially limiting circumstances.

The Politics

It is too bad that the whole political history of the planning of Unesco House has not been revealed. We need such studies by qualified social scientists so that we may better understand the sociology of architecture. We need to explore the closets of the Air Force Academy and the Guggenheim Museum and the United Nations and other important buildings, private and public. But for the most part, the closets remain locked, and rumor is about all that leaks out of them.

To build for an international organization such as Unesco multiplies the usual political and bureaucratic problem many times. It is a miracle that anything good resulted. There was the site, on the Place de Fontenoy, given by the French Government, a good site but hemmed in by legal and ideological restrictions to the point of frustration. There was the natural desire that a French architect should be involved and a political resistance to appointing Le Corbusier, who is French although he was born in La Chaux-de-Fonds. In these circumstances there was Beaudouin, who was supposed only to make preliminary studies but who carried them very far and with much too willing a compliance with the restrictions so that it was obvious his scheme would not do. All this was producing a great deal of embarrassment and meanwhile the clock was running.

Then the committee of distinguished architectural advisers was appointed, headed by Walter Gropius. It was an international committee, comprising Le Corbusier, Costa, Rogers and Markelius. Distinguished as it was, international as it was, it could not be said to represent all the currents of the day, for its CIAM orientation was patent. But this in itself may be a good lesson in architectural politics. Had the committee been more universal, the chairman might have had to spend too much time in reconciling the internal dissensions; as it was he needed all his time, persuasiveness and statesmanship to convince the bureaucratically appointed headquarters committee and the governments behind it that some startling things needed to be done.

All of this Gropius accomplished with great skill. The French government offered another site, and by this Beaudouin was eased out. Breuer, Nervi and the French architect Zehrfuss were appointed as architects. Working at great speed, they produced a solution for the new site; but meanwhile it became more and more obvious that the original location was much better if only some of the limitations could be removed. Gropius and his committee worked so well on this that in the end they were lifted, and Unesco was erected on the Place de Fontenoy and

at the hands of architects of great talent.

Some people think the committee failed in its largest effort, which was to have Le Corbusier appointed as master architect. They feel disappointed that the greatest living architect did not have a chance to crown his career with this important building. They blame this failure on benighted bureaucrats in the American State Department and elsewhere. No doubt there were many among the politicians who had little enthusiasm for Corbu. But the committee had really estopped itself when Le Corbusier was made a member of the advisory committee. We, who believe in the modern movement, would have been incensed had a committee of traditionalists appointed one of their own number for the main task. We would have been justified. But we cannot have a different code of ethics for the old boys than for us. Le Corbusier should never have been on the committee. Then he might have been appointed and Gropius might have won this battle too.

That Le Corbusier is the greatest living architect must by now be beyond argument. Certainly it is to be hoped that the modern world will give him a great and prominent international chance before it is too late. But we cannot know how well in fact he might rise to such an opportunity until it is offered. It may be that his influence on the world will be quite as great as exercised from remote Chandigarh, Eveux-sur-Arbesle or Ahmedabad and Tokyo as if there to be seen by all on the Place de Fontenoy or at 42nd Street and the East River. Moreover we do not know that he would have done better than the very talented team of Breuer, Nervi and Zehrfuss, which did very well. In the end such a discussion is entirely hypothetical. We are left with the fact that as at Geneva (League of Nations) and New York (United Nations), Le Corbusier was for the third time excluded from the big international symbol; this will remain an ironic note in his biography and an example of failure in architectural politics.

There was one other failure or mistake of a political sort. I cannot call it a defeat, for I do not know how hard the committee tried to prevent it. This arose from the idea, so characteristic of what Unesco regards as international cooperation, that a lot of member nations should contribute to the financing and unfortunately also to the design of individual rooms in the secretariat. There is certainly a higher way of achieving international cooperation than by parceling out commissions among the nations. Even Unesco avoided the absurdity of having 79 different rooms, one for each member state. But the principle, carried out on a smaller scale, remains absurd. The results in the rooms themselves demonstrate this clearly enough. A number of the individual architects, such as Belgiojoso, Peresutti and Rogers, or Philip Johnson, were competent enough men, or even gifted men. But not one of them achieved anything significant in the room he designed. The contrast is startling between the triviality of the *décor* and furnishings of these rooms and those that remained in the hands of the principal architects. The mistake was a simple one—a building should be made by its architect and not by a mixture of other architects, serving only as decorators, selected for reasons of political symbolism, no matter how illustrious each of them may be when he works on his own projects. Such a combination is not "teamwork"; it is anarchy.

Yet these reservations merely point up the fact that the realization of Unesco House in its present form was a great triumph for high cause in the realm of architectural politics and political architecture. Most of this must in the end be credited to the patience, skill and manifest sincerity of Walter Gropius. This elder statesman won one of his finest bays in this encounter. It is also apparent from everything Breuer says that the committee was genuinely helpful to the architect as the work progressed and not an aggressive group of kibitzers.

The Urbanism

Modern architects are often guilty of flagrant disregard of the urban terrain on which they place their buildings. When they build in the country, they may manage their marriages with nature with varying success but none asserts that the natural terrain should be ignored, no matter how recklessly he may invoke the bulldozer in practice.

But when he has a shiny new building to place in a city, on terrain which is man-made, the same man's respect for the environment often disappears. We can all think of examples from Oslo and Stockholm to Park Avenue, from Milan to the Back Bay. The test becomes particularly trying when the architect knows that the surrounding urbanism is in fact not very distinguished, however much it may engage the affections of the citizens. This was the situation on the Place de Fontenoy. It is much to the credit of Breuer and his associates that they achieved an urbane result, which spoke its own language without being disdainful of the weaker buildings on its flanks or of the noble eighteenth century one across the Avenue de Lowendal. In less than a year, Unesco has become a straightforward part of the urban scene as few modern buildings have managed to be; and this despite the fact that Paris is no doubt one of the hardest cities in which to achieve this.

When Gabriel, the architect of the École Militaire and the Place de la Concorde, laid out the Place de Fontenoy, it was not to be a square but rather a semi-circular garden on the front of the most important façade of the École Militaire, just as the parade ground, the Champ de Mars, was to be at the other side. All this was of the eighteenth century. In the nineteenth, the Eiffel Tower was added to the axis at the Seine; meanwhile also the city had built up and the baroque openness of the Place de

Fontenoy had been replaced by barracks and other unimportant buildings fronting on the semi-circle. The ultimate decay of the garden was produced by the seven-story banal buildings built in the 1930's which now house the Ministry of Social Security and the Ministry of Marine, occupying one half of the semi-circle of which Unesco was now to occupy the other half. Good or bad, these buildings could not be torn down. They offered a height scale and a scale of fenestration which could not be overlooked. Nor could the fact be ignored that Unesco House and its related buildings were now to complete the enclosure of the Place de Fontenoy, and that the École Militaire across the way was a very fine building, again of a very different manner. Here Breuer accomplished a triumph of urbanism. Adopting a different curvature for the arms of his buildings that face the Place de Fontenoy, he achieved the impression that the curve of the street was maintained; changing the windows entirely from the scale of the older buildings, he produced nonetheless a harmony, assisted by the fact that he kept the building height the same as that of the buildings across the street. Developing an off-center plaza away from the main axis, he was able to create a free and asymmetric interplay between the southwest façade of the secretariat, the conference building, the free-standing walls, the Moore, the Miró and the Calder works without making any denial at all of the formality and symmetry of the great axis. This achievement is something to ponder. It shows that sensitivity is possible without compromise. It suggests that architects who have failed or have not even tried in other situations have shown themselves to be not greater but lesser men. Tearing down or arrogant disregard is all too often too easy a way for the incompetent or the insensitive.

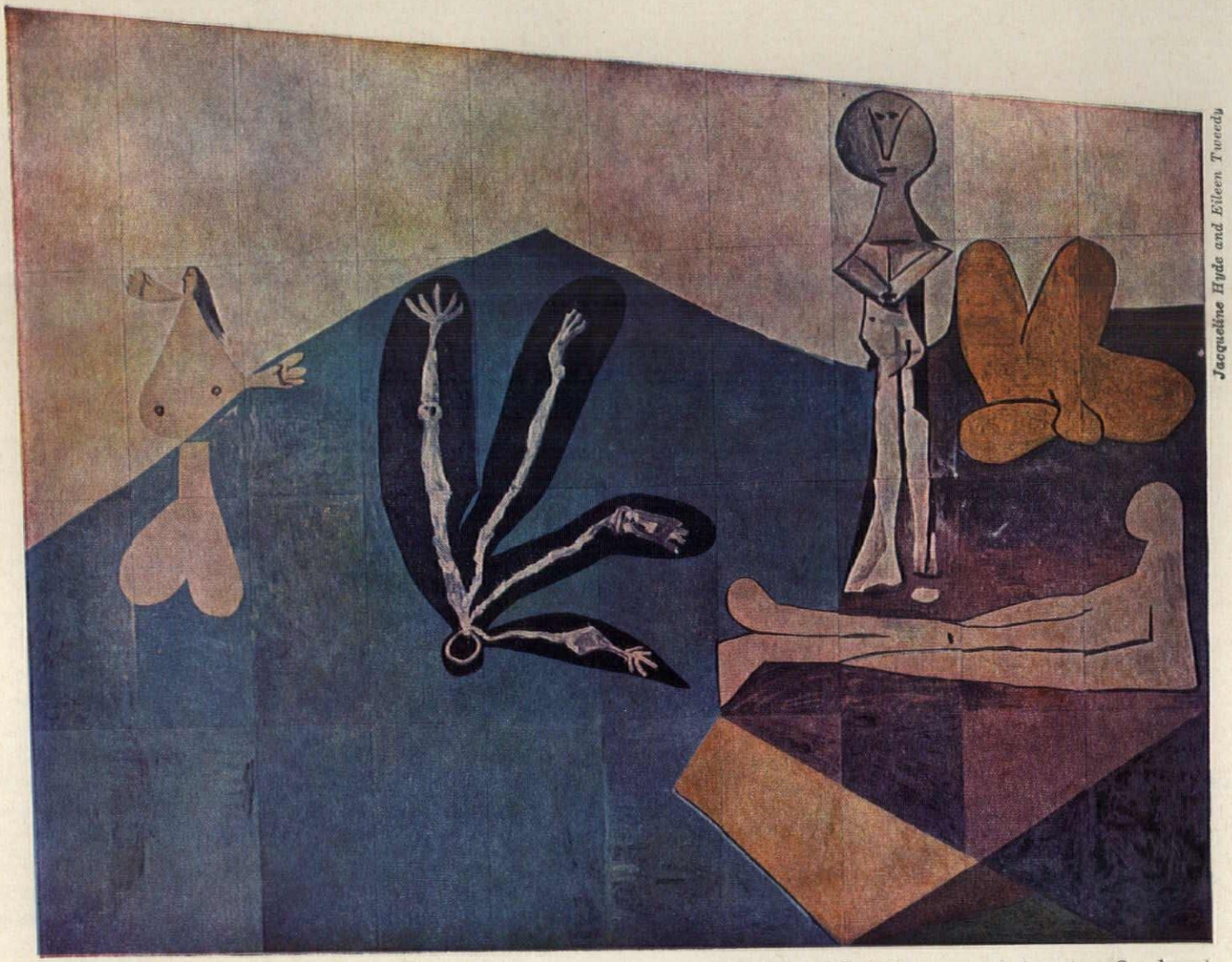
The Architecture

One cannot of course reasonably separate the buildings from the urbanism, from the engineering, from the painting and sculpture. But a few of their aspects can be so observed and they are eloquent. The essential buildings are two, the seven-story Y which houses the secretariat, and the trapezoidally planned, butterfly-roofed conference hall which is connected to the secretariat by the not inconsequential Salle des Pas-Perdus. To these must be added the street walls, the parking lot, the "floating" walls which break up the site a little—on two of which the Miró ceramics are applied—the gardens of Noguchi, and the plot which supports the Moore sculpture. There is also the relatively smaller but not insignificant annex on the Avenue de Saxe.

Each of these elements is quite different in purpose; each is notably different in form; but they fit together in remarkable serenity and unity, much more commodiously, for example, than the elements of the UN in New York. The scale-giving factors of the secretariat are small, save for the unfortunate *porte-cochère*; the monumental scale elements of the ribs of the conference hall are of quite a different order. But these do not struggle for pre-eminence, and the eye and the mind move from one to the other and back with no sense of shock or discontinuity. Of the "firmness," more needs to be said when the engineering is considered. It should be noted here, though, that there is the same opposition between the glass of the secretariat and the concrete of the conference building as is proposed by the scaling elements, but that again this is pleasing, not disturbing, while the occasional use of travertine in both and the occasional appearances of concrete in the secretariat abet this result without being wholly responsible for it. There is no sense of an over-proliferation of materials, though many have been used; no important clash between one and another of the sort which has marred some of Breuer's earlier buildings. Traces of his affection for the violent transition remain in the rough stone of the boundary walls and perhaps in the "floating" walls as well, but it is a tempered affection.

On the side of "commodity," the verdict must be generally favorable. The circulation is readily comprehended and pleasant. The approach to the plenary hall is easy and cheerful while sufficiently impressive. The Salle des Pas-Perdus is a desirable *rendez-vous* marred only by the little curved conference cubicles that somebody dreamed up on a bad night, that offer no real privacy for the conferees although they may afford the wrong kind of bureaucrat the pleasure of knowing that all will be able to see that he is conferring "privately" on what must obviously be a matter of great import. The two main auditoria of the conference building are splendid. The connecting corridor is affable and made impressive by the visible concrete post structure and the explosive Picasso. This is marred a little by an inadequate mezzanine and by a snack bar that seems somehow to be moving in on the more dignified spaces just as it might be expected to do in a half-finished air terminal. Certainly the restaurant on the top floor of the secretariat is brilliantly placed and Breuer was right not to provide it with a continuous window. The outlook over Paris is magnificent, but Breuer will say that one can be fed up with an uninterrupted view and so it was better to provide pictures of Paris framed by the wall of the restaurant, and this argument is convincing.

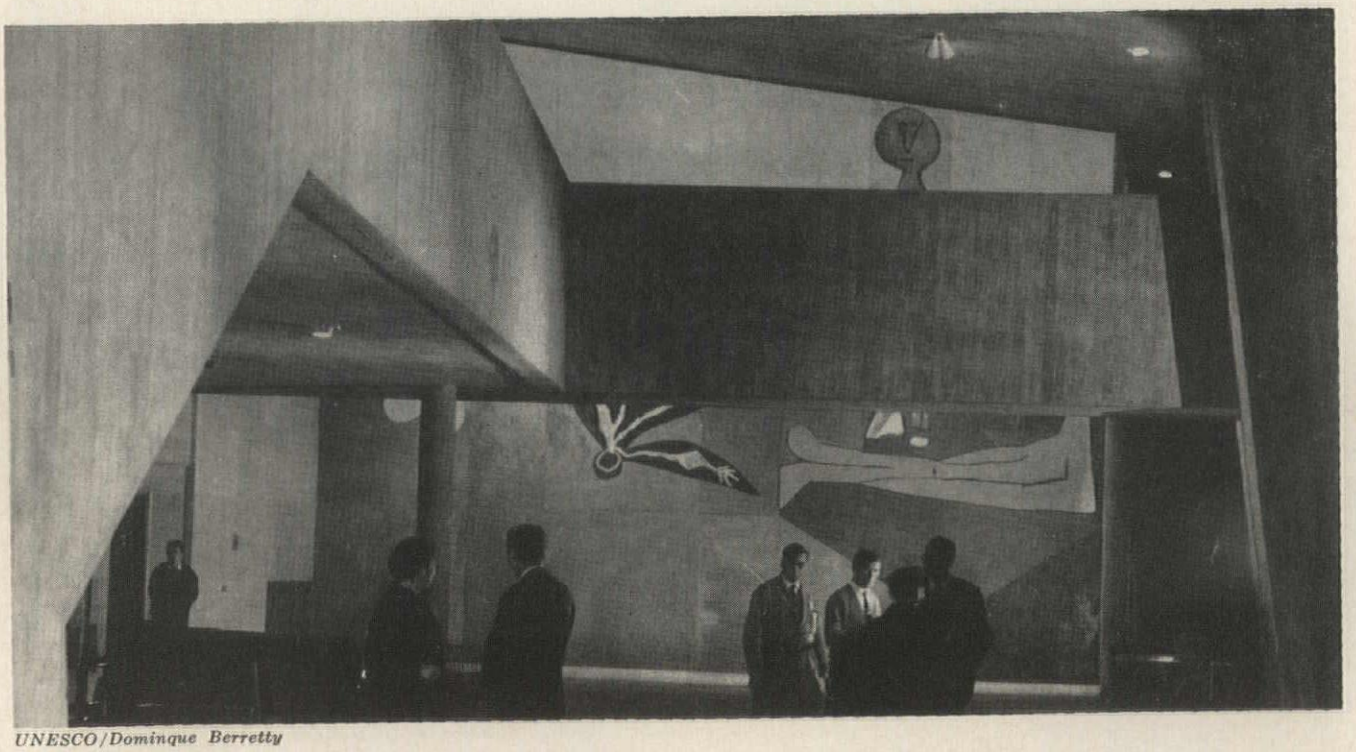
On the larger scale of commodity, one misses an elegant interior stair. To be sure, no one would wish to ascend the full seven stories by stair. In these days, many people, even those who are young enough to do better, use the elevator even to descend one story. But the elevators are inadequate; there is a great deal of vertical foot travel from one story to the one immediately above or below, and for this the walkers enter a typically dingy enclosed stairwell such as one might find in a factory. An important open stair running through the building might



Jacqueline Hyde and Eileen Tweedy

Pablo Picasso. Painting on wood. (courtesy *Quadrum*)

"... the explosive Picasso ... is marred a little by an inadequate mezzanine ..."



UNESCO/Dominque Berretty



"... This delicate stack of cards fanned from the hands of a giant magician is a little too cute ..."

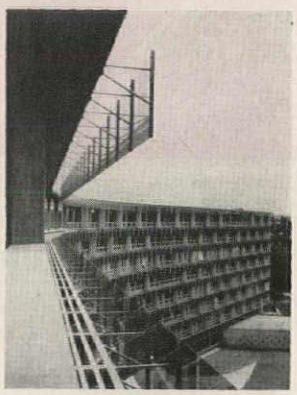
"... canopy ... brusque and graceless and fairly meaningless ..."



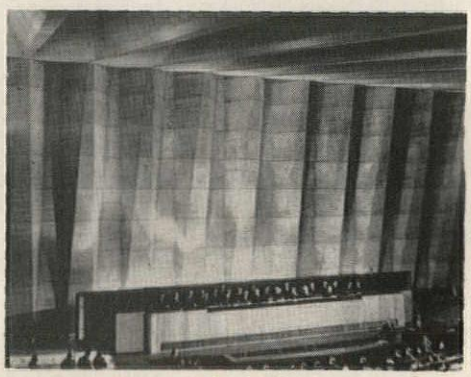
Top four photographs by Doggett



"... piers reach up to grasp at the loads ..."



"... brise-soleil ... better esthetics ... than physics ..."



UNESCO/Dominique Berretty

"... that such people should not appear too magisterial ... a good thing ..."



UNESCO/Anders Holmquist

"... the Arp ... lurks modestly ..."

have been a luxury—but a luxury well deserved. And perhaps it would not even have been a luxury. Modern planning usually forgets that every one does not want to go express from the ground to some remote story and then back down. Of the modern architects, perhaps only Michelucci in Florence is enchanted with the notion that the great stair is an important element in contemporary architecture. It could have served a brilliant purpose in Unesco House.

There are more serious defects of commodity of a kind for which modern architecture has all too often to seek to defend itself (and which it always fails to do convincingly). The building was built on too small a budget. It offers its occupants many of the same distresses that plague those who use Harvard's Graduate Center. The soundproofing is inadequate, almost porous. The doors are flimsy. A host of details above the first floor have been executed too cheaply. They will raise serious maintenance problems in a very short time. It is never easy to say who is to blame for such defects which are absolutely inappropriate for a building of the importance of Unesco. Did the client have too large an ambition for his purse? Was the architect delinquent in trying to do too much for too little; did he have a sure understanding of what the costs would really be? Such questions plague architects all the time, and plague their clients more. From the frequent bad results the public continues to feel that architects are incompetent or deceptive in this respect. But there is sometimes a fourth explanation. The client may be a tightwad. This must have been the situation at Unesco. To plead that the member nations could not have afforded one more million dollars to add to the nine-odd would be absurd. Who was stingy is harder to say. Was it the Unesco bureaucracy itself; was it an American delegation fearful of the Congress; was it an American Director General who has never seemed to have much understanding of or affection for the arts? Did Torres-Bodet give over the reins at an unfortunate moment in the history of Unesco? I do not know, but that there was over-frugality is patent. Much the same thing happened to the arts for which only $191,000 was appropriated.

But there is one serious defect of commodity that can be blamed only on the architects. The secretariat is not really prepared technically to cope with the sun which often beats upon it. It is not air conditioned. The colored glass is not effective enough as a shield. The *brise-soleil* seems to be better esthetics than it is physics. This building is another testimony to the unfortunate nonchalance with which a number of the world's finest designers talk themselves and then their clients into things that may look well but that are quite wrong in a practical sense. For some buildings the eloquence of the appearance may compensate the occupants for their discomfort. In some cases the impression on the transients can even

be held in higher esteem than the convenience of the occupants. But the secretariat is not such a building. Neither are a number of others of our most admired buildings. The fetish of glass seems to be a difficult one to exorcize.

But despite this really black mark on the ledger, the balance of the commodity is overwhelmingly favorable.

On the ledger of delight there are fewer debits. There are one or two positions on the Avenue de Lowendal whence the proportions and scales and even the forms of the secretariat and the conference building seem to clash, but they are few. The flaring concrete canopy on the Suffren elevation, which shelters the main formal entrance to the building, is brusque and graceless and fairly meaningless too. To reach it on foot from any conveyance, one must have walked great distances and have been so thoroughly drenched by the rain, baked by the sun, or buffeted by the wind that the last haven is inadequate relief, only a step or so away from full relief inside. Of course state processions may be scheduled only for fair days; of course most visitors will come to the back door by taxicab and be able to come in comfortably under a less spectacular but more handsome canopy whose soffit ribs lace the ceiling like a modern version of a mediaeval fan. That this back door is on the front, that is, on the Place de Fontenoy, is not a criticism. It is reasonable that the finest vistas of the Unesco complex should be reserved for those who are in it. Even some of these may be questioned.

The baffle walls seem to rise capriciously from the inner lawn, and the explanation that they conceal the parking is inadequate and not even quite true. There seems no overwhelming esthetic logic for opening up three bays of the Nervi structure at the west end to offer a sort of porch not much related to any principal use, beneath which the Arp sculpture lurks modestly. The narrowness of the arms of the Y may have paid a little too much price to delight so far as the library, at least, is concerned. Then there is the obtrusive little spiral stair applied at the center of the inner curve on the Avenue de Saxe elevation as an answer to a Parisian requirement for an outdoor fire ladder. This delicate stack of cards fanned from the hands of a giant magician is a little too cute, a little too charming, a little too trivial in a building of this sort where, if there are to be architectural jokes at all, they should be robust.

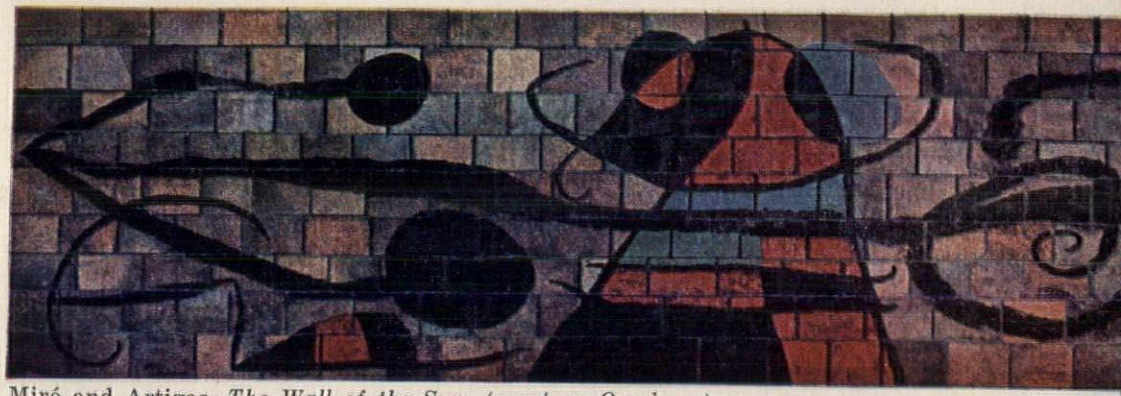
But these remarks are precisely the sort of niggling to which I objected in the beginning. The major elements of the building do fit well together, the general scale, proportions, form, texture and colors are very ingratiating; the vistas of the lobby, framed usually by the majesty of Nervi's pillars, are so fluent and so commodious, the great details, such as the inner and outer end walls and the roof and ceiling of the conference hall, are so grand that demurring footnotes need to be added mostly to demonstrate that the observer has not been swept away by an undiscriminating enthusiasm.

The Engineering

Much the same things can be said of the engineering. There can hardly be any doubt now that Pier Luigi Nervi is the greatest living architectural engineer—the most imaginative, the most restrained, the purest, the most sensitive. Some think he is at his best when allied with a talented architect, such as Breuer at Unesco or Ponti at the Pirelli Building in Milan (Nervi thinks these two men are his most understanding collaborators). Some think he does best when he works mostly alone, as in the ill-fated hangars of Orvieto or the various stadia and circuses of Rome. This question need not be answered to know that architect and engineer worked together at Unesco at the top of their talents. The arguments of dull-minded people that the most efficient span may not have been chosen are quite irrelevant. Engineering is not only a matter of span and pounds of cement and tons of reinforcing steel. There is also the matter of poetry. This engineering is economical enough. A less imaginative solution might have yielded savings that were measurable only in small quantities of pre-de Gaulle francs. This engineering is beautiful, and the building deserved the engineering it got.

The structures are Thomistic, like almost all of Nervi's work. Articulation is almost always clear. The piers reach up to grasp at the loads that can be seen to be coming down to the ground. As they near the ground, the concrete becomes perceptibly heavier and one feels that the whole building sits solidly on the earth, as of course it should, for it is not an airplane and neither is any other building, literally or symbolically. Nervi never tries for more. He is not interested in engineering gamesmanship. He is not interested in being the obedient servant of the whimsy of a clever designer seeking above all for innovation. His architect was fully *en rapport* with such views. I think the structure of the secretariat was perhaps at its happiest when it could all be seen, as it cannot be now that the glazing has been applied and some of the interesting ceiling structures covered over with soundproofing. But we can sense what it was like as we stroll through the ground-floor corridors or in the open bays at the west. This is perhaps enough, although a more telling revelation was probably achieved by Ponti in the Pirelli Building.

The conference hall encourages no such reservations. Here the engineer and the architect have produced a clear masterpiece. The roofs are necessary and impressive. The end walls are majestic with their great ribs of concrete. All this comes to a climax in the interior of the plenary hall whose front wall and whose ceiling work majestically and powerfully upon each other, and very dramatically, too,



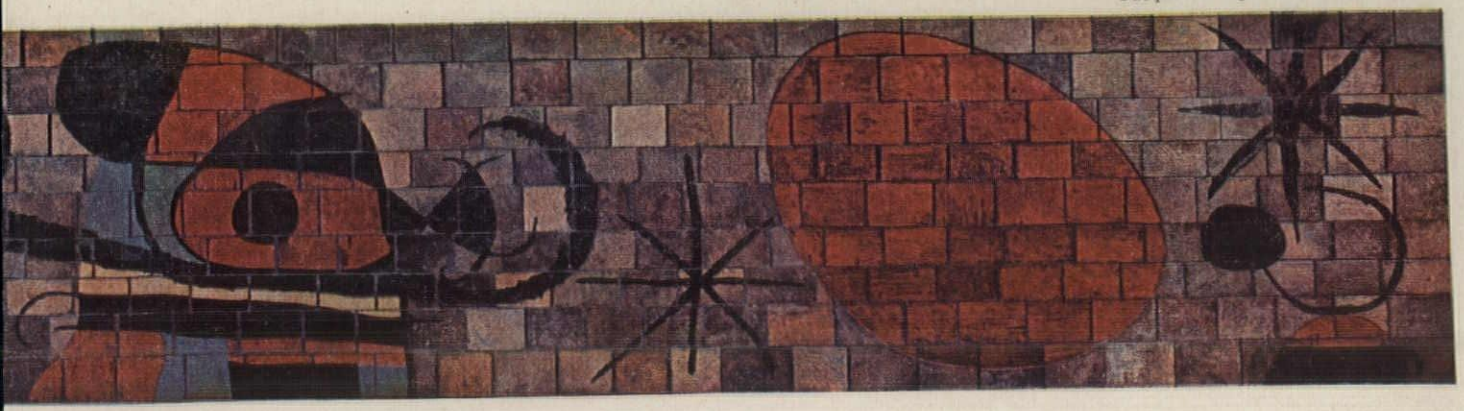
Miró and Artigas. *The Wall of the Sun.* (courtesy *Quadrum*)

Jacqueline Hyde and Eileen Tweedy



Tamayo. *Prometheus Bringing Fire to Man.* Fresco. (courtesy *Quadrum*)

Jacqueline Hyde and Eileen Tweedy



"... Tamayo's Prometheus *has a more obvious symbolism, and is a brilliant red-on-red fresco by a brilliant modern painter ... It does belong where it is and it does say something of the things that might be said, although right mystically ..."*

though not melodramatically. The brilliance of this wall does offer some difficulty for the scale of the dais and the people who sometimes sit behind it, but that such people should not appear too magisterial is no doubt a good thing. The present dais and lighting have not solved the problem of how these people are to be related to their backdrop, but this is not impossible of solution.

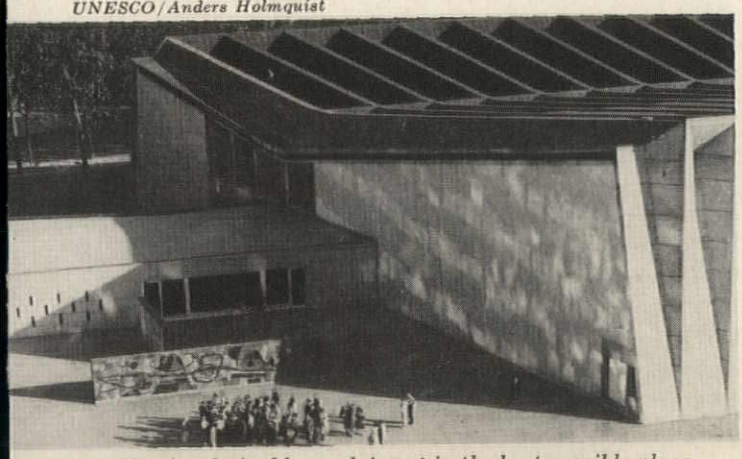
The Art

The art has no doubt caused the most controversy and has most generally been castigated, but this too has been unjust. Certainly the various pieces range widely in quality. Certainly not all the locations are equally appropriate. Certainly there was no clear collaboration such as obviously existed between the architect and the engineer.

Unesco-ship was played, perhaps inevitably, in the selection of the artists. Nations had to be represented, and this meant there could not be more than one artist from any one nation. This is hardly the way to pick a first team. If modern art were to be used, and it was generally agreed that it should be, then it was thought safest to engage only men whose positions as modern artists were beyond controversy. This is not always the way to pick a first team, either. Moreover, the choices had to be made by a Unesco art committee selected also to be geographically representative. Names for this committee were suggested by the architects and also by the national organizations, and from these the Unesco administration put together the committee: Parra Perez from Venezuela, Georges Salles from France, Sir Herbert Read from England, Shahid Suhrawardy from Pakistan, and Sanchez Canton from Spain. Not all of these men have failed to be doctrinaire in their previous judgments, and Read, at least, is known not to believe that modern art necessarily has a useful role to play in modern architecture. But they behaved in exemplary fashion. Augmented by two architects, Zehrfuss and Ernesto Rogers, they worked a-politically, quite impersonally, usually unanimously.

Picasso, Léger, Miró, Arp, Noguchi, Calder and Moore were selected in the beginning to work within

UNESCO/Anders Holmquist

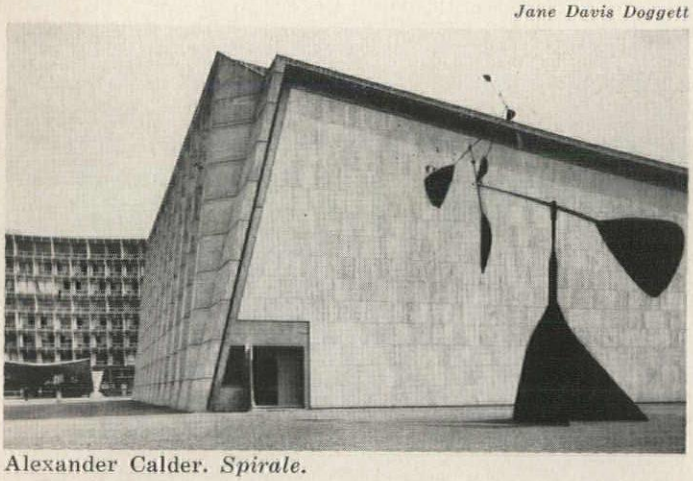


"... Miro's admirable work is not in the best possible place, although no location was given more thought ..."



Afro. *Garden of Hope.* (courtesy *Quadrum*)

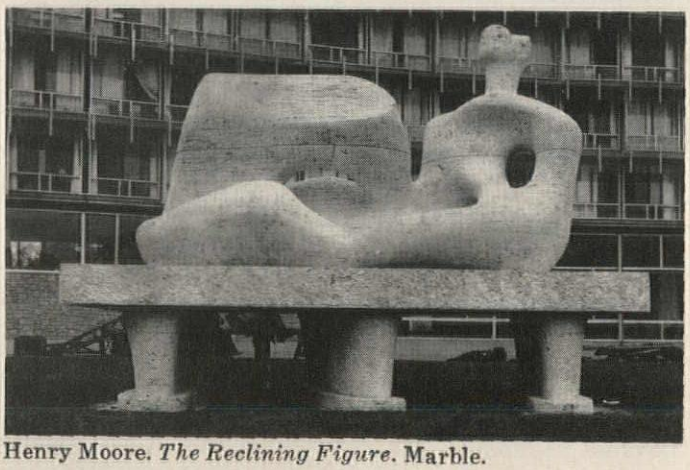
Jane Davis Doggett



Alexander Calder. *Spirale.*

"... the juncture of first class work with first class location happens ... for Moore ... Calder .."

UNESCO/Volta



Henry Moore. *The Reclining Figure.* Marble.

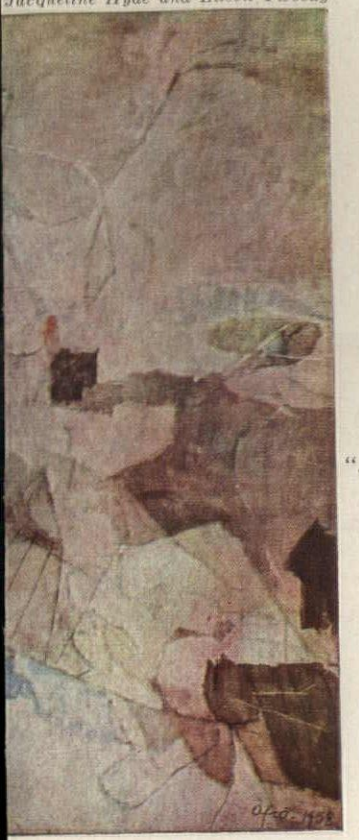
the two per cent of the budget allocated for art. Léger, unhappily, died that summer. Later the City of Paris provided additional funds and Tamayo, Afro and Matta were added. In the end these were joined by Appel, Brassai and Bazaine to make a round dozen.

The major locations for the major works were set down early in the scheme, but by assignment from the architects rather than as the result of collaborative discussion. There seems little doubt that the artists were selected too late to permit of an ideal collaboration. Calder's, Tamayo's and Matta's works ultimately were placed in different locations than called for in the original plan. The most notable of these shifts was that of Calder's mobile after he and Noguchi violently objected (and with reason) to having their works juxtaposed.

The artists showed different degrees of concern for the building they were to adorn and enhance. Henry Moore was characteristically attentive to the point of recalling the materials of the building in the travertine of his sculpture, and the horizontality of the secretariat with his entire composition, while bowing to the reflectance of the façade with his penetrations. Picasso on the other hand was aloof; he never visited the building at all but relied on a model to understand it and produced his mural on prefabricated panels far away and in the quite different light of his studio near Cannes. Calder's mobile was made in Connecticut; Miró and his ceramicist Artigas worked in Majorca and Spain.

The artists too were sometimes plagued by small budgets. At some point Arp is said to have consented to accept the economy of having his great bronze castings, which look like cut-outs, appear in a black finish which makes it hard to tell whether they are of wood or stone or metal. The Picasso materials,

Jacqueline Hyde and Eileen Tweedy



"... pleasant but of modest interest ..."

both of the panels and of the paints, seem not very durable, but this may have been by design.

Of the dozen, it can also be claimed that half are first class works, four of the second class, and only two really weak. But the juncture of first-class work with first-class location happens in only three instances, that is, for Moore, Bazaine and Calder. Miró's admirable work is not in the best possible place, although no location was given more thought. Tamayo's and Arp's works, good of their kind, might have had better places. Picasso's important painting has a highly strategic location and occupies it richly, but whether this is first-class Picasso can probably not yet be established. Noguchi's garden, bigger than many of his efforts and not gaining thereby, certainly has a strategic setting and is good Noguchi, but this does not necessarily mean that it is first class. Nonetheless, one can say that eight of the dozen works are genuine successes, given an averaging of quality and location. The Afro *Garden of Hope* is pleasant but of modest interest and weakly located; Brassai's photomural is a sensitive portrayal of reeds and water but it is still a photomural, and by its excellence simply drives home the point that photomurals are not very convincing at large scale and as part of an important and serious building. Appel's *Rencontre au Printemps* is suitable for a restaurant. Much the same can be said for Matta's *Hypertension*. It sits on a wall where it cannot be missed and it is pretty. But not much more. It might have made a good cover for *The Scientific American* or *Fortune*.

The highest marks must surely be given to Henry Moore, whose attention to the surrounding buildings I have already noted. This is a sculpture which is effective from every point of view, which works well with its various backgrounds, which is in scale with and in sympathy with the architecture; and which may, moreover, offer a symbolism that has something to do with what Unesco stands for. It shows very clearly what is possible when the artist and the architect are really *en rapport*.

Picasso's mural is so spectacularly located in the delegates' foyer on the way to the main conference hall that no one can fail to see it. It is in good scale with its room and in good color relation with the floor and walls and ceilings, while also being rich enough so that it looks well even when part of it is cut off by a structural element. As striking decoration it is a complete success. The plastic expression, the animation, the rigor of the composition are all first rate. It is an amazing demonstration of genius that this could be achieved so remotely.

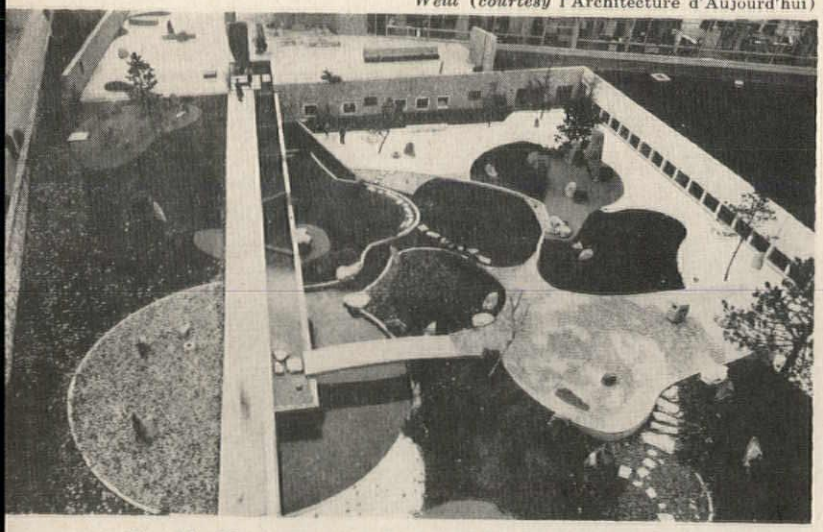
What the symbolism of the bathers has to do with Unesco, I do not understand; but no doubt there will be long essays about this in good time (or may already have been, for all I know; I am pretty sure Picasso will not write them). Thus of the Picasso work we must say that if its only purpose was to enrich the surroundings of an important room the purpose was achieved.

Tamayo's *Prometheus* has a more obvious symbolism, and is a brilliant red-on-red fresco by a brilliant modern painter. One sees this as one leaves the smaller conference hall. It does belong where it is and it does say something of the things that might be said, although right mystically. It is however a reasonable marriage of painting and architecture which is even measurable in terms that the men of the Renaissance would have understood.

Miró's ceramics, executed by Artigas and describing a *Wall to the Sun* and a *Wall to the Moon* (see cover) are no doubt among this artist's greatest works. They mark a return to his earlier sobriety, which seemed to have been sullied sometimes in the later years by merely clever work set in commercial places. Simply as works of art they stand, no doubt, with Moore's sculpture. But the location of the walls seems capricious, they are so low that it is hard to look at the work, and altogether the effort to see is more than it ought to be. It is not greater than the problem of seeing in the Sistine Chapel or of looking at any Renaissance ceiling, but we should have learned how to make such contortions unnecessary by now. Monks may rent mirrors in the Scuola san Rocco; it would be inappropriate for the Unesco staff to go about renting periscopes.

Bazaine's gutsy mosaic, big in scale, brilliant in color, rough-hewn with its rugged projections of big broken tesserae, is an exciting work of much greater power than the Noguchi garden which it backs. Calder's colossal "Spirale," more than thirty feet high and made up of a few large elements tapering to the crowning small triangle, is one of his most important mobiles. It is particularly fascinating to watch it whipping about in a stiff wind, but no doubt

Weill (courtesy l'Architecture d'Aujourd'hui)



"... the Noguchi garden ... suggests a serious clock golf course ..."

it is quite as fine, though different, in a zephyr. It is a little out of the way and many people will see it only after a pilgrimage, but it is worth the trip.

These are the most important pieces. Noguchi's garden, a big piece, gains something genuine from the importation of Japanese stones, which at first hearing seems like a piece of corny sentimentality. It does have many fine details, especially *l'Insigne du Paix*, and one cannot say that the whole does not hang together. But not much more can be said without remembering that it suggests a serious clock-golf course. It might quite as well have been in some other city and serving some other building. I cannot find in it anything so profound as "the new alliance between architecture and space," whatever that means. The older message that Japan so often suggests, namely, that natural forms are wonderful, even when stylized and manipulated artificially to provide an abstract summary, appears here, but less convincingly, and with less purity than in more traditional Japanese work, particularly that of many centuries ago. It is all very pleasant and adds something to the building. But it could be replaced by a different garden without disaster to the building and it could place itself somewhere else with no disaster to itself.

Arp's work is good Arp, but perhaps he has not much new to say these days. His cut-outs seem to have no more reason to be at Unesco than at the General Motors Research Center or in any first-class shopping center.

In fact, the Arp and the Noguchi point out where the Unesco art has most failed. Most of it could be almost anywhere else and serve quite as well. Few of the works say anything about Unesco and its purposes as, for example, the Romanesque and Gothic sculptures and the Renaissance paintings speak of the meaning of the buildings they aggrandize. Perhaps there is nothing to say about Unesco. Perhaps no one can articulate what there is to say. Perhaps art is no longer the way to say anything more than what the personal whim of the artist may dictate. If so, one might question whether any of the personal statements were important enough to justify such a central rostrum. At any rate, the end result is that not very many works of art seem to belong to a particular building which would be diminished, as they themselves would be, by their removal. This is unhappily the situation for most of the work at Unesco—most but not all. It is not so for Moore, for Picasso, for Miró; it may not be so for Calder.

Another failure is that if the art is viewed collectively, one cannot see any firm cohesion between the several works and each other, or between them collectively and the building. It is as if the building were the only common factor; as though it had reached out twelve mutually independent tentacles, grasped a work of art in each, and then held them firmly away from each other lest they should have any mutual attraction. But a Unesco secretariat is not, after all, an art gallery. Merely to have assembled a string of works, no matter how individually admirable, is not to have produced a collaboration between architecture and art.

The political conditions surrounding the selection, the unimaginative postulates of Unesco as to how internationalism may be symbolized—that is, by an array of names drawn each from a different nation —these limitations undoubtedly contributed to inhibit the marvelous result that might have occurred had Breuer and Nervi been joined, say, only to Moore and Picasso, or Moore and Miró, or best of all perhaps to Moore and Léger. But this could not be. And even then the miracle might not have been consummated unless the cooperation had been as complete and had begun as early as the cooperation between architect and engineer.

Is such a collaboration ever going to occur in the modern world? It is hard to be confident that it will. Many buildings by their programs or their ideology cannot legitimately be hospitable to the try. Many contemporary architects, indeed almost all of them, are utterly unsympathetic to the try if it involves them in yielding any of the driving reins to the painter or sculptor. Unesco was a building that did offer such an opportunity. Breuer was the right kind of architect for such a venture. Viewed in this light, the disappointments of Unesco House may seem too great to accept. But this, I think, is too dismal a view. The successes are transitional and partial, but Unesco House is nonetheless the best thing of this sort that modern architecture and modern art have yet achieved (one excepts such unities as Matisse's chapel at Vence or Le Corbusier's solo flight at Ronchamp). That Unesco House has set this mark is the note to rest on, because it should encourage others to see what has already been attained and to aspire to what remains in the realm of the possible. Pursued with enough ardor, the goal of the magnificent *collaboration* will yet one day be reached.



The Loeb Student Center
New York University
Washington Square Center
New York City

Harrison & Abramovitz, Architects
Edwards & Hjorth, Structural Engineers
Jaros, Baum & Bolles, Mechanical Engineers
Ebner Associates, Electrical Engineers
George Nelson Company, Interiors
Caristo Construction Corp., Builders

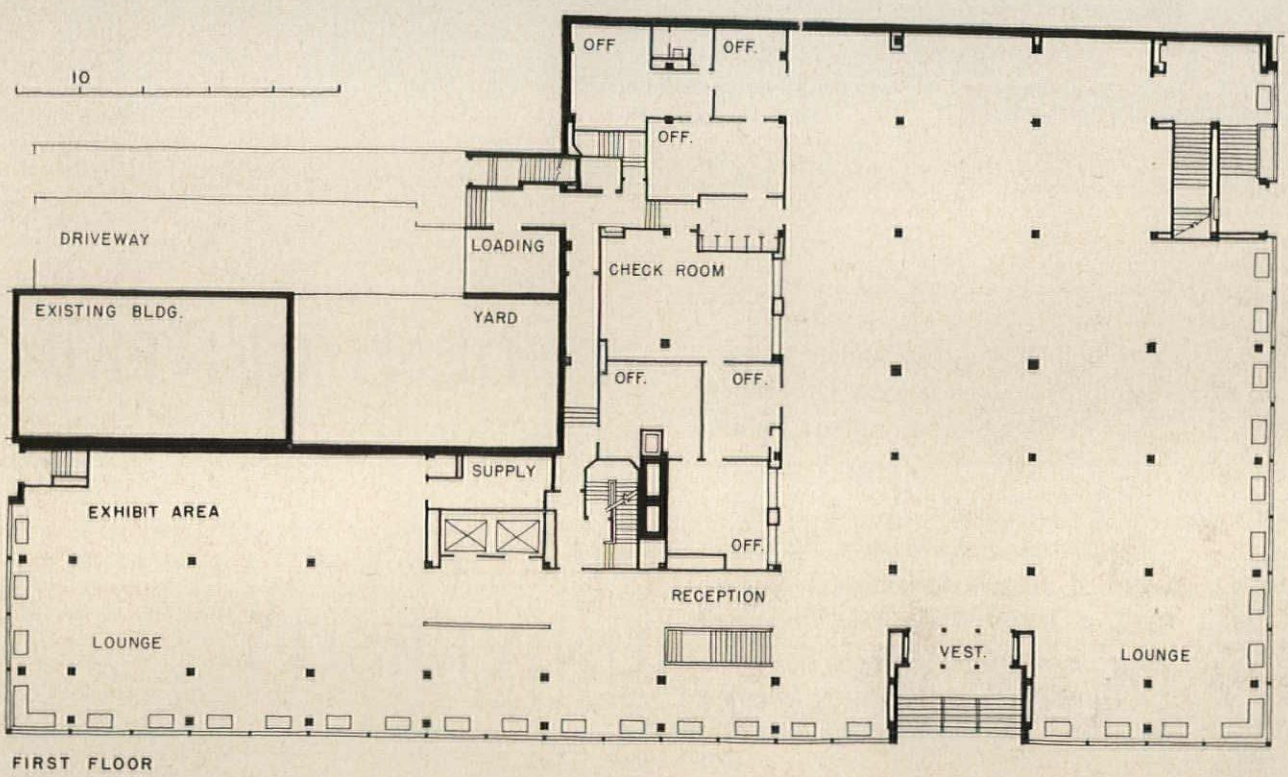
STUDENT CENTER FOR BIG CITY UNIVERSITY



NOTE ON THE INFLUENCE OF ARCHITECTURE:

The Loeb Student Center has added an attractive visual note to the Washington Square scene, and has also—more remarkably—wrought an improvement in student appearance, according to University officials. Those old sweaters and open-neck sport shirts seemed out of place in the smart new surroundings, and have been widely replaced by jackets, neckties, and more careful grooming. Evidence, it appears, that people will—given the chance—rise to their environment.

The super "student union" has in fact created a whole new campus atmosphere in New York's old Washington Square park; additional trees and planting have been set in, and a general toning up is in progress. The $5 million building, financed in part by the Loeb gift and in part by the College Housing Loan Program, was designed to conform to the general character of the neighborhood. Red brick and limestone—predominant existing materials—were used; the scale and arrangement of the three elements that form the building were carefully considered in the light of the surroundings. These three elements (see page 157) consist of the spreading, one-story "platform" of lounges and reception area; the irregularly-shaped auditorium wing; and the nine-story block of student activities offices and meeting rooms. Principal areas are oriented to the park view.



FIRST FLOOR

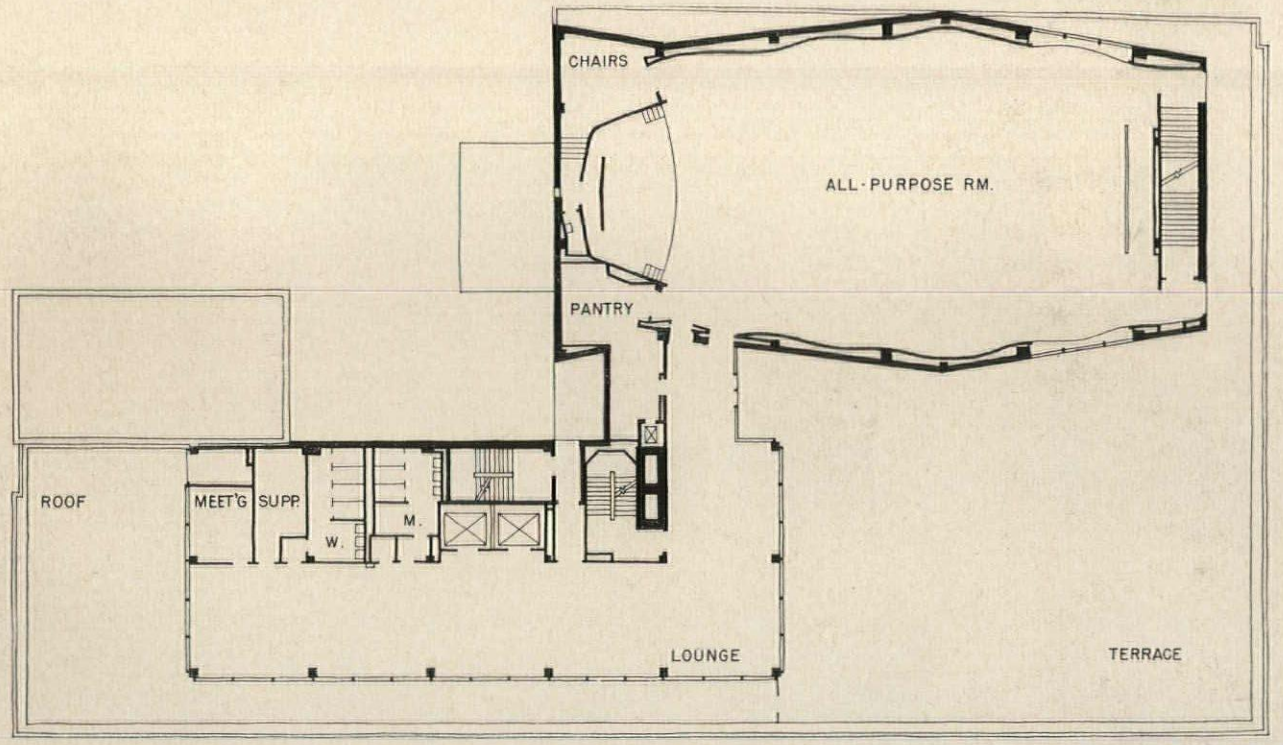
All photographs by Joseph W. Molitor



Loeb Student Center

The smartly furnished lounges at ground level—dubbed the "living room"— are directly served by a cigarette and candy shop, as well as by a check room. Offices of the director are also at this level. A flexible exhibit area occupies a portion of the smaller lounge. Since the building is used daily by approximately 6000 students, control (against "characters" from nearby Greenwich Village) is maintained by a doorman stationed at the first floor entrance.

A large cafeteria and smaller snack bar are housed in the space below, which is raised slightly above grade to provide continuous natural lighting on three sides of the building

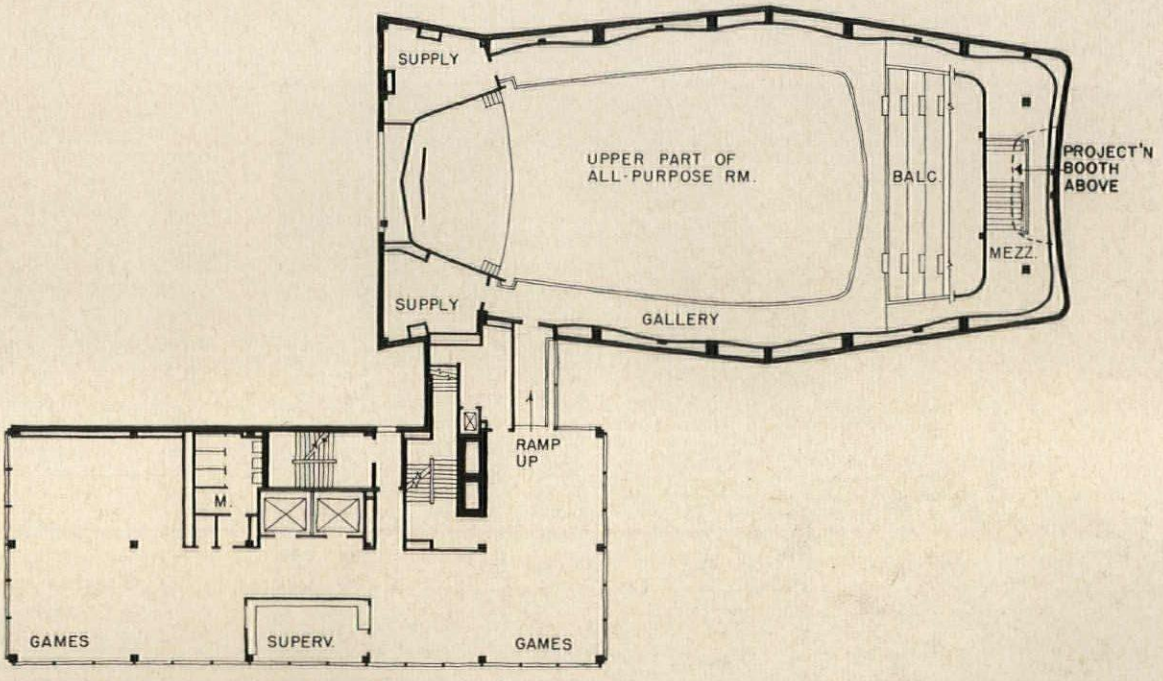


SECOND FLOOR

Loeb Student Center

The Eisner-Lubin auditorium, appropriately called an "all-purpose" room, serves handily for a variety of uses. Removable chairs seat 1000 for plays, movies, concerts and lectures; the room is also used for dances, parties, and receptions. The adjoining pantry takes care of refreshment service. Acoustical control is provided by the serpentine red brick side walls (which are laid with open vertical joints) and the undulating ceiling of wood slats, veneered with natural birch. The public address system can be connected to speakers throughout the building.

The second floor of the office block is occupied principally by a lounge; the corresponding third floor area houses rooms for billiards, table-tennis, darts, card games, etc.



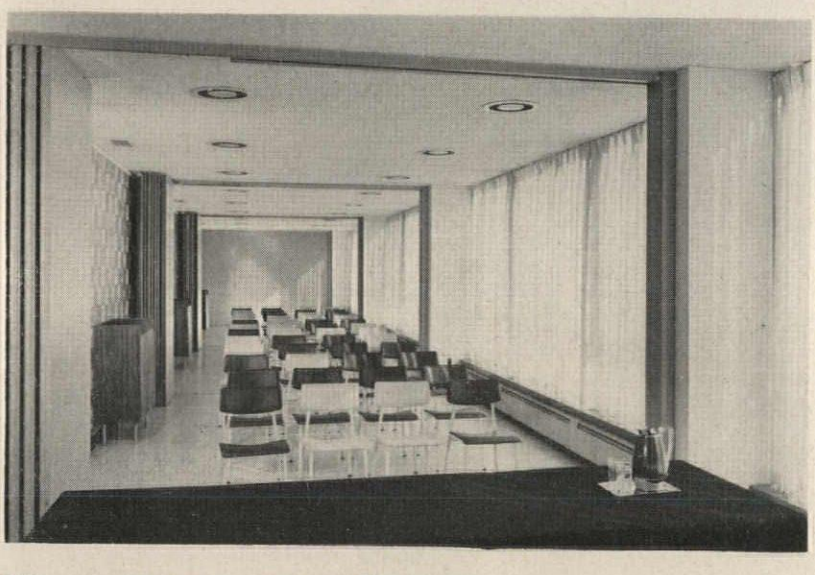
THIRD FLOOR











Loeb Student Center

The second floor lounge (top), which opens to a roof terrace facing the park, is quieter and more intimate in character than those below. It is carpeted in beige; the furniture is upholstered in orange-red plastic; the curtains are of spun-glass fabric.

The fourth floor luxury restaurant (center), called the "Top of the Park," is carried out in white and gold; is carpeted and has an acoustical tile ceiling for sound control; and opens to its own terrace facing the park.

The bottom photo shows a bank of four adjoining meeting rooms at fifth floor level, which can be used individually or opened together into various combinations as occasion demands

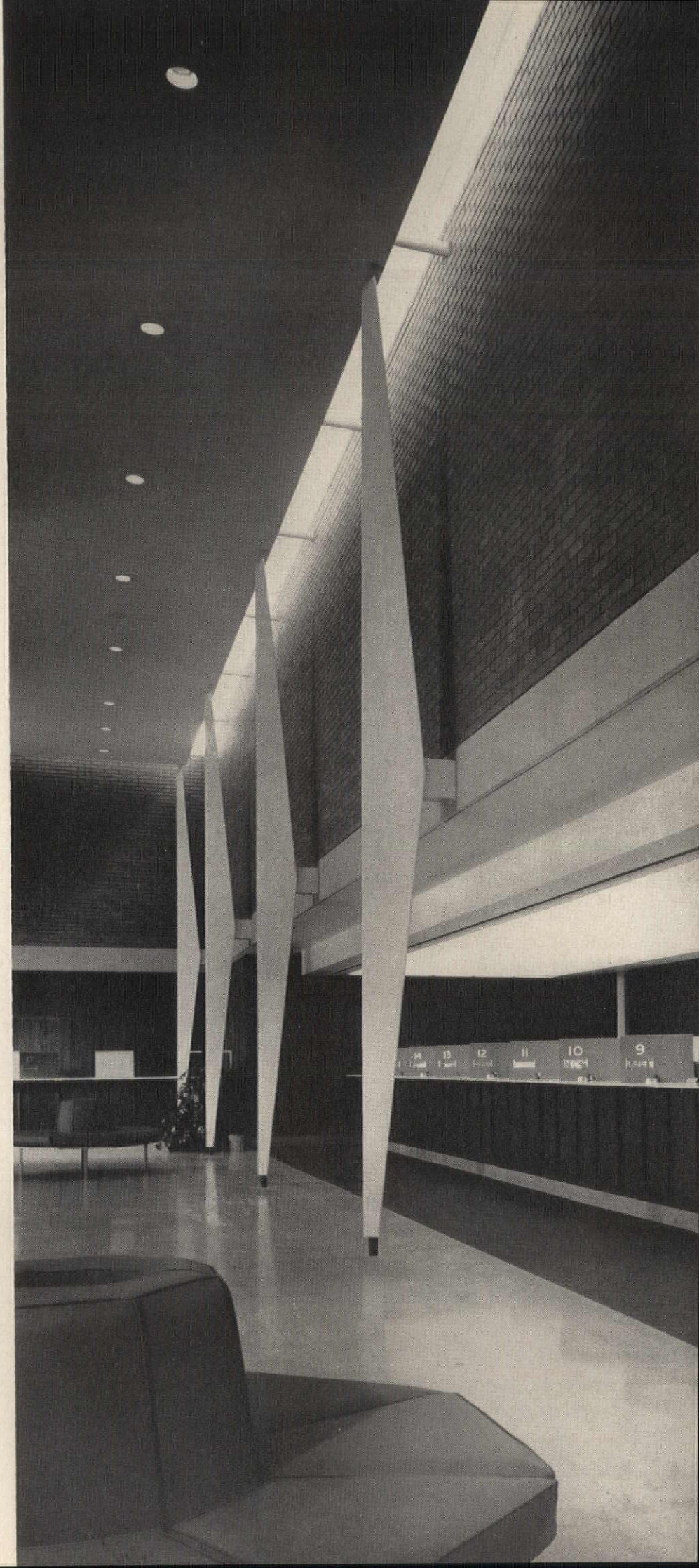
THE USUAL MADE UNUSUAL

The State Bank of Clearing
Chicago, Illinois

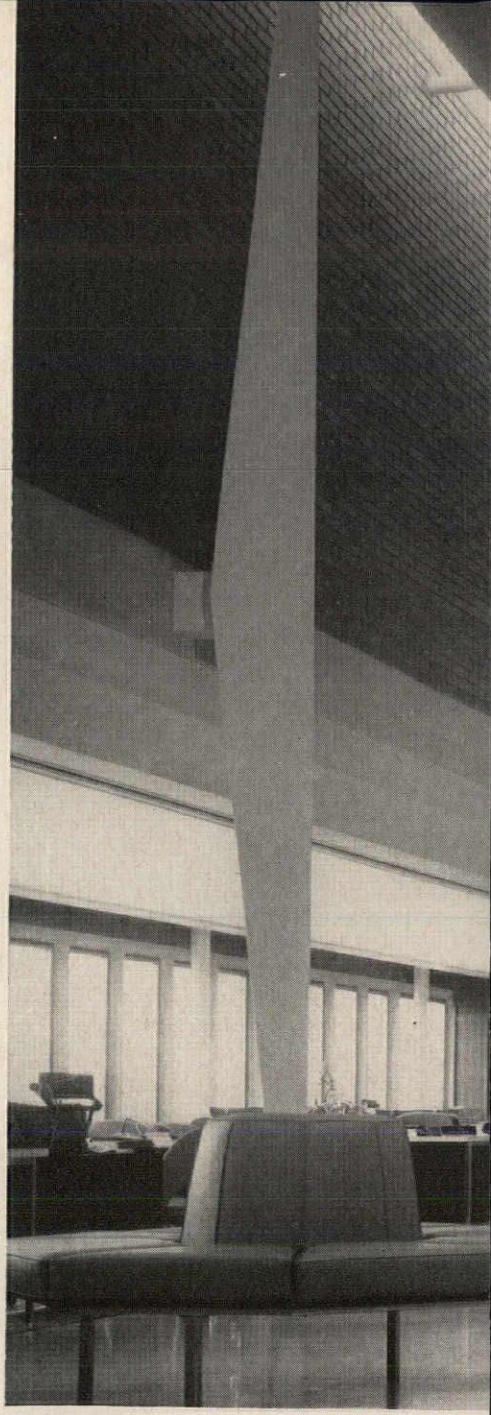
Harry Weese & Associates
Architects

Frank J. Kornacker
Structural Engineer

Samuel R. Lewis
Mechanical Engineer



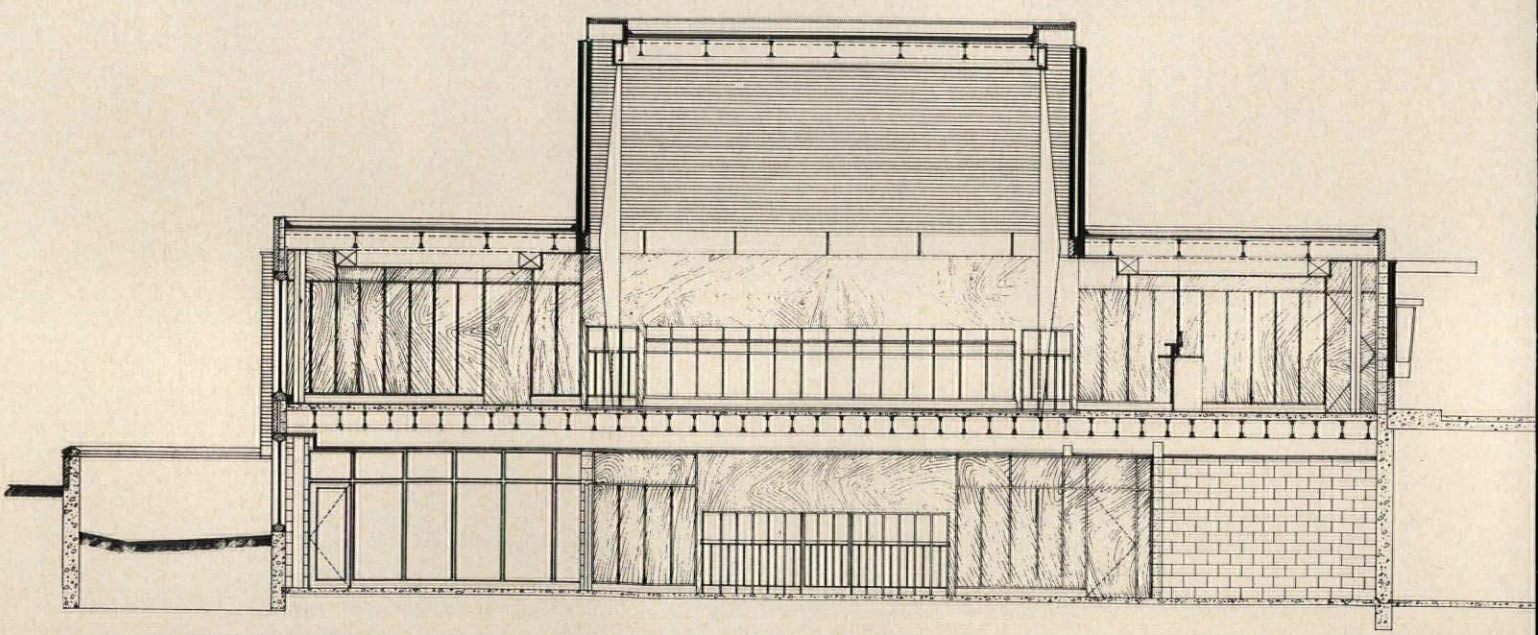




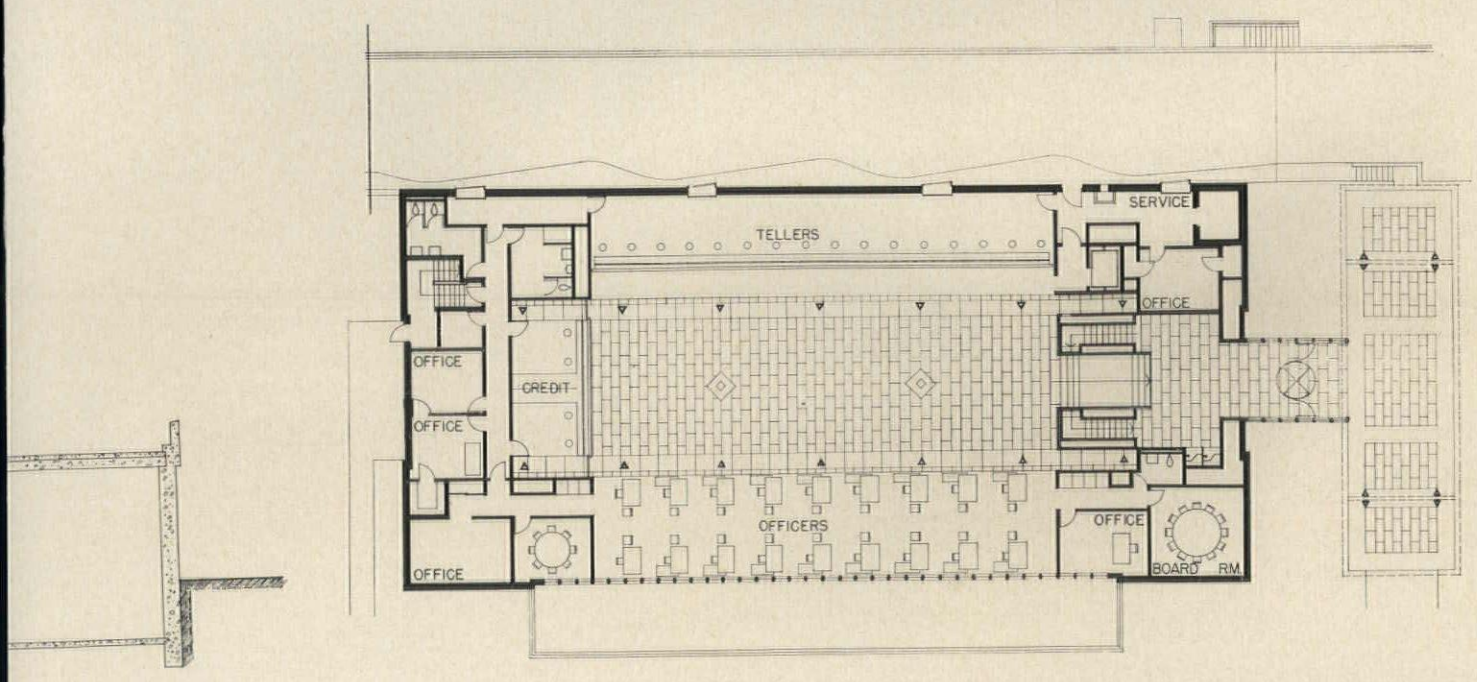
State Bank of Clearing, Chicago

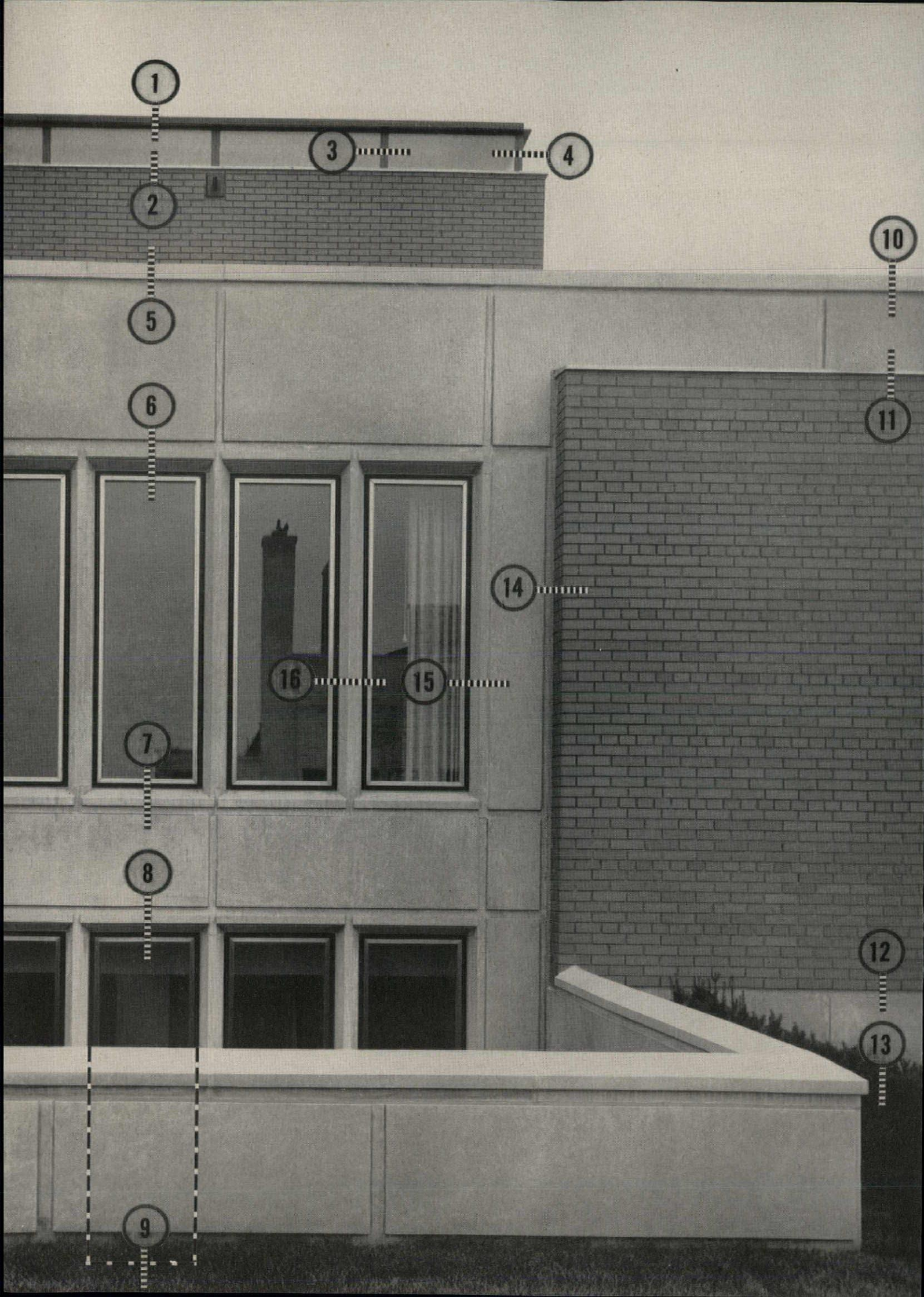
The aim was to create a dignified banking space that would reflect the stability of the institution without being formidable in character; to employ also natural materials in such fashion that maintenance is minimum and the door remains closed to the decorator who would "redo" the bank every several years. The main space is thus carried out in brick and natural wood, with vinyl-asbestos and carpeted floors, and has a suspended plaster ceiling which is independently supported by a system of exposed concrete bents.

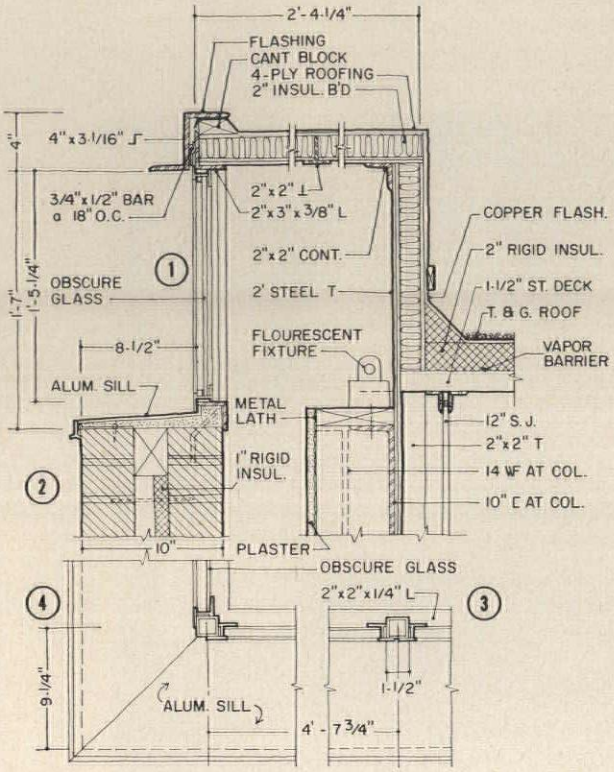
There is a story in those bents, for they allow the ceiling to be hung free of the walls, thus making it possible to terminate the walls in a continuous peripheral clerestory in order that the brick can be texture-lighted by a wash of graduated natural light during the day—or by fluorescent at night. The unusual and efficient structural system consists, at each bay point, of two rigid T-bents of concrete, pin-connected at the floor line and held stable by three tension members—one in the ceiling, and the other two in the outer low walls, which then carry only half of the low roof and their own weight. Thus, the good old parti—a high, central banking room flanked by lower tellers' and officers' spaces—has here been newly interpreted with a high degree of imagination.

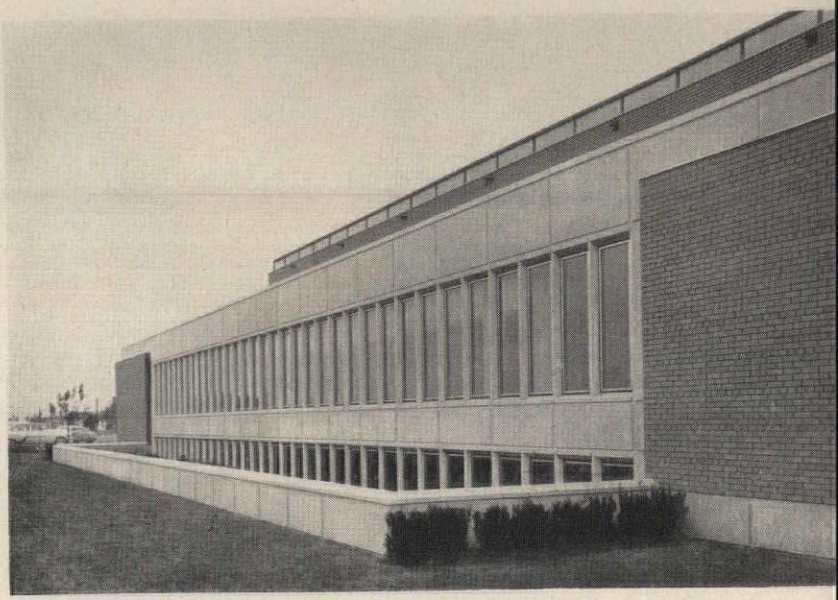


All photos by Bill Hedrich, Hedrich-Blessing



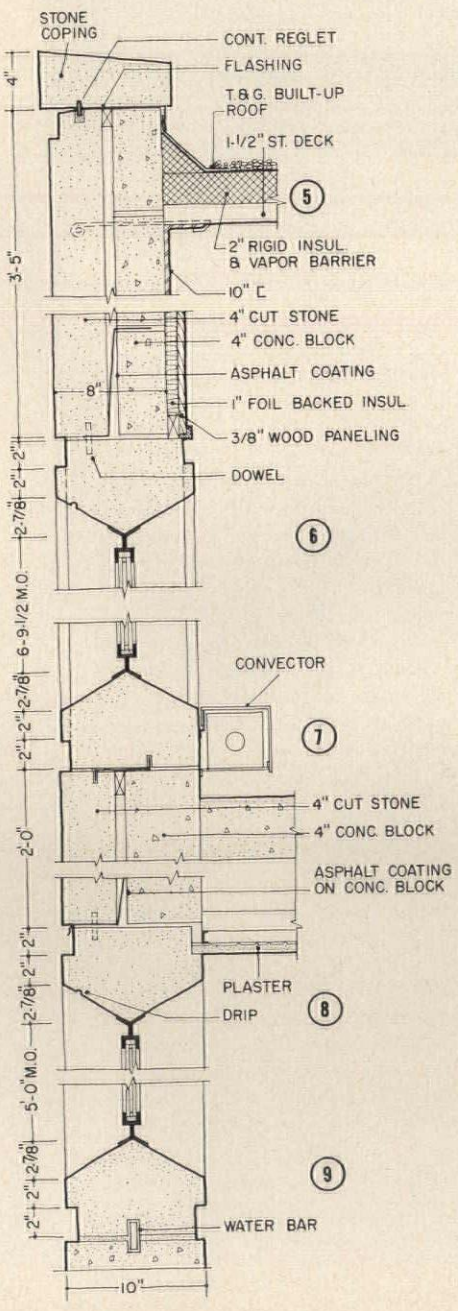

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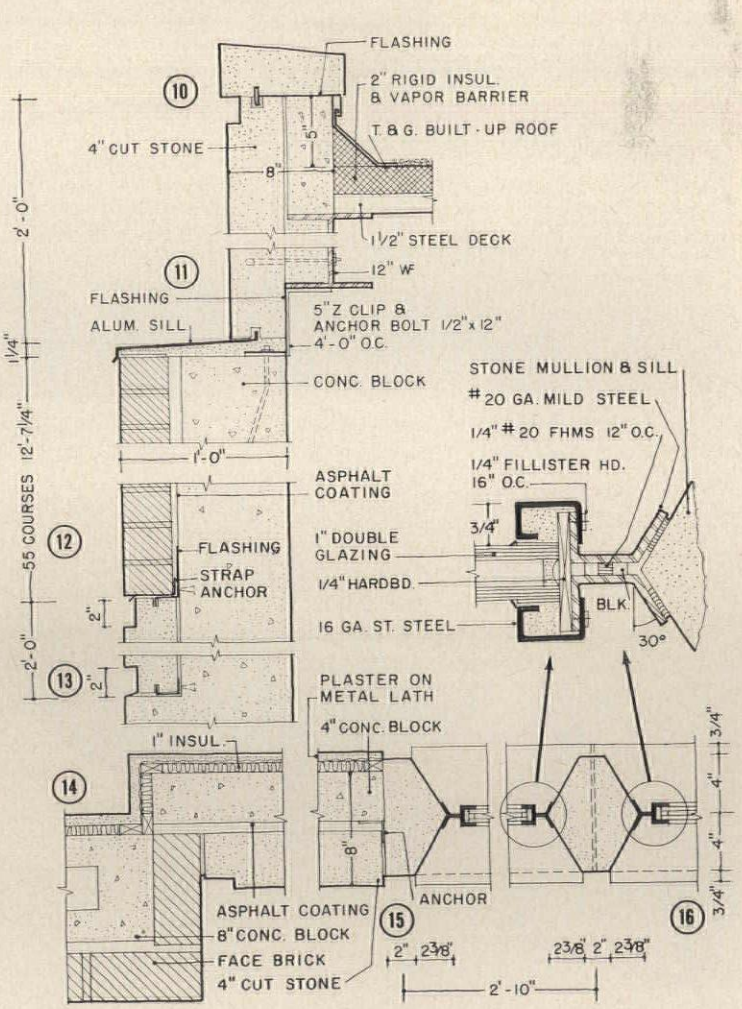




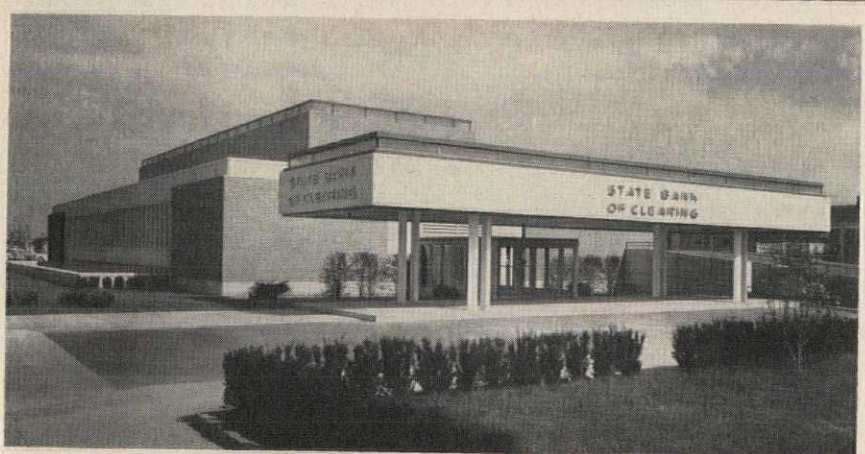
State Bank of Clearing, Chicago

When viewed superficially the building appears fairly conventional, but careful study of its construction and details will reveal an architecture that is both subtle and highly original











State Bank of Clearing, Chicago

The free-standing entrance pavilion serves visually as a marker for the street entrance at the end of the building without disturbing the disposition of interior spaces or the basic integrity of the rectangular plan form. Architecturally, the pavilion is interestingly developed—echoing as it does the peripheral clerestory of the larger, main banking room mass.

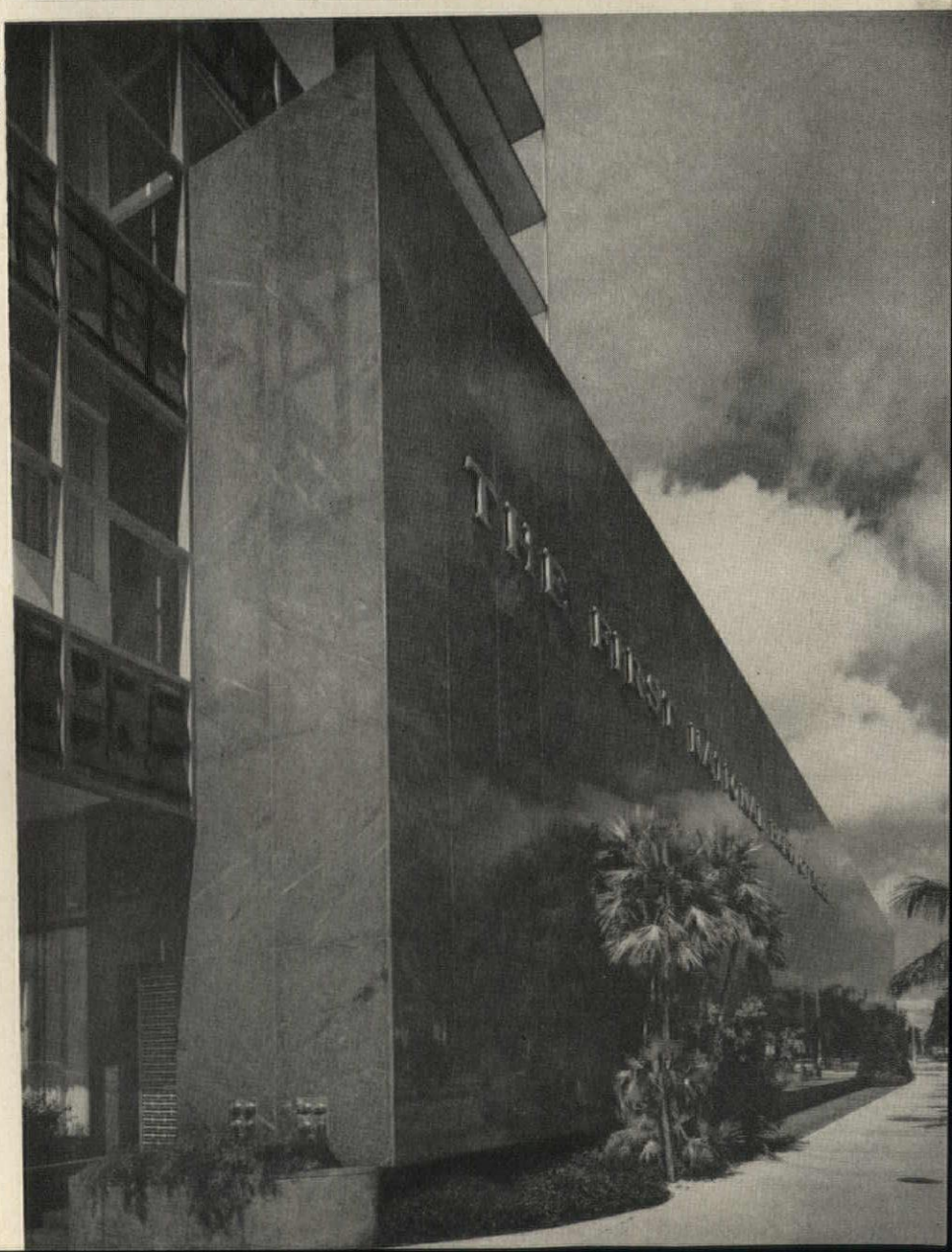
The four drive-up windows can be seen at the right side of the building in the top picture. They are located so it is possible for tellers within a common work area to handle both interior stations and the drive-up windows (refer to plan, page 165). The present windows are spaced 40 ft apart, but provision has been made for future additional windows between, resulting finally in 20 ft spacing. Such an arrangement will involve the use of a series of teller-operated moving belts—in the pavement—to travel the customer's car laterally to the window and return it to traffic

At right:
buff-colored, precast
sunshades create
an interesting pattern

Below:
façade cladding on
Biscayne Boulevard is
highly polished
gray granite



Lynn Pelham



Lisanti, Inc.

DOWNTOWN OFFICE BUILDING AND BANK

The First National Bank of Miami
Miami, Florida

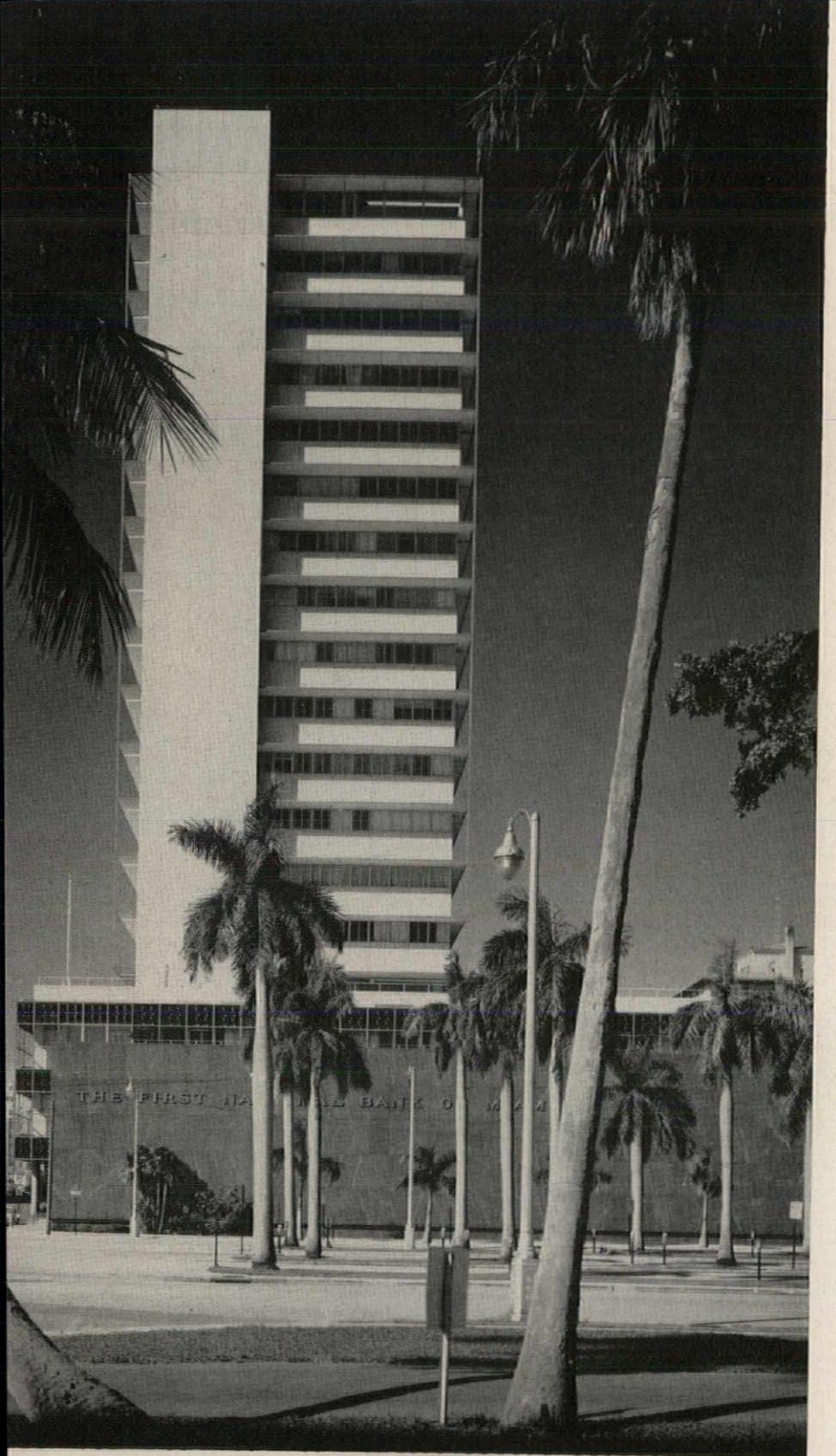
ARCHITECTS:
Weed Johnson Associates

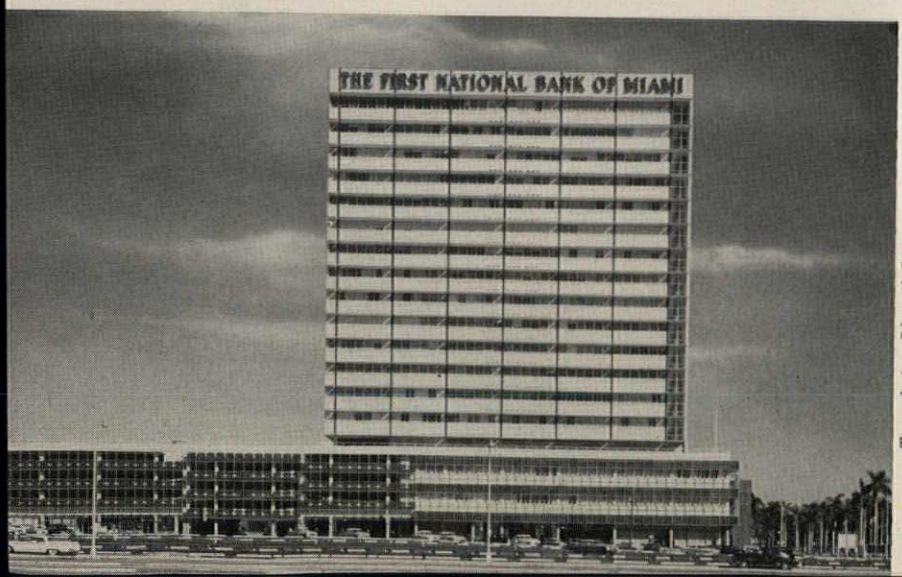
STRUCTURAL & ELECTRICAL ENGINEERS:
Norman J. Dignum and Associates

MECHANICAL ENGINEERS:
R. L. Duffer and Associates

INTERIOR DESIGN:
Knoll Planning Unit

GENERAL CONTRACTORS:
Rooney-Turner





Two photos: Lisanti, Inc.

Miami Bank

This recently completed, 18-story office building and bank—Miami's tallest—occupies an entire block at the edge of a busy shopping district, and faces east over a park to Biscayne Bay. Architecturally, the design consists of two main elements: a broad, three-story bank and parking building, and a 15-story tower of offices. The ground floor area (see plan, right) is occupied by the main banking room, 12 drive-in teller's booths—arranged so one may drive through from street to street—a group of retail shops for rental income, and the entrance to the parking decks. The self-parking type garage occupies four levels above and below grade, and will handle 600 cars. The structural frame of the bank element is reinforced concrete; the office tower has a steel cage frame.

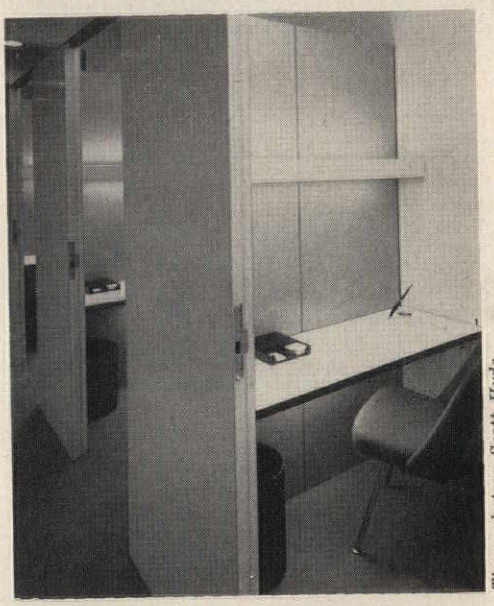
The mechanical equipment for the entire building is located on the fourth floor; a lounge, terraces, and dining rooms for bank officers and executives occupy the 18th floor penthouse.

The bank portion of the building is sheathed in polished gray granite; the remainder of the exterior is clad in buff-colored ceramic tile, which is cast integrally as facing for the precast surfacing panels; the sash and venetian blinds are of anodized aluminum in natural tone.

On the long north and south sides of the office tower, a carefully calculated system of sun screens serves to break down the tropical sun, eliminate sky-glare, and reduce the air conditioning tonnage. These shades are precast, balcony-like overhangs set in anodized aluminum frames. They project 3½ ft on the north façade, 5½ ft on the south, and are set at door-head height. For the three-story bank element, the shades are of blue anodized aluminum.

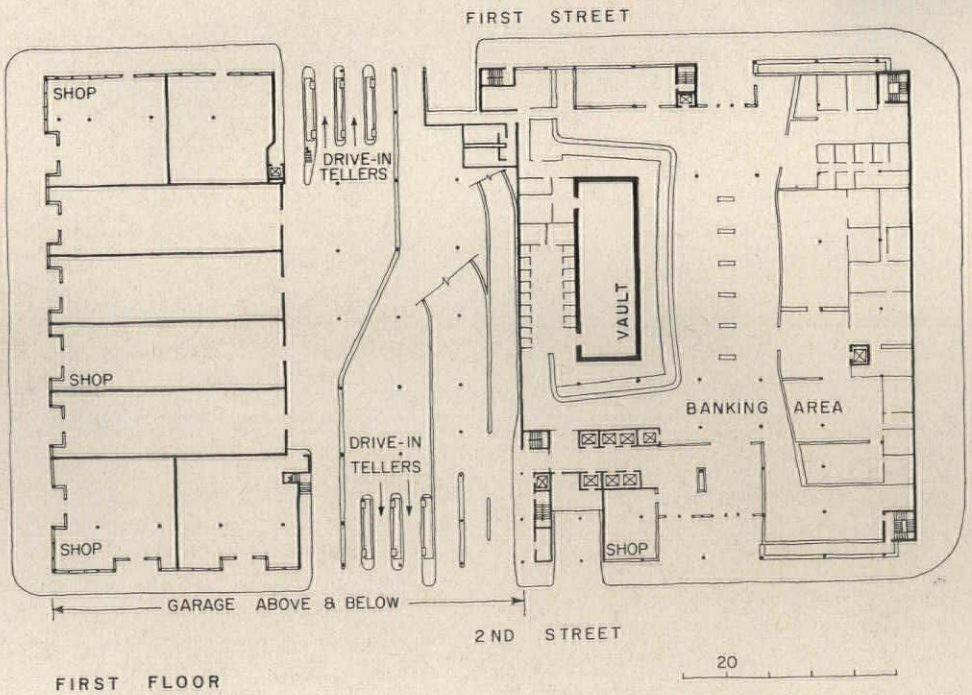




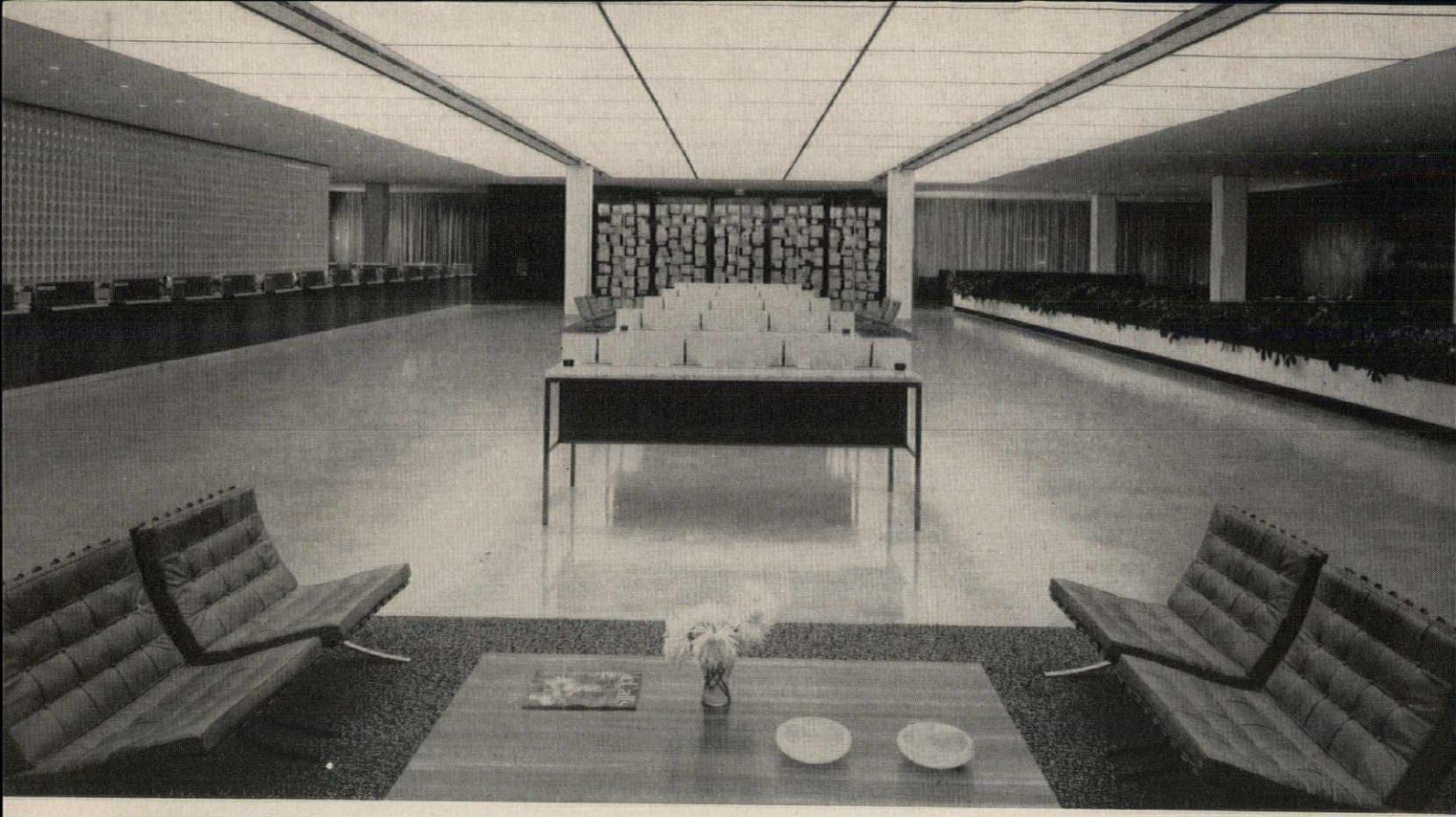


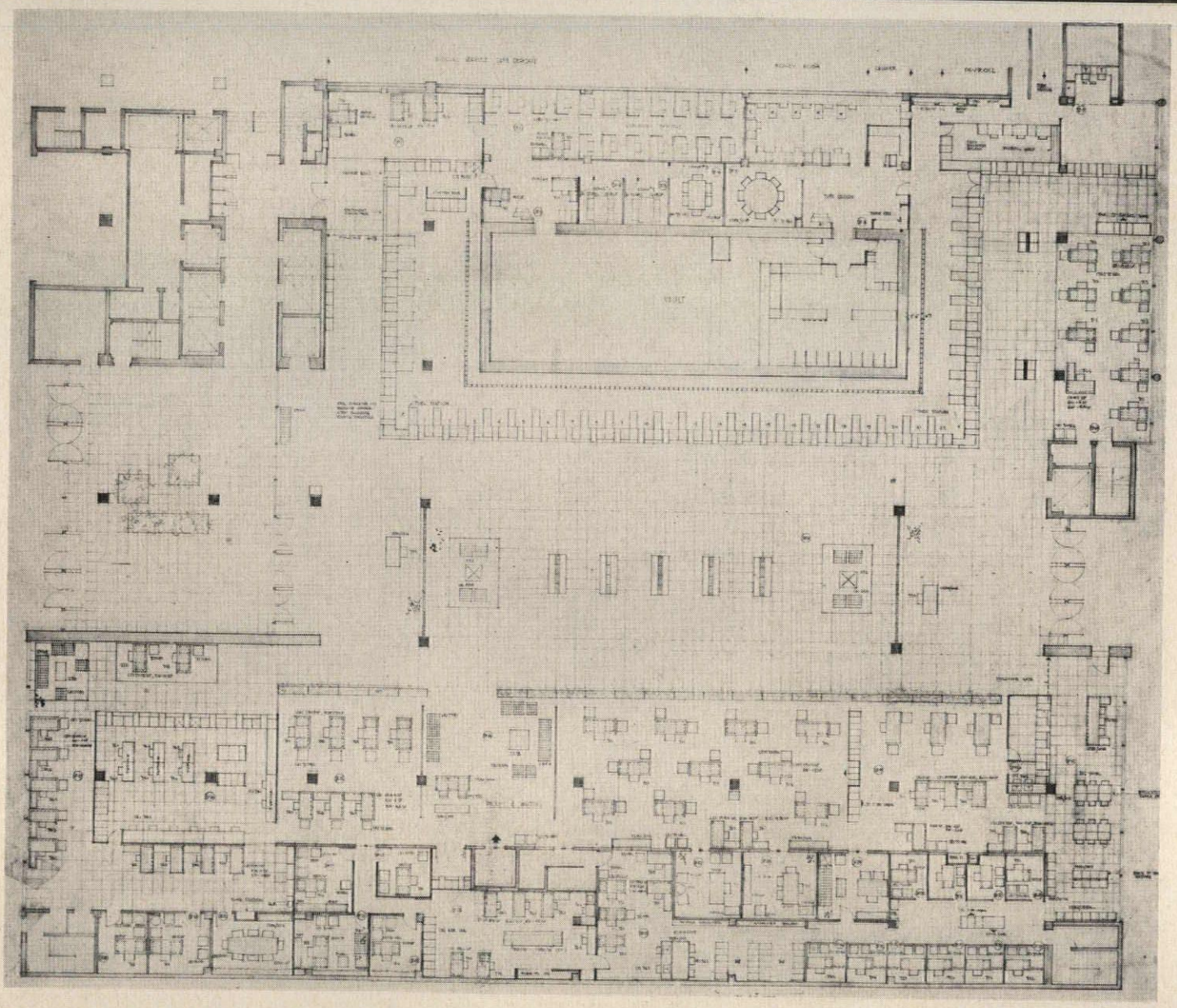
Above, reception area for the bank executive offices: teak paneling, beige carpeting, special desks with built-in telephones. Top right, installment loan offices: yellow and white plastic partitions in steel frames, white vinyl on plaster walls, beige carpeting. Lower right, safe deposit booths: dividers of blue or white plastic, beige carpeting, plastic counter with special design pop-out ash tray

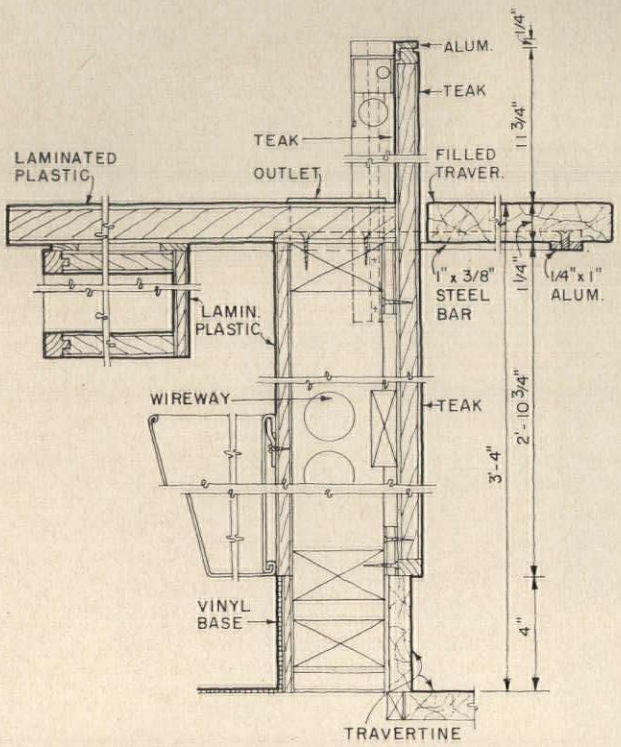
Three photos: Scott Hyde



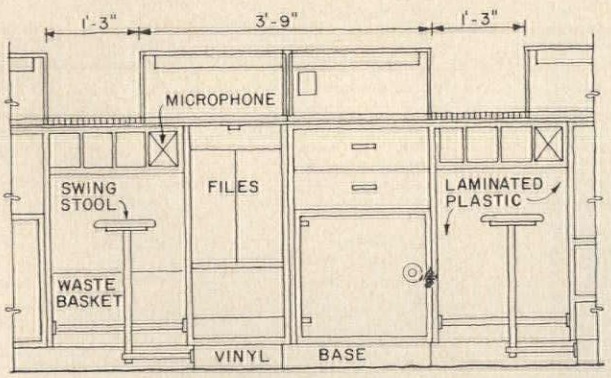
FIRST FLOOR



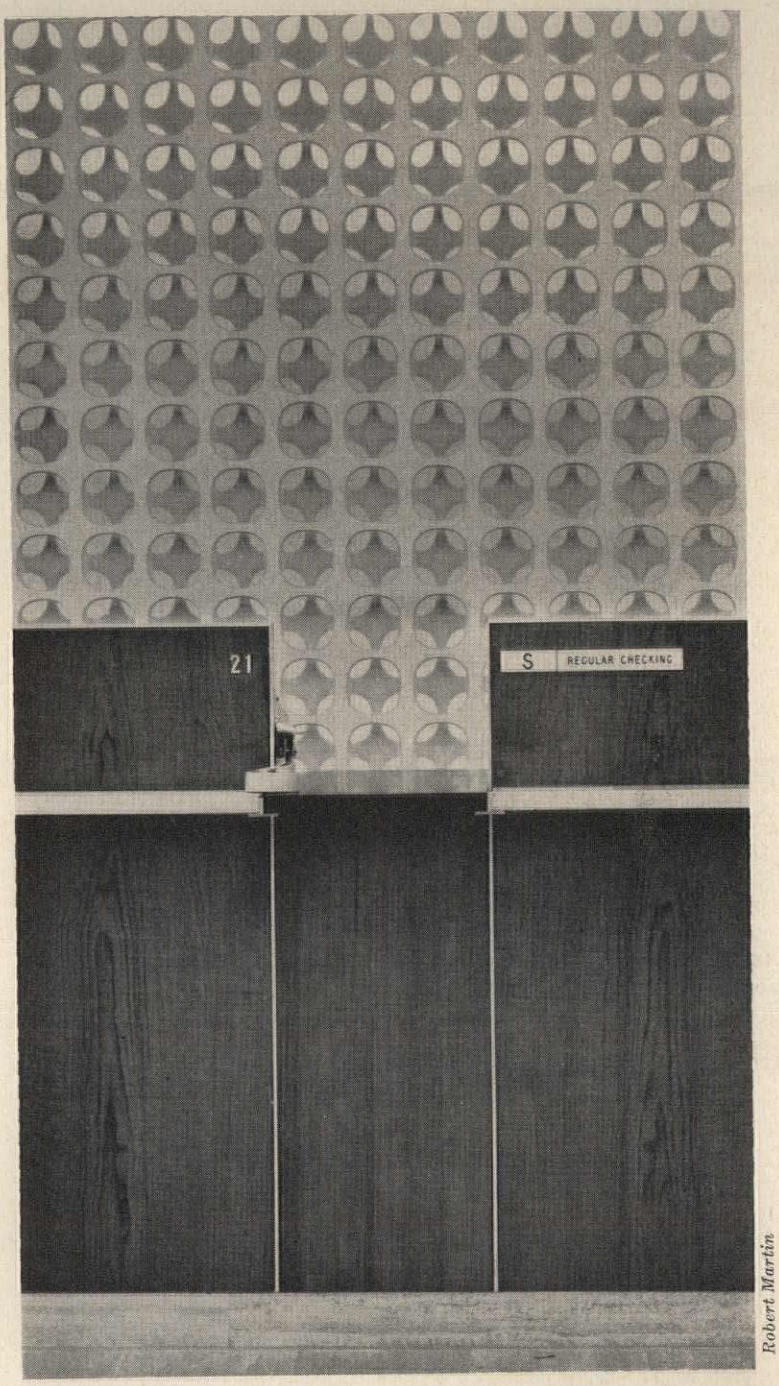




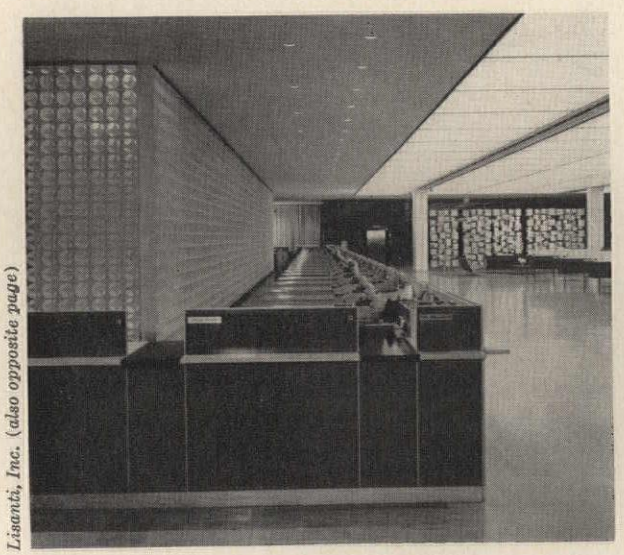
SECTION



TYPICAL ELEVATION



Robert Martin



Lisanti, Inc. (also opposite page)

Miami Bank

The main banking room—located at ground level—has an air of elegance and a degree of dignity appropriate to the banking function. Typical walls are paneled in teak; the Bertoia screen serves as background and diverts public traffic to proper areas.

The luminous ceiling consists of pyramidal plastic sections, alternately hinged for relamping. The metal strips between the columns contain two-way air conditioning diffusers.

The pierced block screen, designed by Erwin Hauer, surrounds yet stands free of the vault, which is painted blue. The contrast thus created makes the vault the visual focus of the room.

The handsome banking counter is of teak and aluminum, and features a microphone system which enables any teller to summon a guard without leaving his station or attracting undue attention



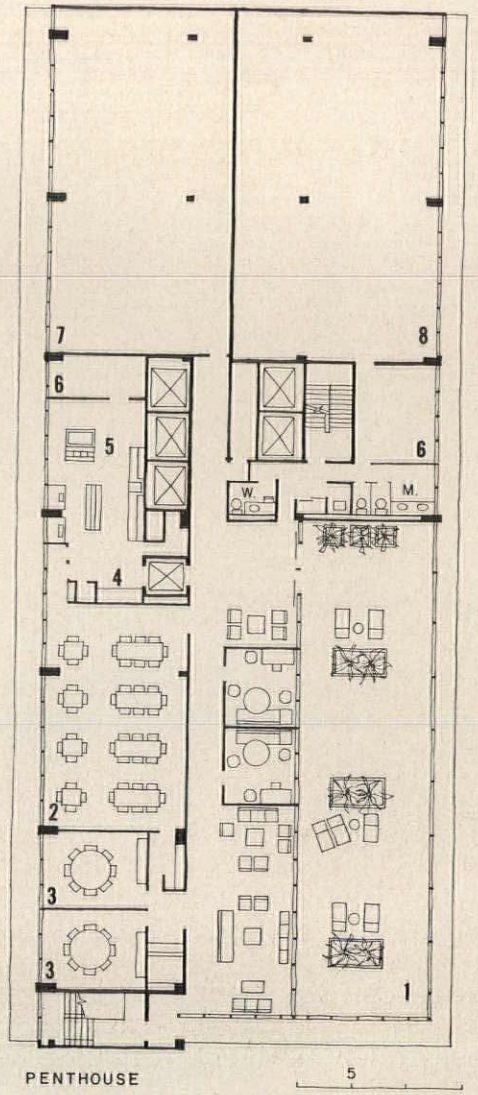
James Forney



Scott Hyde



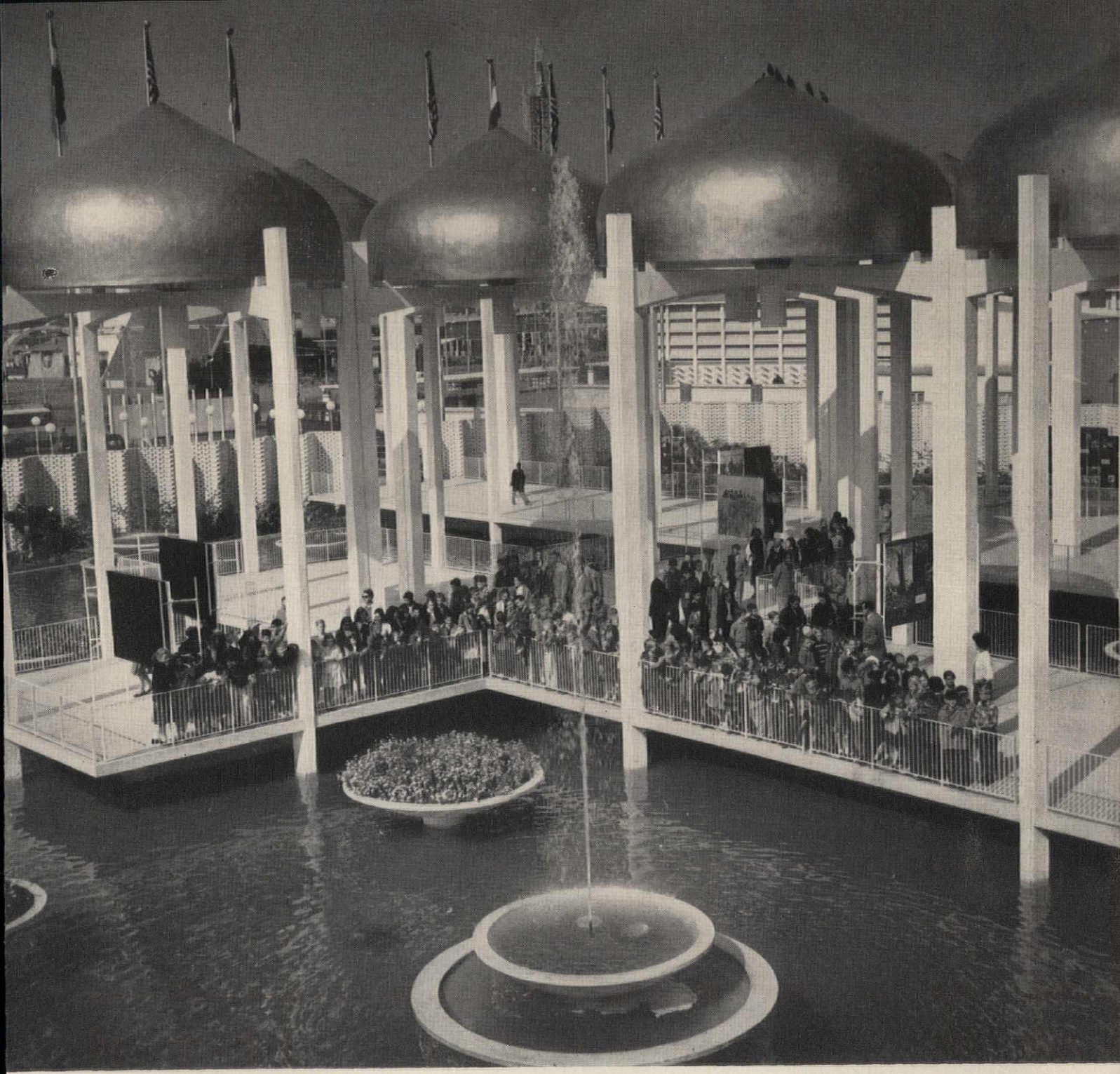
James Forney



1. Roof Terrace
2. Dining Room
3. Private Dining
4. Linen Storage
5. Kitchen
6. Storage
7. Expansion Area
8. Cooling Tower

Miami Bank

The bank officers' penthouse lounge, top: white lacquered wall panels with vertical brass splines, yellow curtains, off-white wool carpeting, furniture of leather, brushed chrome, and marble. The board room, center: gray flannel on plywood wall panels, charcoal gray carpeting, white silk curtains, table of special design consists of five interlocking pieces which can form various combinations. The bank officers' dining room, bottom: wall panels of natural teak or white lacquer, teak and black leather chairs, white linen curtains, and deep blue wool carpeting

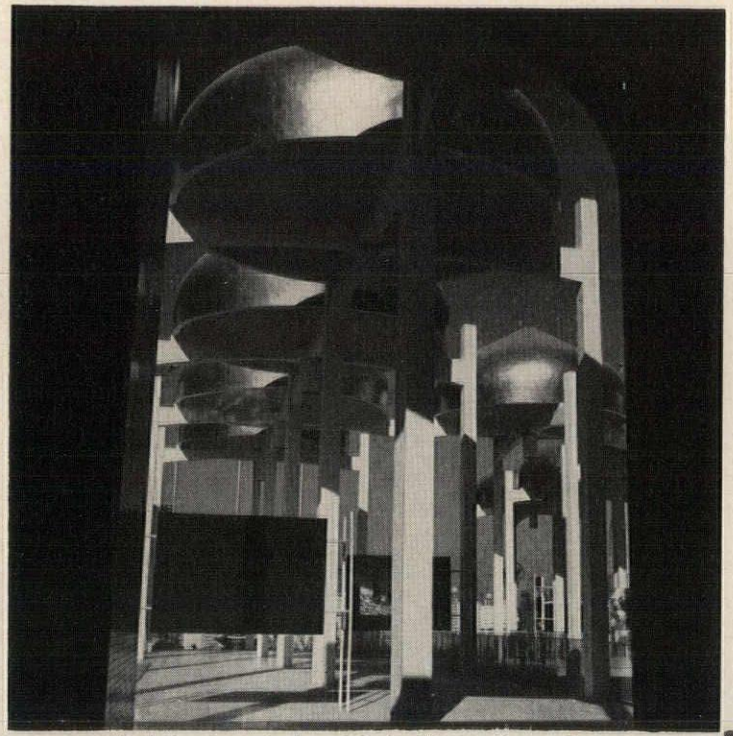


GOLDEN ARCHITECTURE STEALS SHOW

U. S. Pavilion, World Agricultural Fair, New Delhi, India; Office of International Trade Fairs, Department of Commerce, Nathaniel Knowles, Director of Project.

Minoru Yamasaki & Associates, Architects and Engineers; William Ku, Design Associate and Resident Architect; Henry Guthard, Electrical Engineer and Resident Engineer; Walter Graydon, Project Chief; Walter Tronianko, Job Captain; Edwin Siegel, Mechanical Engineer.

Ammann & Whitney, Structural Engineers; Mahindra Raj Mendiratta, Resident Structural Engineer; Frank Noftz & Associates, Exhibits; Don Reid—Sam Fatzick, Resident Exhibit Designers; Tirath Ram, General Contractor; Bhagwan Singh & Co., Electrical Contractor.



All photos (except of model) by Minoru Yamasaki

U. S. FAIR IN INDIA

The U. S. Pavilion at the 12-nation Agricultural Fair in New Delhi was more than outstanding—it completely stole the show. The combination of dazzling, fairyland-like architecture and the lively, informative display together provided one of the most successful foreign exhibits the U. S. has ever built.

Architect Minoru Yamasaki explains it all with a verbal guided tour: "The entrance is a curved ramp placed so the visitor can only guess what happens inside. A line on the ramp serves to draw more people. Inside, we find ourselves on a series of white terrazzo platforms floating over a lake filled with fountains and gaily colored flowers. Here we say, 'We are friends; you are welcome.' The large body of water, walled away from the remainder of the fair, gives a sense of space and quiet freedom away from the crowded buildings, streets, and chaos outside.

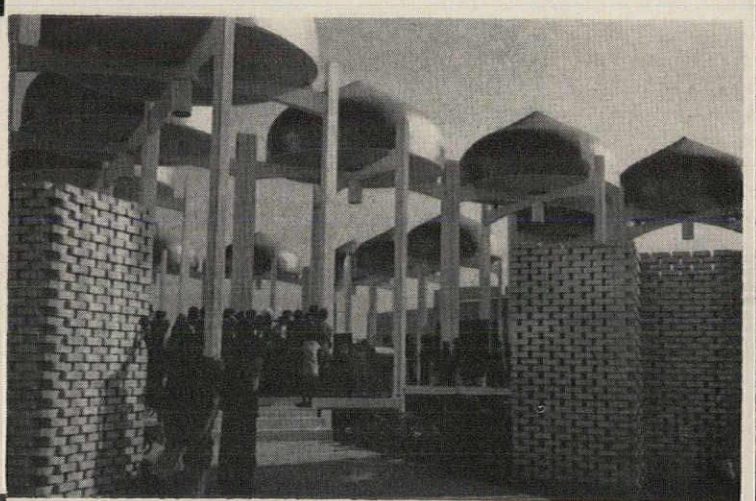
"Then we enter the first building, a low-ceilinged interior painted black for contrast. Here the story of agricultural progress in America is told; how U. S. farmers became the most productive in the world, through free initiative, organized research, technology, and communications.

"Next, we come out into daylight to visit an American county fair. Gaily colored tents shelter displays of handicrafts, prize-winning jams, jellies, pickles, hooked rugs, etc. Opposite, farm equipment is demonstrated; nearby is a barn where milking and egglaying devices are on display. A children's area nearby features a carousel and airplane ride.

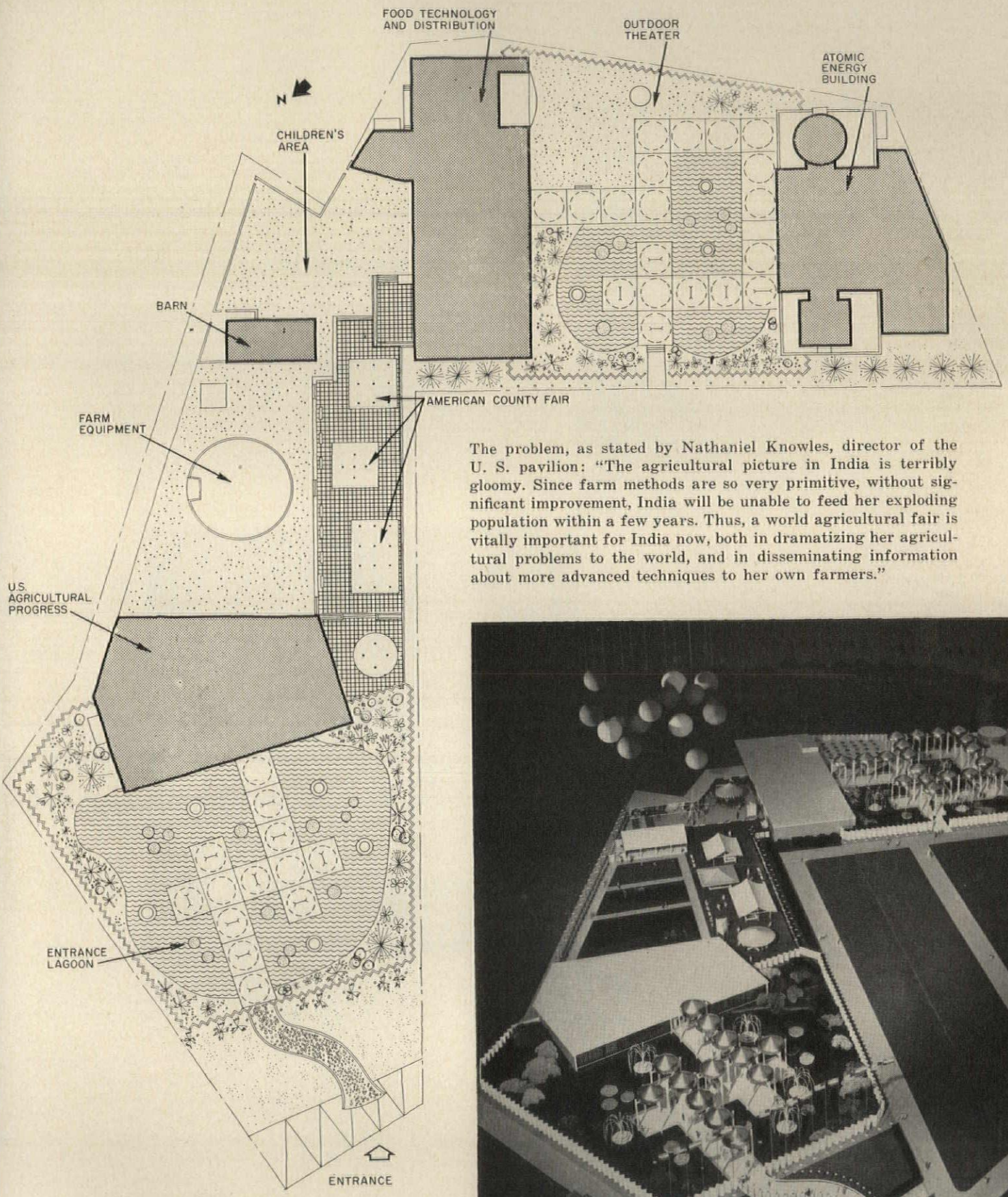
"From this area, the visitor next enters a building where the processing, shipping, and distribution of food in America is described. Then, outdoors again into a second domed and fountained garden containing a stand-up theater for 1000, where square dancing, singing, and motion pictures are presented.

"The atomic energy building—the last—tells the story of farming's future. There is a reactor, and experimental examples of what atomic energy can do for the future farm. Finally, we go out again into the garden, where we bid our visitors farewell."

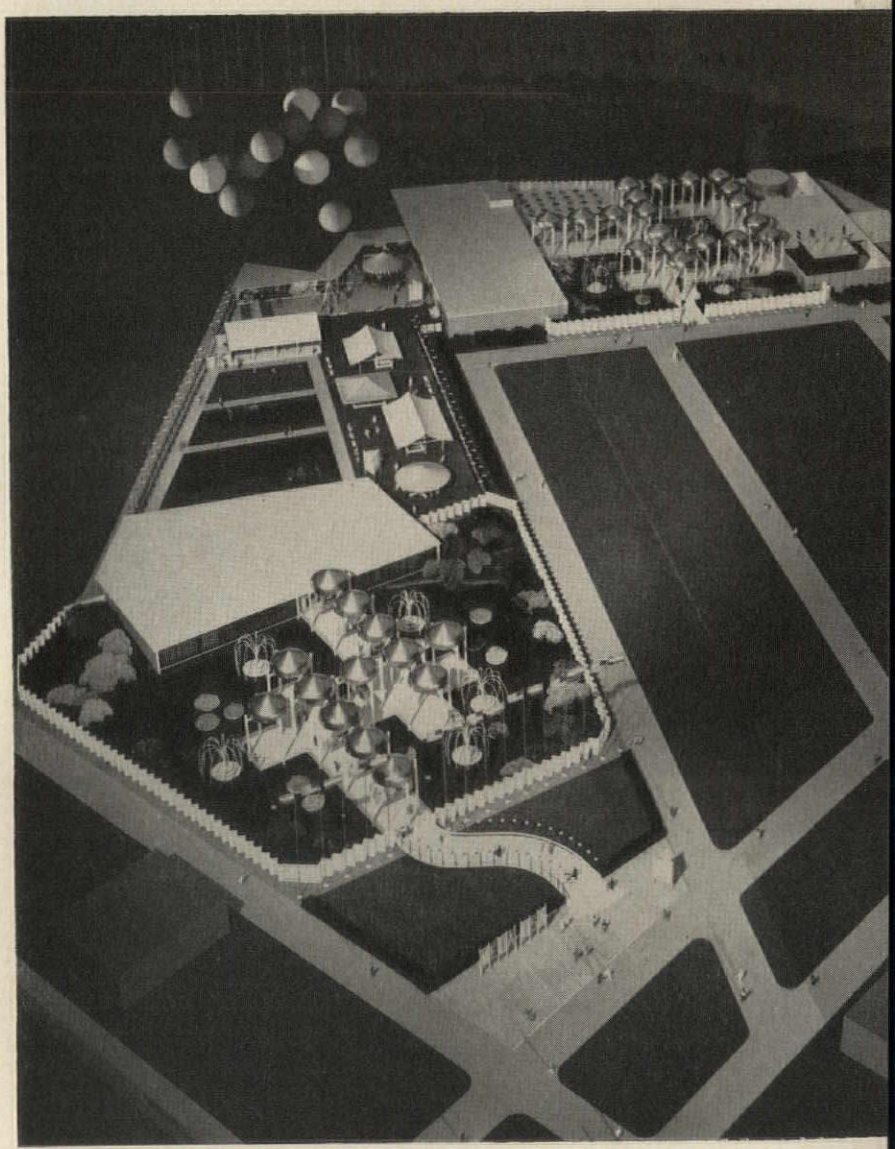
Yamasaki: "Our concept was that of a walled complex of gardens and buildings, with a continuing series of surprises within —we hoped delightful ones. We wanted to capture an Indian flavor, to show our friendship and respect for India and her ancient culture. The series of stilted domes (40 ft high) would be seen from a distance, and would be intriguing in contrast to the bulky buildings of the other countries. This proved in actuality to be quite true. The outer brick wall is 11 ft in height."

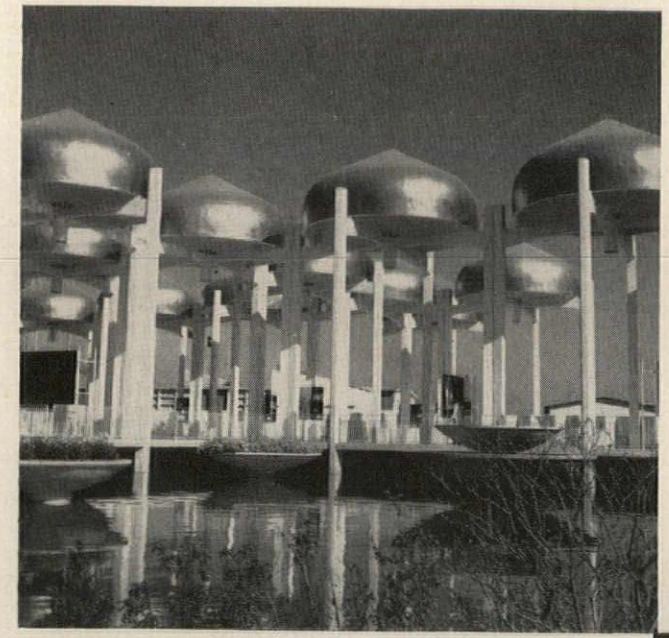






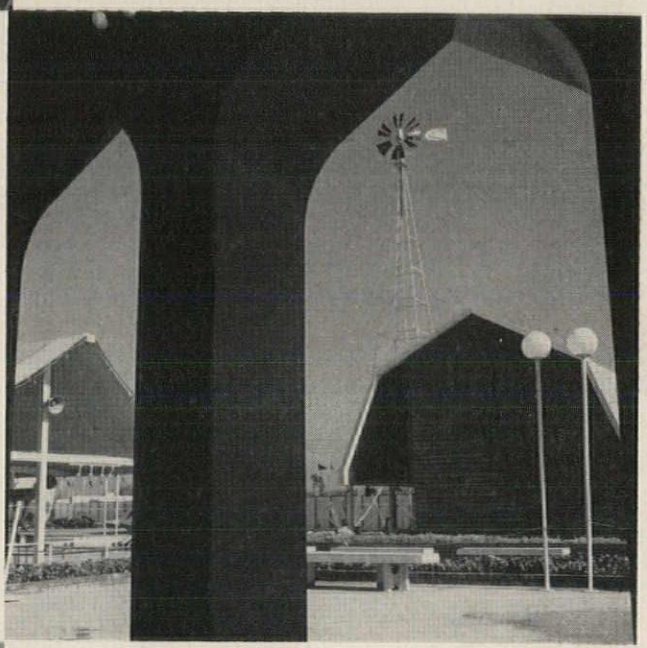
The problem, as stated by Nathaniel Knowles, director of the U. S. pavilion: "The agricultural picture in India is terribly gloomy. Since farm methods are so very primitive, without significant improvement, India will be unable to feed her exploding population within a few years. Thus, a world agricultural fair is vitally important for India now, both in dramatizing her agricultural problems to the world, and in disseminating information about more advanced techniques to her own farmers."





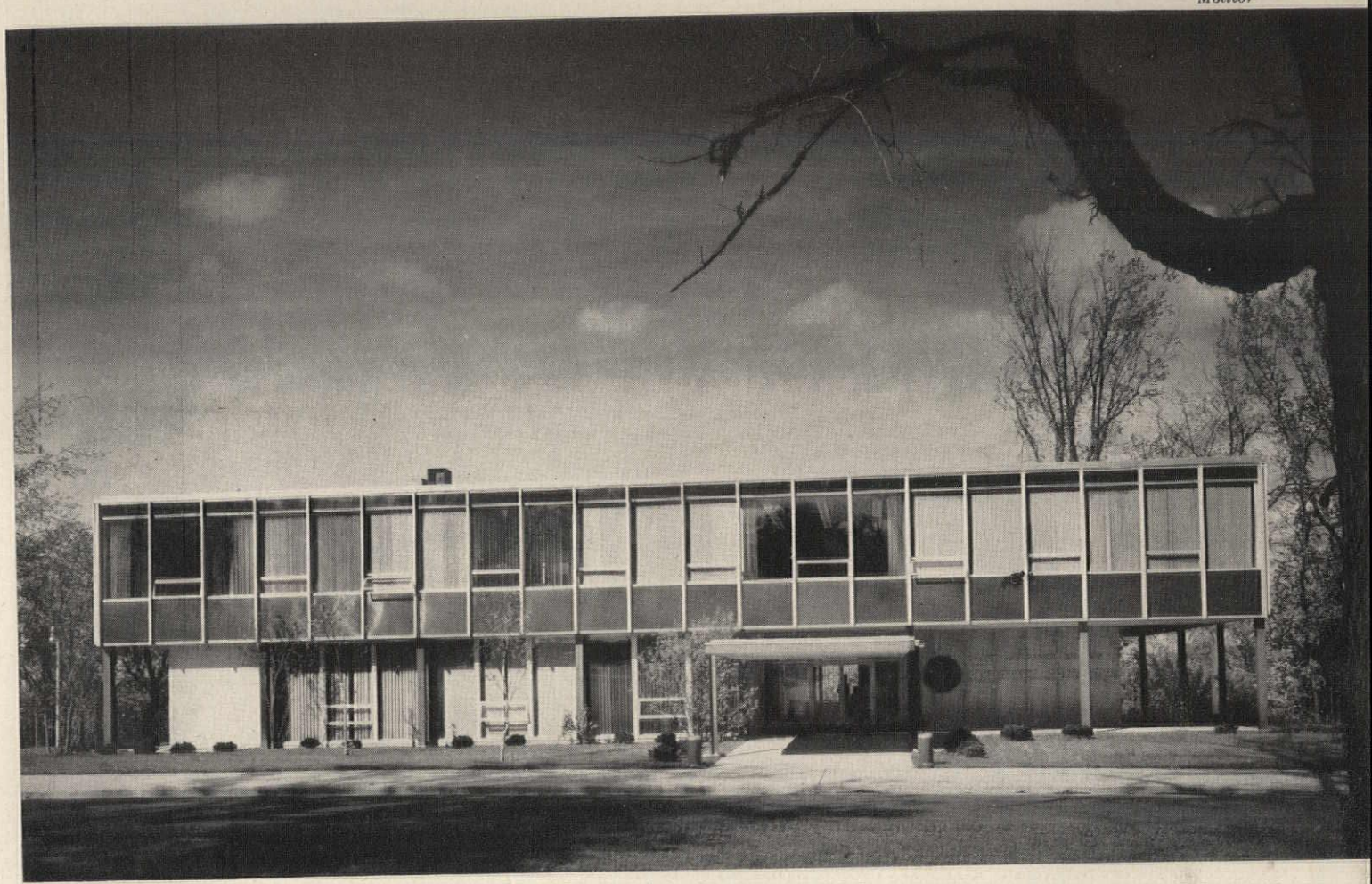
U. S. FAIR IN INDIA

Yamasaki: "We had hoped the domes and columns could be precast, but lack of facilities prevented, and they were poured in place. The buildings had brick bearing walls, plastered; steel joist roof construction. There were brick platforms for the county fair; the demonstration area was covered with powdered brick, hand crushed on the job. The concrete lake bottoms were painted blue; the exterior of the domes gold. All other concrete was rendered pure white. At night, pools, walls and domes were lighted—a grille in the first building was silhouetted. All this reflecting in the water was great fun."





Molitor

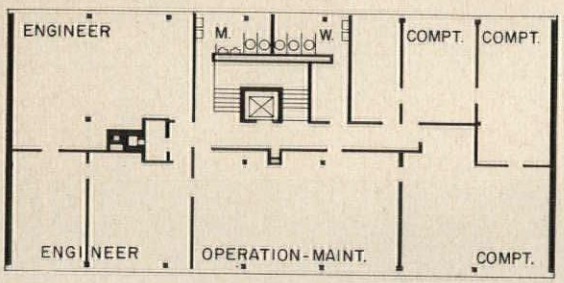


Office Building for St. Lawrence Seaway Development Corp.

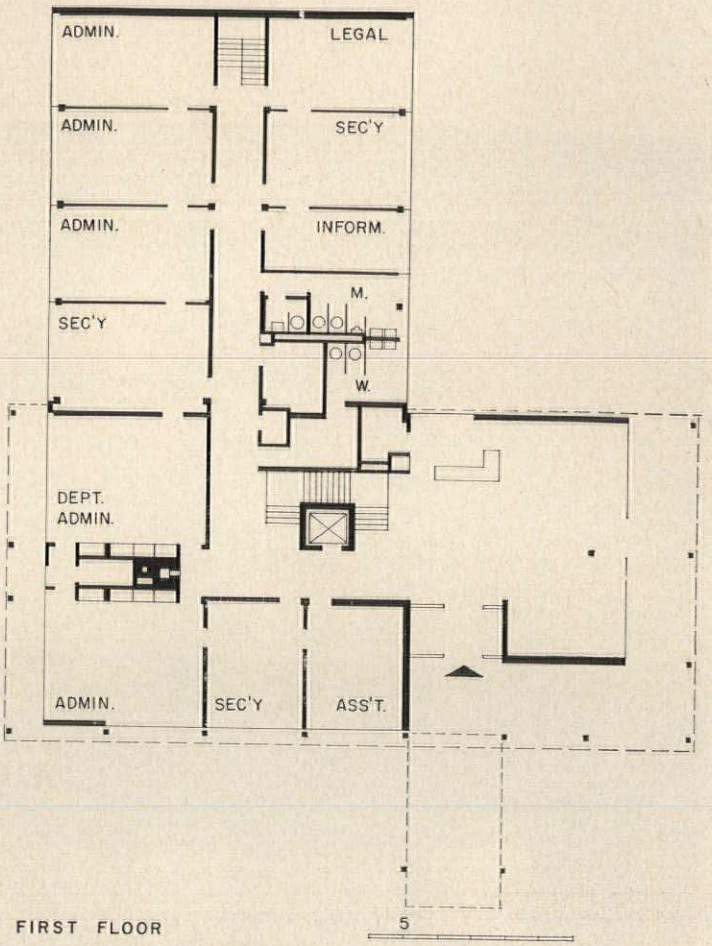
LOCATION: *Massena, New York*

ARCHITECTS: *Sargent-Webster-Crenshaw and Folley*

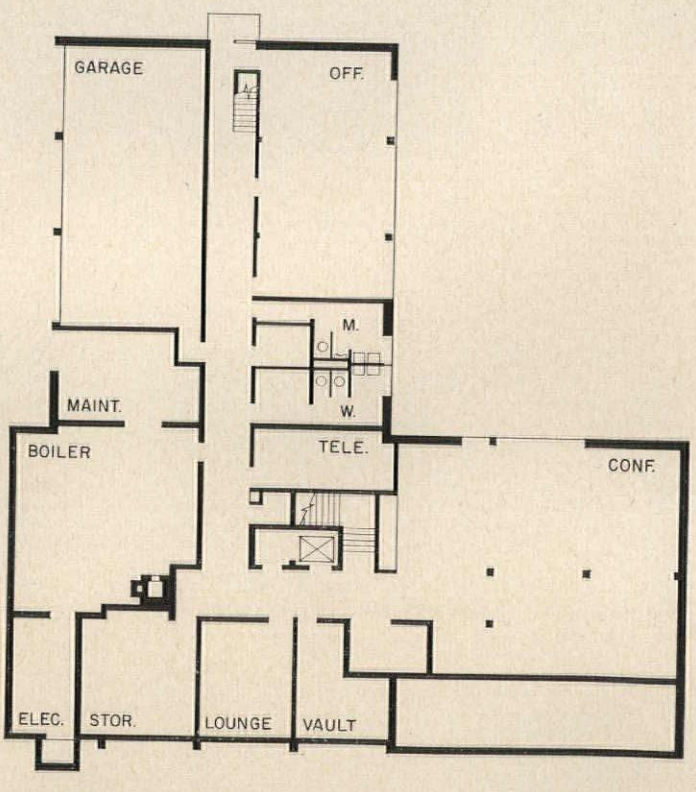
GENERAL CONTRACTOR: *Joseph E. Bennett Co. Inc.*



SECOND FLOOR



FIRST FLOOR

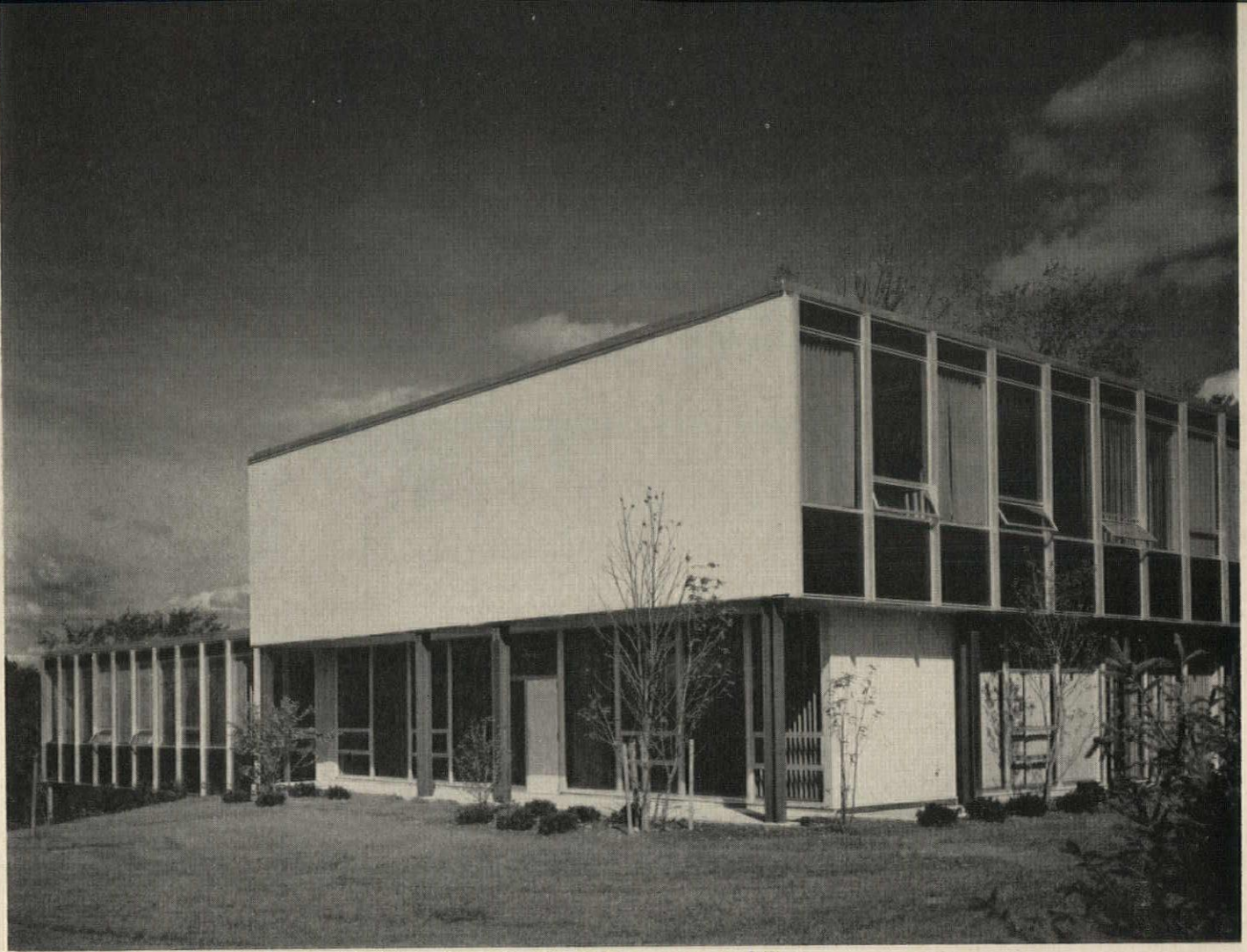


BASEMENT

This three-level structure provides work space for men in charge of the construction of the St. Lawrence Seaway. Built on a site which slopes sharply to the rear, the basement extends toward a lower grade level of the slope and obtains natural light for additional office space at the rear. The first floor is occupied by administrative offices with a small exhibition lobby to the right of the entrance. On the second floor are engineer's offices and drafting rooms.

The structure is steel frame with columns exposed at grade level. Interior floors are 2½-in. concrete fill over metal decking. No air intake grilles appear on the curtain wall exterior; they have been located in the soffits.

Continuous exterior surfaces are white marble. Window walls consist of dark blue panels, green-hued, heat resistant glass, and both fixed and projecting aluminum sash.



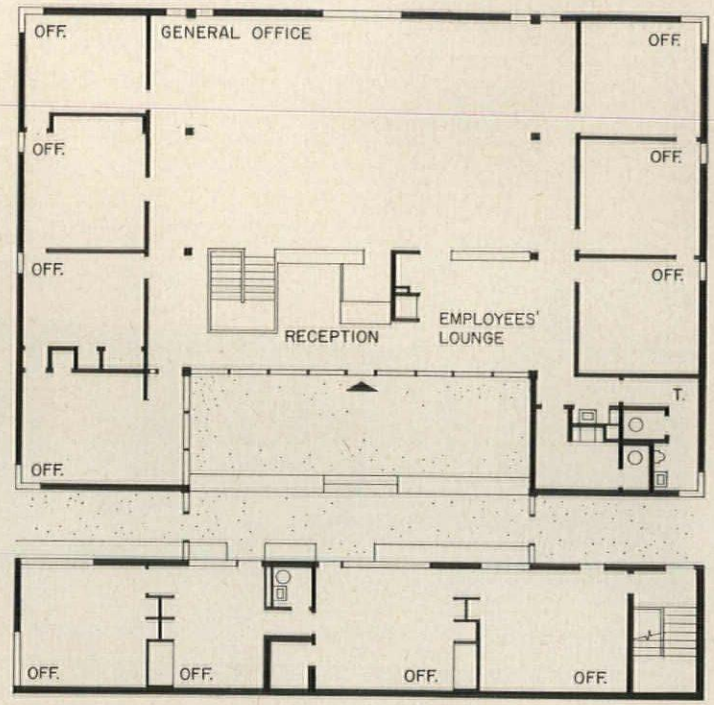
Second floor provides overhang. Administration wing is at rear, garages below

Exhibition hall to right of entrance opens onto terrace sheltered by overhang



Moltior

Offices for Aircraft Industry



NAME: *Maytag Aircraft Corp.*

LOCATION: *Colorado Springs, Colorado*

ARCHITECTS: *Lusk and Wallace*

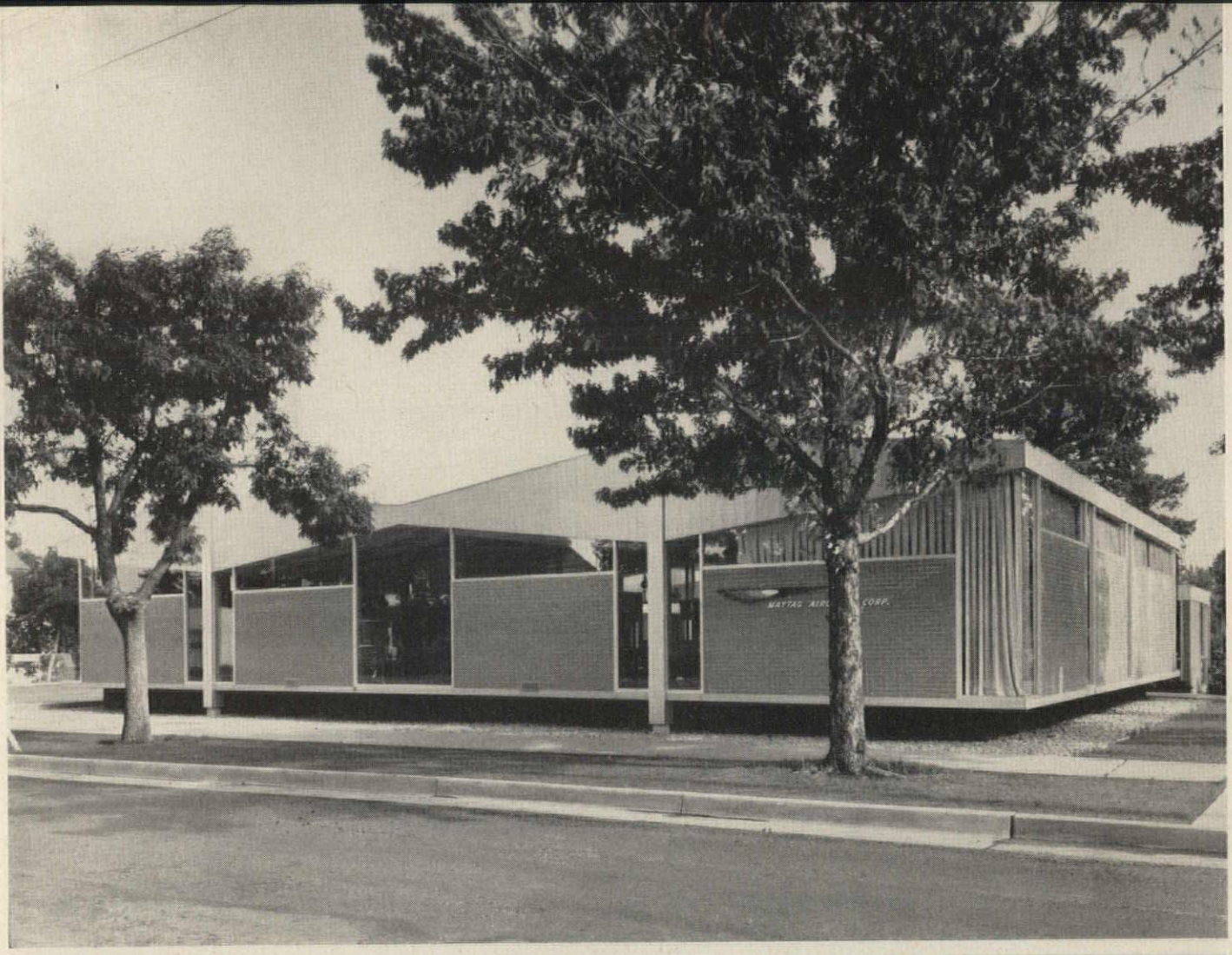
STRUCTURAL ENGINEERS: *Johnson and Voiland*

MECHANICAL ENGINEERS: *Harmon and Beckett*

ELECTRICAL ENGINEER: *Al McKitrick*

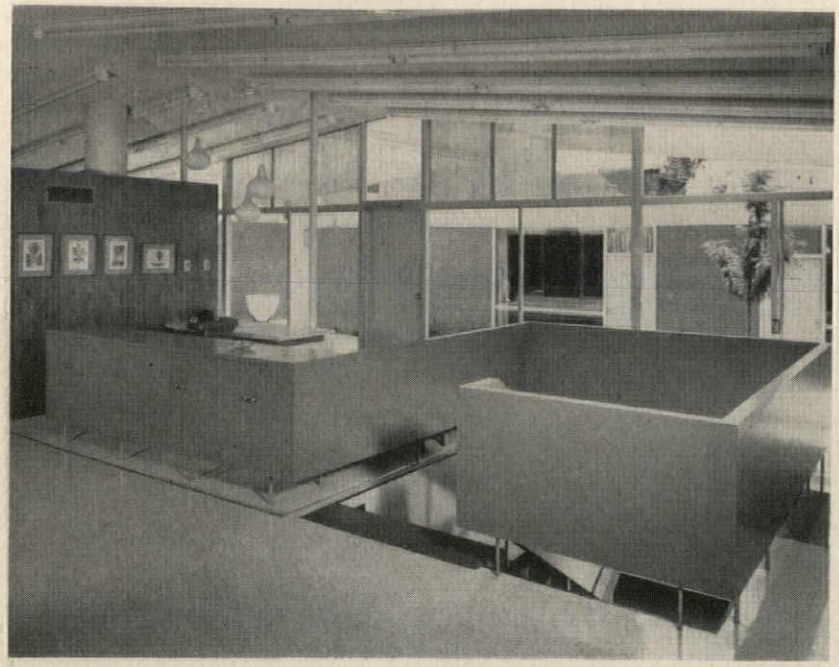
GENERAL CONTRACTOR: *Platt Rogers Inc.*

In this building cantilevered roof trusses provide flexible open space and have an air age 'look.' The larger portion houses the main office of the Maytag Aircraft Corporation which is a world-wide refueling service. The four offices in the separate unit to the south have been provided for separate tenants who share mechanical services and storage facilities with Maytag. The main area is planned around a central general office space which opens onto a reception area and a small court. The court admits north light to the offices to the south, and southern sun for the workers at Maytag. Mechanical equipment is housed in the basement of the main unit. The main floor is raised above ground and projects beyond the basement wall creating a band of shadow which serves as a visual base. The offices on the south have no basement, are lower, and have a flat roof. Exteriors are of anodized aluminum and blue glazed brick.





Guy Burgess



Reception area for main unit overlooking entrance court

Executive office. Entrance court beyond



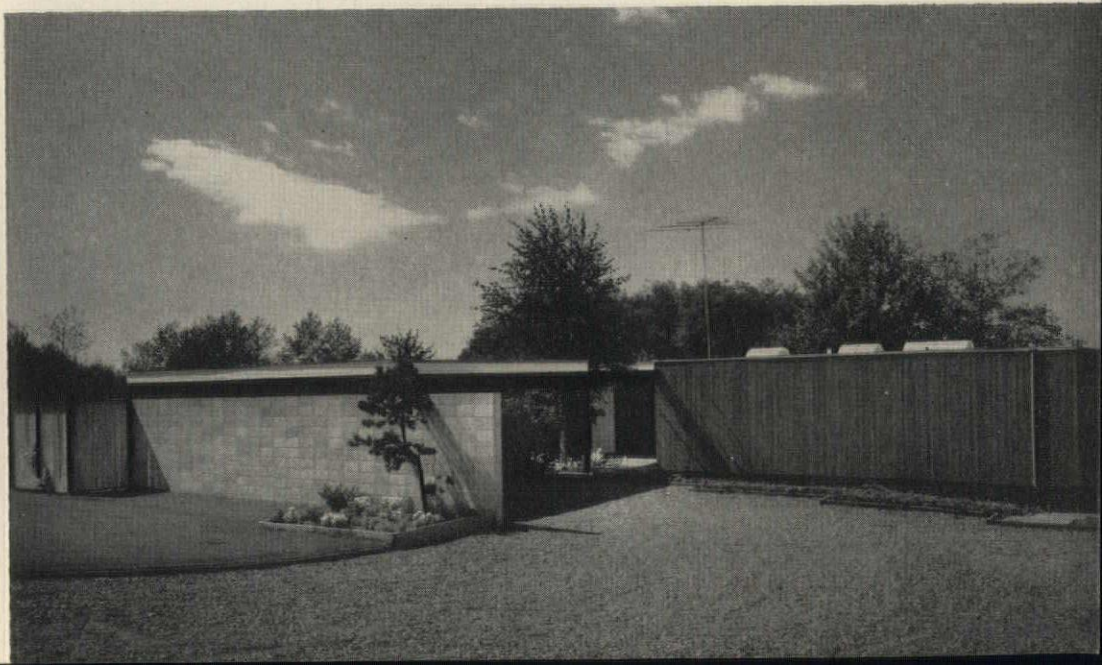
Guy Burgess

HOUSES



Dearborn-Maasar Photos

SMALL BUDGET OFFSET BY LARGE VIEW

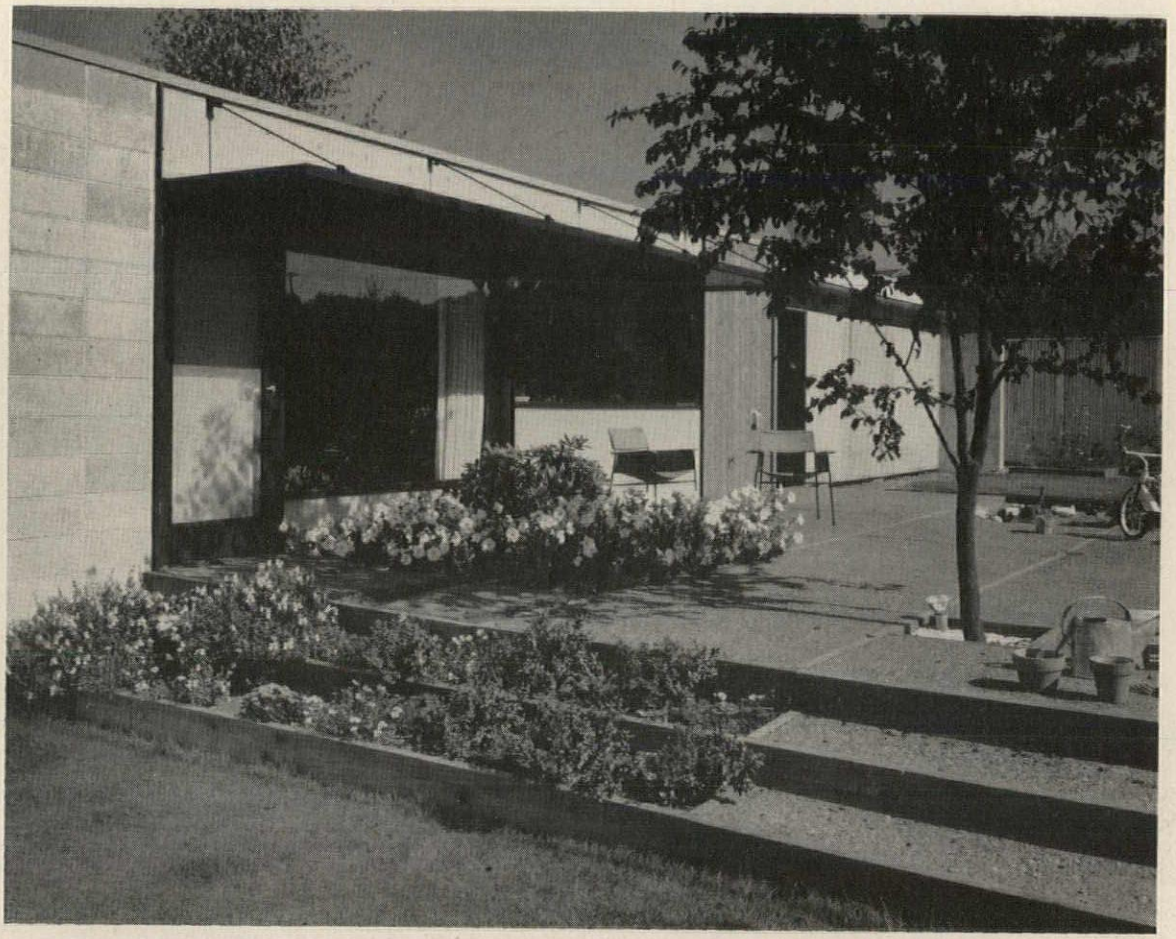


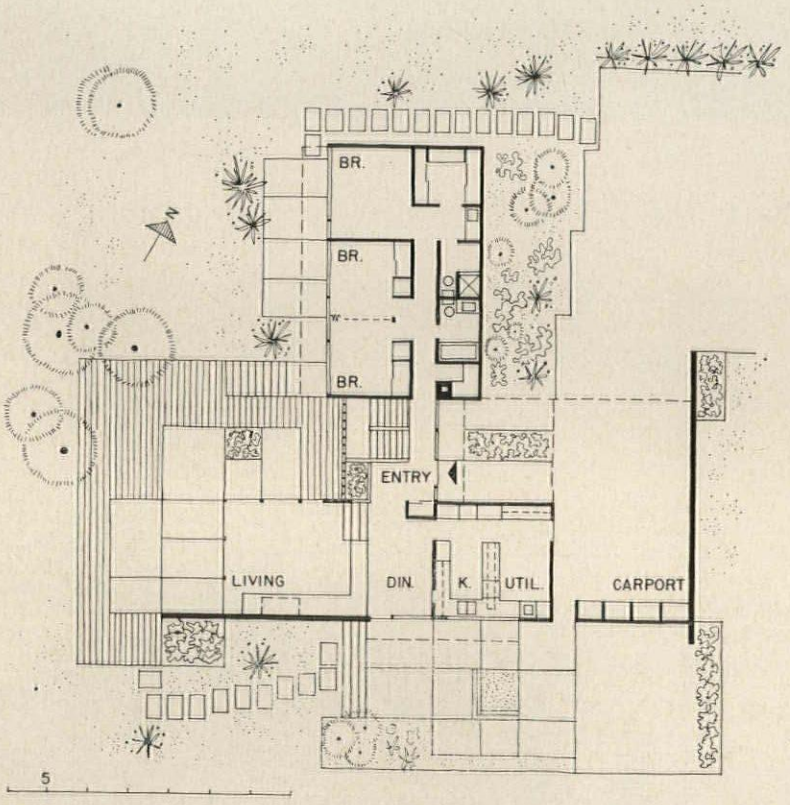
OWNERS:
Mr. and Mrs.
Richard N. Wegner

LOCATION:
Tacoma, Wash.

ARCHITECT:
Robert Billsbrough Price, A.I.A.

CONTRACTOR:
Richard N. Wegner





Wegner House

The only real problems posed by the clients were the not unusual ones of a limited budget and a desire for easy maintenance, and the pleasant challenge of a view of Puget Sound and the Olympic Mountains. The living room, the terrace and the bedrooms are all oriented to take advantage of this view, from which the dining room also benefits, as the living room is dropped 2½ ft. The lowered living room also conforms to the sloping site, and adds dignity to this area.

Activities are separated into two clearly defined zones: the sleeping wing, and the living and dining wing, connected to each other by the narrow "neck" of the entry.

The fact that the owner could act as his own contractor helped hold the cost of the house to $18,000.







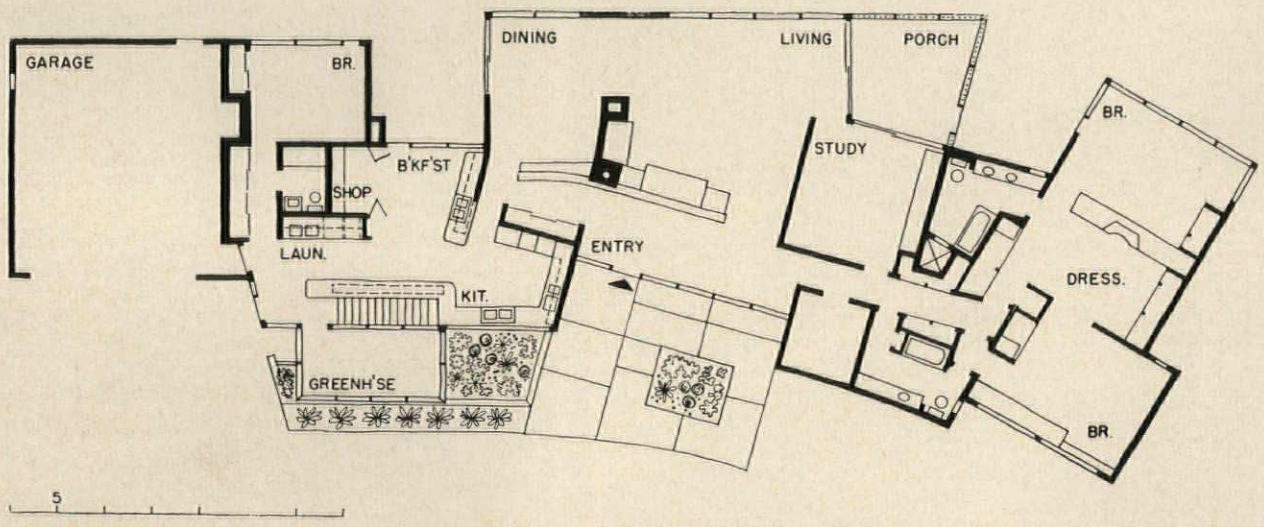


Torkel Korling Photos

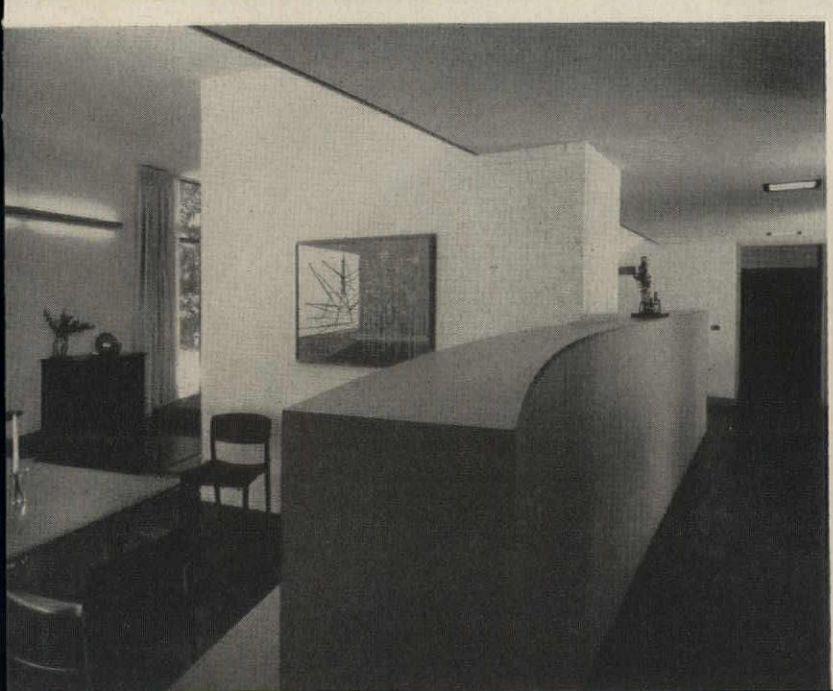
LARGE HOUSE FITS IRREGULAR SITE WITHOUT CRAMMING

LOCATION: *Highland Park, Ill.*
ARCHITECT: *Edward D. Dart*
ENGINEER: *Donald Robinson*
LANDSCAPE ARCHITECT: *Gertrude Kuh*
CONTRACTOR: *Rieke Construction Co.*

The fan-shaped plan of this house is a solution to a problem posed by an irregularly shaped lot backed by a ravine. The house is, in fact, built on the lip of the ravine. Designed for a couple whose children no longer live at home, many of the areas serve double purposes: the second bedroom is either extra space for the master suite, or a guest room; study is extra living room for parties, or, again, a guest room.





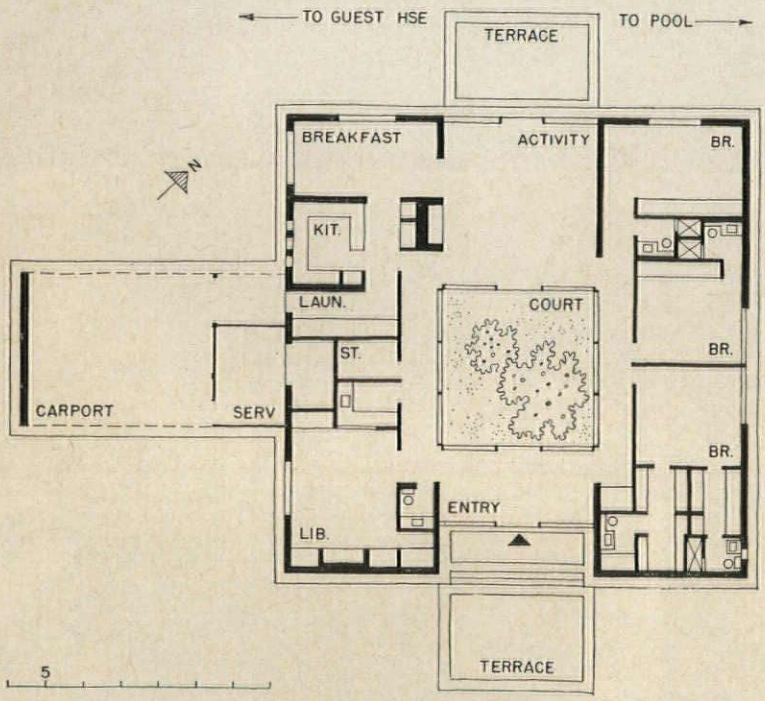






Frank Lotz Miller Photos

VARIATION ON THE COURT HOUSE THEME

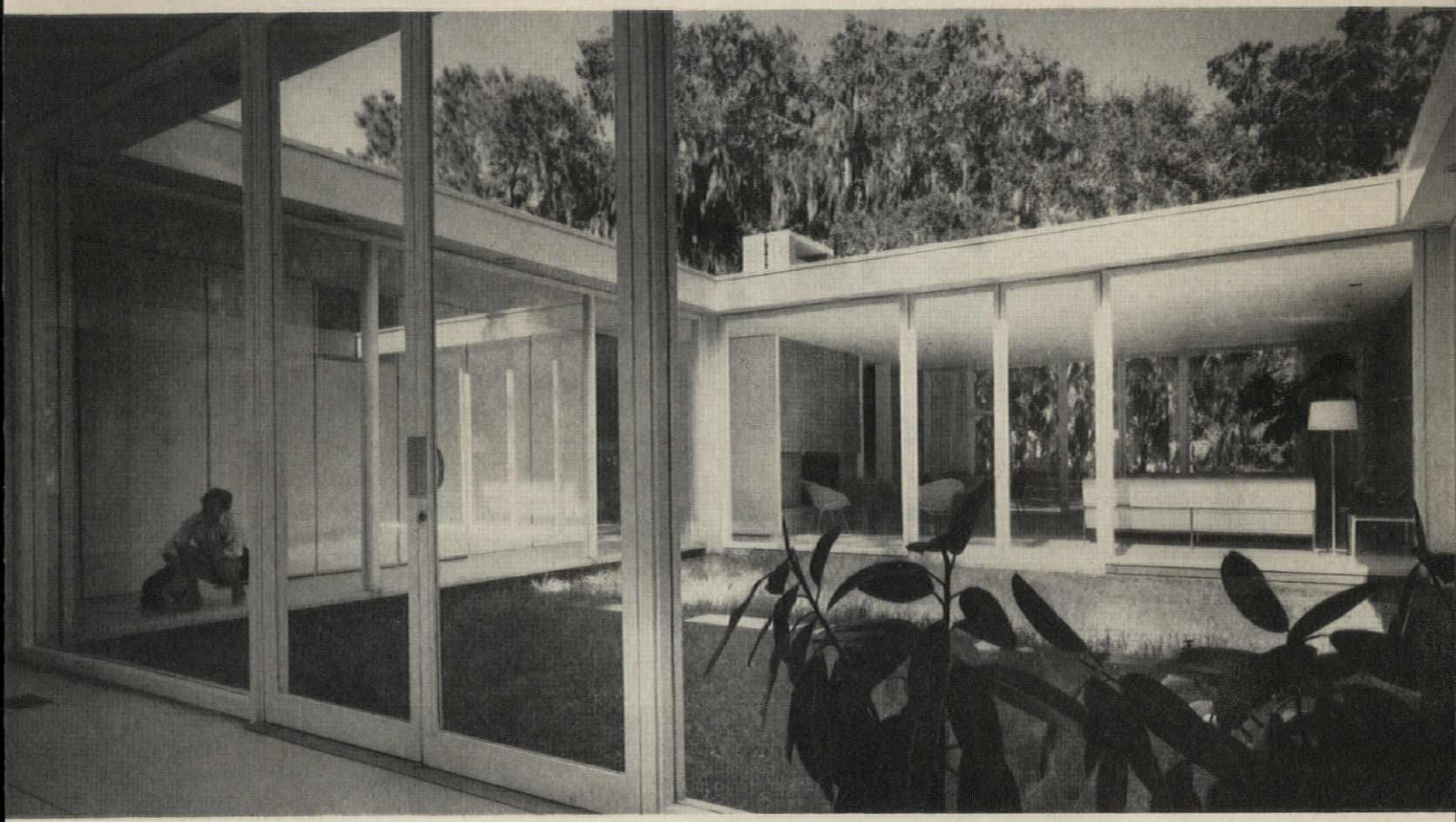


OWNERS: *Mr. and Mrs. M. L. Cook*
LOCATION: *Friendswood, Texas*
ARCHITECTS: *Bolton and Barnstone*
STRUCTURAL ENGINEER: *A. T. Knies*
INTERIOR DESIGN: *Knoll Planning Unit*
CONTRACTOR: *Robert E. Pine*

The continuing interest in the court house is partly a result of its many possibilities of variation. Here, the court is completely surrounded by living space, and is glazed on all four sides. It is fully open only to the two general areas of the entry and the activity room. Where a feeling of shelter is wanted, as in the library and bedrooms, it is available; but anyone moving about the house is always conscious of light and greenery.

The house is the final element in a group of buildings already on the property: the former house, now converted to a guest house, service buildings, garages, and a bath house.











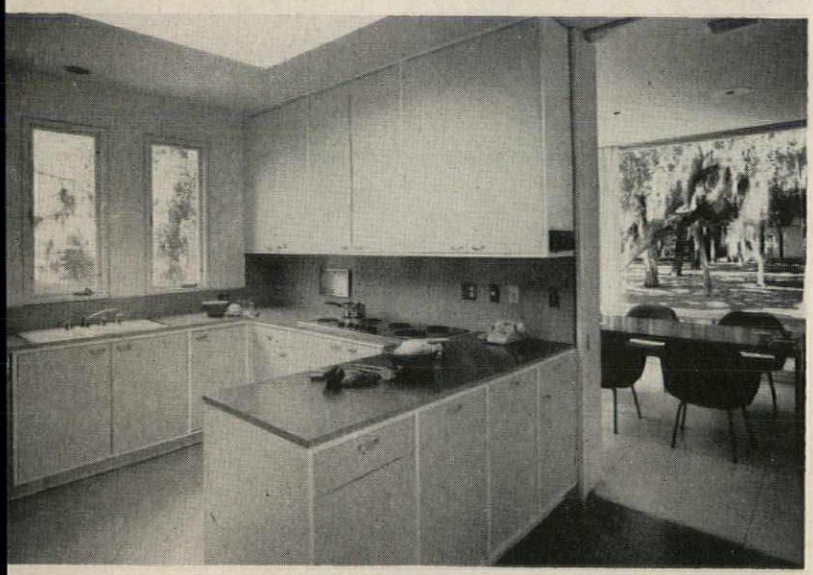
Cook House

This house took a First Honor Award in the Texas Architecture 1959 program, sponsored by the Texas Society of Architects.

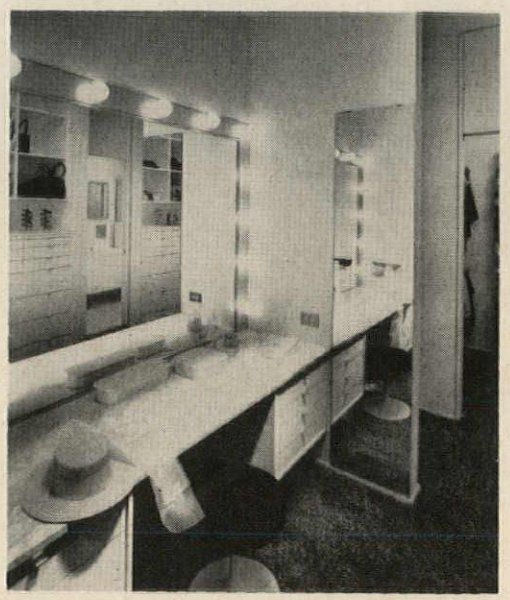
High intensity lighting, furnished by 20 floodlights set under the eaves, provides both interior and exterior lighting around the courtyard; and because the light is brighter outside, this device obviates the need for curtains.

The library is intended to serve as a formal area for receiving guests, and is served by the bar and a powder room; the activity room accommodates informal entertainment. Because of the existing guest house, no guest bedroom was required in the main house.

The house is equipped with year-round air conditioning







BUILDING TYPES STUDY 282

®

SCHOOLS

Almost everyone involved in education in any way seems to spend some portion of his time these days in self-examination. The avowed purpose of this is improvement of education. Much of the examination seems to be concerned with the role of architecture and architects in the provision of environment for learning. One of the most important continuing examinations now going on is that sponsored by Ford Foundation's Educational Facilities Laboratories, Inc. Much of this work has been reported on in the pages of the RECORD during the past months. In this issue, E.F.L. adds a further dimension to their work so far, an analysis—complete with predictions—of the path of educational architecture in the future.

Regarding the burden the schools must carry in the next two decades, E.F.L. speaks of the growth expected in the next two decades, ". . . our population will double by the year 2000! In a sense this means that in the next 40 years we must build another—an additional—America." A discussion of this idea is contained in "Sighting the Sixties: Launching a Second U.S.A., The F. W. Dodge Corporation Construction Outlook for 1960 and Beyond," published in ARCHITECTURAL RECORD, November 1959.*

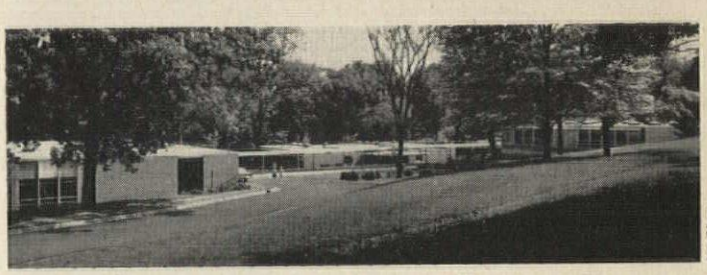
The five schools included in the present study represent present-day methods being used by architects for achieving some of the improvements discussed by E.F.L. Among the buildings shown, there is considerable variation. None solves its problems exactly as they are solved in another. Perhaps none fully realizes the potential E.F.L. is talking about. Yet each, in varying degree, approaches the potential.

*Reprints of the "Sighting the Sixties . ." article and other F. W. Dodge Corp. publications on this subject are available to architects and engineers who request them. These publications include: Construction, Consumer Spending and the General Economic Outlook for 1960 (submitted to Joint Economic Committee, Congress of the United States, Feb. 1, 1960), A Bright Picture, The Outlook for Industrial Construction, (Jan. 27, 1960), Construction Project: Build A Second U.S.A. in 40 Years (1960), The Housing Market: Soaring Through the Sixties (Jan. 25, 1960), Preview of Housing Construction for 1960 (Jan. 1960). All of these are based on statements or speeches of Dr. George Cline Smith, Vice President and Chief Economist, F. W. Dodge Corp.



Molitor

Sarasota Senior High School, Sarasota, Florida
Architect: Paul Rudolph



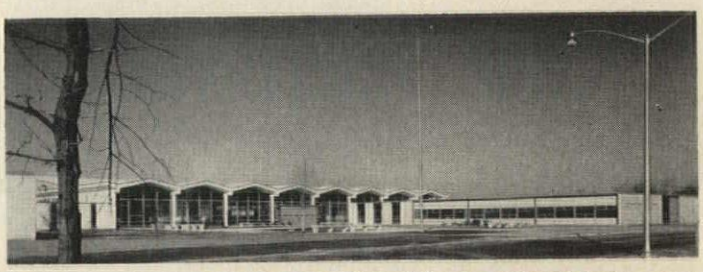
Molitor

Hilltop Elementary School, Wyoming, Ohio
Architects and Engineers:
Charles Burchard, A. M. Kinney Associates



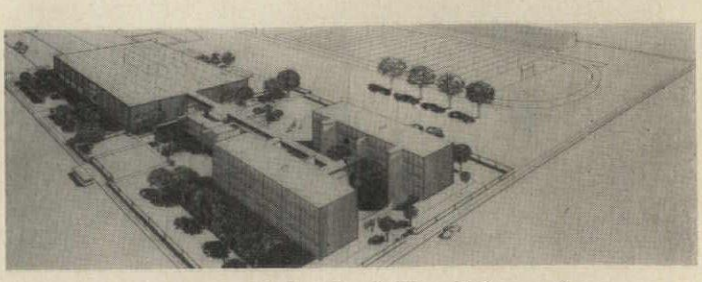
Jay Oistad & Assoc.

Robert E. Lee Senior High School, Tyler, Texas
Associated Architects:
Caudill, Rowlett & Scott and Bruce & Russell



Amiaga

Smithtown Central High School, Smithtown, New York
Architects: Ketchum and Sharp



Lawless Area Junior High School, New Orleans, La.
Architects: Charles R. Colbert
of Colbert-Lowrey-Hess-Boudreaux

SCHOOLS FOR TOMORROW

*Prepared by Educational Facilities Laboratories, Inc.**

Many a school being built today will be operating well into the twenty-first century. If tomorrow's schools must accommodate tomorrow's methods and tomorrow's content of education, it behooves everyone who plans a school today to think about the probable shape of things to come —such as these:

Small Spaces Will Be Multipliable

Central to the design of space for teaching and learning is how the persons involved, adults and children, are to be deployed. If the custom continues of arranging children in uniform class groups of 25 to 35 or more children to be taught by one teacher, unaided and alone, then the schoolhouse will continue typically to be a series of uniform classrooms, of equal-sized boxes, supplemented by such specialized large spaces as the standard gymnasium—whose dimensions are determined customarily by the requirements of basketball; an auditorium, which may stand idle for all but a few hours each week; a cafeteria, offering little other use than noontime feeding; and a library.

If, on the other hand, schools move toward arrangements of pupils and teachers that vary from the solitary teacher in her solitary classroom, the arrangement of spaces will vary accordingly. A number of school systems, chafing under the restriction of the conventional egg-crate arrangements of classrooms, row on row and layer on layer, have moved on to a clustering of four or more classrooms around a central space as a way of bringing better communication among teachers and, to children, a sense of community larger than the classroom but smaller than the school.

Today's clustering of classrooms is a half-step development toward the variety of space required when teachers become members of instructional teams and pupils are regrouped from time to time during the day according to the size of group most appropriate to the task at hand. To use an analogy from medicine, fewer teachers will be general practitioners, and more will be specialists. Thus also will return to teaching a zest for scholarship since each teacher on the team needs to know in depth—and have pride in knowing in depth—a particular field of knowledge.

Many schools are now being designed to provide instructional spaces of varying size—from individual study spaces to the small, round-the-table, seminar space, to lecture-discussion rooms that double, triple, or even quadruple the standard classroom. But the desire now expressed by a number of schools to achieve malleable space that can be shaped at once and at will must await the development of a retractable partition which will give acoustical privacy. It seems likely that such a partition will soon be available, since only its cost remains unsolved.

The quest for immediate flexibility has taken many forms. The Belaire Elementary School in San Angelo, Texas, a circular school of eight classrooms, separates its rooms by retractable partitions. Several schools now on the drawing boards, or under construction, are specifying the retractable partitions—e.g., the Chicago University Laboratory High School, the North Chicago Teachers College of the Chicago Board of Education, the Newton South High School, Newton, Massachusetts, and the Dundee School in Greenwich, Connecticut, which is designed for team teaching. Schools of loft construction, such as the Hillsdale and the Mills High Schools near San Francisco and Clare High School, Clare, Michigan, provide flexibility not at once but within hours. Indeed, most schools being planned today are careful to make sure that some interior spaces are not frozen, even if only to the extent of separating classrooms by non-bearing cinder-block or other cheaply destructible walls, however rare their actual removal.

Large Spaces Will Be Divisible

Immediate divisibility of large spaces through the use of folding doors has, of course, been standard practice for years in gymnasiums. Because relatively low levels of acoustical privacy can be tolerated in a gymnasium, these doors have worked with reasonable success. But for most other spaces, particularly the academic, the folding or otherwise movable partition, though tried many times through the years, has usually proved ineffectual in stopping the intrusion of intelligible sound in areas that require acoustical privacy. When a simple, removable barrier offering acoustical separation becomes available at reasonable cost, the principle of mutable spaces will find ready adoption for academic spaces, thereby increasing the freedom to group children at will and to diminish the spaces that otherwise, but now necessarily, lie idle in many schools.

Hotels have long recognized the need for securing high multiple use of space in ballroom and banquet areas. Large business concerns which conduct meetings of varying sizes are providing divisible space. A number of colleges are experimenting with divisible studio-auditoriums. In Boulder City, Nevada, a high school auditorium is about to be constructed to provide three lecture-discussion spaces at once by drawing partitions across a 600-pupil auditorium. The Superintendent of Schools of Boulder City estimates that this divisible auditorium in a large high school will reduce by five classrooms the total amount of academic space that would otherwise have to be constructed. If his calculations are accurate

*This article was developed from the concluding chapter of the forthcoming book, THE COST OF THE SCHOOLHOUSE, soon to be published by Educational Facilities Laboratories, Inc., 477 Madison Ave., New York, N. Y. Copies may be obtained from E. F. L., upon request, by those interested.

it is clear that though divisibility costs more than non-divisibility, the over-all effect is to diminish the cost, to increase utilization, and to accommodate more sensitively the kind of academic arrangement of teacher and pupil, collegiate in principle, toward which many schools are moving in the press for academic achievement.

Space Will Be Added and Subtracted

Most large school systems can predict with reasonable accuracy the total number of children who will be enrolled in the school system for a few years ahead. But prediction of the ebb and flow of enrollments in individual schools defies all available arithmetic. To illustrate: last year San Diego built a new high school for 1,500 students. Factors visible now but not then will cause the building to overflow next year by a dozen classrooms. Chicago has a 1,200 pupil school with an annual turnover of 100 per cent in enrollment.

One way to provide schools at once for overflowing districts is to dispatch mobile classrooms and related facilities. Los Angeles, for example, has 3,300 transportable classrooms, and moves about 500 around the city each year. In San Diego, approximately 23 per cent of the school population is housed in transportable schools. Houston, Texas, uses a thousand transportable classrooms; Rochester, New York, and Toronto, Canada,—indeed, a host of communities—use mobile classrooms to rush space to overflowing schools and to recapture their equity when the rush is over.

The trend toward transportable schools has been hampered by the common practice of making them substandard, makeshift arrangements unworthy of careful design, good construction, and continued maintenance. In many communities the transportable school has inherited the disrespect of the World War I shed-like "portable" that still blemishes the backyards of schools in our big cities. Yet there will be developed a mobile, probably demountable, school that will be good. It will provide for children and teachers an environment at least as good as the permanent school. And it will offer to educational management the ability to provide space on short notice and later to recover that space for deployment elsewhere as unpredictable needs arise. Some rapidly growing school systems have set a proportion of one-fourth to one-fifth of all space to be mobile.

To avoid unnecessary building as the waves of enrollment pass through a school system, expect the junior high school to become the flexible linkage between elementary school and high school, varying in grades contained according to the flow of enrollments in the whole system—at times housing grades 7-9, at others, 5-8, 6-8, 7-8, and possibly other combinations. Even the name may gradually change to "middle school," and its purpose and the grades contained may be exactly that—the school that is midway between the elementary school and the senior high school.

Some Schools Will Be Convertible and Shared

Communities, like families, mature—and at different rates. Some communities in America have clearly matured. No more land is available for new homes. Old homes are giving way to encroaching business, industry, and commerce. Coming down the street toward the school are the neon signs, the automobile sales lot, the beer joints, the light manufacturing, the decaying residences. Left by the side of the road is the schoolhouse, half empty, ill-maintained, and obsolete, adding its gloom to the general depression, unable by its unchangeability to accommodate itself to the engulfing tide. There it sits, no longer good for children, no longer good for anything. And eventually it is abandoned, sold for the value of the land less the cost of demolishing the building. Almost every city, even the satellite suburbs, have schools like this. Not just the big old cities need worry about this; the big new suburbs should think about this matter.

The life and death of areas in a city are fast reaching predictability. The school board, superintendent, and architect who plan each school for an unchanging society saddle us with a continuation of the errors of our forefathers. Consider with every school whether it should be designed for the ages or just for a time until it must be something else—a showroom for the automotive trade, a place of manufacture, an office building, a settlement house? Will a school always be needed here? If not, plan now, for later is too late. Design it to be good as a school in its early years, but convertible with grace to other use, to business, to commerce, to housing, or to whatever can now be predicted to be its ultimate disposition.

As a case in point—New York City is contemplating a new commercial high school, some floors of which may be occupied by private enterprise—some compatible, rent-paying business concern whose customary occupation can provide real, rather than contrived, on-the-job training. Consideration is being given, too, to the design of a building that will divide itself between schooling and housing: the first three floors, for example, could be for children at school; the remaining floors could be apartments. Such a school could grow or shrink according to the fluctuation of enrollment, moving into or withdrawing from space designed to accommodate either classes or families according to need—perhaps with a playground on the roof.

This concept of joint occupancy raises new questions and new possibilities. If urban renewal is the aim, does it make sense to send the children from the new development to the surrounding slums for their education? Need we always have a separate school for children in early childhood, ages 4 to 10, when a massive housing development is created? May not the small children, who must be protected from traffic hazards, go to school at home in the housing project itself?

Children Will Learn From Teachers and Machines

The advent of mechanisms for assisting the teacher will likewise reshape the schoolhouse. Consider that a half million pupils were receiving regular instruction by television as long ago as 1958. With airborne methods of telecasting, the number may approach five million in 1960, and with the development of more economical and simpler video-tape recorders, ultimately the numbers taught may approach the 43 million now enrolled in American schools.

Consider, too, that in our national intention to become a bilingual people, language laboratories are becoming the prevailing supplement to the voice of the teacher. The audio-tape recorders, cartridge-loaded to avoid the problems of rewinding; the overhead projectors; the teaching machines for which specific bodies of subject matter will be programmed in order that the student may confront and learn a body of knowledge at his own rate

or in his own time; about to become generally available is a real "talking book" from which one child or many may learn through both eye and ear; video-sonics, simultaneous sight and hearing used so successfully in industry; all these and more will become the new tools for learning. They will strengthen the teacher, not replace him. They will free teacher and learner from the lockstep of standard groupism; the machines will speed communication between student and teachers, freeing each child to pursue knowledge proportionate to his talents and his drive. Ultimately the school will become as automated as the American home where the housewife has been freed from so many boring and laborious tasks.

In large schools and school systems we can expect an increase in the use of electronic data processing to provide better information on which to base administrative decisions, to reduce the clerical work now performed by teachers, and to improve the efficiency of class scheduling in order to achieve more effective utilization of physical facilities. As mechanisms come generally to be the necessary and ever-present aids to teaching and administration, expenditures for equipment will grow larger in proportion to the cost of the building shell. We can expect, too, an increase in the number of schools linked by closed-circuit television as a means of sharing faculty and resources. The small rural schools will be linked by television into regional networks, thus diminishing their cultural isolation and enabling them economically to offer courses ordinarily provided only by the larger urbane or consolidated schools.

One-fifth of all public elementary and secondary schools in America are still one-teacher schools. However desirable physical consolidation may be, the fact remains that thousands of schools will remain small and isolated. Television, films and video tapes offer intellectual and academic consolidation to these small but numerous islands in our culture.

Environment Will Be De-juvenilized

The typical classroom today is a glass and masonry box filled with kitchenlike furniture. Its surfaces are hard and cold. Its furnishings and appointments are totally utilitarian. Nothing yields to the body, is soft to the hand or warm to the eye. Connected by cavernous corridors of echoing tile and steel lockers, most modern classrooms are sterile and unyielding and institutional.

Several recent schools are striving to soften and humanize the environment of such quarters of the building as commons rooms, study quarters, and students centers. Gradually furniture that is comfortable is being introduced. Some schools are searching for an economical acoustical and insulating floor covering, which would be more agreeable than today's hard and noisy surfaces that institutionalize the environment, make teaching harder, and are thought (erroneously) to delight the janitor. As more and more responsibility is placed on the child for his own learning, more dignity will be accorded him. The larger school especially will seek some measure of amenity to diminish the effect of its overpowering mass and the sense of anonymity induced by its hugeness.

Not only will the environment encourage the student to hasten his maturity but the management of students will move toward a more adult relationship with the student. In the secondary school the bells will cease to ring, the more mature and responsible students will be "de-scheduled" from the close control and maximum security regulations in force for the immature and irresponsible, and students will confront the prescribed bodies of knowledge, whether of school or college grade, when they are ready to profit from such study and not just when the subjects are offered in the course of study. To de-juvenilize the high school and hasten the maturity of students requires the closest of cooperation between educator and architect. Look, too, for more large schools to be divided into schools-within-the-school, of "houses" in which the pupil feels at home because he senses that someone in authority knows him.

New Forms and Surfaces

The American schoolhouse, its shape and materials, has seldom varied from whatever was prevailing in its region at the time it was built. Experimentation and the emergence of new forms have not been characteristic of schoolhouse construction. Though there is no national system of education in America, our schools are as alike as though uniformity were compulsory and diversity were illegal. Yet there has been some reaching out here and there for new forms. A case in point is the dome (geodesic and otherwise) now coming into use as a structure for large places of assembly and for gymnasiums. Though the geometry of the geodesic dome was worked out by R. Buckminster Fuller in 1917 and over 500 have been built, only now is the structure being considered for public education. Wayland, Massachusetts, has a high school field house in a wooden dome, and Utica, Michigan, has also used such a dome for an auditorium. Pryor, Oklahoma, has an aluminum geodesic dome housing an auditorium.

New materials are coming into use in building and will be in the schools before long. Plastics are finding their way into building in ever increasing amounts. M.I.T. is developing a school of steel and plastic. As the cost of conventional building materials mounts yearly while plastic prices come down, we can look for more plastics tomorrow. You will find plastics on the inside and outside surfaces, as insulation, pipes, and, often in combination with other materials, as structure. The invention of the cheap, uniform, high quality nail once revolutionized American building practice. The development of new adhesives may do it again. We may soon be fastening our buildings together cheaply, quickly, and strongly with adhesives.

Look for new uses of old familiar materials. More and more wood will be laminated in various ways to serve as structural members, arches, and domes as well as surfaces. Concrete will be sprayed in new curvilinear forms as well as cast. New materials and new uses of old materials will call for new forms. The box will not continue to be the almost universal building form. Arches, domes, hyperboloids, paraboloids are all here now and we will see more of them. Some of our buildings will look lighter and less permanent than they ordinarily look now, and they will be less permanent. They won't look like today's conventional buildings which don't look like yesterday's conventional buildings.

A More Precisely Controlled Environment

There are at least two architectural approaches to environment. One is to live with nature and use all the light, breeze, and beneficial climate available while blocking out

the brutal glare, the cold wind, and the hot summer sun. In short, accept and use nature. The other approach is to block out nature insofar as we can. We can fabricate our environment with artificial light, air conditioning, and controlled sound. The precision with which environment can be controlled is increasing. There is no doubt as to ultimate direction: environment will be more and more controlled. In the school as in our other buildings we turn from nature to industry.

We know something about color, humidity, odor, heat, light, space, and air movement, but little of their combined impact on the processes contained within the school. When economy is equated to productivity, when the question of how much we are spending for a school is answered in terms of what we are getting out of it, the case for providing an environment that is controlled and automatic will be clear. Temperature, ventilation, humidity, light, color, texture, noise—all these will be regarded as factors in determining efficiency of output—i.e. learning—and not, as now, just factors of input—i.e. cost.

Groups of Schools Will Build Together

Today a school is specified by a school board, planned by an architect, and built by a contractor. These three partners may never have worked together before and may never work together again. Typically, building a school is a one-shot enterprise pursued without regard to similar enterprises that may be going on in the same or in adjoining municipalities.

In England, the situation is different. In order to reduce the duplication of effort, to share resources, and to secure the benefits of group rather than individual action, the Ministry of Education encourages the formation of consortiums, the voluntary clustering together of school districts faced simultaneously with the planning and building of similar schools. Among the benefits accruing from the consortium is the attraction of major contractors who can deploy manpower and equipment with maximum efficiency—and consequent savings—among several projects. In America, in contrast, most schools are built by small contractors, many of them a job at a time. A single custom-built schoolhouse, we are told by several large general contractors, is a headache which they choose to avoid.

Recognizing this general problem, and eager to save time and money, several states have reacted by plumping for the opposite extreme—stock plans. This method involves the acquisition by the state of a number of "model" school plans which school boards may then order free of charge from the state according to which model seems to fit the local need best. Among the benefits claimed for this method are reduced architects' fees, reduction in time of planning and designing, and the establishment of state-endorsed standards of acceptability.

As with most issues, the truth will be found somewhere in the middle, in this case somewhere between the present practice of building in solitary isolation and the opposite extreme of offering mail order schools. And there is a middle ground: not stock plans but stock components; not whole schools but the parts and pieces that go together to make a school.

The movement toward this middle ground, wherein lies greater economy of effort and money, will be hastened as modular measure comes into more general use. Modular measure makes possible the dimensional coordination of materials so that they may be mass-produced and incorporated in a structure without modification. The reduction of building construction costs through modular measure has been a matter of study in the United States since 1921. In 1934, the movement toward modular measure, or modular coordination, as it was then called, was promoted by the National Bureau of Standards of the United States Department of Commerce. Brick makers and metal window manufacturers were among the first to cooperate. In 1945, the American Standards Association approved the 4-inch module as an American standard suitable for dimensional coordination. In 1953 in Europe, 10 countries, at the suggestion of the United Kingdom, joined in efforts to establish a European module. Currently the American Institute of Architects, the Associated General Contractors of America, the National Association of Home Builders, and the Producers' Council are jointly sponsoring the Modular Building Standards Association to promote modular measure in the United States. Modular measure has not yet taken hold in school construction—only about one school building in ten is modular—despite the savings that could accrue from reduction in (1) range of product size, (2) cutting and fitting on the job, (3) cost of designing and detailing, and (4) cost of estimating.

Summing Up

In the long run, economy in school building will be better served by encouraging experimentation and diversity of design. Particularly in these times do we need to encourage the new and unfreeze the old because education itself is in flux. Great changes are taking place in what and how to teach. Even the word "classroom," is having to extend its definition to mean a general ratio of space to pupils, alterable according to the task at hand. Someday we shall come to speak of spaces for learning, not classrooms for teaching. As educators improve their descriptions of what should be going on in the school, as architects are encouraged to design imaginatively around such descriptions, and as groups of school boards build together rather than alone, more economical and better functioning schools will come about.

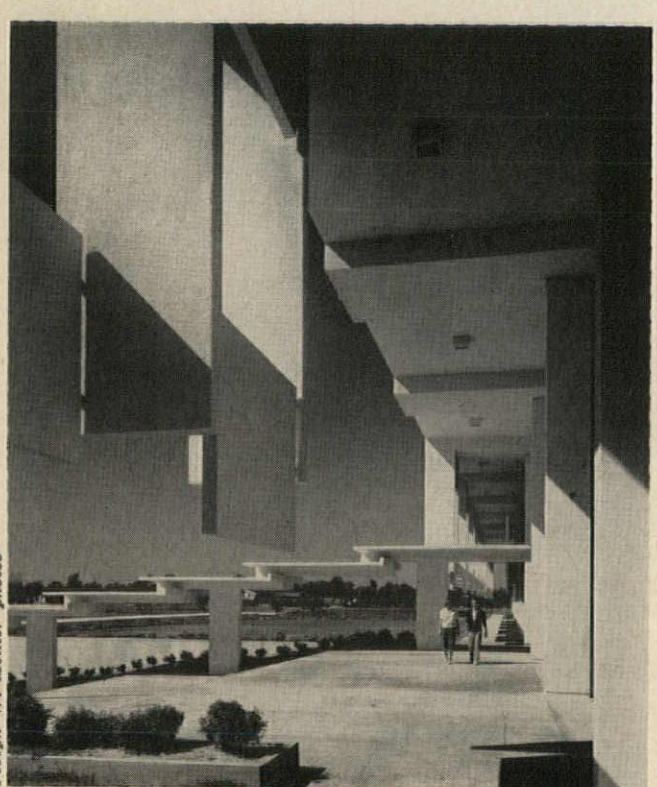
The demographers tell us that our population will double by the year 2000! In a sense this means that in the next 40 years we must build another—an additional —America.*

Schoolhouses—the most numerous of public structures, the ones that more people care about than any others, and have more to say about than any other—must carry their share of the burden of change.

Education is for perpetuating and, hopefully, improving our culture by transmitting it to the young. The schoolhouse is not, of course, as important as the school teacher. But the schoolhouse, because it stands there to be seen, speaks of the intentions of the community toward the children. Any school you build either helps to anchor the people to the community or, instead, hastens their departure. The schoolhouse more than any other structure in town declares the public intention to press on, to rest awhile, or to go back. Winston Churchill said it best: "We shape our buildings; thereafter they shape us."

*This idea was first expressed in a speech given to the New York Society of Security Analysts on June 30, 1959 by George Cline Smith, Vice President and Economist, F. W. Dodge Corp.

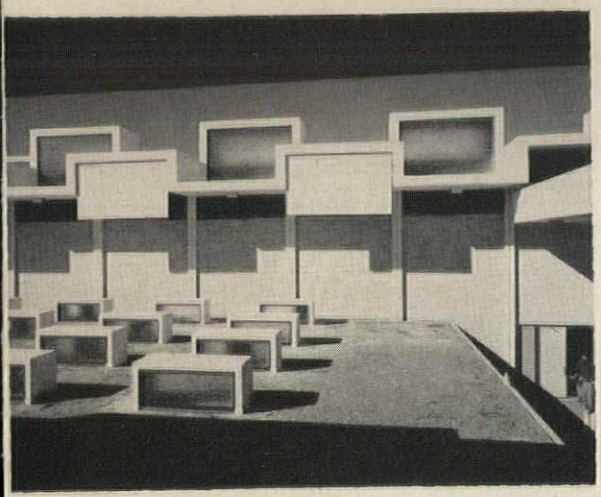
SCHOOL DESIGNED TO CONTROL FLORIDA CLIMATE



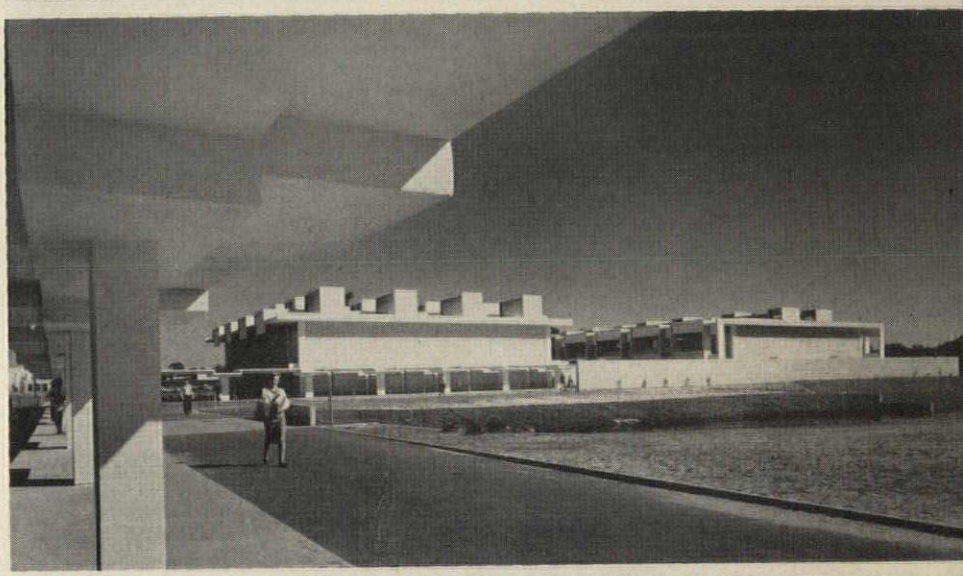
Joseph W. Molitor photos

This is the latest school in the excellent building program which has been under way in Sarasota for the past five years.* The school is significant for a number of reasons. One of the basic principles of its design was the control of the extreme characteristics of Florida climate, while taking advantage of the good attributes. In order to accomplish this, the school was placed on the highest area of the site; it is oriented north-south for maximum effect of prevailing breezes and for control of sunlight. Direct sun is prevented from entering the building during the hot season. Cooling breezes are brought in by skillful design of openings and clerestories for ventilation. Air handling units draw air into the rooms when natural breezes are still. The structure is thoroughly organized and integrated into the overall design. Mechanical and electrical systems and equipment are combined with other design elements in an orderly and functional manner.

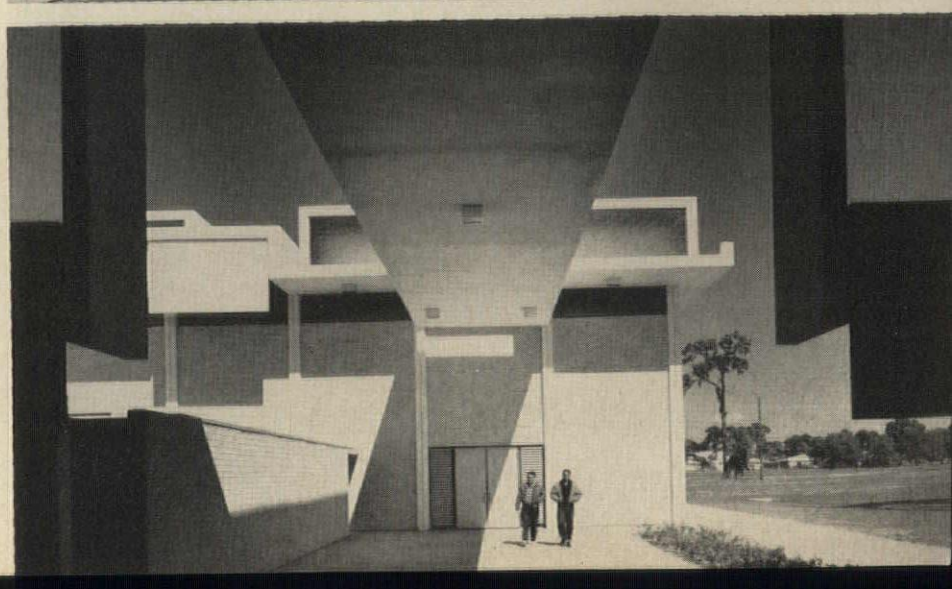
*Other schools in the program were shown in ARCHITECTURAL RECORD in Feb. 1959. This example was published as a project in the March 1959 issue.





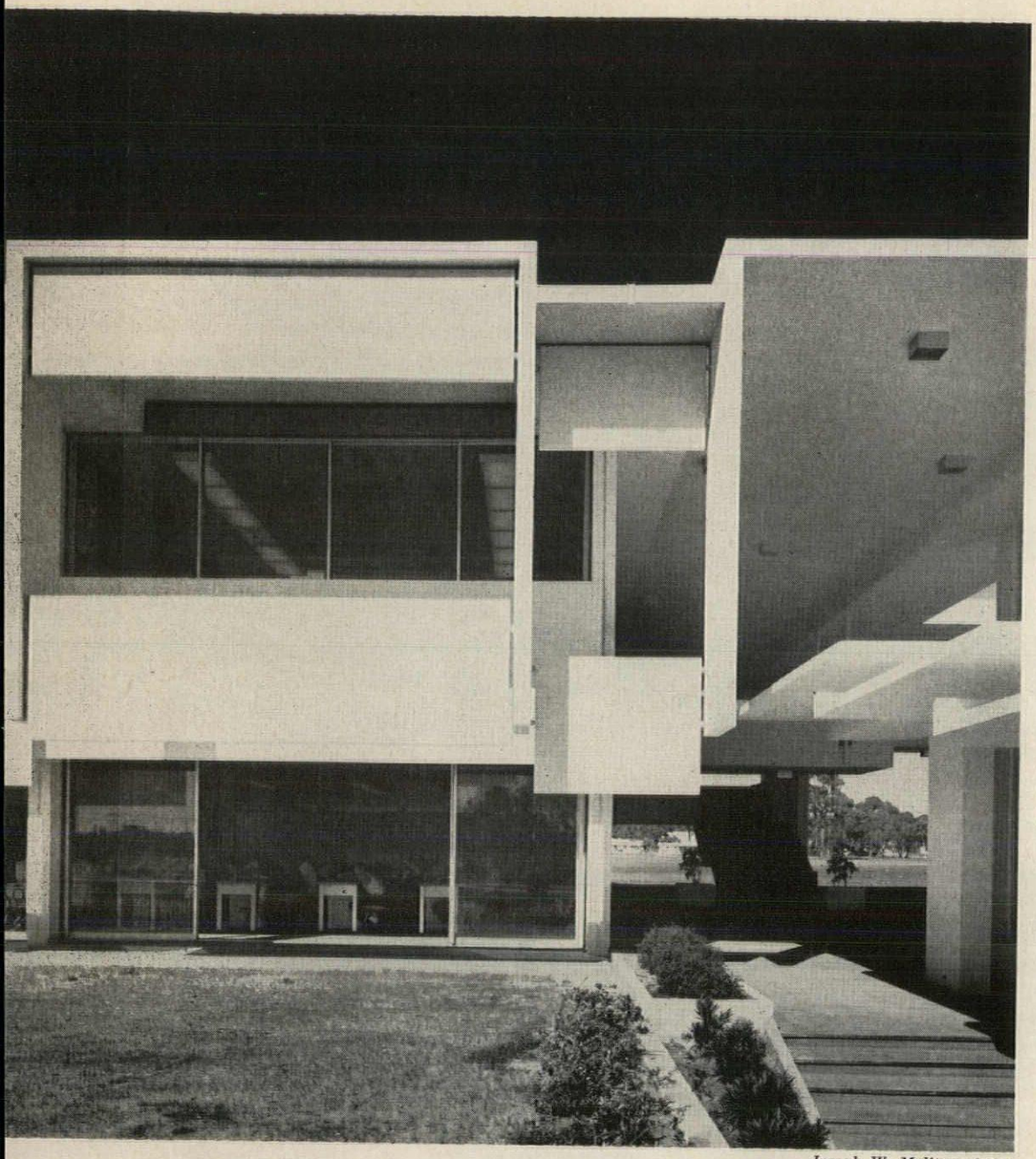






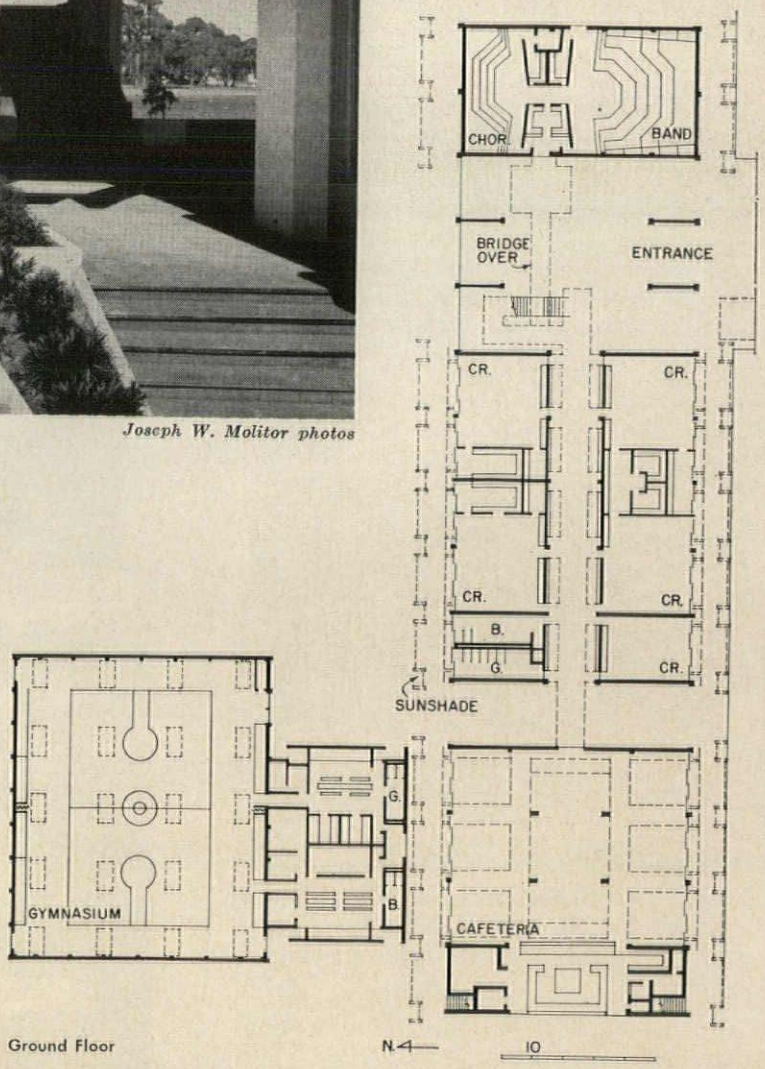
The view above shows the monitors on the roof of the building. These furnish light and ventilation to the interiors of classrooms and other areas of the school. The main entrance (opposite page and above, right) is covered but open. The entrance is connected with the covered bus unloading area by a portico which follows the slope of the stairs down the grade (opposite page and right, above). In the view on the right, second from the top, the gymnasium is shown in the left background, the classroom building on the right. The view is taken from the covered walkway leading to the old high school. The old school will eventually be razed when further development of the new scheme has been completed. The next view shows the opposite end of the two new buildings. On the left may be seen the handling of the white precast reinforced concrete sun shades. These are fixed to exclude summer sun entirely. The remaining view (right, bottom) shows the covered walkway at the rear of the locker room area. This walk connects the classroom building with the gym. The structure of the buildings is reinforced concrete frame. All concrete is left exposed, except for certain ceilings which have been sprayed with gypsum acoustical plaster. The buildings are enclosed with walls of concrete brick

Sarasota Senior High School, Sarasota, Florida; Paul Rudolph, Architect; Sidney L. Barker, Structural Engineer; Charles T. Healy, Mechanical Engineer; Smally, Welford and Nalvin, Civil Engineers; Coe Construction Company, Contractors

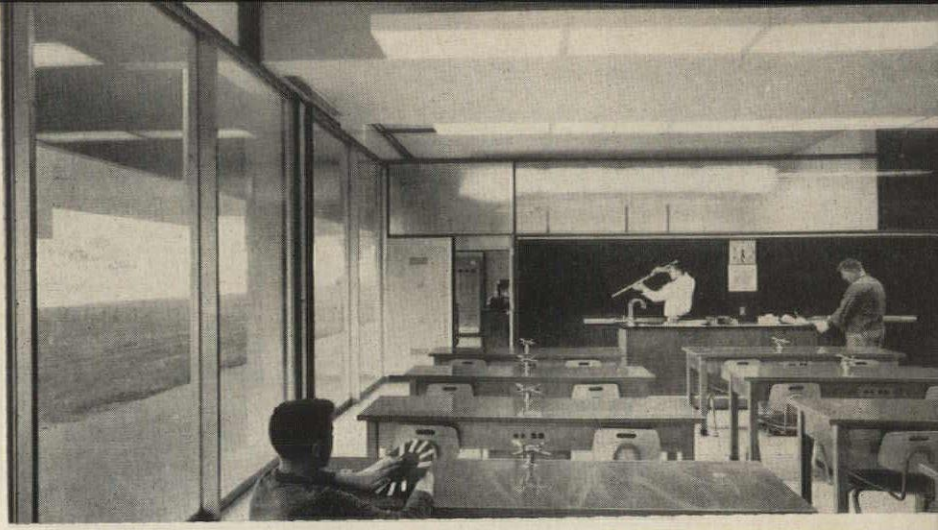


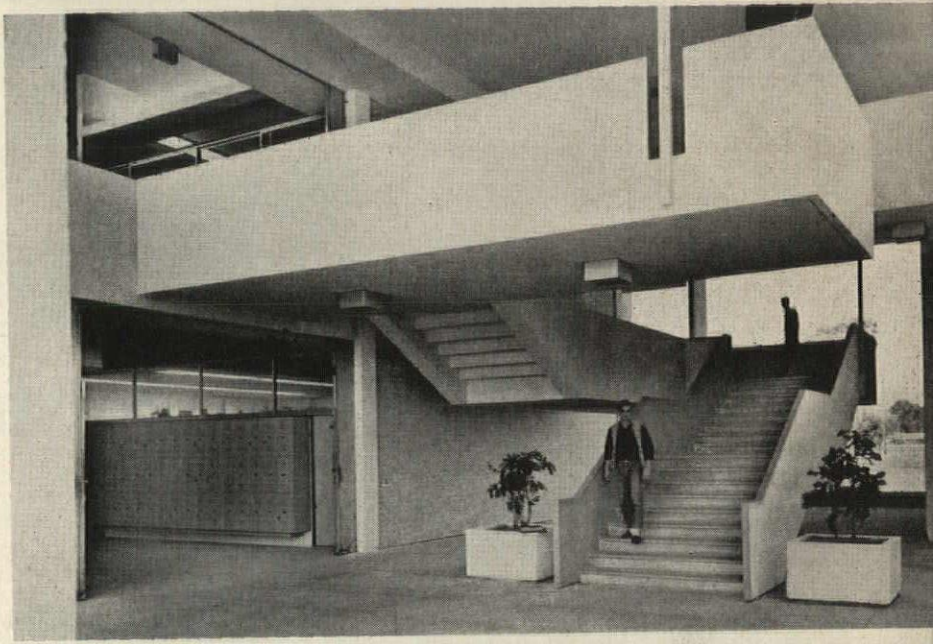
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Sarasota Senior High School

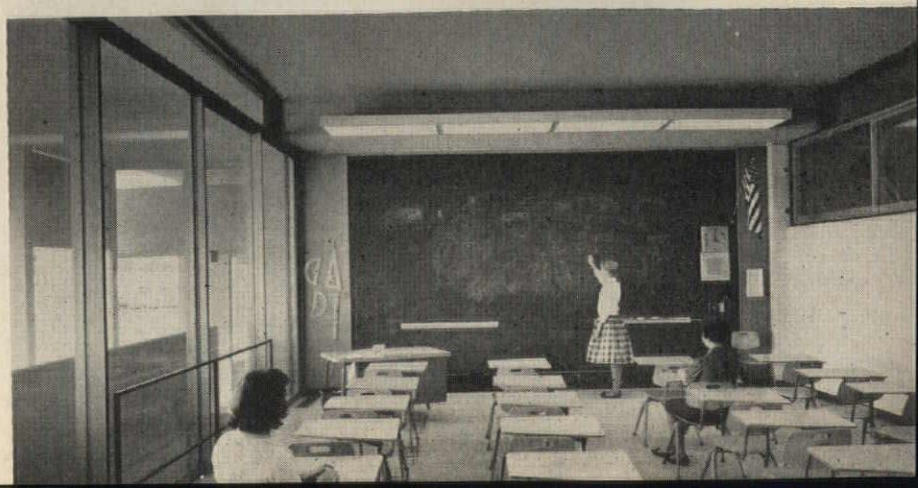


Ground Floor

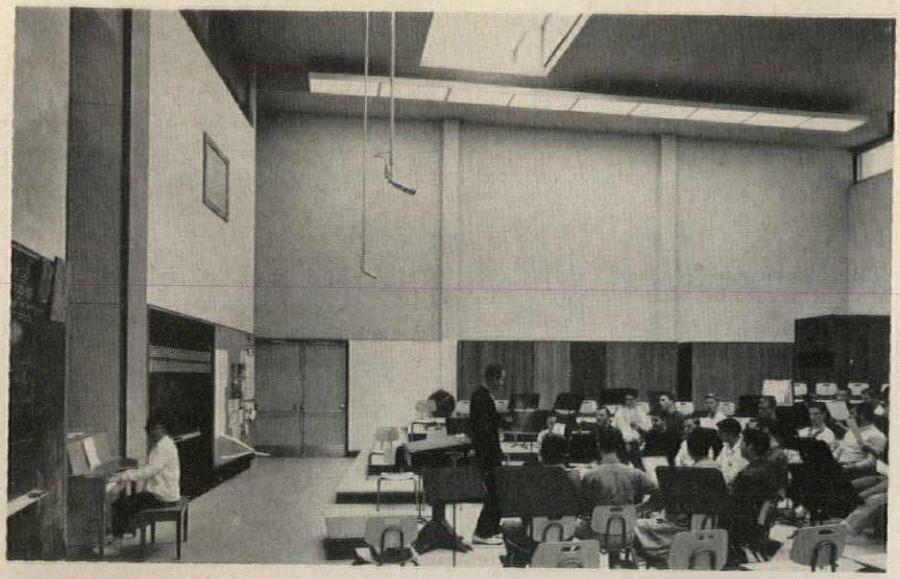








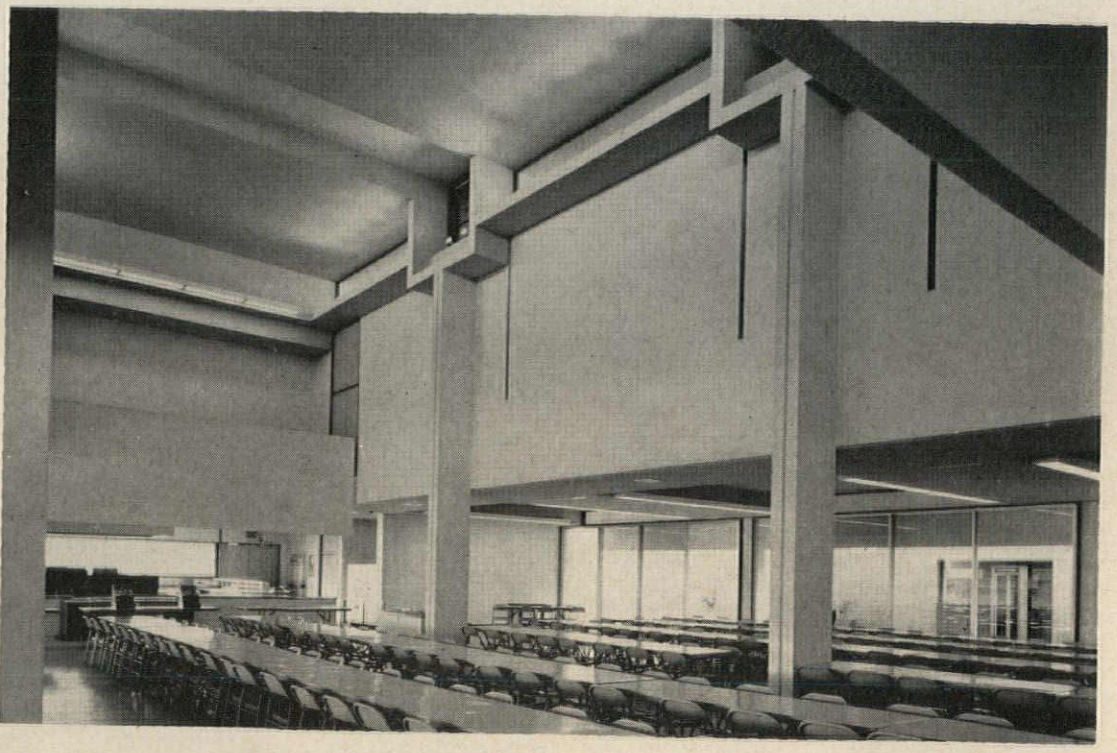
Right, top: view of a typical ground floor classroom. Windows are large aluminum sliding units. At the rear of the room may be seen the entrance to the connecting storage area. Ducts on the ceiling are part of the ventilation system. Each duct contains an air handling unit and diaphragm for exhausting air from the room. The main stair (next view) is located in the entrance area lobby. At the head of the stair is a balcony overhanging the lobby area below. On the ground floor, to the left, may be seen a typical group of student lockers. Similar ones are located in the halls just outside each classroom. The second floor hall (third view from top) has a series of openings in the floor. Lockers are placed in front of these. The openings allow light and air to reach the first floor. Monitors over the hall permit air and light to enter the areas below. The high courses of windows on the hall side of each classroom allow entry of light into the rooms. Right, bottom: a typical second floor classroom, showing the sliding glass windows in the exterior wall and the clerestory course on the hall side. On the outside of the building may be seen the concrete sun shields and the framing which suspends them from the roof structure



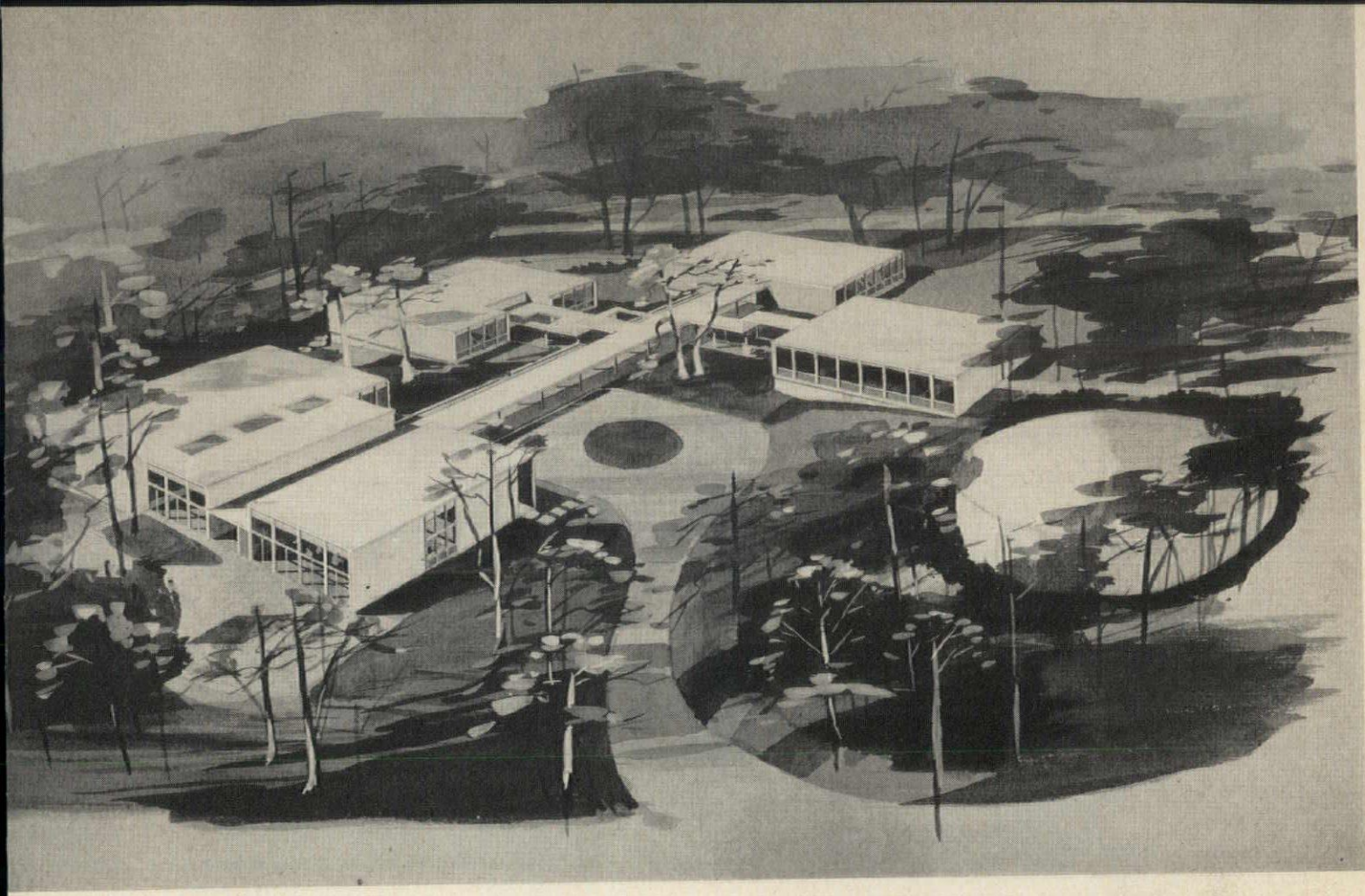


Sarasota
Senior High School

Left, top: the choral and band room is two stories high. Located at the extreme end of the classroom building, this area is acoustically treated. Left, middle: view of the gymnasium, located in a separate building and connected with the classroom facilities by a covered walk and the adjoining locker rooms. Below: view of the cafeteria with the serving line and kitchen in the background. At the opposite end, the entrance to the main hall is located. Through the sliding glass doors may be seen the entrance to the gymnasium and the student locker room areas



Joseph W. Molitor photos



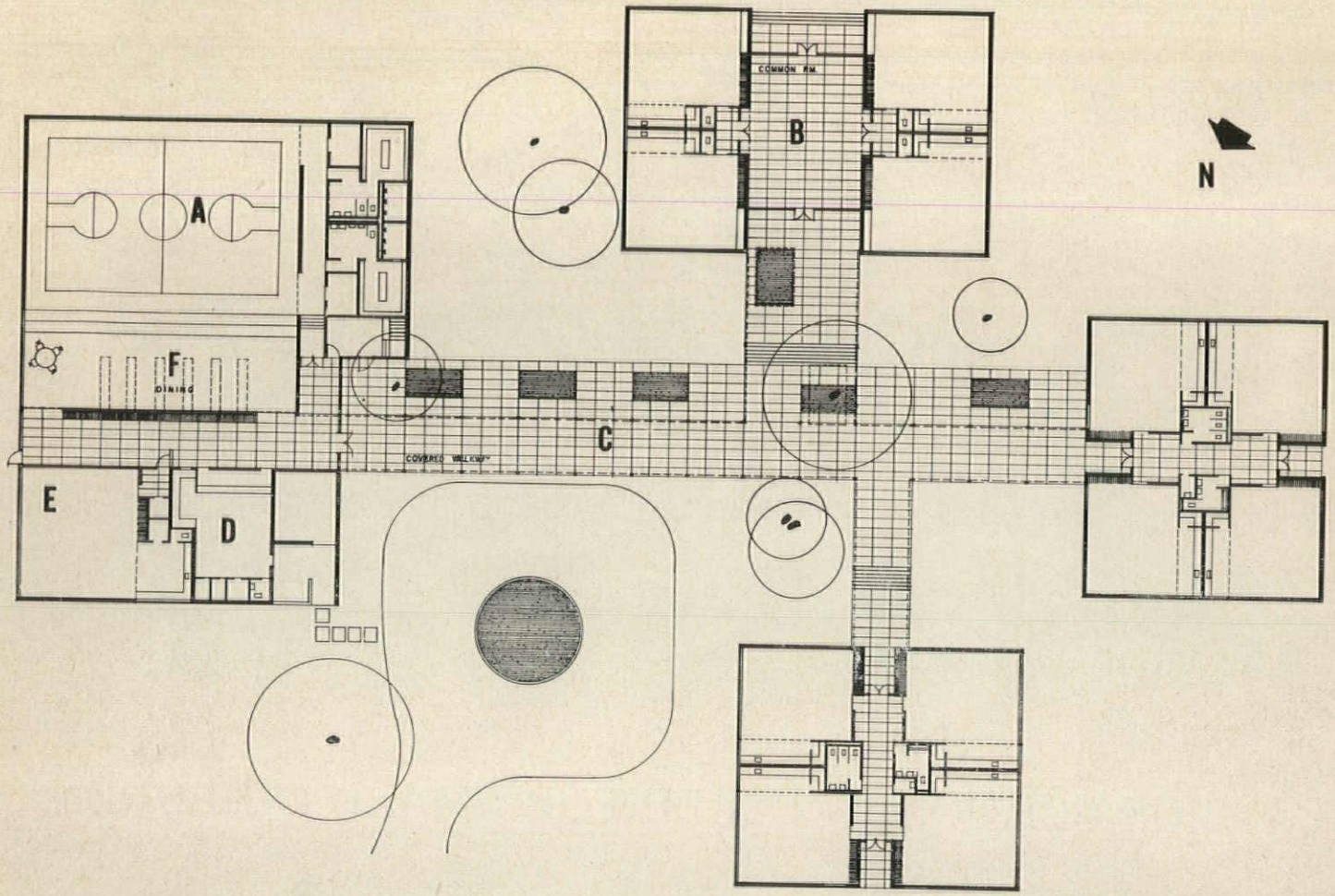
CAMPUS SCHOOL IN SCALE FOR SMALL CHILDREN

The four separate buildings of this campus-planned school, with their connecting walkways, form a pleasant and efficient plant for the elementary grades. The scale of the school and all of its details are simple and in small scale. The architects feel that this was the most desirable way to treat the building, from the viewpoint of the students. Happily, the solution is in complete harmony with the large, wooded site located in a residential area north of Cincinnati. As it turned out, the final construction costs were considerably lower than those of compact schools of similar size in the area. The scheme of the school is based on the separation of activities and classes into four units. One building houses grades one and two, another grades three and four, the third grades five and six; the last contains the kindergarten and activity areas. The overall plan of the campus has been developed to meet the needs of present-day educational practices at a cost consistent with the intent of the school system. All areas are of adequate size to function efficiently. Sound absorption and transmission were closely studied and designed for. In this way, restlessness and fatigue of the young pupils are considerably reduced. The design provides for community use of portions of the school after hours without opening the entire plant.



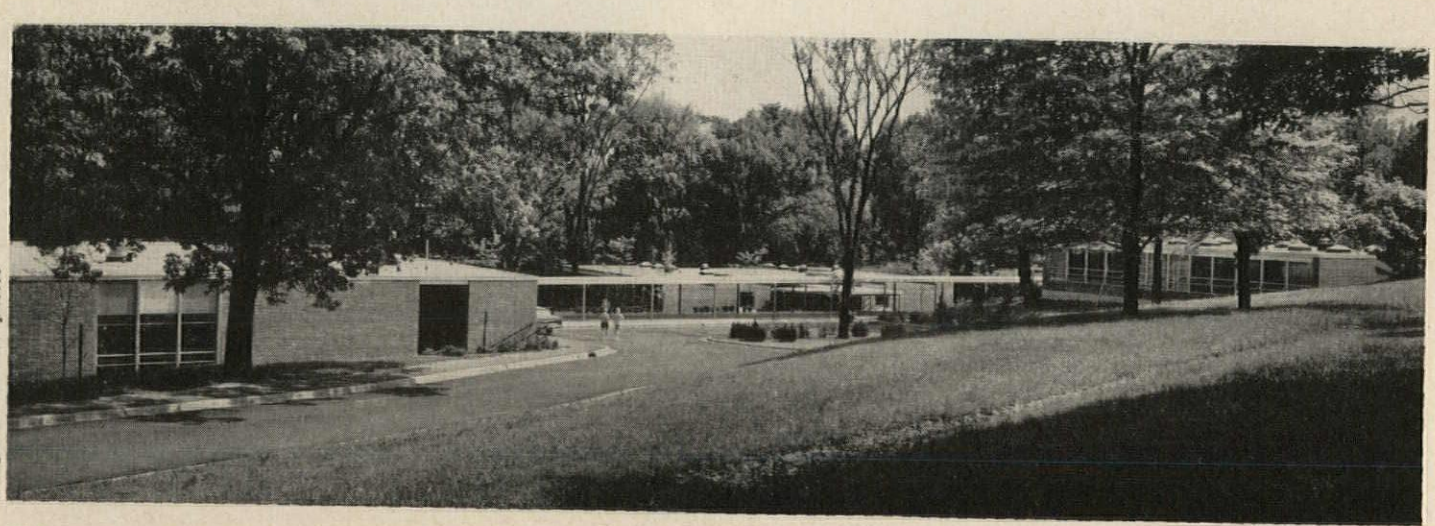
Joseph W. Molitor

Hilltop Elementary School, Wyoming, Ohio: Charles Burchard, A. M. Kinney Associates, Architects and Engineers; Richard E. Grant, Landscape Architect; Wagner, Inc., Contractor

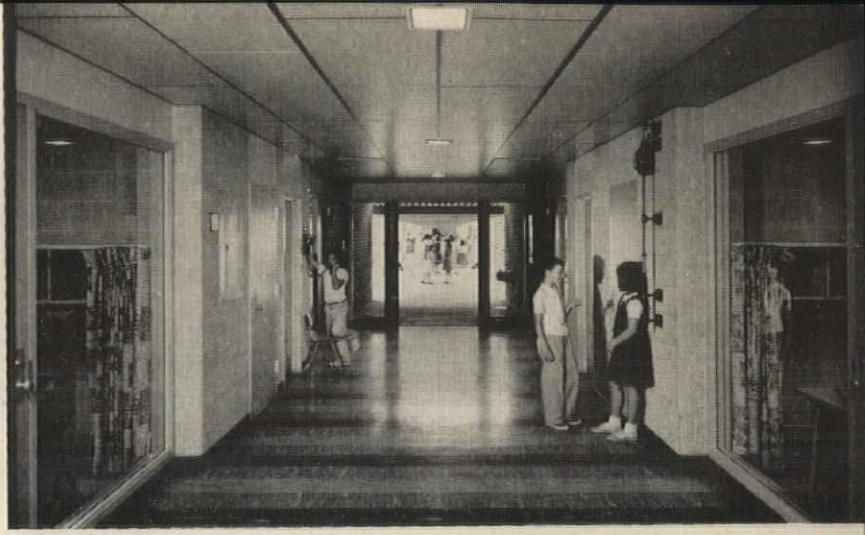


A. All-purpose Room
B. Common Room
C. Covered Walk
D. Kitchen
E. Kindergarten
F. Dining Area

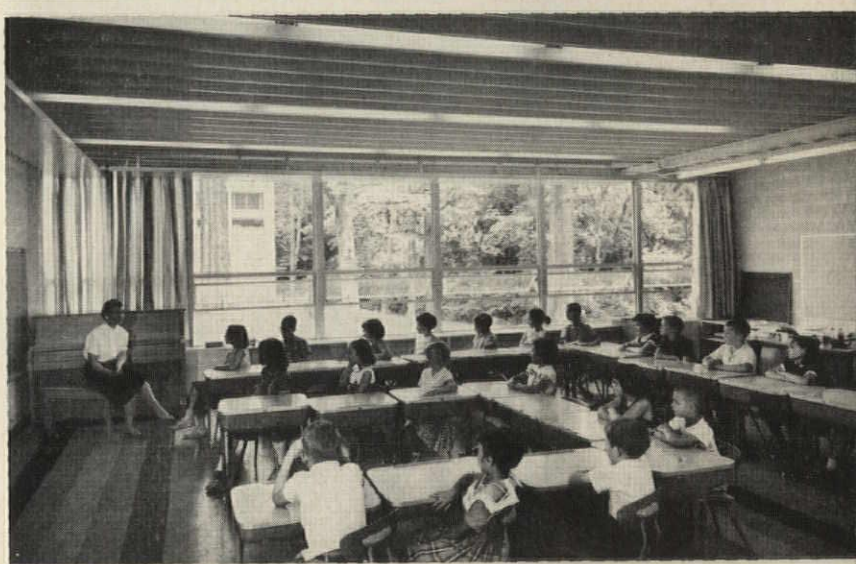
Hilltop Elementary School



Joseph W. Molitor photos







Between the first grade classrooms and the second, a common room is provided for the use of the children. Radiant heating panels are installed in the ceiling here, as well as in the classrooms and halls. A gas-fired boiler with small size lines has proved economical and efficient

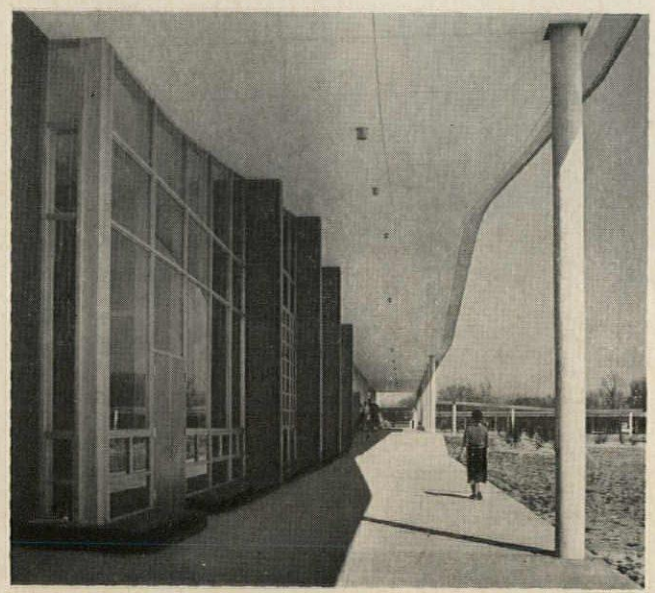
The kindergarten is located in the largest of the buildings, near the multi-purpose room and kitchen. Noisy activities are concentrated in this unit, away from the quieter classroom areas. Interior walls here and throughout the school are painted cinder block. Floor surfacing is asphalt tile

Classrooms have bilateral natural lighting supplemented by three skylights per room and evenly distributed artificial light from recessed fluorescent fixtures. Structural system is made up of cinder block and brick bearing walls with long-span metal roof decking and block partitions.

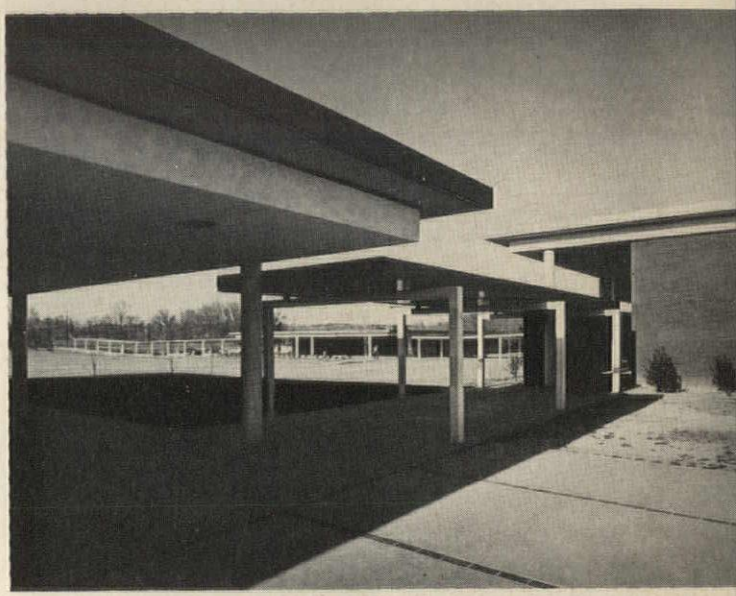
The multi-purpose room may be used as a gymnasium without the necessity of folding up the dining tables. As shown, the gym portion of the floor is finished with hardwood, while the dining section has asphalt tile as used elsewhere in the school. Adequate storage is provided in all areas.



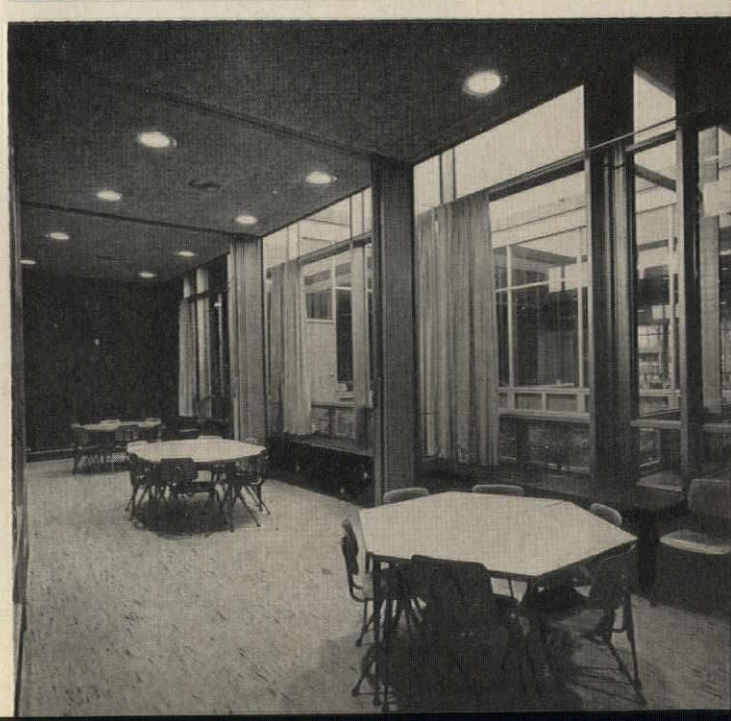
LARGE SCHOOL ACCENTS OUTDOOR LEARNING



The design of this school reflects the wide-open character of Texas and the expansive attitudes of the people who live there. Texas weather has a lot to do with the design, too. The teaching and activity units of the school spread over the large area of the site. There are almost no inside corridors. Many sports events, physical education classes, assemblies, and other activities take place outside. Students meet and study outdoors. For these purposes, a number of courts are provided. Quiet courts for study and conversation are balanced by activity court areas.

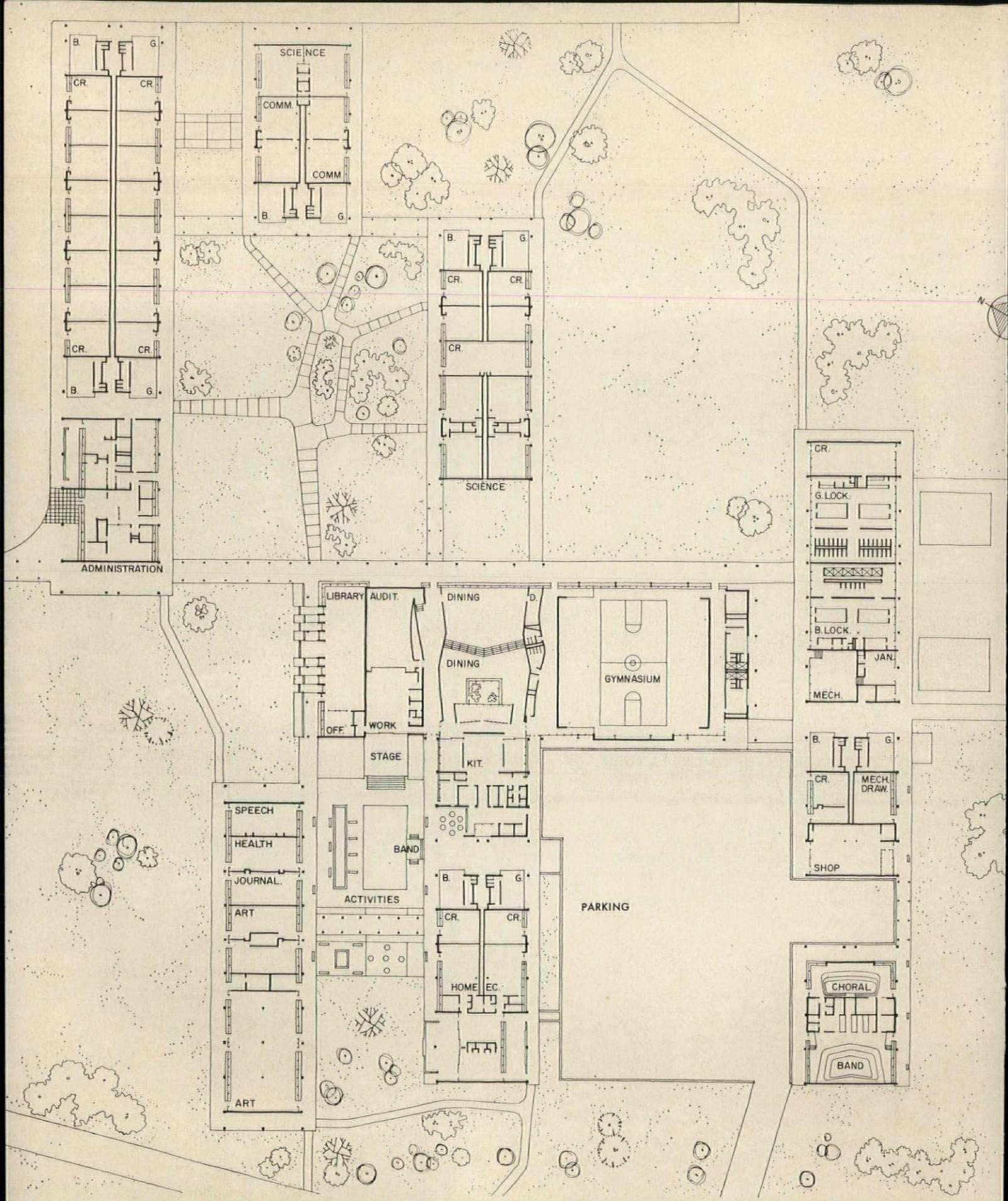






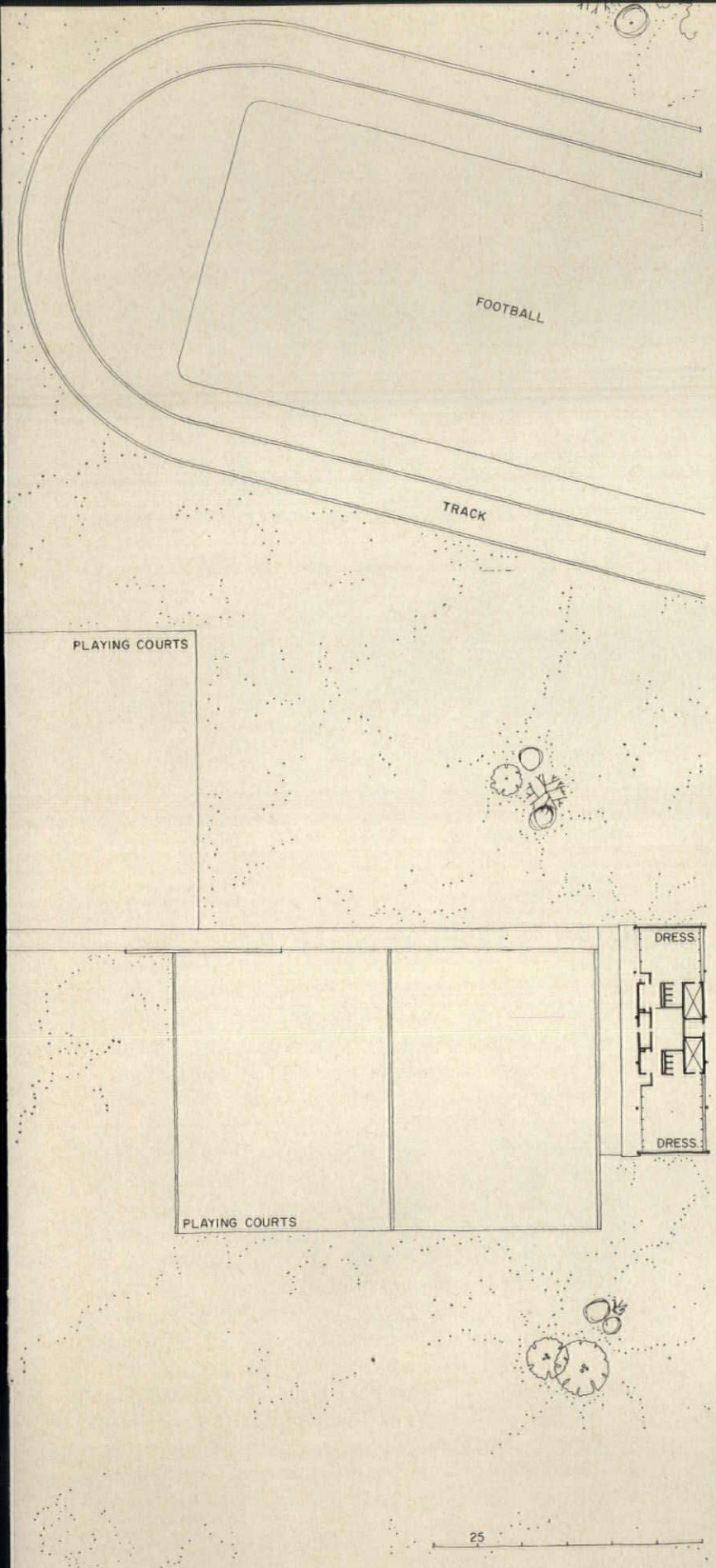
Robert E. Lee Senior High School, Tyler, Texas; Caudill, Rowlett & Scott and Bruce & Russell, Associated Architects; Gregerson and Gaynor, Mechanical and Electrical Engineers; Boner and Lane, Acoustical Consultants; Clanahan Construction Co., Contractors

Covered walkways interconnect the various units of the campus plan (right, top). These are generally of a size for circulation functions alone; a number of larger areas (right, middle) joining the walkways are used extensively by students for gathering places. Some are roofed as shown, others left uncovered. The school has a large number of benches placed in spots where students gather. One example of the completeness of the facilities is the snack bar (right, bottom). Outside of this area is a mall where many of the students have lunch. The school is air-conditioned.

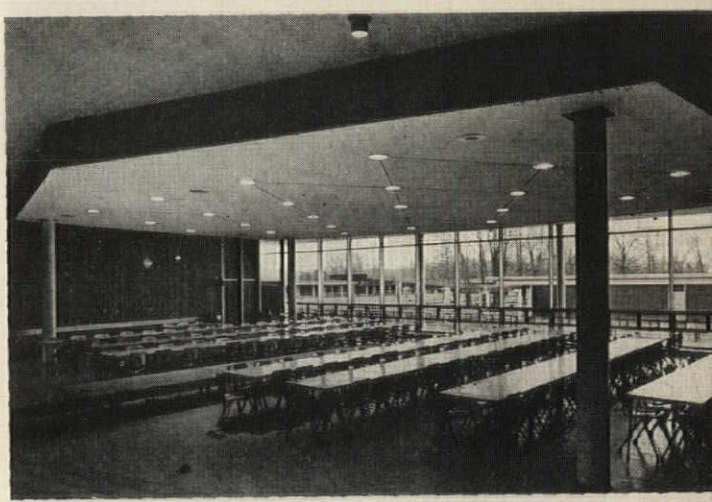


Robert E. Lee Senior High School

The school was planned for an enrollment of 1600, with provisions for eventual expansion to 2000. Over 350 of the students drive cars to school each day. By contrast, only 75 walk. Faculty automobiles and those of students who occasionally drive swell the total automobiles to be parked to about 550. This accounts for the large parking area provided in juxtaposition with the activity areas











Jay Oistad & Assoc. photos

Right, above: unusually complete facilities are provided for band and choral group instruction and practice. The other views show, in order, the enclosed portion of the cafeteria, the gymnasium, and the auditorium. Since the gym seats 2000 and is used for all large indoor gatherings, the auditorium was designed for only 237 students, thus creating an area for smaller meetings

TWO HIGH SCHOOLS SHARE ACTIVITY AREAS

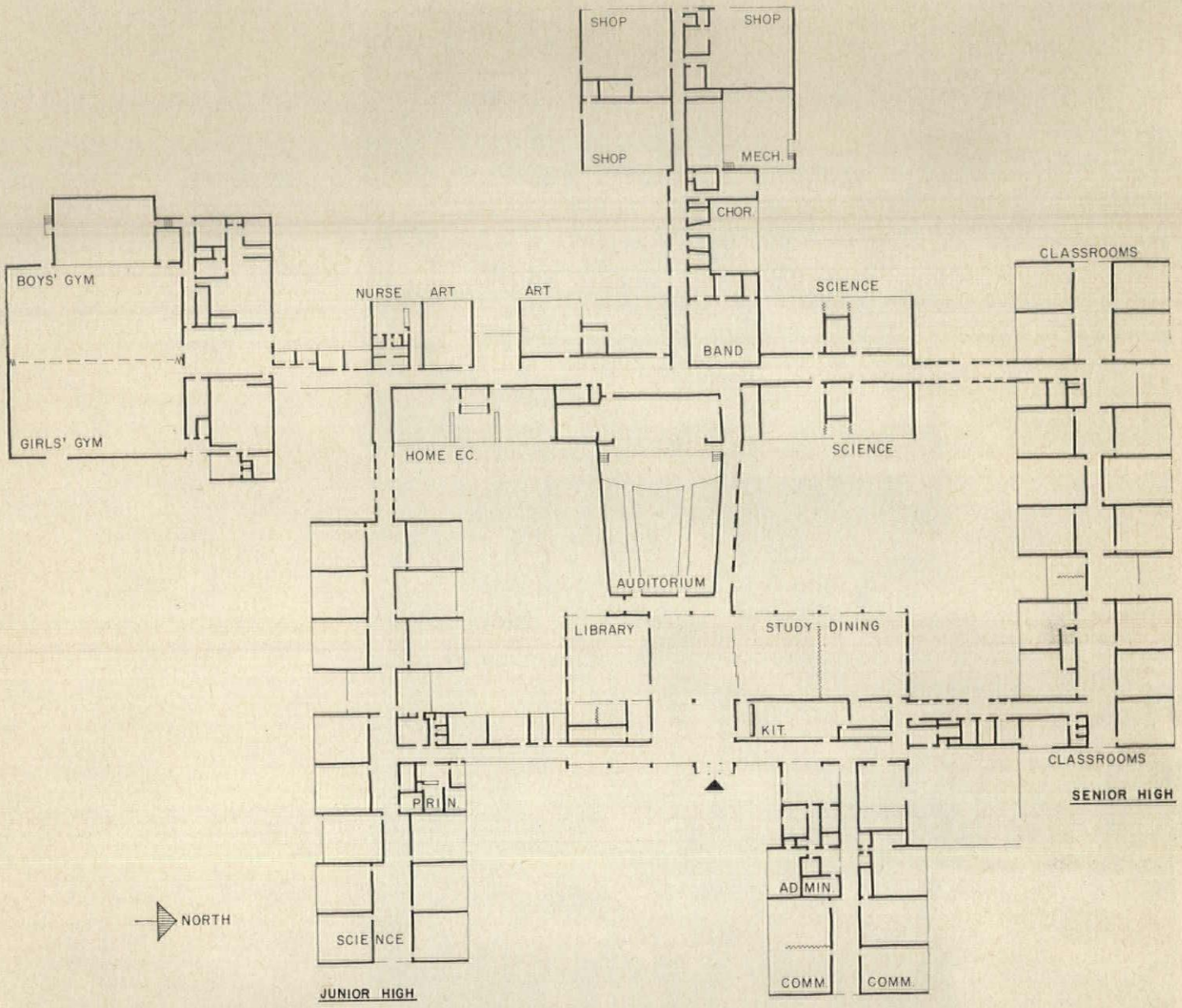


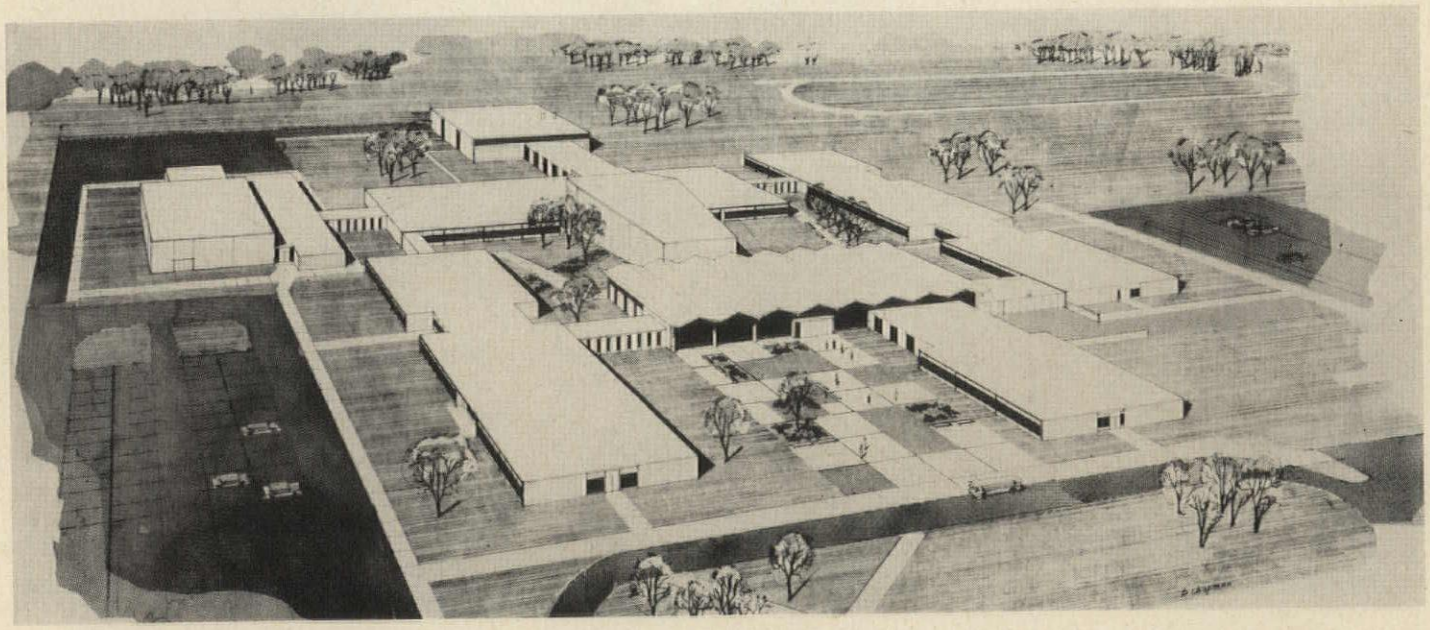
G. Amiaga photos

This high school is actually two. The campus is shared by a junior and a senior high. Each school has its own separate teaching facilities. They share activity areas such as the auditorium, cafeteria, gymnasium, and library. The design is such that the students of the two high schools interfere with each other very little. Since many smaller communities (and their architects) are faced with similar problems, this successful solution of the problem is of value.

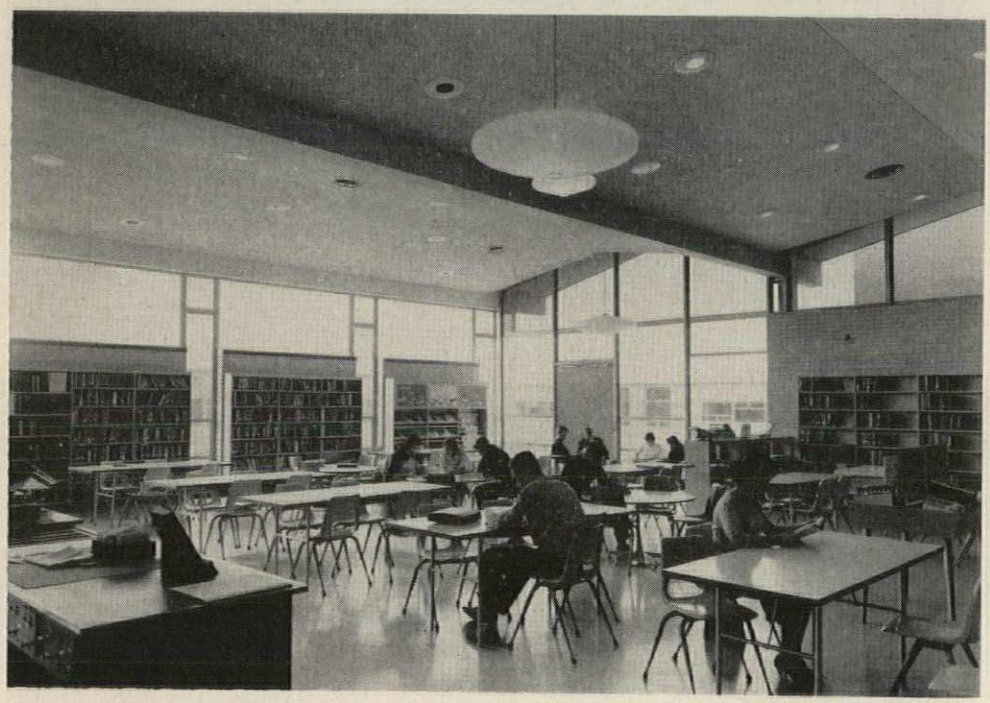
Except for the gymnasium located at the extreme end of the complex, all of the common areas of the schools are centrally located. Senior high classrooms are in the wing to the extreme right, junior high to the left. Shops are removed from the quieter areas and placed at the rear of the campus. Courts located between the various wings were planned for student use. Eventually, another high school will be constructed on this site. At that time, each school will house three grades.

Smithtown Central High School, Smithtown, New York, Ketchum and Sharp, Architects; Dr. Walter D. Cocking, Educational Consultant; Severud-Elstad-Krueger Associates, Structural Engineers; Consentini Associates, Mechanical Engineers; Paschall Campbell, Site Engineers; Edward Corning Company, Contractors


SHOP
SHOP
SHOP
MECH.
CHOR.
BOYS' GYM
NURSE
ART
ART
SCIENCE
CLASSROOMS
BAND
GIRLS' GYM
HOME EC.
SCIENCE
AUDITORIUM
LIBRARY
STUDY
DINING
KIT.
CLASSROOMS
SENIOR HIGH
PRIN.
ADMIN.
NORTH
SCIENCE
COMM.
COMM.
JUNIOR HIGH







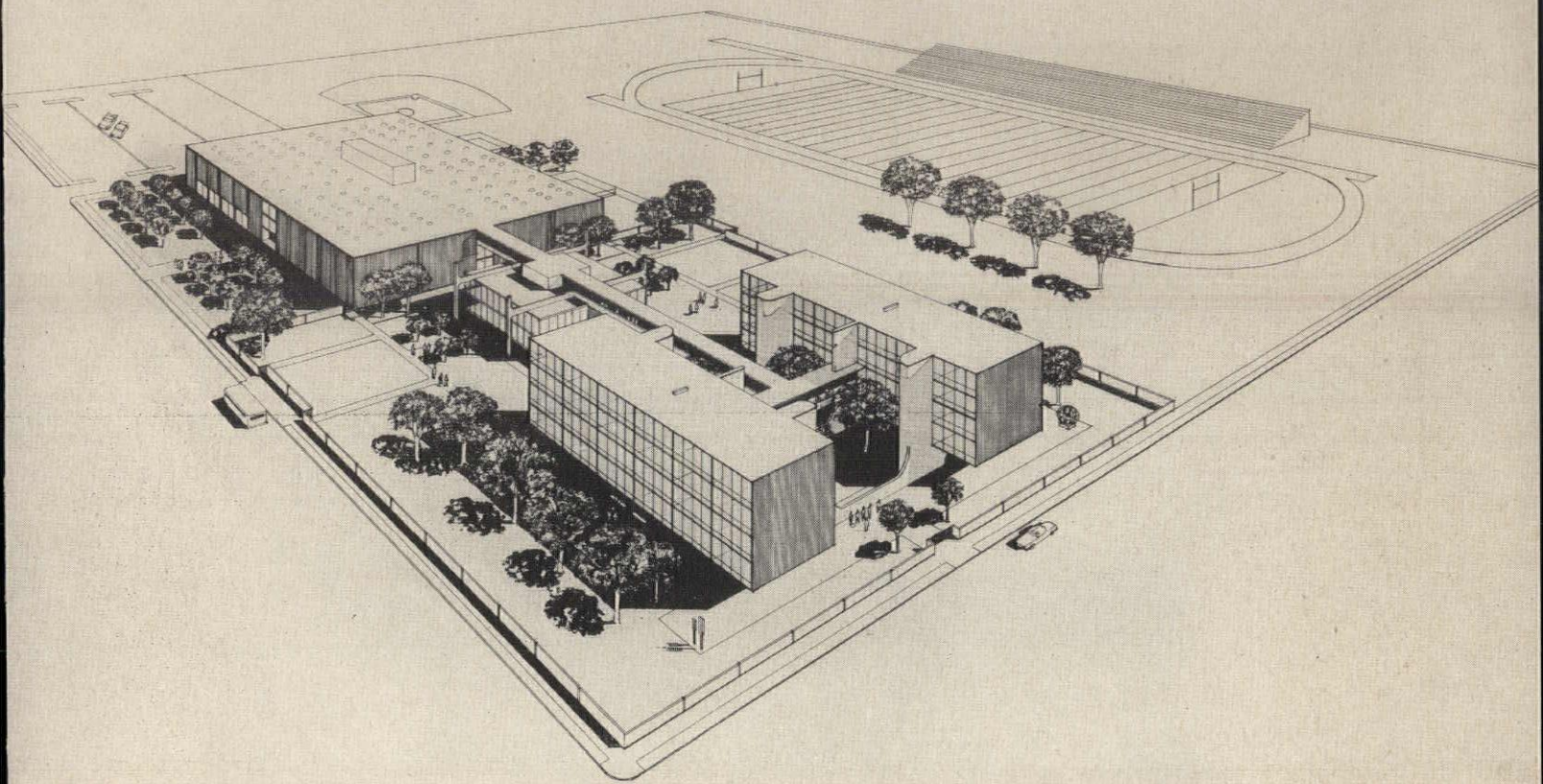
Smithtown Central High School

Left, above: commons room is extensively used by the students. Left, middle: library adjoins the commons. Below, left: lockers and coat spaces are located outside home rooms. Below, right: science rooms combine lecture spaces with labs





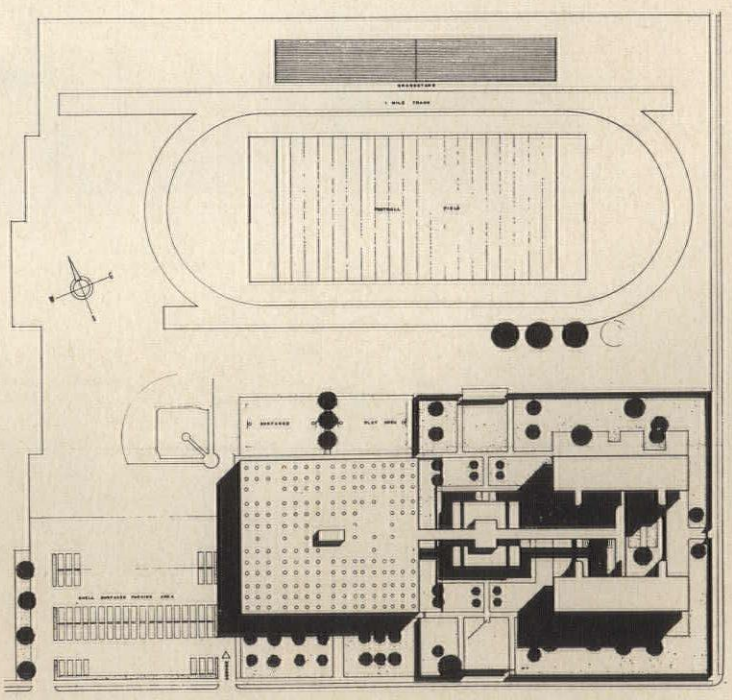
G. Amiaga photos



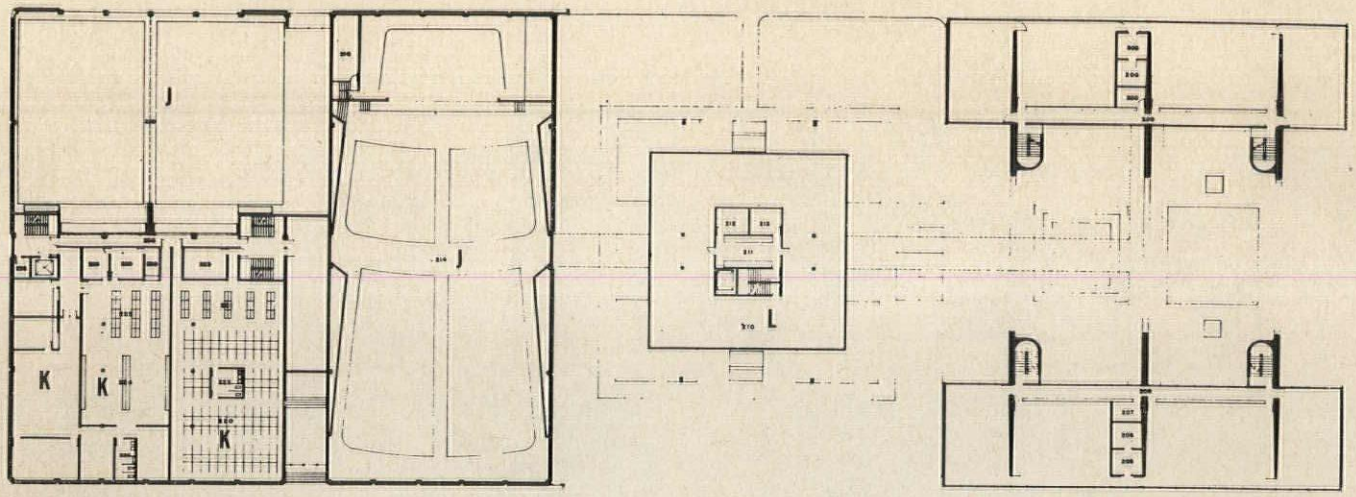
SCHOOL PROVIDES VARIED STUDENT ENVIRONMENT

The underlying philosophy of the design of this junior high school is that the learning process is strongly affected by environment. The basic principles of this philosophy have been stated before by the architects of this building in a prototype school (ARCHITECTURAL RECORD, Sept. 1957). The principles are put into practice in the design of a building for the first time in this proposed school.

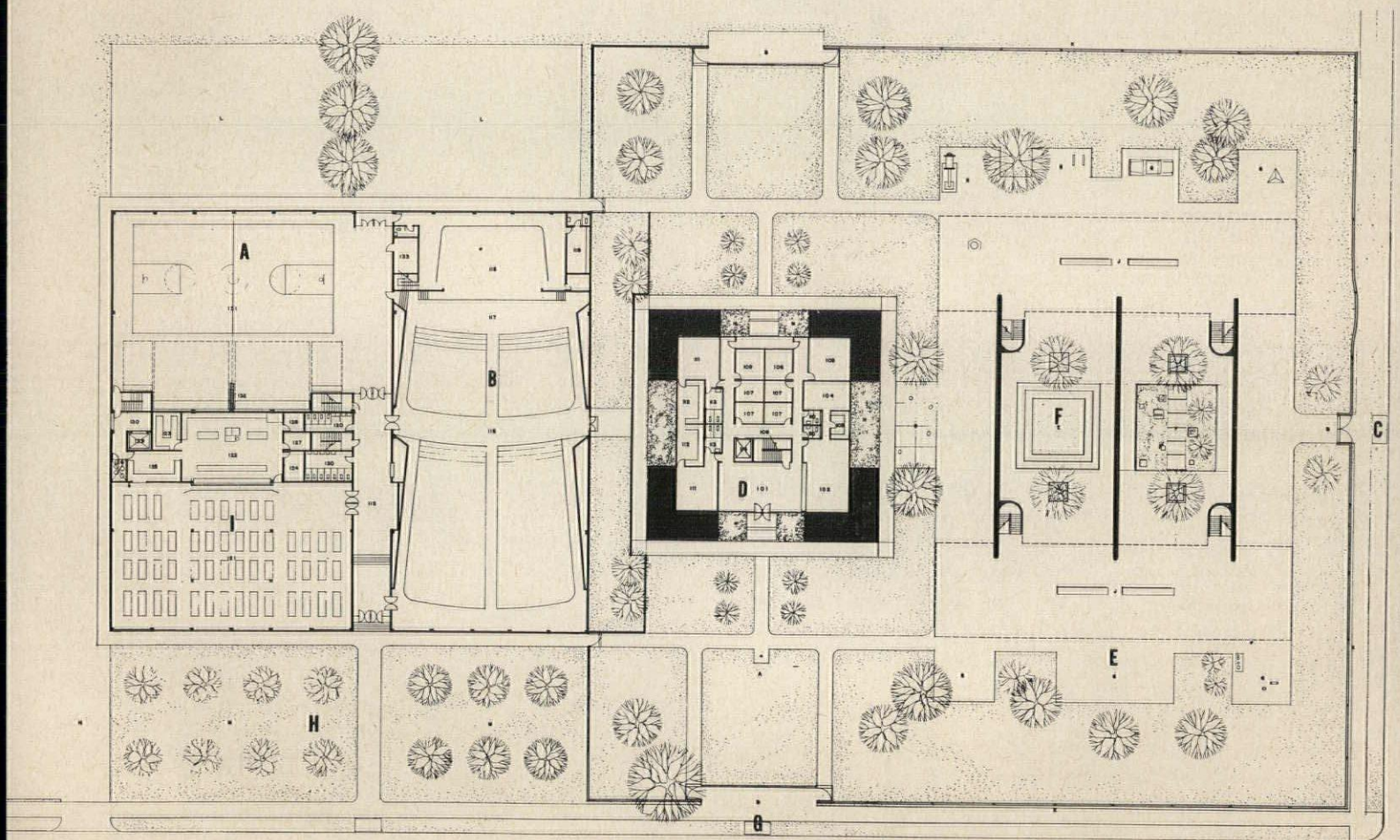
Essentially, the principles are expressed in this school by the provision of many different kinds of spaces, vistas, closed-in areas, objects, low levels and high, all combined into a complex allowing for varied perceptions and experiences. The school is noteworthy for other reasons. It is a five-story scheme in an area which has always had low-level schools. This is primarily an answer to the problem of a limited site. It also provides for a variety of experiences. The school has order; it has simplicity and human scale. Both are admirable accomplishments in view of the complexity of the program and the diversity of the spaces.



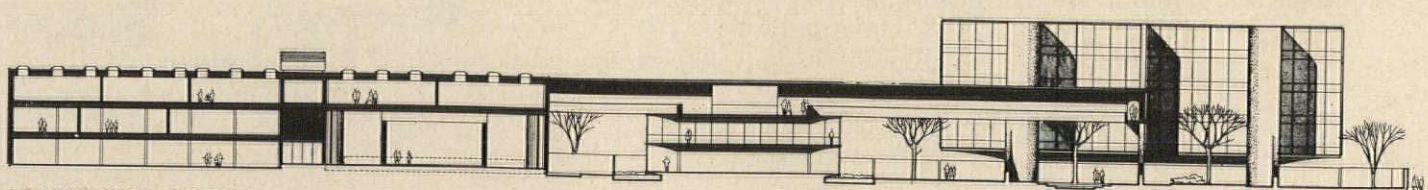
Lawless Area Junior High School, New Orleans, Louisiana; Charles R. Colbert of Colbert-Lowrey-Hess-Boudreaux, Architects



SECOND FLOOR



GROUND FLOOR

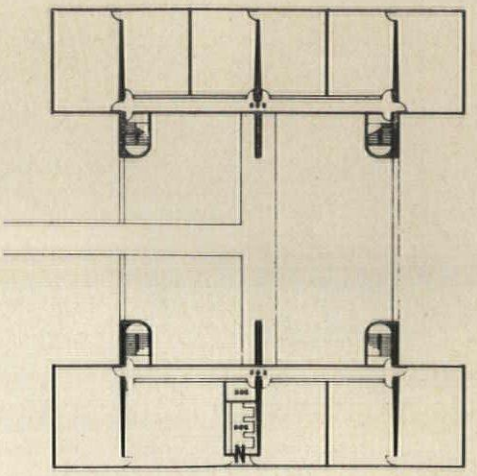


LONGITUDINAL SECTION

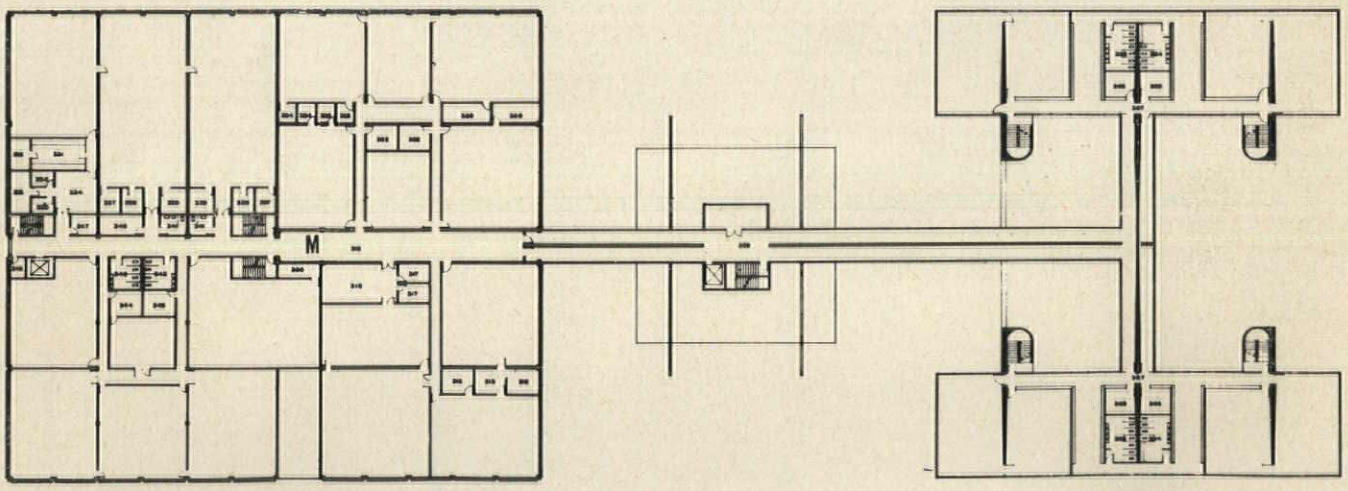
Lawless Area Junior High School

Students may enter the school ground through any of a number of entrances, thus minimizing confusion and congestion at the beginning and end of the school day. The major entrance to the buildings is located between the auditorium and cafeteria. From the lobby located here, entry may be had to the gym, cafeteria, or auditorium. Stairs lead to the upper floor shops and special classrooms. The covered walkway at the third level allows traffic to flow between this element, the library and the regular classroom units. The auditorium and gym are two stories high. The two classroom buildings are five stories high; the first level is used for open, but covered, conversation and projects areas. The four remaining floors are much alike in plan. Each contains classrooms of various sizes. Two sets of stairs for each unit interconnect all floors and give access to the ground level. The administration suite is centrally located on the ground level.

The structure of the three-story activity-special classroom building is reinforced concrete frame. It is not unusual except that the third floor is supported by story-high trusses in the walls. The structure of the two classroom buildings is unique. It is composed of three inverted hairpin concrete forms with cantilevered arms supporting the floors. The third floor walkway is essentially a self-supporting concrete H beam



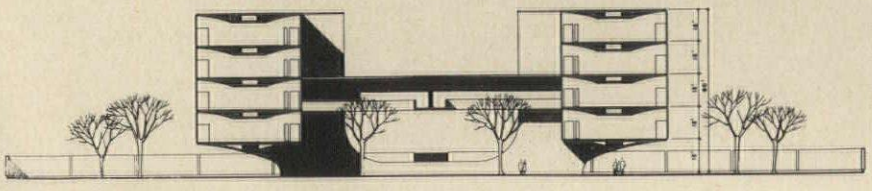
FIFTH FLOOR (Fourth Similar)



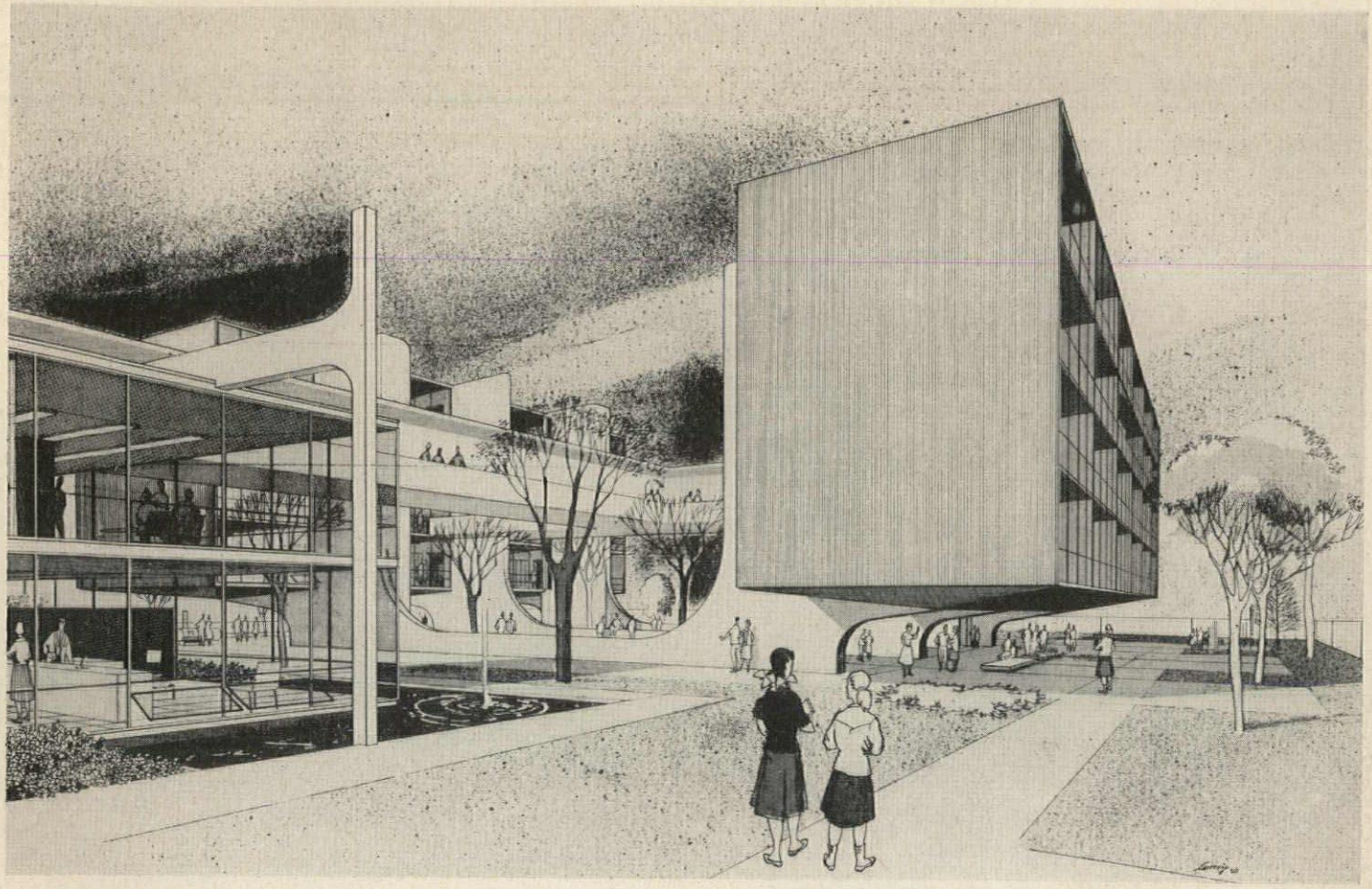
THIRD FLOOR

LEGEND

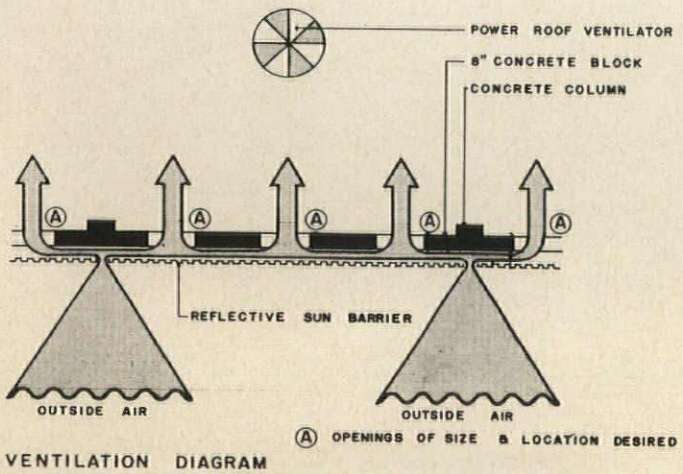
A. Gymnasium	H. Orchard
B. Auditorium	I. Cafeteria
C. Entrance	J. Upper Auditorium, Gym
D. Administration	K. Locker Rooms
E. Educational Aids	L. Library
F. Conversation Area	M. Shops, Special Classes
G. Projects Area	N. Audio-Visual Room



TRANSVERSE SECTION



Lawless Area Junior High School



VENTILATION DIAGRAM

The cantilever hairpin structural system may be seen in the view above. Each of the hairpins is counterbalanced through the placement of a classroom unit on either side. The counterbalanced structures are tied together by a lateral concrete walk at the third level. Pools and fountains similar to that shown are to be placed in a number of locations on the school grounds. Of them, the architects say, "these are intended as symbols of water sources in nature and allow cool aeration of the air." The windowless shop areas will be ventilated by means of high capacity fans using the corridors as plenums. Shown at the left is a detail of the floor plan of this area. The flow of air through openings in the reflective sun shields and the walls may be seen in this diagram

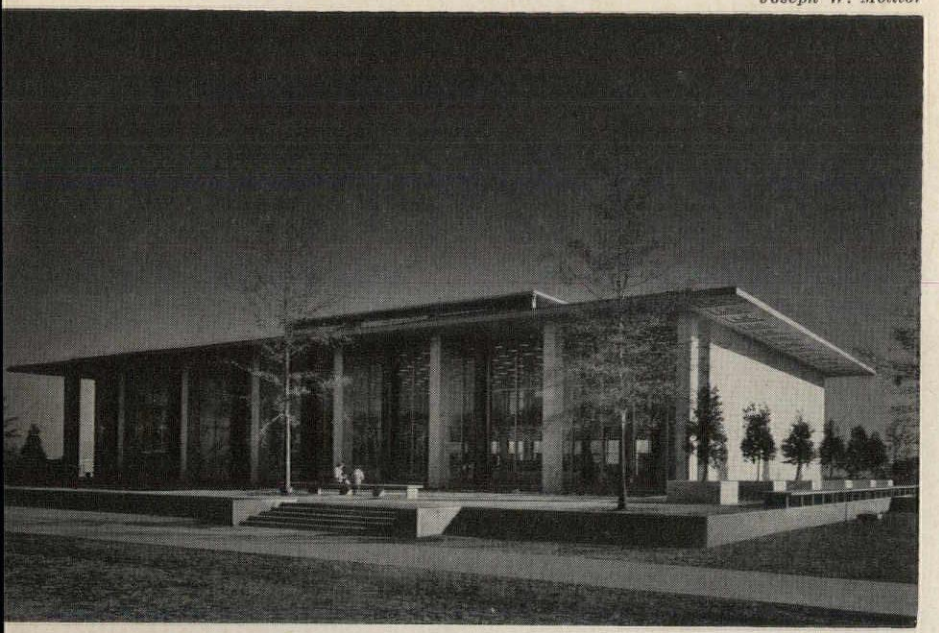


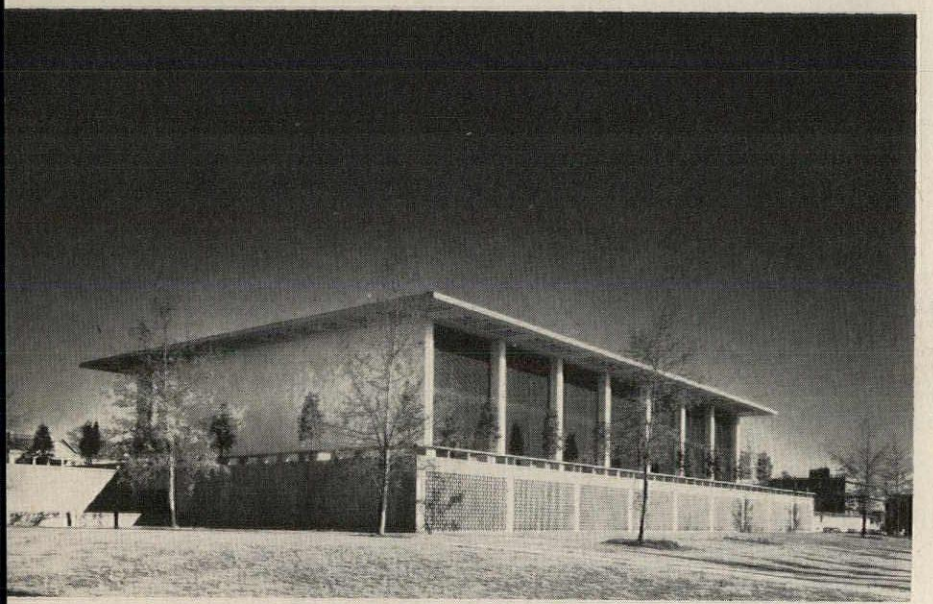
Joseph W. Molitor

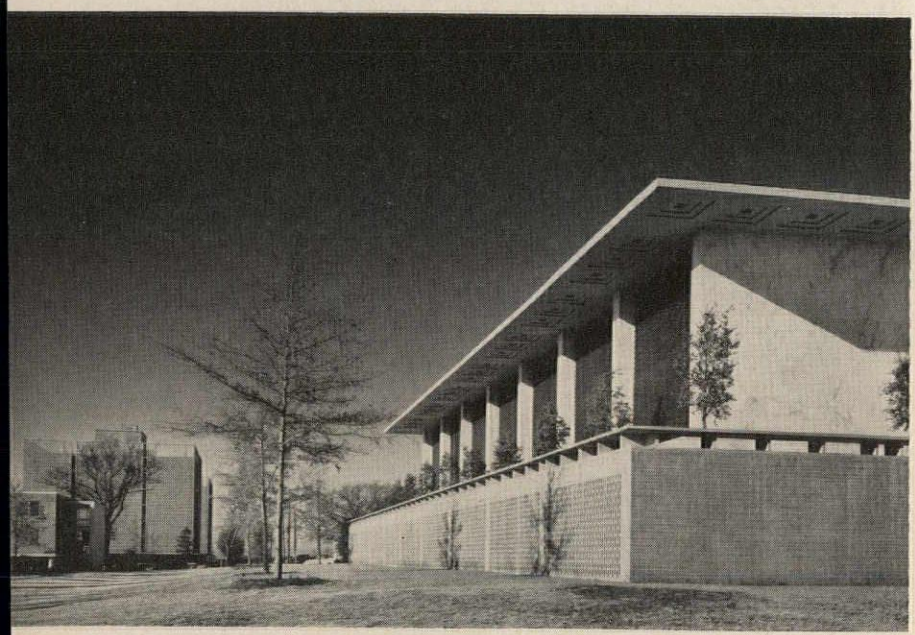
In the role of consulting architect for the University of South Carolina, Edward D. Stone helped establish the library design. Lyles, Bissett, Carlisle and Wolff were the architects.

NEW LIBRARY IN THE CLASSIC TRADITION

Joseph W. Molitor





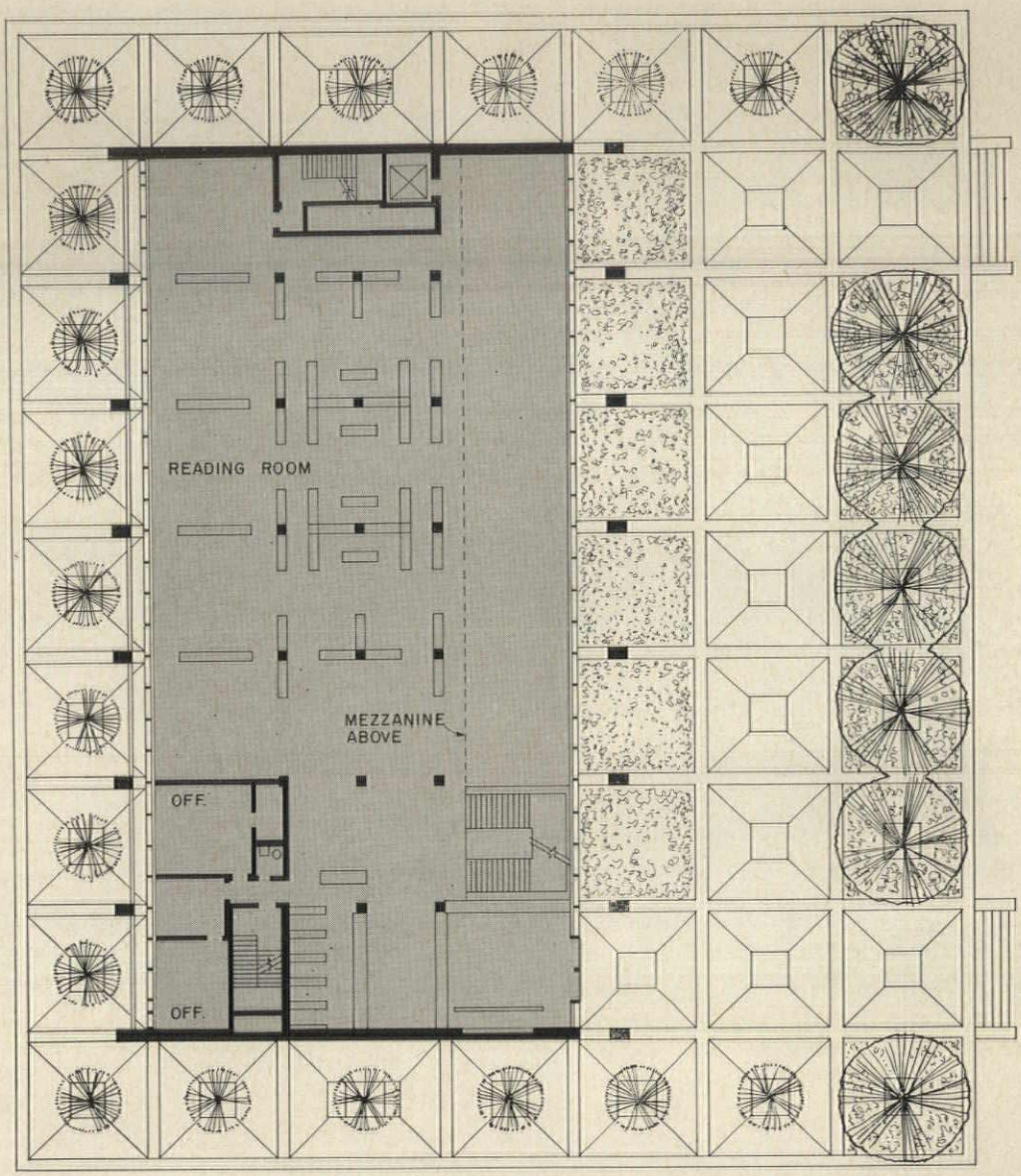


NAME: *Undergraduate Library*
OWNER: *University of South Carolina*
LOCATION: *Columbia, South Carolina*
ARCHITECTS: *Lyles, Bissett, Carlisle and Wolff*
ASSOCIATE ARCHITECT: *Edward D. Stone*
LANDSCAPE ARCHITECTS: *Innocenti and Webel*
LIBRARY CONSULTANT: *Dr. Keyes Metcalf*
INTERIOR DESIGN CONSULTANTS: *Jack Scoville Assoc.*

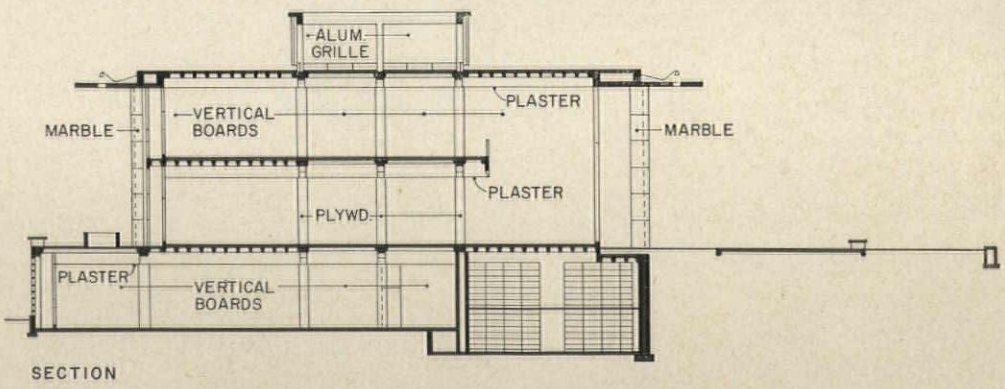
The tradition of the campus at the University of South Carolina is classical. Buildings of the American Colonial period share the academic scene with those in the English Renaissance manner. Nineteenth century classical revival buildings are part of this theme. Edward Stone described the location of the new library as the "center of gravity of the campus." Classically symmetrical, the building has been placed on the axis of a quadrangle. Its balanced composition on a podium base relates it to the similarly ordered dormitories which Stone designed earlier with architect G. Thomas Harmon. (See seven-story structures in the photograph at bottom left and ARCHITECTURAL RECORD, February 1958.) The gold anodized aluminum screen at the south wall of the structure and the patterned brick wall of the podium are in the Stone tradition and harmonize with the continuous concrete screens of the dormitories.

The north and south walls are glass. The end walls and columns are faced with golden vein Georgia white marble. The base and terrace platform are brick in pale pink tones, with divider strips and center squares of gray quartzite stone from Tennessee. This stone is also used in the copings, steps and bench railings. Window mullions and other metal surfaces are anodized gold. The plant boxes are marble.

Total cost of the building including furnishings was $900,000.



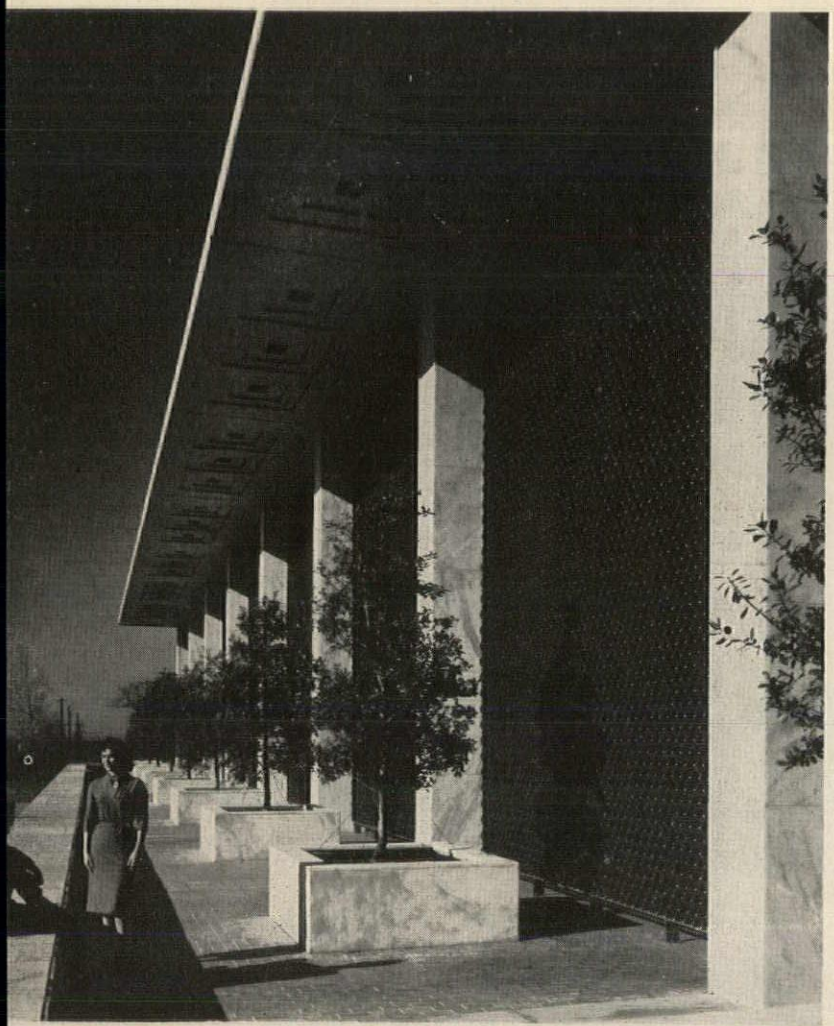
PLAN



SECTION

The building is sited over a former city street about 12 ft below the upper campus level. This grade differential was used to advantage by locating the entrance at the mid-level between the ground and mezzanine levels. The main floor is 150 ft long and 75 ft wide, the mezzanine is 150 ft by 52 ft, and the lower level is 200 ft by 100 ft. The total area is 40,000 sq ft

Joseph W. Molitor



Gold anodized screens shield glass on south wall



Main entrance from north podium is monumental

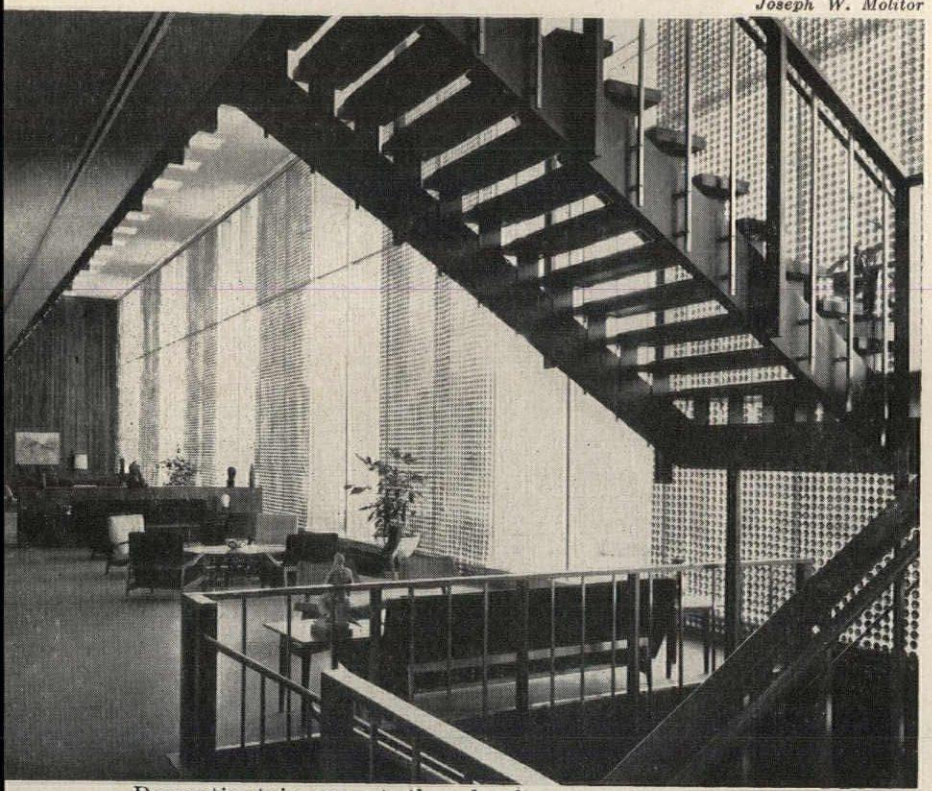
Right: mesh curtains of copper wire and discs of gold aluminum minimize glare on north wall

Two-story reading room and mezzanine. Interior walls and columns are paneled in natural finish African mahogany. Book shelves are of this material. All reading areas are carpeted to cut down noise and to create a warm non-institutional feeling

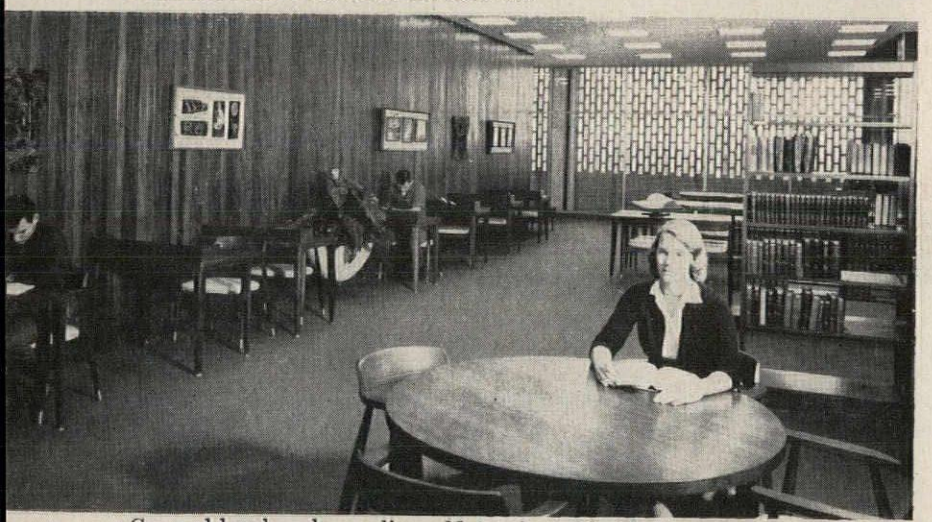




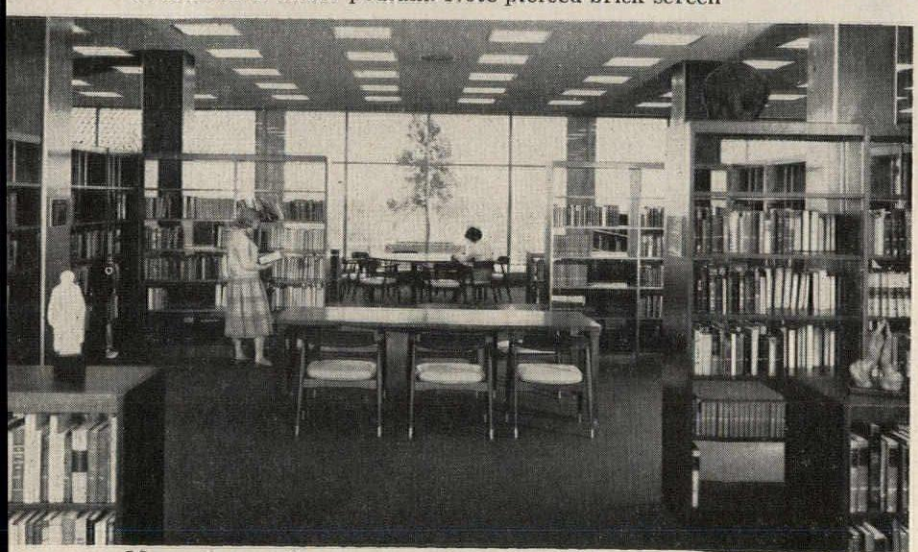
Joseph W. Molitor



Dramatic stair connects three levels



Ground level under podium. Note pierced brick screen



Mezzanine reading area

The library has space for 60,000 books and storage area for 150,000 more. The students obtain books by going directly to the open stacks which enables the library to keep a smaller operating staff. The stacks are centrally located on all floors with direct access from the entrance or stairway. Students pass through the stacks before reaching the reading areas which are therefore relatively quiet

Architectural Engineering

Air Conditioning—Today and Tomorrow

Today's air conditioning systems are capable of producing a comfortable, clean, healthful atmosphere. Tomorrow's systems may be able to simulate invigorating mountain air or a relaxing sea breeze. With a long stretch of the imagination we might envision a series of punched cards for a climate machine with such legends as "Miami in January" or "Maine in August." This will come about not so much through fundamental developments as through gradual improvement of equipment, better system design and identification of the characteristics that comprise an ideal atmosphere. Research men and engineers speaking at the Building Research Institute Spring Conferences in New York last month pointed out that even now the indoor climate can be controlled within close limits; on the horizon are systems which might influence man's moods as well as his comfort.

Finn J. Larsen, research director for Minneapolis Honeywell, described the air conditioning for a space cabin simulator 5 by 8 by 12 ft in which two men will soon take a thirty day "flight." Basic techniques for comfort are not appreciably different from those now in use. A particular problem in space, however, is that the capsule, which has heat-reflecting and heat-absorbing materials on the outer surface, may need to be rotated to keep the occupants from roasting one instant and freezing the next.

Building design has not exploited the freedom in planning that air conditioning permits, suggested William L. McGrath of Carrier at the BRI meeting. For example, he maintains that "cross ventilation" is an anachronism, since air conditioned buildings do not have to be designed in such shapes as "L's, O's, H's, U's, E's and T's, a veritable alphabet soup." McGrath said that total air treatment (i.e., control of temperature, humidity, dirt and dust, allergens, odors and contamination) is in large measure obtainable today at a saving over traditional practice.

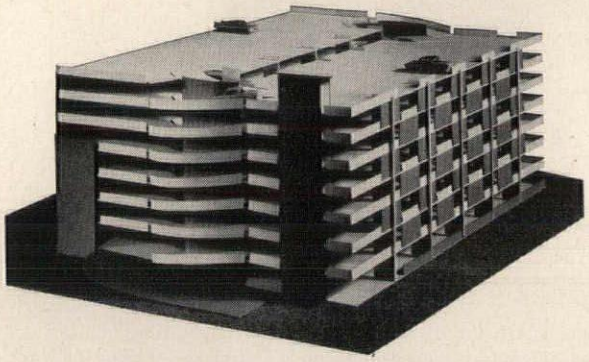
Multifarious bacteriological problems associated with air handling systems in hospitals were discussed in a paper by Dr. V. William Green and associates at the University of Minnesota. Items: Distribution of airborne bacteria and viruses is a complicated process (an unguarded sneeze or cough could contaminate a patient several stories away). The ventilation system must be designed specifically for each hospital area. (A nursery or delivery room might call for positive air pressure to prevent contamination from nearby hallways. On the other hand, such a condition for an isolation ward might endanger everyone in the surrounding area; air lock arrangements might provide a solution.) The overall structure must be kept in mind in relation to air flow, Greene said, since shafts, stairwells, etc. offer pathways for microbe-laden air. In operating rooms, a refinement of the air dilution method for reducing bacterial count is the "piston" effect in which supply air is introduced over the total ceiling area and exhausted at the floor [Ed. note: see last month's AE section for a recent development of this sort.]

Heave Ho!

There's always a Texas story. This one relates to a new kind of foundation problem for tall buildings on deep clay soils and is called "foundation heave." Instead of settlement as is encountered with most buildings, there is an upward movement of soil in adjacent areas. Cause, explained by Bramlette McClelland, Houston consulting engineer, at the February ASCE convention, is trend toward larger basements which subtracts from the gross pressure of buildings. At Rice University Stadium in Houston, the playing field, located 25 ft below natural grade, has risen 4 to 6 in. relative to the concourse in seven years.

This Month's AE Section

PARKING GARAGE HOLDS 500 CARS AND A HILL, pp. 224-226.
Forgotten Engineering: *POST AND LINTEL POSTDATED*, pp. 227-231.
HARNESSING THE COMPUTER FOR SPECIAL STRUCTURES, pp. 232-233.
PRODUCT REPORTS, Selecting Service Fixtures for School Labs, p. 234, 235.
OFFICE LITERATURE, p. 229. *TIME-SAVER STANDARDS*, pp. 239, 241, 243.



PARKING GARAGE HOLDS 500 CARS AND A HILL

O'Hara Parking Plaza at the University of Pittsburgh will have a structure that opens up interior spaces and pushes back the earth

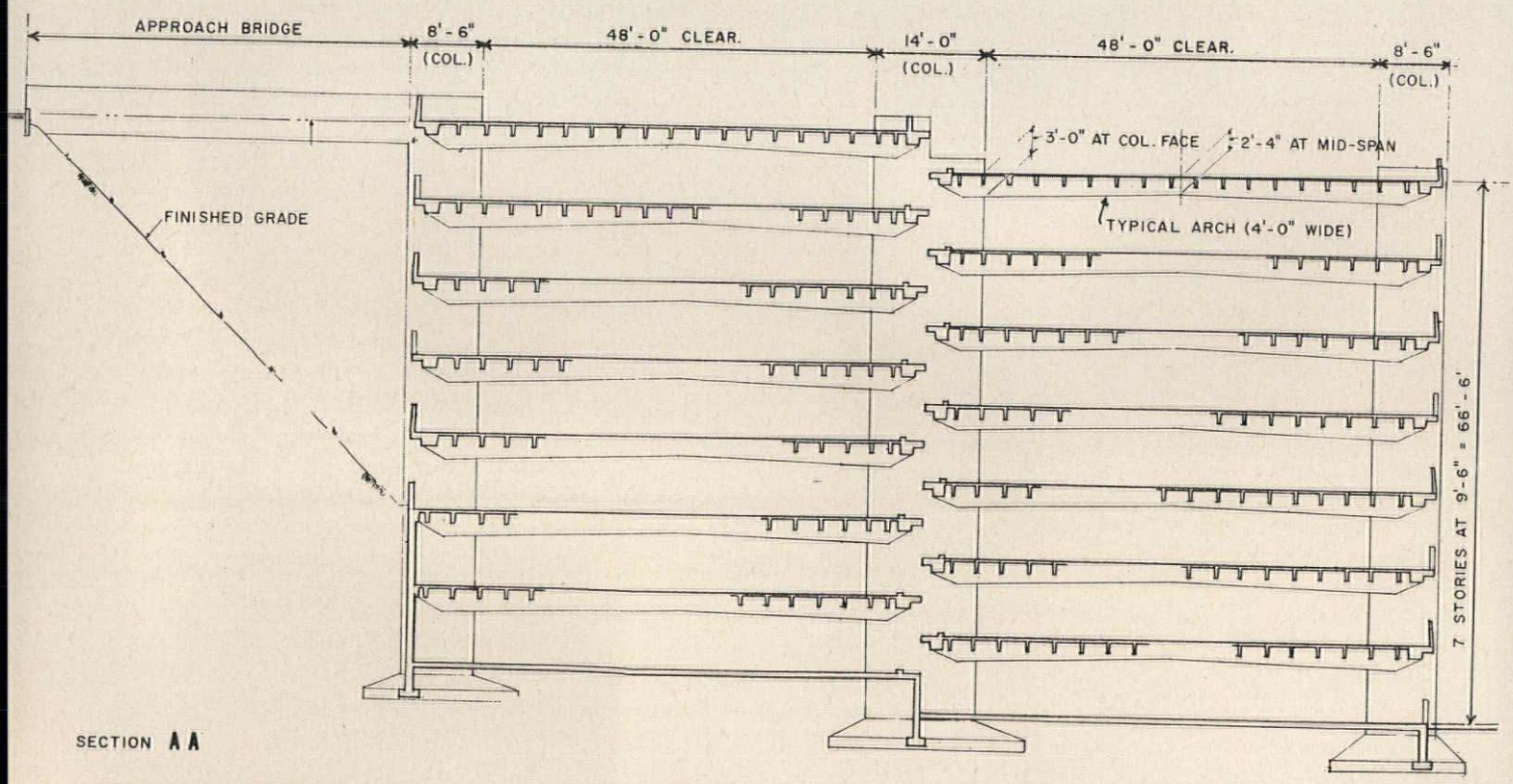
Architect: Tasso Katselas. Structural Engineers: Gensert, Williams & Associates. Soils Analysis: David V. Lewin. Mechanical Engineers: Howard D. Bennett & Associates. Electrical Engineers: Anton J. Eichmuller. Contractor: Navarro Corporation.

Various structural systems have been used for parking garages to squeeze the maximum number of car spaces into a given volume. Framing for the O'Hara garage not only satisfies this function, but takes on the job of resisting the pressure of an adjacent hill. The large spans offer a great deal of flexibility for maneuvering automobiles, and the shallow, haunched beams (called arches on the drawings) permit the required number of stories to be sandwiched between the upper and lower streets.

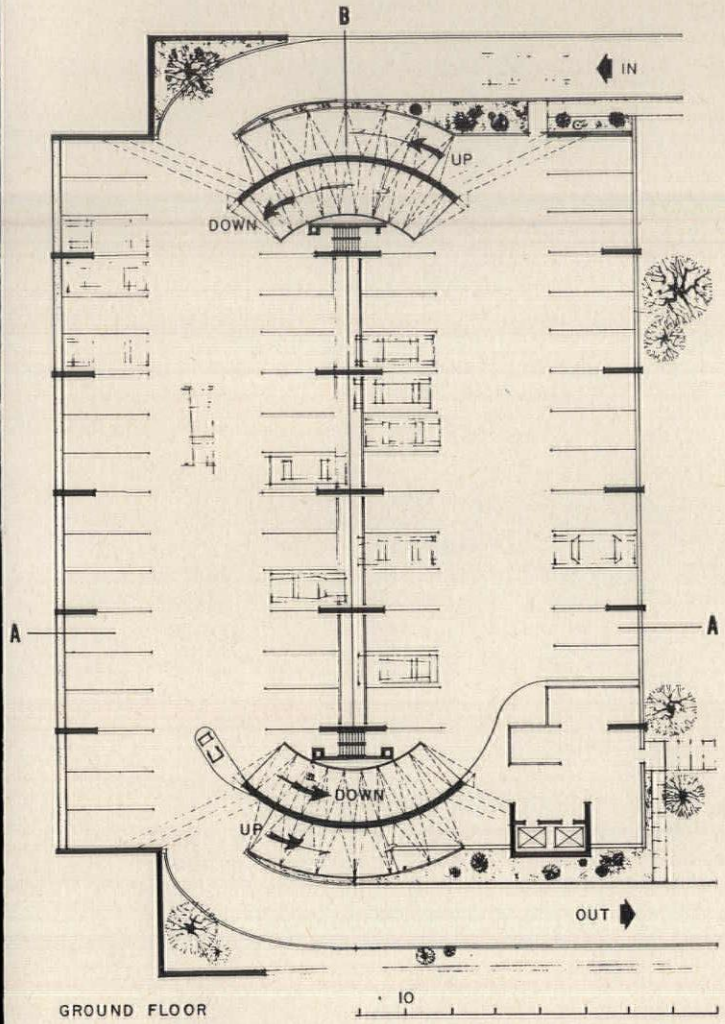
The columns are unusually deep to take lateral load, but they were made only 14 in. wide to gain usable space. The haunched beams are only 3 ft deep at the columns and 2 ft 4 in. in the center, made possible by the fact that so much of the bending moment is thrown into the columns. Because of this, the beams had to be 48 in. wide at the column face.

Design of the ramps indicates careful attention to the interrelationship of function, structural efficiency and appearance. Supports for the cantilevered ramps might have been cantilevered brackets with a slab on top. Since slab brackets in concrete construction act together, it was natural to fuse the element as indicated on the plan.

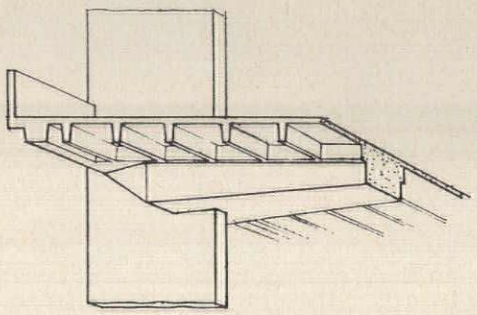
Curved walls supporting the ramps will be accented by means of vertical grooves to disguise any irregularity in formwork and to act as control for shrinkage cracks.



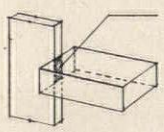
SECTION A A



COLUMN, BEAM DESIGN

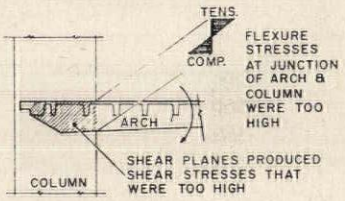


The basic structure is a deep, thin column, a wide, shallow beam and a ribbed slab. Theoretically the beam could be attached to the column in several ways. Below are the engineer's sketches and comments showing his approach to the problem. Structural behavior of the full frame is shown on the next page

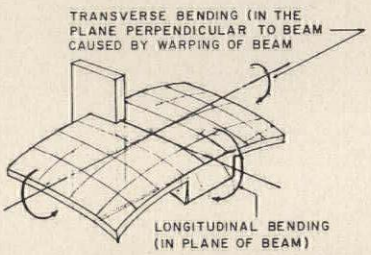


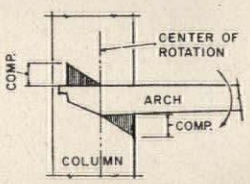
Obviously the beam cannot be attached merely to the edge of the column. Such abrupt transition will not work



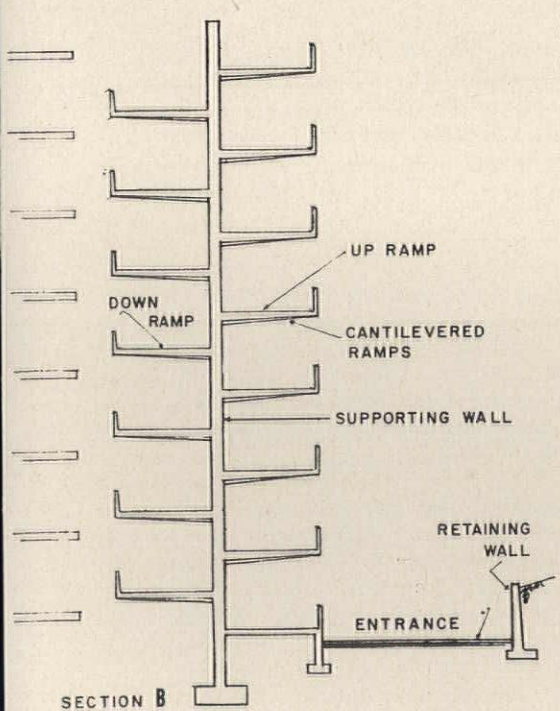


If the arch is considered as a fork with prongs on either side of the column, torsional shear would be excessive





The final scheme was based on a notched column, with a rigid arch extending into the column. A check on bearing stresses at top and bottom of the notch gave a satisfactory solution



GARAGE CIRCULATION

Circulation is a one-way feed through split levels. Aisle widths give space for passing and for backing up so that circulation is unimpaired by approaching vehicles. The ramp system is a cantilevered section independent of the main structure

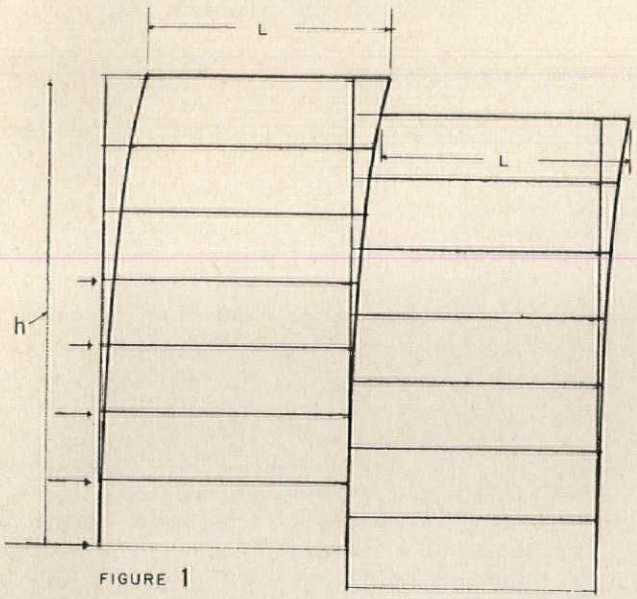


FIGURE 1

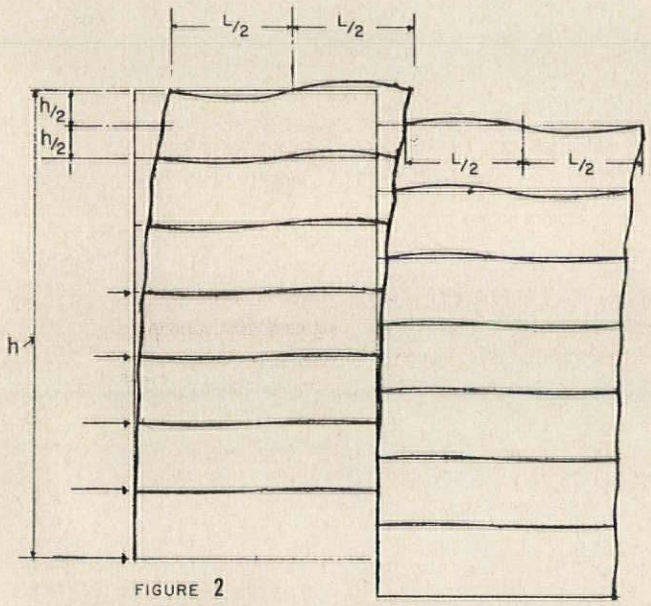


FIGURE 2

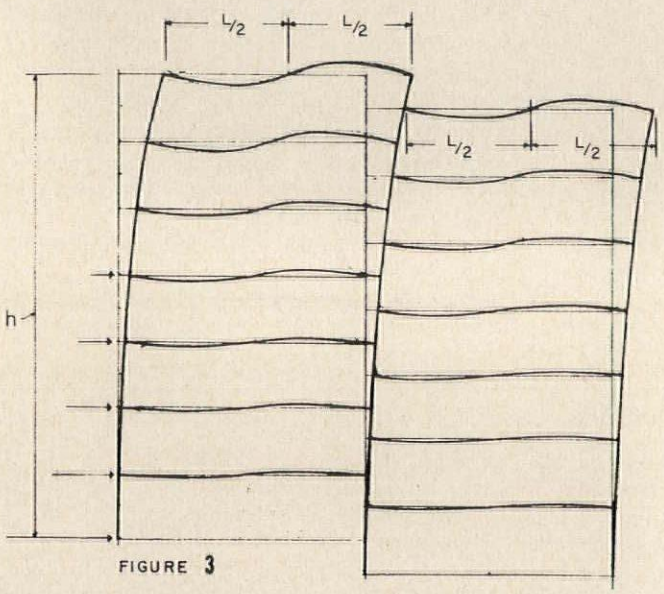
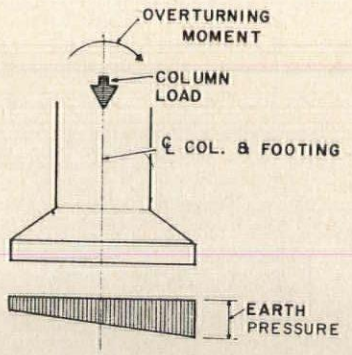
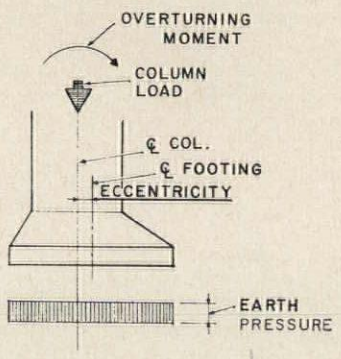


FIGURE 3





FOOTING DESIGN

The earth produced large overturning moments in the foundations. These moments required a large extension of the column footings to keep earth pressures within limits. By putting an off-set on the footing, it was possible to make the moment from the column load and eccentricity balance the moment from the hill. Footings were sized for vertical loads only

THREE ASSUMPTIONS FOR FRAME ACTION

Figure 1. Here it is assumed that columns act as cantilevers with the beams transmitting thrust from one column to the next. The beams are designed for a thrust, but not a bending moment from lateral loads. Although the analysis is simple, it is incorrect since the beams are not free to pivot at the column when the column is rotated

Figure 2. This typical approach to the analysis of a bent assumes rigid frame action with points of inflection at the mid-height of all columns in each story and at the mid-span of all beams. Before this assumption can be true, the stiffness of beams and columns must be nearly equal. This condition does not exist because beams are considerably longer and shallower than the columns

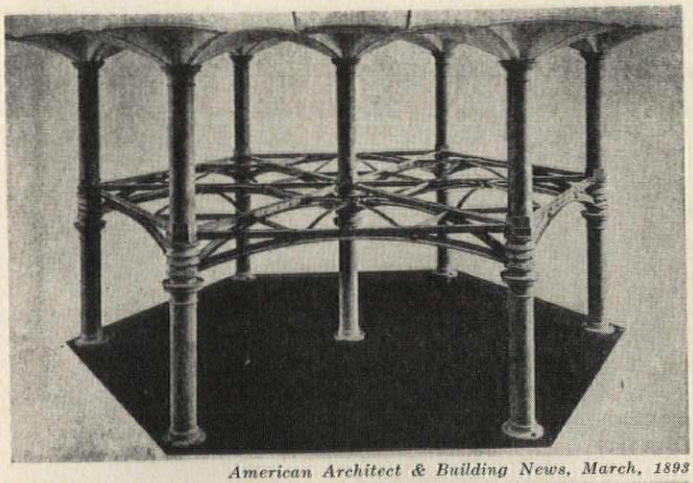
Figure 3. In this solution, cognizance is made of the great stiffness of the columns, and the rigid connection of beam and column. Unlike Figure 2, the beams receive a bending moment from the rotation of the columns. Since the cantilevered columns undergo their greatest rotation at the top, the uppermost beams receive the maximum bending moments which are proportional to the column rotation

Forgotten Engineering:

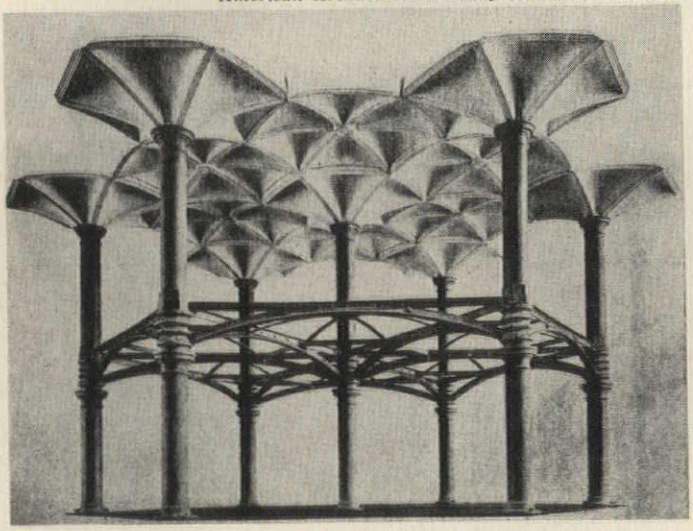
POST AND LINTEL POSTDATED

by Alan Burnham, A.I.A.

In this second article in his series on "Forgotten Engineering," Mr. Burnham tells of a floor system that economically combined a web of steel framing with integral fireproofing and an elementary form of war air radiant heating. As the model photo below shows, the system, with its network of tiny groined vaults inscribed in polygonal bays, bore more resemblance to some recent work in plastic and concrete than to current steel construction. In its day, it too was a new and inventive use of a still-new material. But it disappeared with the advent of the skyscraper, leaving no trace—except, perhaps, such recent developments as space frames and geodesic domes.



American Architect & Building News, March, 1893



Writing for the RECORD in 1892, Louis De Coppet Berg, a distinguished civil engineer and member of the architectural firm of Cady, Berg & See, said about developments in iron construction in New York City: "The great trouble . . . is not so much the material used as the slavish following of old constructive ideas. . . . Why, the old Egyptians, thousands of years before our era, put stone girders on stone columns, and at right angles to these the stone beams forming the roof coverings. . . . Now we make steel do the same." [11]

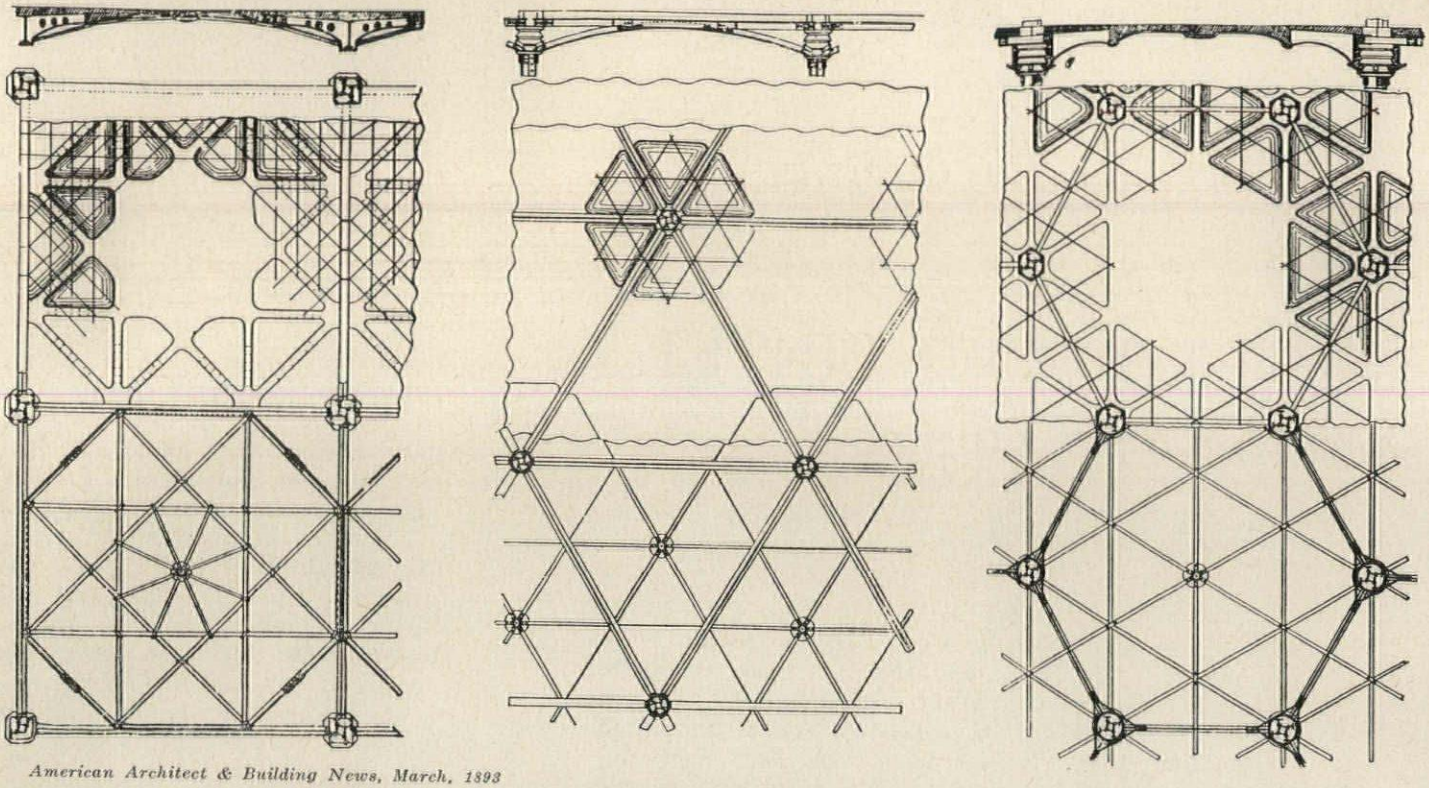
He asked whether no one could invent something new after all these centuries, and went on to cite hopefully the then newly-patented designs of Niels Poulson as a step in this direction. Not content with a floor system that consisted of flooring supported on beams supported on girders, Poulson had devised one which bridged from column to column in a single flying leap. It also could be readily fireproofed and made possible an elementary form of warm air radiant heating.

Poulson himself was an immigrant Danish mason who had earned for himself the title of "The Danish Ironmaster" by becoming, in true Horatio Alger fashion, the proprietor of the Hecla Iron Works (formed as Poulson & Eger), a large and successful enterprise whose ornamental iron work still adorns many buildings—and subway entrances—in New York City and Brooklyn. Along the way, he exercised his engineering talent by designing and developing, among other things, the unique floor framing system shown here.

Square to Hexagon to Triangle

Poulson's framing system was designed to occupy one bay, carried by columns or by walls, but it could be multiplied indefinitely horizontally, each bay adjoining the next, while producing virtually no lateral thrust on neighboring bays or on the outside walls.

[11] For this and following references, see bibliography on page 248



American Architect & Building News, March, 1893

In its first and simplest form, as adapted to small structures with square bays, it was described as follows: "Flat iron bars are placed across the entire span of the room . . . crossing each other at right angles and diagonally across the corners, the whole [being] bent to the 'natural arch curve' by rolling, and riveted together at all intersections." [11]

The outer periphery in this system became an octagon which absorbed the outward thrust of the arched members in the iron-ribbed dome. By 1893, Poulson had adapted the system for use with hexagonal and triangular bays, in addition to the octagon-inscribed square bays. These too were capable of indefinite multiplication, the arched trusses absorbing lateral thrust and transmitting the load of the floor system directly to the columns. Only the lower chords of the trusses were given an arched form, so that their top chords and the floor members carried by the intermediate arched ribs remained horizontal.

Since the arched ribs were being made of heavier sections—tees and angles—this type of construction, in its various forms, had by this time (1893) become practical for stores and large office buildings, and in fact, was used in one of the buildings at the Hecla Iron Works. A photograph of the drafting room in this building clearly shows the square bays with their domical system of ribs springing from the lower chords of the trusses that arched between the columns.

In a talk, illustrated with models, which he gave at the Massachusetts Institute of Technology in 1893, Poulson claimed that such an arched system would cost only one-third as much as the usual type of beam and girder construction, since the dead load was self-supporting and was carried directly to the columns.[13]

Integrated Structure: Circa 1890

In addition to the structural features embodied in this floor system, Poulson answered one of the primary construction problems of his time (and ours, for that matter) by introducing an effective method of fireproofing. Like some other methods then in use, it depended on plaster to protect the lower flanges of structural members from direct exposure to flame.

In Poulson's system, plain or ornamental plaster ribs, moulded to the proper curve and cut in lengths to suit the conditions, were applied to the underside of the arched steel ribs. Next rubber bags were placed in the spaces between the ribs and inflated with gas or air so that they assumed a natural curve. On top of these miniature triangular "forms" a thin, uniform layer of plaster of paris or cement was spread. When it had set, the bags were deflated and removed, leaving the plaster "spandrels" intact. In this way, the entire steel floor system could be protected on the underside by a continuous sheath of plaster work.

Poulson's next innovation was the introduction of a heating system in which the space between the arched ribs and the horizontal floor above was used as an almost continuous chamber for the circulation of warm air. This was achieved by building up pierced, vertical concrete ribs that extended between the top of the arched iron ribs and a point just below finished floor level.

The ribs were constructed using wood forms with suitable inserts to produce circular openings at stated intervals. After the concrete had set, the forms and inserts were removed and "wire netting" (metal lath) was stretched over the top of the pierced concrete ribs. A level concrete floor slab about 3 in. deep was then poured over the lath, complete with wood sleepers to receive the finished flooring. In some cases, tile or carpet was applied directly to the concrete slab, omitting the sleepers.

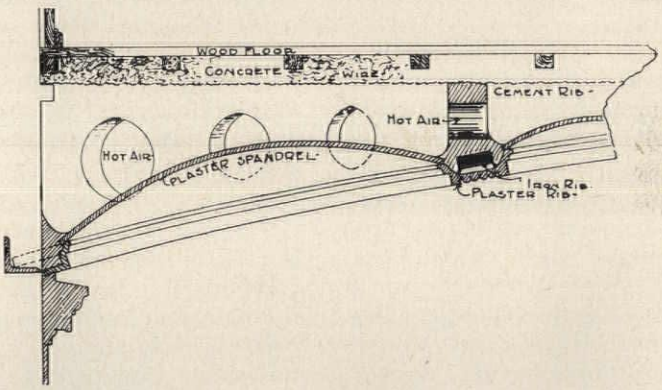
Poulson, comparing this with the brick-arch type of fireproof floor construction then in use, declared that it would cost much less. It used less material and, except for forming the vertical ribs, involved only simple operations — applying precast plaster ribs to steel ribs, spreading plaster over inflated bags, and pouring a concrete fill—which did not demand much labor or skill.

In its earliest form, Poulson's floor system consisted of a network of arched steel ribs laid across a square bay so that they crossed each other at right angles and diagonally. As shown in the plan at far left, the periphery thus became an octagonal "ring" which absorbed the lateral thrust of the arched dome. Later, Poulson also devised systems for triangular and hexagonal bays (middle left and left) outlined by trusses that transmitted the floor loads from the intermediate arched ribs directly to the columns. Since this made the dead load self-supporting, Poulson claimed that his system would cost only one-third as much as conventional beam and girder construction



New York Public Library

Like most techniques then in use, Poulson's method of fireproofing his floor system depended upon plaster to protect the steel. It consisted of applying precast plaster ribs to the underside of the steel ribs, laying inflated bags between them, and spreading plaster "spandrels" over the bags—thus completely encasing the underside of the steel. Building up pierced concrete ribs over the steel ribs as shown below then made it possible to pour a concrete floor and to use the space between it and the plaster sheath below as a plenum for warm air radiant heating

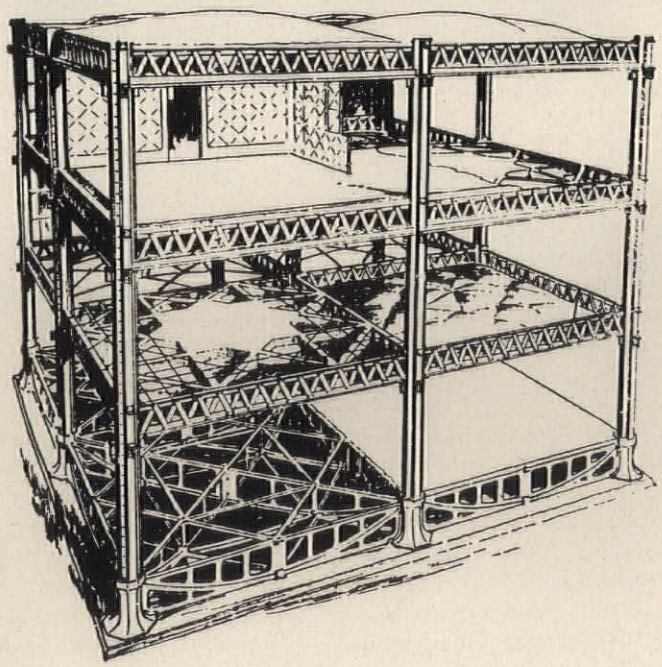


Form Swallows Function

Poulson had spent much time in devising for use with his floor system various types of columns—some octagonal and some, using channels, swastika-shaped—which could be used for vertical pipe runs, and which would extend through several floors, diminishing in the amount of material used as they ascended. Unfortunately, however, the opportunity such continuous columns offered for visual expressiveness was largely lost upon the architects of the day.

For example, in Smith Gray & Company's store in Brooklyn, where the Hecla system was used to reconstruct the building after a disastrous fire, architect Peter J. Lauritzen expressed the columns as separate entities, with elaborate corinthian capitals, even though the steel columns themselves actually went up through several floors. A post and lintel expressionism was thus superimposed on the fluidity of the underlying structure.

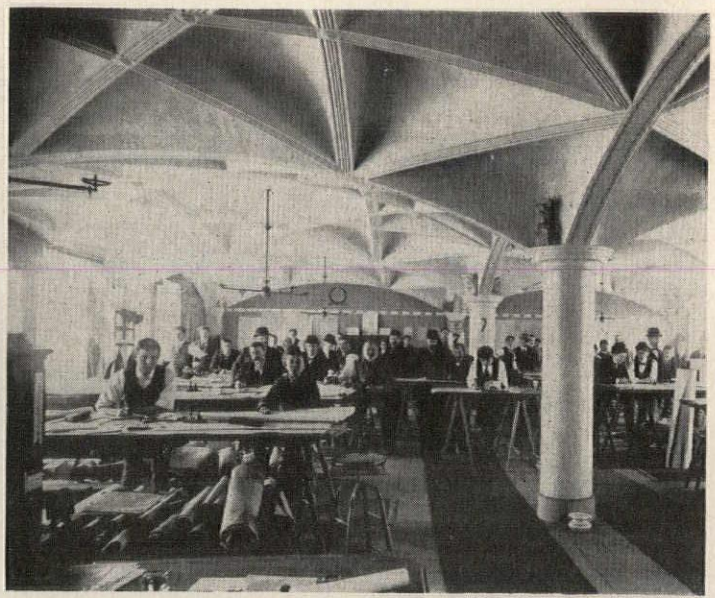
Poulson himself, on the other hand, expressed his structural system quite beautifully in the drafting and exhibit rooms at the Hecla Iron Works. Here the post and lintel concept is subordinated to an almost plastic feeling of flow that more nearly reflects the steel arches and continuous vertical columns within. Since there was no lintel as such, Poulson abandoned the block-like abacus of the capital, sweeping



Architectural Record, April-June, 1892



Blumenberg Press



New York Public Library

out the echinus to take the soffits of the simply-grooved ribs. Where ribs met, rosettes were applied to emphasize the points of intersection.

In this case, although the sheath of plaster was a fireproofing necessity, the engineer managed to express visually the structure it concealed. It is quite conceivable that, in the hands of a sensitive architect, the grooved soffits of the arched girders might have been swept right down to the floor via the columns—a gothic concept quite close to the structural facts. Victor Horta, for example, would have perfectly understood the possibilities in Poulson's system, and would no doubt have expressed it as the "Art Nouveau" with which it was contemporary.

The House that Neils Built

To his neighbors in Bay Ridge, Brooklyn, the most conspicuous evidence of Poulson's ingenuity was his own home, the famous "Copper House," which was a Brooklyn landmark from the time it was built in 1890 until it was razed in the early 1930's.

Although it was noted chiefly for being sheathed entirely in copper, it was also the earliest building in which Poulson used his octagonal (square bay) floor system, complete with arched ribs and integral warm air heating, and, according to one source [9], the first steel-framed residence ever built in the United States.

Externally, it was just another Victorian mansion, with towers, bays, projecting greenhouse and porte cochere. Even the copper sheathing was designed in keeping with the times. It featured four circular ornamental panels representing America, Europe, Asia and Africa (all copied from the Albert Memorial in London), and a copper frieze that extended entirely around the house between the first and second stories. On the exterior, only the light bamboo-like columns of the porch were in any way expressive of the metal used throughout.

The walls, though framed in steel, were nogged solid with 8-in. thick brickwork, and plastered directly on the inside without any air space. It appears that the external copper sheathing was effective enough to prevent all condensation, since the original wall paper was found to be in good condition at the time the house was razed.

When it was demolished, in spite of the rough treatment required to loose the plaster and the nogging, the frame stood four-square and true, and it was found that the steel was in such perfect condition that many of the bolts could be freely removed. This absence of rust must also be attributed to the copper sheathing.

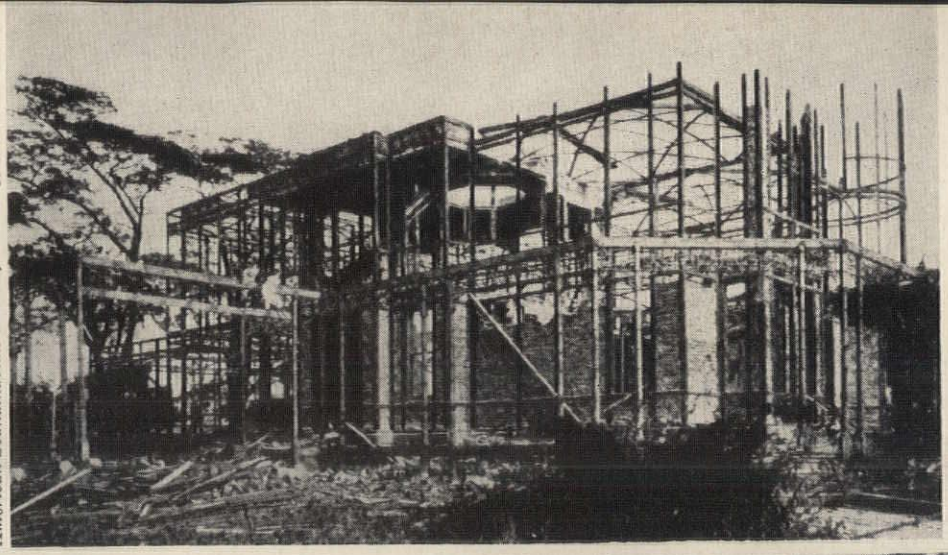
Small wonder that the Superintendent of Buildings for the Borough of Brooklyn, who had watched the erection of the Copper House in the summer of 1890, proclaimed at the time of its demolition that it was structurally one of the most advanced buildings he had ever known.

An architect viewing the ruins at the same time took a slightly different point of view. To him the bare steel frame with its spider web of convex bays enmeshed between vertical steel was more beautiful than the house itself had ever been.

But the most rapturous verdict of all came from the American Scandinavian magazine in 1911 [14]. "The house is emphatically an ironmaster's house," it said, "the very flower of his fancy's playing with the hard materials he had chosen to work with . . . such varied colors and exquisite shapes that all thought of hardness or coldness seems eliminated from the material."

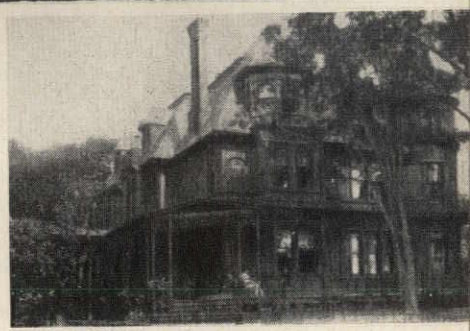
Hexagonal Honeycomb for Grain

Even before he designed his novel floor system, Poulson had turned his engineering talent to solving, apparently, whatever construction problems struck his fancy. One such project was a scheme, advanced in 1877, for constructing fireproof grain elevators from a series of hexagonal cells, made up of steel-reinforced masonry carried on a system of groined arch castings which were supported in turn by hollow cast iron columns.



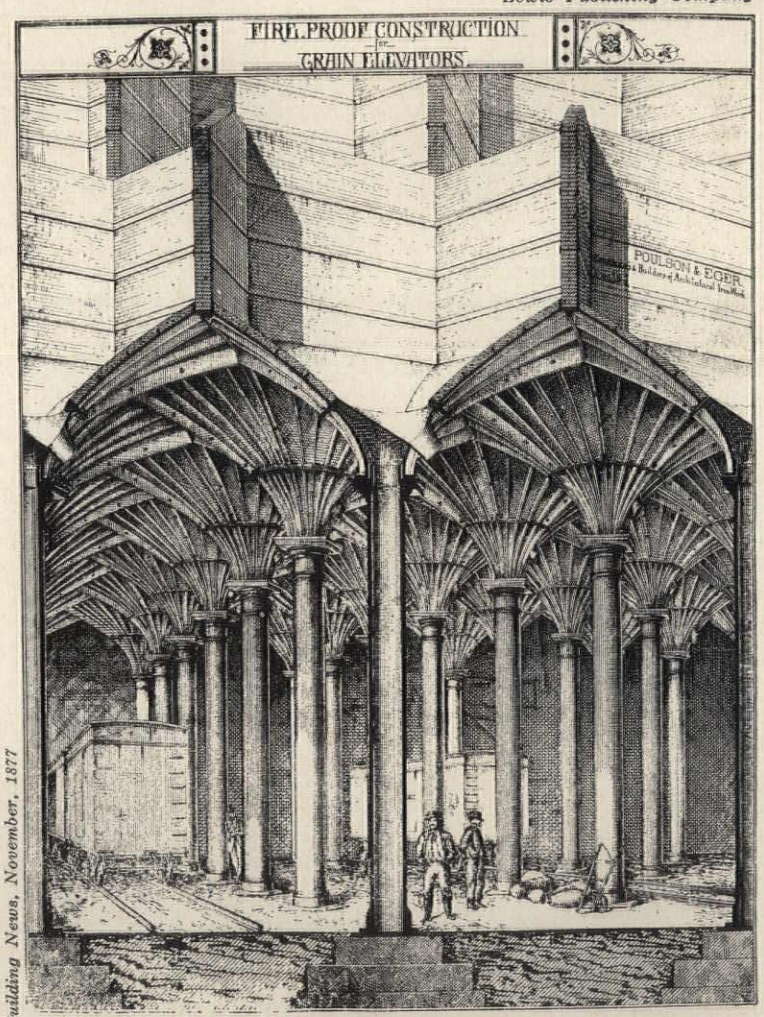
American-Scandinavian Review, February, 1931

Although Poulson's floor system featured columns that extended through several floors, the architects of the day seem to have been too enamoured of the neo-classic post and lintelism then in vogue to have recognized the design opportunities offered by continuous columns. In the photo at far left, for example, the ornate corinthian columns give no hint of the fluid structure they hide. Poulson himself was more sensitive. In the Hecla drafting room, (left), he simplified the columns so that the steel ribs seem to flow through them instead of only resting on top

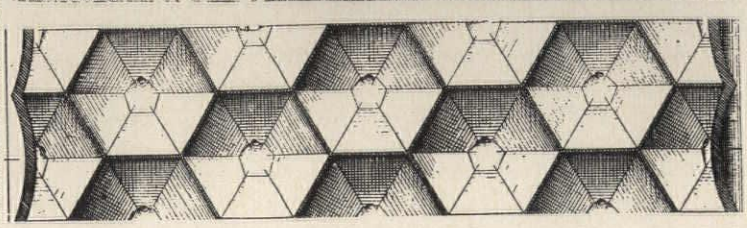


Lewis Publishing Company

Poulson's own home, the famed "Copper House" (shown above during razing, at right as it originally appeared), was the first in which he used his octagonal floor system and integral warm air heating, and reportedly the first steel-framed residence in this country. The drawing below shows an early scheme for a fireproof grain elevator made up of hexagonal masonry cells resting on ribbed vaults supported by hollow columns. Concave exterior walls (plan) closed the open sides of the half hexagons at the building perimeter and resisted outward thrust



American Architect & Building News, November, 1877



In describing this early proposal, Poulson boasted that the floor load was carried only once, thus avoiding the use of beams and girders; that the elevators would require no insurance; and that they would be completely rot- and vermin-proof.

The ribbed vaults forming the bottoms of the bins were to provide an inverted cone from which the grain could be discharged through a chute at the lowest point. Thus the supporting framework could be mass-produced from only three types of units: the ribbed lower section, the upper sections, and the chute section.

To maintain a rectangular shaped building, Poulson devised a system of concave exterior walls wherein the concavity of each wall segment closed the open side of a half hexagon and resisted outward thrust. With this arrangement, half-castings could be adapted to meet the side wall conditions.

Poulson stated that his hexagonal grain elevators "[would] not cost much if any more than a wooden building, and compared with the fireproof grain elevators in Brooklyn and Philadelphia, built with columns, girders, beams, iron floor and circular wrought iron bins, it would not cost nearly half so much."[6]

Unfortunately, the grain merchants of the day did not hear—or did not heed. There is no record of the scheme's having actually been built.

HARNESSING THE COMPUTER FOR SPECIAL STRUCTURES

by *KURT EISEMANN*,
Research Mathematician, International Business Machines Corporation
SAUL NAMYET,
Assistant Professor of Structural Engineering, Massachusetts Institute of Technology
LIN WOO,
Engineer, International Business Machines Corporation

Although computers have in the past decade proved that they can perform such diverse tasks as "flying" unbuilt aircraft and making out payrolls, they have yet to carve a niche for themselves in the building field. The reason has been economic. Engineers are quite willing to turn over to a machine the tedious calculations necessary for an accurate analysis of complicated structures, but they have rarely been able to do so. They have found instead that unless a project involves a vast number of repetitive calculations or a firm can count on designing many similar structures, the time and manpower saved by using a computer may not justify the cost of programming.

One answer to this dilemma is now being sought under the auspices of the Massachusetts Institute of Technology and the International Business Machines Corporation. The object of the joint project, as outlined here, is to devise a "standard" program for analyzing three-dimensional framed structures ranging from multi-story rigid frames to domes and other types of space frames. Such a program would speed up the inevitable trial and error process of design, making it possible to handle very large rigid structures in a single computer run; and it would permit much more exact and sophisticated analysis of structures that, because of the time involved, would otherwise have to be designed by approximation.

More important, the development of a standard program would make it economical to use computers for the analysis of even small "one of a kind" structures. Programming time would be limited to the day or so it would take an experienced engineer to acquaint himself with the program requirements and to transfer the necessary information to "input sheets" described in the general program write-up.

To demand accurate three-dimensional analyses of rigidly-framed structures would exact from the engineer an intolerable toll of tedious labor and precious time. It has therefore become the established practice to treat loads and stresses as if they were carried by two-dimensional sections of the structure. The amount of work necessary for solution is thus reduced to feasible proportions, but the simplifying assumption introduces a definite source of errors. The resulting discrepancies between the calculated and the actual behavior of a structure reflect the concessions enforced by limitations of available manpower and human mental fatigue.

No comparable limitations exist in regard to an electronic computer. It can be harnessed to perform, within a reasonable amount of time and without fatigue, the complete analysis of a structure, taking into account all three dimensions. We have thus reached the point where analyses can be carried out not only with greater speed but also with greater accuracy than has ever been practicable in the past.

Accordingly, the development of a technique for analyzing three-dimensional framed structures by electronic computer has been undertaken by the Massachusetts Institute of Technology and the International Business Machines Corporation.

The joint project aims to serve a dual purpose: to abolish the tedium of manual calculation and at the same time to achieve more accurate structural analyses with rapidity.

The value of applying a computer in this area is evident on examination of the traditional methods of analysis, which were established through a process of evolution. In this process, desirable objectives could be realized only within the confinements of human limitations. The result was compromise between objectives and available means by which to achieve them.

A decisive factor in effective design is time. Even under the simplifying assumption of two-dimensionality, careful analysis of a multi-story building frame may take an experienced engineer several weeks to perform. By contrast, the same amount of work can be executed by machine within a matter of minutes.

Another crucial factor is that of size. The number of man-months required for an analysis rises steeply with increasing size of a structure. By contrast, the vast storage capacity of computers, which can store, identify and retrieve millions of numbers in various types of "mem-

ory," should permit the reduction of man-years of effort to a comparable number of machine-hours.

The current MIT-IBM project aims at applying the speed and versatility of computers to the complete and accurate three-dimensional analysis of arbitrary framed structures composed of prismatic members. Among the numerous factors that will be taken into account are arbitrary joint configuration with arbitrary orientation of members; arbitrary set of loads; rigid, pinned, and flexible joints; arbitrary types of oblique reactions; settlement of foundations; and temperature effects.

The analysis will take into account not only transverse, but axial and shear stresses and deformation as well. Applications will include such diverse structures as multistory building frames; towers; truss-bridges; support structures for industrial equipment, for storage tanks, for radar antennae, and for radio telescopes; masts and cranes; domes; and space frameworks in general.

An appropriate master computer program—the set of instructions to the machine which govern computations and control—is already in the advanced planning stage. As input it will require no more than the geometrical and elastic data defining the joints, members, and supports of the structure, together with external loads. The program will then proceed to calculate all joint displacements, external reactions, and the internal forces and moments induced at the extremities of each member. These data permit easy subsequent stress and deformation analysis for any individual member.

The automatic execution of a program involves not only the actual numerical computations, but also a complex system of logical control. This supplies full identification for each number, rearranges data within internal storage as needed, performs checks on consistency and accuracy, and decides at each step on the required type of computation.

As a result, for the complete analysis of a large structure, an electronic computer will be required to execute hundreds of millions of instructions, mostly arranged in repetitive "loops." Techniques for achieving a minimum of machine time for large size structures thus assume paramount importance. Numerous such techniques, designed to combine feasibility with optimality, are currently under development and will be incorporated into a single, comprehensive computer program. It is expected that structures with hundreds of joints and well in excess of a thousand members can thereby be analyzed with unprecedented accuracy and speed.

The computer for which this program is planned is the IBM 704, such as the one installed at the MIT Computation Laboratory. It has a high-speed core "memory" of 32,768 ten-digit numbers plus unlimited storage capacity on electromagnetic tapes. Its speed of execution is about 2½ million operating steps ("instructions") per minute. Since installations of this model exist in most major cities and Data Centers rent machine-time by the hour, a program, once written, will become accessible to engineers in every part of the nation.

The advent of the electronic computer has already revolutionized many organized areas of activity of human society. Aircraft are designed and "flown" on computers. Their behavior is studied under wide ranges of operating conditions, before even a test model is built. Huge industries alter their traditional operating practices as a result of new insights revealed through extensive studies on computers. And wherever immense volumes of arithmetical calculations, logical decisions, or clerical operations are called for, computers have begun to transform the hitherto impossible into an impressive array of accomplished facts.

This versatile tool is slated, in time, to exert a profound influence upon architectural practice as well. No longer need the architect graft non-organic modifications on his original artistic concepts so as to take into account computed structural requirements not fully anticipated. Instead, he will be able to obtain a rapid analysis of a preliminary general sketch and utilize the results in perfecting the functional details of a pleasing and effective design. The computer thus puts at his disposal sufficient information on which to base judicious decisions concerning such fundamental parameters as height of stories, interior plan dimensions, and column spacing and arrangement. More detailed design can then be followed by a more detailed analysis.

Even at this stage, the architect retains full freedom of action. If he decides on a change of design, either to remove objectionable structural features or to broaden an artistic idea, he need no longer fear the consequent delay in the execution of his project. Re-analysis of a revised design literally can be done overnight. The architect thus is freed from subservience to the demands of structural details. Instead, he can turn the tables and, as the master, subordinate the computed structural requirements so as to blend harmoniously with architectural expression and form.

The impact of the computer on architectural as well as engineering practice is due to be felt in yet another direction. It now has become feasible to perform, within a very short period, not one but an entire battery of analyses for alternate designs under various loading conditions, providing valuable data for comparative study and evaluation.

Informed choices can then be made between competing forms as well as competing materials. Rapidly obtainable data on the required dimensions and arrangement of structural members can assist in a determination of the optimal structural form. This, in turn, will facilitate the architect's decision on the most appropriate architectural form.

Similarly, it is possible to compare the size, composition and cost factors of different materials, such as steel, reinforced concrete, aluminum, or prestressed concrete. It will thus be an easy matter to choose, among a set of proposed alternatives, the most desirable and economical design.

The computer program currently under development is expected to provide the engineering profession with a potent tool of wide utility. Yet it will become only one phase in the development of constantly-improving engineering. The day is not far off when not only the tiresome arithmetic of analyses, but even the judicious and economical design of entire engineering structures, can be safely and dependably entrusted to man's new friend—the electronic computer.

SELECTING SERVICE FIXTURES FOR SCHOOL LABS

. . . Some tips on evaluating fittings for educational laboratory furniture

by CARL SPATT, *Chief Engineer, Lab-Flo Division, T & S Brass and Bronze Works, Inc.*

There are practically no demonstrations or experiments in the average school laboratory that do not require a supply of water or gases, and each such element requires some type of fixture to dispense it—easily, safely, and with long term usage in mind. Since school laboratories represent a substantial expenditure, it follows that high quality materials and equipment should be used throughout. This is equally true of the service fixtures. Unless they are designed to withstand laboratory usage, even the best equipment will not function as it should —just as an automobile will perform no better than its engine.

Faucets and Valves: Construction
The amount of metal used in a faucet or valve is one good indication of quality since material represents the highest item of cost to a manufacturer, and hence the area in which the greatest savings (and profit) can be realized. A heavy valve or faucet usually reflects quality not only in increased wall thickness, but also in heavier working parts such as spindles. The larger the diameter of the threads of the spindles, the longer they will last, and since the faucet body will have deeper threads to receive the "oversize" spindles, it too will last longer.

One alloy that has proven quite successful for faucet and valve bodies is a bronze that consists of 85 per cent copper plus equal parts of tin, zinc and lead. This particular alloy is usually cast, but some valves are produced as forgings from a brass made up of 65 per cent copper and 35 per cent zinc. This higher percentage of zinc makes for a lower quality product since the zinc may dissolve in water passing through the forging, but satisfactory service can be obtained if forged items have sufficient wall thickness.

Indeed, forgings have several advantages over castings: the absence of tiny "sand" holes which sometimes result in leaking castings; the greater density of the forging wall which results in higher strength; and a smoother external surface which leads to a better finish. Three examples of products which can be satisfactorily produced from forgings are the tabletop turrets or pedestals in which gas cocks are mounted; the gas cocks themselves; and handles of faucets and valves.

All joints of faucets should be constructed so that internal back pressure will not cause leaks at the joints. For example, placing a nonsplash aerator or aspirator on the tip of a faucet nozzle will restrict the flow of water to such an extent that the interior of the faucet will be under higher pressure than normal. This pressure manifests itself in leaks at poorly protected openings.

Faucets and Valves: Types
The part of a faucet or valve at which the flow is controlled is known as the seat. Most faucets have one of three types: a seat which is an integral part of the body; a removable seat; or a removable barrel insert style.

The first attempt to repair a leaking faucet is made by replacing the seat washer. If this does not prove satisfactory, the seat itself must be replaced or repaired. An integral seat cannot be replaced but must be repaired by re-machining the seat with a hand tool. The removable seat, which is made of brass, stainless steel or monel, is replaced by merely unscrewing it from the faucet interior see Figure 1. The removable barrel insert is also replaceable and has the advantage that the spindle does not "work" on the faucet body.

On the other hand, the removable seat is sometimes preferable because corrosion will usually localize at the seat, replacement of which will renew the faucet. Sometimes, in the case of the barrel insert, corrosion will take place between the barrel and the faucet body, ruining the body and defeating the purpose of the removable barrel.

Steam valves come with two types of seats. One has a removable seat washer; the other has a removable stainless steel seat and a floating needle cone. Both types perform satisfactorily, but the needle style affords better control over the volume of steam.

Faucets and Valves: Finishes
The standard finish for exposed laboratory faucets is chromium plate over nickel plate over a highly polished base. It is pleasing in appearance and easy to keep clean, but has poor resistance to the chemical attack of fumes. Epoxy-coated fixtures are being used in increasing quantities to resist exterior corrosion, but no standard specifications have been set for the epoxies because they have not been in use long enough to yield sufficient test data. Stainless steel service fixtures are also available, and will undoubtedly find increasing application in fume hoods. They are particularly useful in radio-isotope fume hoods which must be decontaminated with strong detergents and, sometimes, acid solutions that would rapidly cause chrome plated fixtures to become dull and pitted.

Electrical Pedestal Boxes
Since an electric box has no working parts and is not subject to internal corrosion as is a faucet, the most economical satisfactory material can be used for its construction. Tabletop-mounted electric pedestal boxes are now usually furnished with a cast iron body, finished in either painted enamel or chrome plate. However cast aluminum boxes are becoming more popular and will probably supplant cast iron eventually. They can be chromium plated to protect against corrosion and minimize oxidation of the aluminum surface. Cast bronze electric pedestal boxes, chromium plated, are also available and are

the most corrosion-resistant of the types so far mentioned. Although they are the most expensive of the three, they will outlast the others both in appearance and in utility.

Distilled Water Service

The chief concern in selecting faucets for dispensing distilled water is to avoid contamination of the water. It has been traditional to use tin-lined brass or bronze faucets for this purpose, but aluminum faucets are now available also. It has recently been shown[1] that the pickup of aluminum by the distilled water in aluminum systems is less than that of copper in tin-lined copper alloy systems. It should also be remembered that in tin-lined faucets in which the moving parts are also tin-coated, some rubbing together of parts will occur, causing the coating to wear and eventually exposing the bronze.

Distilled water faucets are usually self-closing, and come in tabletop and wall mounted models. The pipes supplying them must also be of aluminum or other suitable material to avoid contamination.

Multi-Function Fixtures

Budgetary pressures and educational reasons have started a trend toward multi-purpose science rooms on the very logical assumption that different sciences can use the same laboratories. This has sparked the development of multi-purpose service fittings which not only save tabletop space but are usually lower in cost than the separate fittings otherwise required.

For example, a physics laboratory table might have gas and electric service only, while the services on a chemistry table would include gas and electricity plus cold water. Since the vertical support rods on a physics table differ from those on a chemistry table, a combination table would, in effect, be a chemistry table with provision for switching support rods.

In such a case, a combination gas and water fixture (Figure 2) might be installed, and there are also combination electric and gas pedestals which are useful in either chemistry or physics rooms, or in multi-purpose labs. Other dual purpose turrets or pedestals (Figure 3) allow the use of two different services from the same base fixture, and can also be used as a remote fixture in a fume hood, thus saving the tabletop space formerly occupied by, for example, the gas or water base.

Mixing Faucets and Water Supply

Steam and hot water service are rare in student laboratories, but since steam may be in the building for heating purposes, the use of combination steam and cold water mixing faucets (Figure 4), fed by a branch line from the steam system, might be considered. These faucets will deliver cold water only, or steam only, and when used as a mixing faucet will produce warm water for washing hands and equipment. As a steam faucet, they can be used for steam baths and find extensive use in organic chemistry laboratories.

Floor or wall mounted foot pedal valves, delivering either cold, hot or mixed water are also finding more use in laboratories. The water is piped from the pedal valve to gooseneck or nozzle outlets. They allow the student the use of both hands, and are used to fill vessels, wash hands, rinse equipment, and so on.

Another variation is the concept of a "flexible water supply" which brings water to the object rather than bulky objects to a water source. Flexible metal hoses with self-closing valves on the outlet ends serve this purpose. The valve may have a spray head for use in rinsing or a plain open end for filling. For example, in dark rooms, large jars stored on shelves can be filled in place. Or a hose and spray (Figure 5) can be used to rinse photographic trays.

The flexible hoses are attached to mixing style workboard faucets which allow either cold or tempered water to be used. When used as a filling device, the hose and valve are attached to a cold water line, and the hose is hung in a convenient position when not in use. Other uses of a hose and valve include filling water baths, aquariums, etc.; plant spraying; and immediate washing down of equipment, students and demonstrator for removal of corrosive substances in emergencies. *Lab-Flo Div., T & S Brass and Bronze Works, Inc., 128 Magnolia Ave., Westbury, L. I., N. Y.*

more products on page 252

[1]W. W. Binger and C. M. Marstiller, *Corrosion*, Vol. 13, No. 9, pages 591t-596t (1957) September

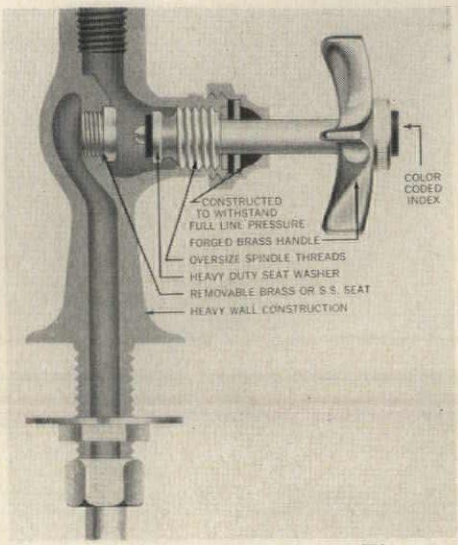


Figure 1



Figure 2

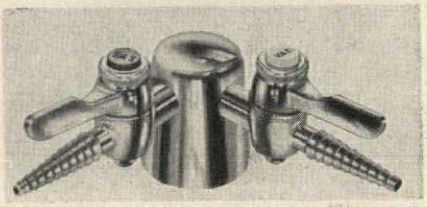
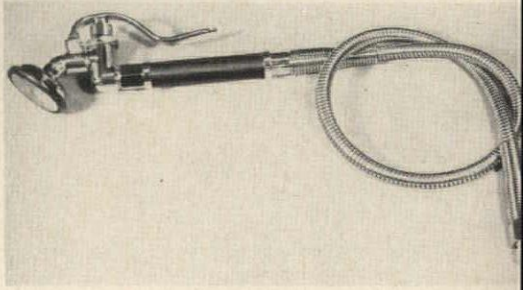


Figure 3



Figure 4

Figure 5



Building Products Literature Competition

Results of the eleventh annual Building Products Literature Competition have been announced by its co-sponsors, the American Institute of Architects and the Producer's Council, Inc. The competition, which was instituted to encourage the upgrading of building industry literature, has evidently done so. This year, the architects on the jury agreed that the quality of the entries had risen to a point where the competition, which in effect serves as a check, need be held only every other year. The award-winners (listed below) were selected by Harry B. Tour, F.A.I.A.; Edward G. Conrad, A.I.A.; George Bain Cummings, F.A.I.A.; James B. Newman, A.I.A.; and H. Griffith Edwards, A.I.A.

CLASS I

Literature concerned primarily with basic technical information including material offering general information on design, specifications, methods of application, standards of workmanship, maintenance, and the like, with regard to a class or type of product

Certificate of Exceptional Merit

DOUGLAS FIR USE BOOK, West Coast Lumbermen's Assn.; Agency: Cole & Weber, Inc.

Certificate of Merit

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Honorable Mention

ULTIMATE COST OF BUILDING WALLS, Structural Clay Products Institute; METAL CURTAIN WALL PANEL, National Assn. of Architectural Metal Manufacturers; FUNDAMENTALS OF BUILDING INSULATION, Insulation Board Institute; TECHNICAL BULLETINS, Metal Lath Manufacturers Assn.; SPECIFICATIONS FOR METAL LATHING AND FURRING, Metal Lath Manufacturers Assn.; MANUAL FOR HOUSE FRAMING, National Lumber Manufacturers Assn.; ENGINEERING IN WOOD, Timber Structures, Inc., Agency: Arthur E. Smith, Advertising; FIR PLYWOOD BOX BEAM HANDBOOK, Douglas Fir Plywood Assn.; STRUCTURAL CLAY FACING TILE, Structural Clay Products Institute; WOOD WINDOW DETAILS, Architectural Woodwork Institute

CLASS II

Literature offering technical information concerning the building product or products of a single manufacturer

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ARMSTRONG FLOORS—TECHNICAL DATA, Armstrong Cork Company; ARCHITECTURAL SPECIFICATIONS MANUAL, Pratt & Lambert, Inc.

Certificate of Merit

SOUND CONDITIONING, The Celotex Corporation; ACOUSTICAL CEILINGS, Armstrong Cork Company; CATALOG NUMBER 8, Julius Blum & Company, Agency: Seery & Ward; LUPTON ALUMINUM CURTAIN WALL, Michael Flynn Manufacturing Company, Agency: Erwin Wasey, Ruthrauff & Ryan; HOLLOW METAL DOOR UNITS, Fenestra, Inc., Agency: Fuller & Smith & Ross, Inc.; BOOK I—POWER SYSTEMS APPARATUS, BOOK II—UTILIZATION APPARATUS, BOOK III—APPLICATION GUIDE, General Electric Company; CERAMIC TILE PRODUCTS MANUAL, U. S. Ceramic Tile Company, Agency: Griswold-Eshleman Company; DESIGN KIT, Arketex Ceramic Corp., Agency: Keller-Crescent Company; WATERLOO AIR DIFFUSING EQUIPMENT, Waterloo Register Company, Inc., Agency: Michel-Cather; TOILET COMPARTMENTS, Sanymetal Products Company, Inc., Agency: Clark & Bobertz, Inc.; TRU-MESH METAL LATH & ACCESSORIES, Truscon Division, Republic Steel Corporation; PLUMBING FIXTURES & FITTINGS, Plumbing & Heating Div., American-Standard, Agency: Batten, Barton, Durstine & Osborn, Inc.; BUILT-UP ROOFING, The Ruberoid Company, Agency: Fuller & Smith & Ross, Inc.

Honorable Mention

GLORIFYING THE AMERICAN BATHROOM, The Philip Carey Mfg. Company, Agency: Farson, Huff & Northlich, Inc.; ALUMINUM & STEEL CURTAIN WALLS and ALUMINUM WINDOWS & SCREENS, Ceco Steel Products Corp., Agency: Charles O. Puffer Co.; CURTAIN WALL PANELS FACED WITH CERAMIC TILE, Ceramic Tile Panels, Inc.; CURTAIN WALLS, General Bronze Corp., Agency: Wildrick & Miller; ENTRANCES—STORE FRONTS—CURTAIN WALLS, American Art Metals Company; BASIC TYPES FOR COMMERCIAL INTERIORS and BASIC TYPES FOR RESIDENTIAL INTERIORS, Armstrong Cork Company; THE ECONOMICS OF THERMAL ROOF DESIGN, F. E. Schundler & Company, Inc., Agency: Kenneth B. Butler & Assoc.; RECESSED ARCHITECTURAL LIGHTING, Lightolier, Agency: Alfred Auerbach Associates, Inc.; STAINLESS STEELS FOR ARCHITECTURE, Armco Steel Corporation; TILE WORKBOOK FOR ARCHITECTS, The Mosaic Tile Company, Agency: Farson, Huff & Northlich, Inc.; CERAMIC TILE, U. S. Ceramic Tile Company (The Sparta Ceramic Company), Agency: Griswold-Eshleman Company; METAL WINDOWS, The Flour City Ornamental Iron Works, Agency: Ray C. Jenkins Advertising Agency; ALUMINUM WINDOWS AND STEEL WINDOWS, Fenestra, Inc., Agency: Fuller & Smith & Ross, Inc.

CLASS III

Literature of a primarily promotional nature, supplemental to CLASSES I and II

Certificate of Exceptional Merit

LAMINATED PLASTIC SPECIFICATIONS, Formica Corporation, Agency: Perry-Brown, Inc.

Certificate of Merit

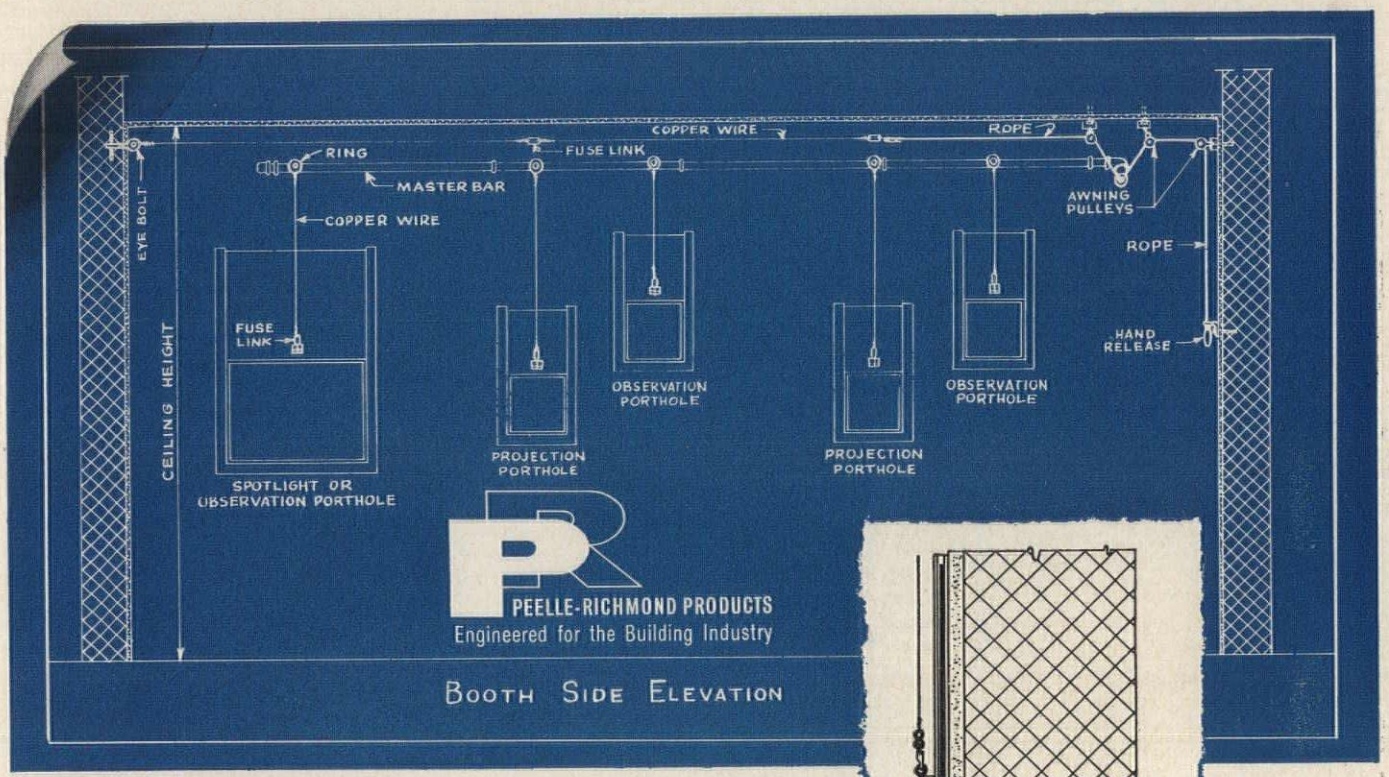
THE FACING WITH A FUTURE, Mo-Sai Associates, Inc., Agency: David W. Evans & Assoc.; CURTAIN WALL PANELS & FACINGS, General Portland Cement Company, Agency: Harris & Wilson, Inc.; THE SECOND NEW IDEA IN ENTRANCES, Kawneer Co., Agency: Fuller & Smith & Ross, Inc.; SCHOOL EQUIPMENT, Brunswick-Balke-Collender Co.; Agency: Garfield-Linn Company; THIS KEY WORKS, Russell & Erwin Div., American Hardware Corporation, Agency: Noyes & Company, Inc.; MEMBRANE FIREPROOFING, U. S. Gypsum Company, Agency: Fulton Morrissey Company; GARDEN REDWOOD, California Redwood Association; MASONITE CONTEMPORARY STUDIES, Masonite Corporation, Agency: The Buchen Company; NEW INTERIORS WITH LARGE SIZE CERAMIC TILE, American-Olean Tile Company, Agency: Arndt, Preston, Chapin, Lamb & Keen; BRICK & TILE, Structural Clay Products Institute

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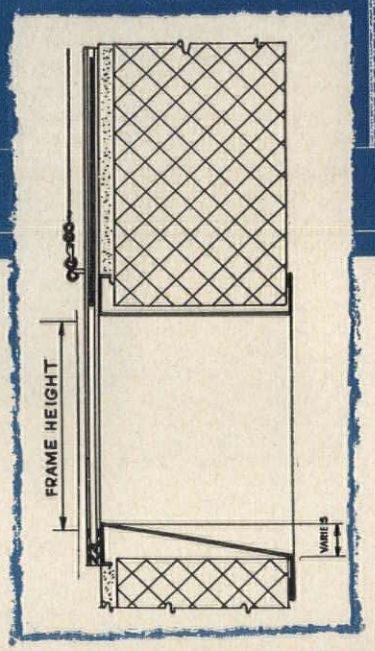
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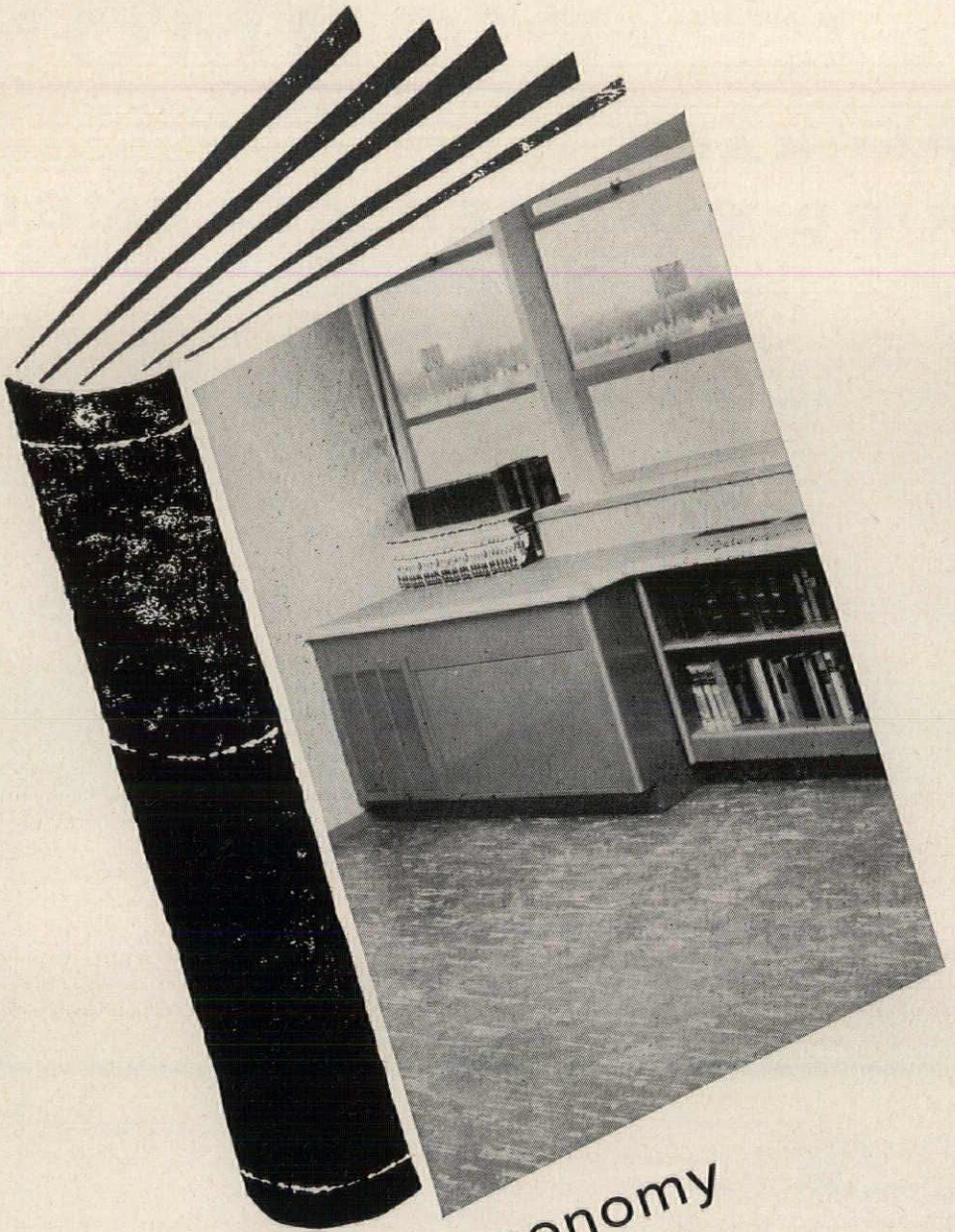
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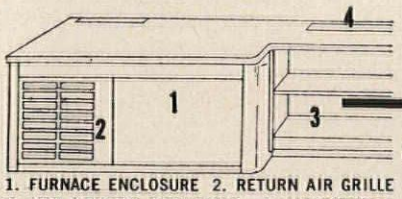
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RESIDENTIAL WARM AIR HEATING AND AIR CONDITIONING: 7—Summer Air Conditioning

by S. Konzo, Professor of Mechanical Engineering, University of Illinois; E. J. Brown, Research Associate in Mechanical Engineering

Air Distribution for Heating and Cooling

The air-flow rate for cooling is, in general, greater than that required for heating. The ducts required for cooling therefore are necessarily larger than those for heating. If a system is to be used for both heating and cooling, or if the addition of cooling at a later date is contemplated, the duct system should be designed for cooling. A procedure for designing a year-around air distribution system is included in Manual No. 9 of the National Warm Air Heating and Air Conditioning Association.

A cooling unit should not only maintain a reduced air temperature indoors, as compared with that of outdoors, but should maintain a satisfactory level of indoor relative humidity. The conventional cooling unit accomplishes these ends by the removal of *sensible heat* (as indicated by a reduction in air temperature), and the removal of *latent heat* (as indicated by a reduction in moisture content).

Summer Heat Gains

The heat gains from *external sources* include: (a) transmission heat gain, (b) solar gains, and (c) infiltration heat gains. The transmission heat gains through walls, windows and ceiling surfaces result from the temperature difference between indoor air and outdoor air, and are largely dependent upon the construction of the barrier between indoor air and outdoor air. Solar gains result from sunlight passing through unshaded windows, and from sunlight striking a wall or ceiling surface and increasing the surface temperature. Infiltration gains are caused by the introduction of warm outdoor air through cracks around doors and windows into the conditioned space. Heat gains from *internal sources* arise from lighting fixtures, domestic appliances, cooking and bathing operations and from occupants.

Heat Gains as Affected by Construction

The cost of the original cooling equipment, as well as operating cost, may be minimized by the use of house insulation and by the proper selection of exterior colors of walls and roofs and by shading devices. Adequate insulation should be provided in new construction, not only in the ceilings, but also in the sidewalls. Full-thickness insulation is recommended for sidewalls and more than 4 in. for ceilings. In existing construction, insulation should be added in ceiling and sidewalls if construction permits. All sidewall and ceiling insulation should be provided with a vapor barrier on the *room side* of the wall or ceiling in order to reduce the migration of water vapor from outdoor air into the house. The room side is specified primarily for the more serious condensation problem in winter.

Light-colored walls and roof surfaces serve to reflect sunlight and thereby permit smaller heat gains than do dark colored surfaces. Shading devices, such as trees, awnings, exterior Venetian blinds, overhanging roofs are effective not only in reducing the solar gain through windows exposed to sun, but also in preventing an increase in wall temperatures. For new construction, it is possible to consider the benefits to be gained by proper orientation of the house. For example, large windows which face north will be least affected by sunlight. A window on the south wall can be readily protected by a roof overhang from solar heat gain in summertime. Windows located on east and west walls cannot be protected by roof overhangs because the sun is relatively low in the sky during morning and evening hours when it is shining on east and west walls. Hence, special care must be taken to minimize the solar load on these unfavorable exposures. This can be done by omitting windows, by decreasing their size, or by providing shading devices such as awnings, exterior Venetian blinds, shutters, vertical louvers, trellises, trees, or, window screens that are specially designed with louvered strips to exclude the sun.

Weatherstripping around doors and windows will serve to reduce the infiltration of warm outdoor air into the conditioned space. Infiltration of outdoor air is not considered as a major influence in heat gain during the summer because wind velocities are low. Furthermore, some amount of infiltration is considered desirable in order to minimize odors that arise indoors.

Heat Gain Calculations

Heat gain calculations should be made with a reasonable degree of precision. An undersized cooling unit may not provide sufficient cooling capacity to maintain satisfactory indoor air temperatures on a hot day. On the other hand, this does not imply that a greatly oversized unit should be selected. Research findings have demonstrated that a greatly oversized unit may be able to maintain room-air temperatures at a satisfactory level by on-and-off cycling of the compressor, but the resulting wide fluctuations in indoor relative humidity have proven most annoying to the occupants. In general, a cooling unit that can be operated almost continuously during average hot weather is preferred to a greatly oversized unit.

One of the many accepted procedures for determining heat gain of a building is presented in Manual No. 11 of the National Warm Air Heating and Air Conditioning Association. In addition, the Manual gives methods for the air-distribution system as well as a method for selection of equipment.

Cooling Equipment

The most common air-cooling unit (shown schematically in Fig. 9) consists of the following parts:

a) A *compressor*, in which a refrigerant is pumped to a high pressure and a high

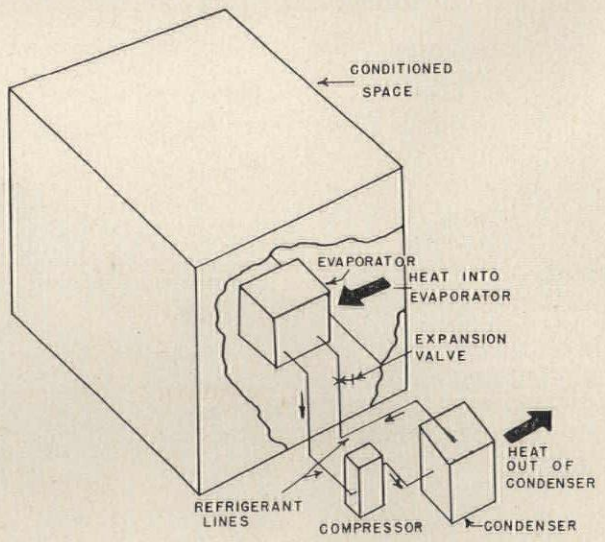


Figure 9

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RESIDENTIAL WARM AIR HEATING AND AIR CONDITIONING: 8—Summer Air Conditioning

by S. Konzo, Professor of Mechanical Engineering, University of Illinois; E. J. Brown, Research Associate in Mechanical Engineering

temperature by means of an electric motor drive.

b) The *refrigerant.*

c) A *condenser* which serves to cool the hot gas that comes from the compressor and changes it to a liquid, but still at high pressure. The condenser can be of *water-cooled* design, in which cool water is pumped through pipes inside of the condenser. Because of the cost of water for this purpose, water-saving devices known as *cooling towers* have been commonly used. In this case, the water that has circulated through the condenser is cooled in the cooling tower and delivered back to the condenser. In other words, the water is used over again except for that which is lost through evaporation. In smaller residential applications, *air-cooled* condensers are most commonly used. A large fan delivers relatively large quantities of air directly from outdoors over the condenser coils where heat is absorbed, and then returns the heated air to the outdoors. In many respects the condenser is the most important part of the cooling unit, since its location will determine the relative complexity of the installation as well as the operating performance.

d) The *expansion valve* or the capillary tube, which is a constriction in the line that reduces the pressure of the liquid from the high pressure existing at the condenser to the low pressure existing downstream of the expansion valve.

e) The *evaporator* which contains the gaseous refrigerant for cooling and drying room air. The moisture which is condensed out of the circulating air is discarded to a drain.

Self-contained units are those which house the compressor, condenser, and evaporator in the same cabinet, as indicated in Fig. 10, which shows a self-contained unit located outside of the house. The cabinet also contains a fan which circulates air through the duct system to the conditioned space. The self-contained unit projects through the wall and may be located in the basement, crawl space, or attic. The unit shown in Fig. 11 is separately installed from the heating system, although it could be connected to an existing forced-air duct system.

The *split unit,* as indicated in Fig. 11, provides for two locations of the component parts: the compressor and condenser are located in the cabinet outside of the house, while the evaporator is located inside of the house, usually in the plenum chamber of an existing forced-air furnace. The refrigerant is piped from the remotely located condenser to the evaporator through well-insulated piping. The furnace blower is utilized for circulating the conditioned air through the duct system.

"Packaged" heating-cooling units for houses are now generally available on the market. The compressor and evaporator are usually included in the "package," and an air-cooled condenser is provided to be located outdoors. A seasonally operated damper directs the air through the cooling coils or the heat exchanger, as required. Heating-cooling units are available in the same types that were described earlier in the discussion of furnaces—low-boy, high-boy, counter-flow, and horizontal.

In the South and other areas where power cost is favorable, the relatively new *heat-pump* may be a practical solution. The heat-pump is simply an air-conditioner so arranged that the flow may be reversed in the winter. During the heating season the warm air from the condenser is used to heat the house, and the cold air from the evaporator is discharged outdoors. Heat-pumps are now available in "packaged" form in sizes suitable for residential use. Many of them include auxiliary electric heating coils for use in the coldest weather. Heat-pumps occupy relatively little space and eliminate the need for a chimney and for fuel storage, but at present both installation and operational costs are generally higher than for other types of heating and cooling equipment.

Location of Supply Outlets for Cooling

The locations of supply outlets were discussed in the section on Forced Warm Air Heating Systems. For cooling only, either

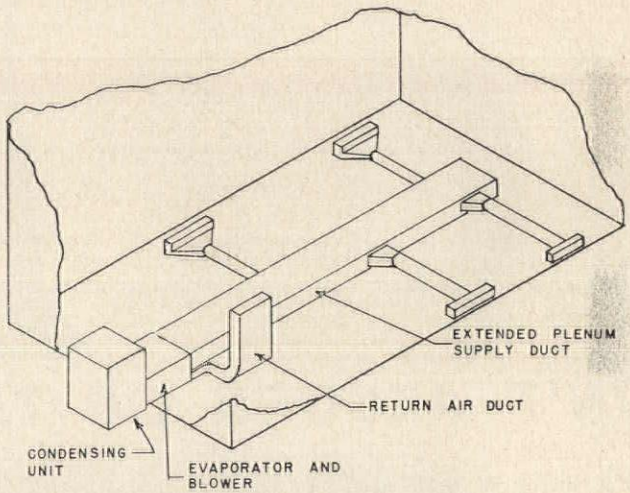


Figure 10

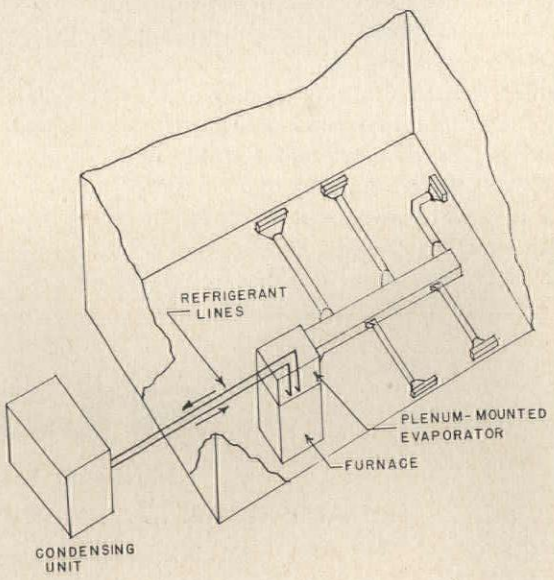
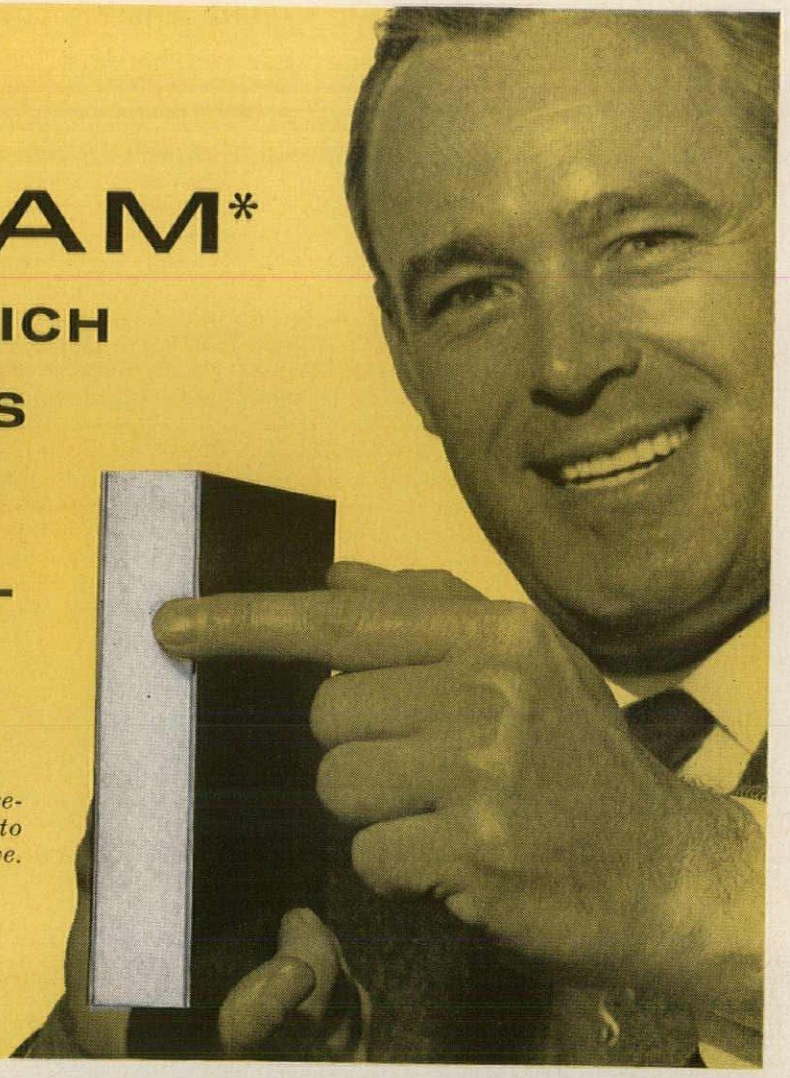


Figure 11

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RESIDENTIAL WARM AIR HEATING AND AIR CONDITIONING: 9—Summer Air Conditioning

by S. Konzo, Professor of Mechanical Engineering, University of Illinois; E. J. Brown, Research Associate in Mechanical Engineering

high sidewall or ceiling outlets provide satisfactory results in the form of uniform room-air temperature and air motion. Low sidewall and floor outlets located along the exposed wall and discharging vertically will prove acceptable if the recommendations of the National Warm Air Heating and Air Conditioning Association are followed.

Design of Air Distribution System

In Manual No. 11 of the National Warm Air Heating and Air Conditioning Association, step-by-step design procedures are shown in considerable detail for four different types of duct distribution systems, as follows:

a) trunk duct system
b) perimeter-radial system
c) perimeter-loop system
d) small pipe (4-in. round) system

The details of the design procedures should be obtained from the Manuals. However, pertinent information concerning the design of a 4-in. round duct system, with floor diffusers, will be presented here to show the type of information available in the Manuals.

This small-pipe system is similar to the perimeter-radial system described in the warm-air heating section of this article in that individual pipes connect each supply outlet with the furnace plenum. The system is ideally suited to a plenum-mounted evaporator connected to remotely located compressor and condenser. The principal details of the duct system can be itemized as follows:

a) Determine the heat gain for each room to be conditioned.
b) Locate floor diffusers under windows wherever possible.
c) Locate the furnace plenum (in which the evaporator is housed).
d) Show the tentative duct plan connecting the diffusers with the plenum. The length of the individual ducts should be noted on the plan, as well as the number of right-angled elbows in each individual duct.
e) Refer to Table 5 which lists the Btuh capacities of individual 4-in. ducts according to the length and the number of elbows. For example, a duct which is 22 ft long and contains 3 elbows shows a Btuh capacity of 1680 Btuh under summer conditions. (Note that this capacity does not apply to winter heating conditions). If the capacity of a single duct is not sufficient for the room, additional ducts should be used.
f) Locate the return-air duct system, which should be simple and direct. In small homes, a single return-air grille located in a central hallway is usually sufficient. Complete details for the design of the return-air ducts system are given in Manual No. 11.

The total air-flow rate for a given installation is determined by the capacity of the cooling unit that is installed, and manufacturers' catalog will indicate the magnitude of the flow rate that must be maintained. A deficiency in the air-flow rate passing over the evaporator may lead to difficulties in operation. For this reason, the duct design should be conservative and the number of ducts ample. If the air-flow rate is found to be inadequate in installation, a larger blower may be installed or the speed of the existing blower increased. The latter alternative is not recommended since even a slight increase in speed can result in greatly increased power requirements, frequently beyond the capacity of the existing motor.

Insulation of Ducts for Summer Cooling Installations

It must be realized that cooling effects are obtained at considerable expenditure of electrical energy and with relatively large sized equipment. Any loss of the cooling effect of the circulating air before it reaches the conditioned space is a most expensive one. For this reason, all ducts located in unconditioned spaces must be carefully and thoroughly insulated. On the outside of the insulating blanket must be applied an effective *vapor barrier*, which serves to reduce the passage of water vapor from the unconditioned space to the cold duct surface. Obviously, any moisture which condenses on the cold duct surface will penetrate the insulation, thereby reducing its efficiency, and may drip on surfaces below the duct. All joints should be effectively sealed with vapor-proof tape to prevent access of water vapor at the weakest link in the armor surrounding the duct. Preferred industry practice calls for 2-in. thick insulation on supply ducts and 1-in. thick insulation on return-air ducts.

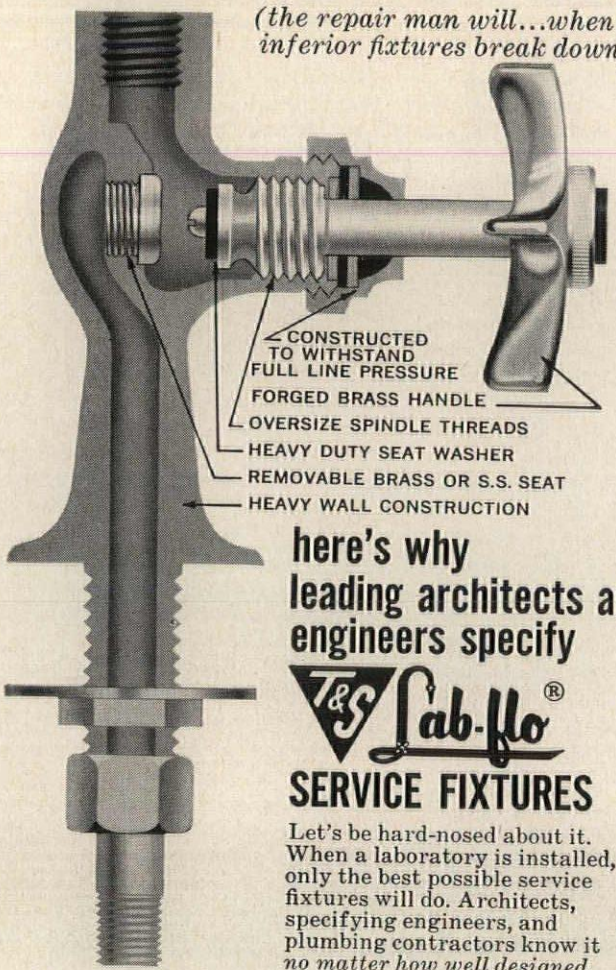
TABLE 5: SUMMER AIR CONDITIONING—SIZING 4-INCH INDIVIDUAL PIPE SYSTEM

Total cooling Btuh (sensible plus latent)

No. of Elbows	Length of Pipe (feet)									
	0-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50
1	2280	2140	2000	1920	1840	1760	1680	1620	1560	1510
2	2140	2000	1920	1840	1760	1680	1620	1560	1510	1460
3	2000	1920	1840	1760	1680	1620	1560	1510	1460	1430
4	1920	1840	1760	1680	1620	1560	1510	1460	1430	1400
5	1840	1760	1680	1620	1560	1510	1460	1430	1400	1370
6	1760	1680	1620	1560	1510	1460	1430	1400	1370	1320

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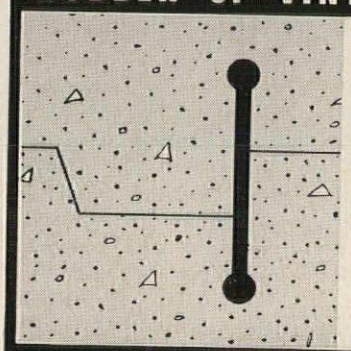
FOR MASONRY JOINTS

Water Seals for cast-in-place construction joints between concrete footings and walls, walls and floor slab, wall section and wall section, and floor slab and floor slab.

Sealing Gaskets for use between sill and coping stones, brick and stone wall panels, masonry wall panels and structural steel members.

Sealing strips for control joints in block constructed walls . . . watertight seals with an inherent, permanent liveliness for use in Michigan and Besser Control Joints.

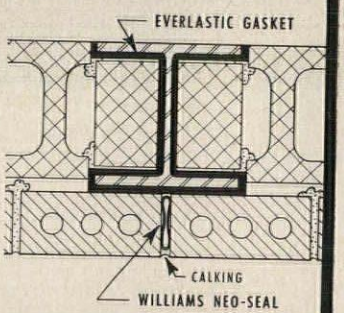
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Williams Waterstops are made from Natural Rubber Stock and designed for maximum effectiveness in any type of cast-in-place construction joint. They will bend around corners, and will not crack or tear from shear action. Tensile Test: 3990 lbs., Elongation Test: 650%. Available in rolls up to 80 feet in length. Field splicing is simple. Williams Waterstops can also be furnished in Vinyl or Neoprene for industrial uses where resistance to oil and other injurious wastes is desirable.

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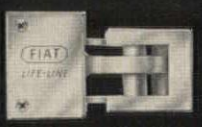
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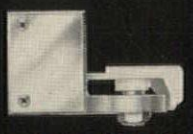
FIAT



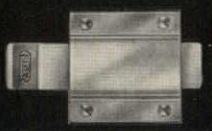
S-2 Alloy Wall Stirrups



S-2 Alloy Top Hinge Bracket



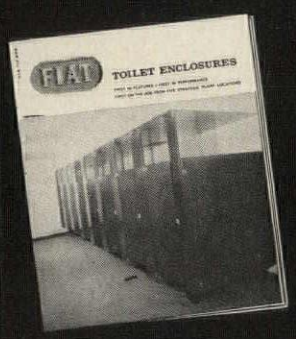
S-2 Alloy Bottom Hinge Bracket



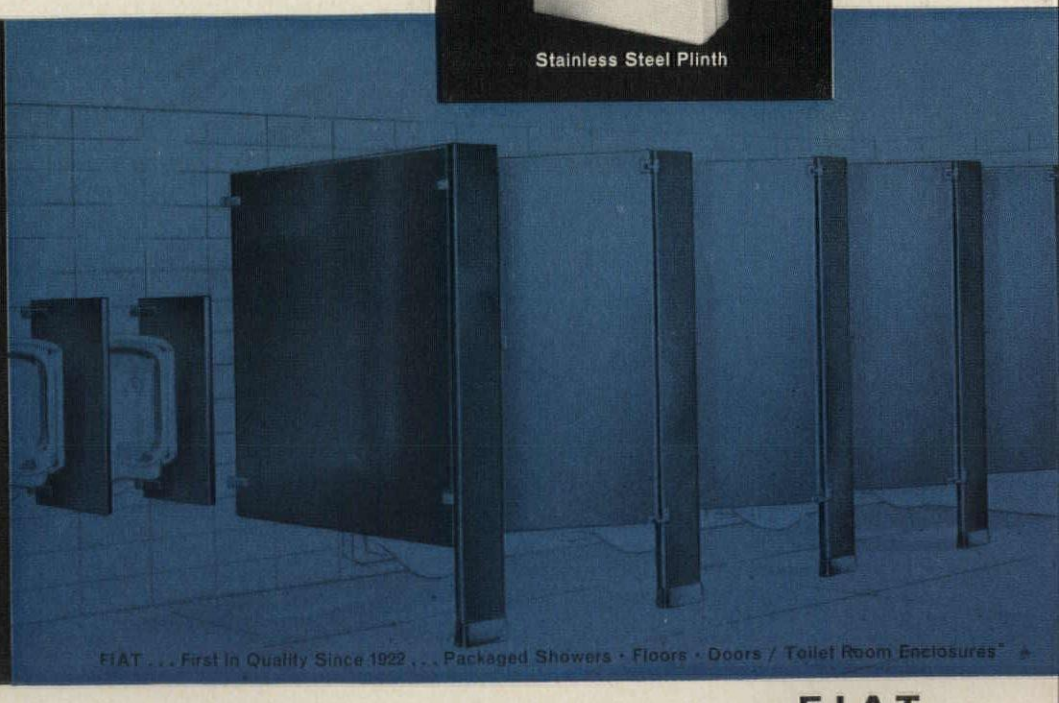
S-2 Alloy Slide Bolt



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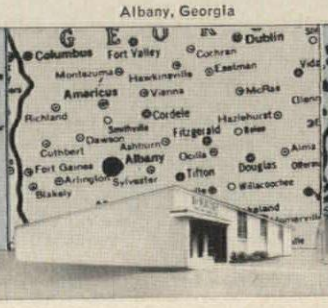
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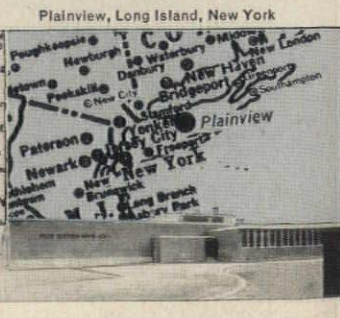
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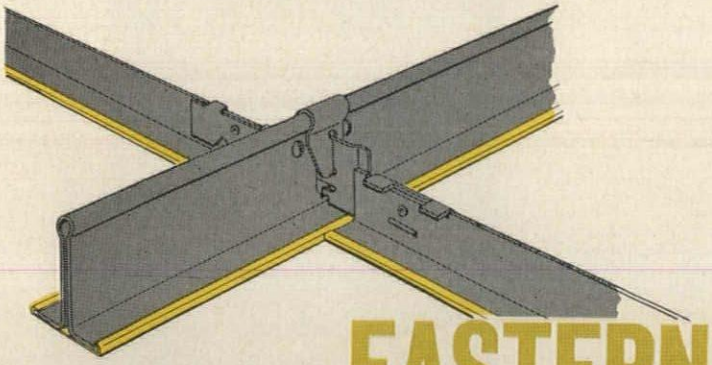


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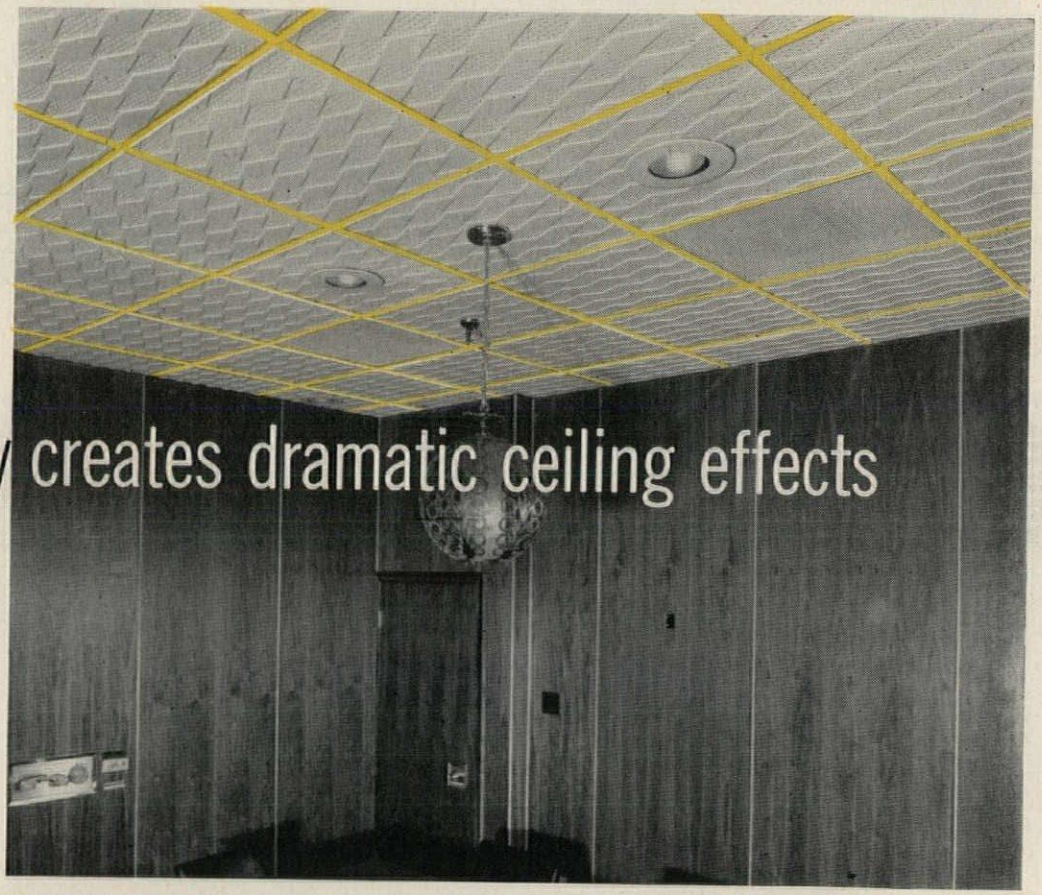


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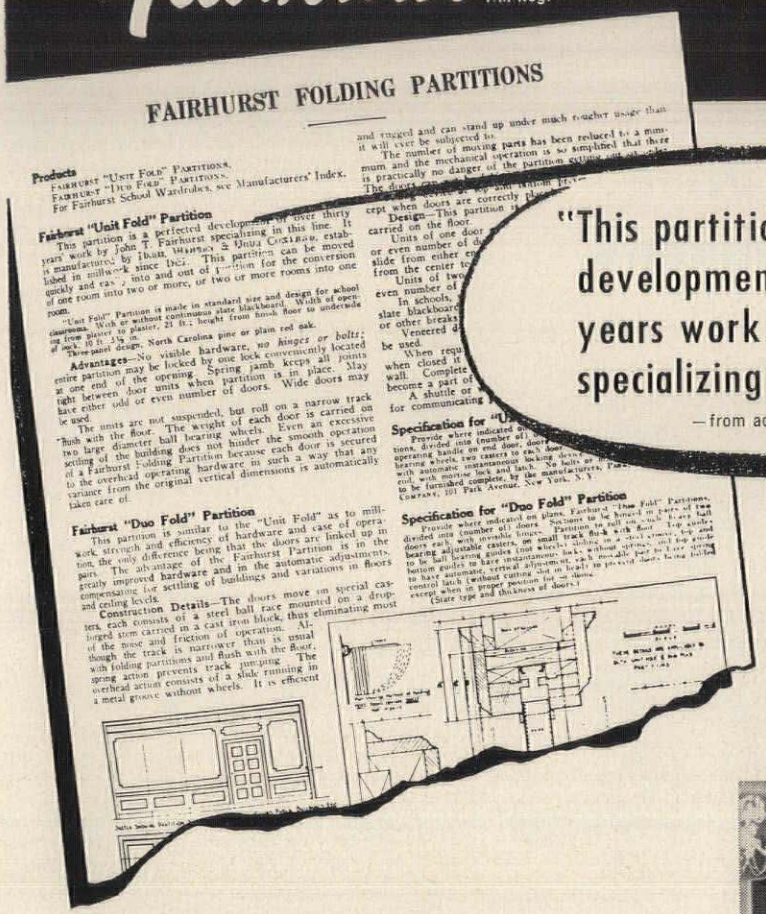
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FAIRHURST "DUO FOLD" PARTITIONS.
For Fairhurst School Wardrobes, see Manufacturers' Index.

Fairhurst "Unit Fold" Partition

This partition is a perfected development of over thirty years work by John T. Fairhurst specializing in this line. It is manufactured by Thain Wardrobe & Office Co. Ltd., established in millwork since 1861. This partition can be moved quickly and easily into and out of position for the conversion of one room into two or more, or two or more rooms into one room.

"Unit Fold" Partition is made in standard size and design for school classrooms. With or without continuous slate blackboard. Width of each ing from floor to plaster, 21 ft.; height from finish floor to underside of rack, 10 ft. 3½ in. North Carolina pine or plain red oak. Three-panel design.

Advantages—No visible hardware, no hinges or bolts; entire partition may be locked by one lock conveniently located at one end of the opening. Spring jamb keeps all joints tight between door units when partition is in place. May have either odd or even number of doors. Wide doors may be used.

The units are not suspended, but roll on a narrow track flush with the floor. The weight of each door is carried on two large diameter ball bearing wheels. Even an excessive setting of the building does not hinder the smooth operation of a Fairhurst Folding Partition because each door is secured to the overhead operating hardware in such a way that any variance from the original vertical dimensions is automatically taken care of.

Fairhurst "Duo Fold" Partition

This partition is similar to the "Unit Fold" as to millwork, strength and efficiency of hardware and ease of operation, the only difference being that the doors are linked up in pairs. The advantage of the Fairhurst Partition is in the greatly improved hardware and in the automatic adjustments compensating for settling of buildings and variations in floors and ceiling levels.

Construction Details—The doors move on special casters, each consists of a steel ball race mounted on a drop-forged item carried in a cast iron block, thus eliminating most of the noise and friction of operation. Although the track is narrower than is usual with folding partitions and flush with the floor, spring action prevents track jumping. The overhead action consists of a slide running in a metal groove without wheels. It is efficient and rugged and can stand up under much rougher usage than it will ever be subjected to.

The number of moving parts has been reduced to a minimum and the mechanical operation is so simplified that there is practically no danger of the partition getting out of order.

Design—This partition is a perfected development of over thirty years work by John T. Fairhurst specializing in this line. It is carried on the floor.

Units of one door or even number of doors slide from either end or from the center to

Units of two

even number of

In schools,

slate blackboard

or other breaks

Veneered

be used.

When requ

when closed it

wall. Complete

become a part of

A shuttle or

for communicating

Specification for "U

Provide where indicated on plans, Fairhurst "Unit Fold" Partitions, divided into (number of) doors, doors to be hinged in pairs of two operating handle on end door, doors to fold to (left, right) with two ball bearing wheels, two casters to each door, bearing adjustable guides (not wheels) sliding in a steel channel, top and with automatic instantaneous locking device, bottom guides to have instantaneous, locks without springs, and top guide to be furnished complete, by the manufacturers, Fairhurst Folding Partition Company, 101 Park Avenue, New York, N. Y.

Specification for "Duo Fold" Partition

Provide where indicated on plans, Fairhurst "Duo Fold" Partitions, divided into (number of) doors. Partition to fold to (left, right) doors each, with reversible hinges, doors to be hinged in pairs of two ball bearing adjustable casters, on small track flush with floor, to each door, bearing guides (not wheels) sliding in a steel channel, top and bottom guides to have instantaneous, locks without springs, and top guide to be ball bearing guides (not wheels) sliding in a steel channel, top and to have automatic, vertical adjustment, each movable part to be self strong control latch (without cutting tool — theirs) to prevent doors being pushed except when in proper position for — doors.

(State type and thickness of doors.)

"This partition is a perfected development of over thirty years work by John T. Fairhurst specializing in this line."

—from advt. in Sweet's Catalog File, 1931

Many years ago the Fairhurst Folding Wall came of age. Even the name "Fairhurst" itself is a registered trademark for a product that is specific and unique.

Fontainebleau Hotel, Miami Beach, Morris Lapidus, architect





▲ Wall separates ballroom and dining room

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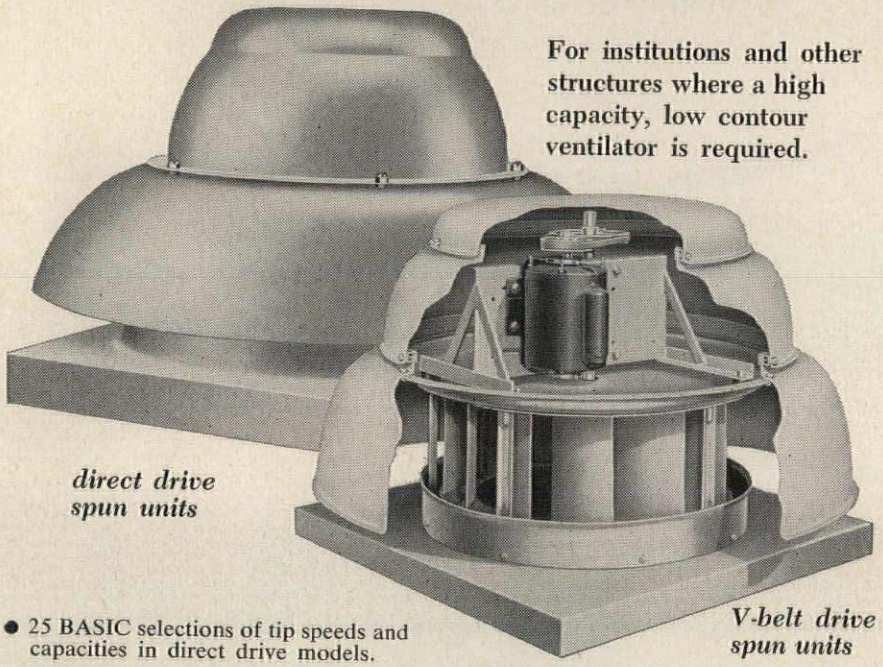
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continued from page 231

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17) *Patents:* No. 309, 799: 1884; 339, 465: 1886; 344, 790: 1886; 404, 982: 1889.

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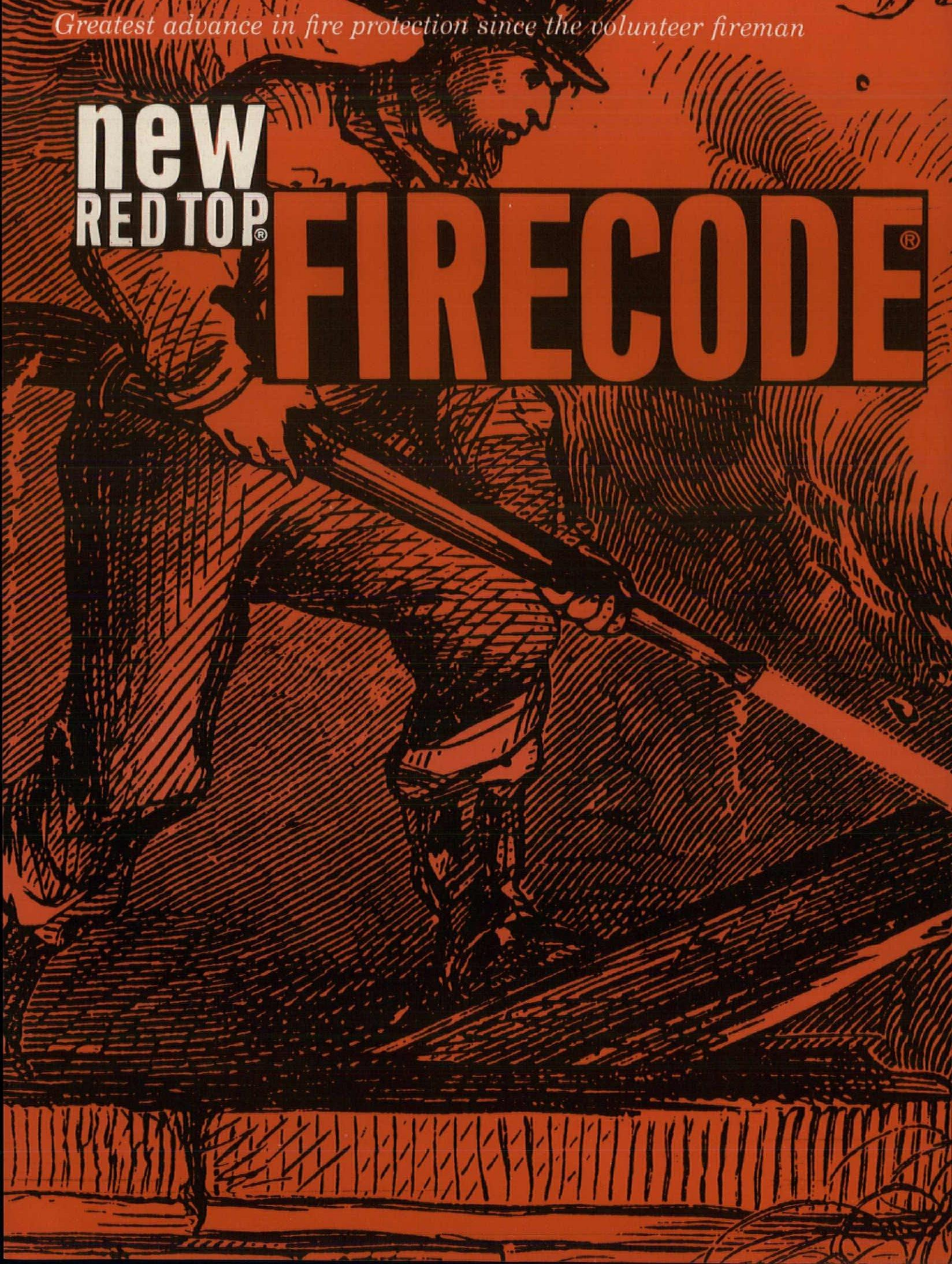


Harris Trust & Savings Bank, Chicago, Ill.
Architects: Skidmore, Owings & Merrill
Contractors: Turner Construction Co.

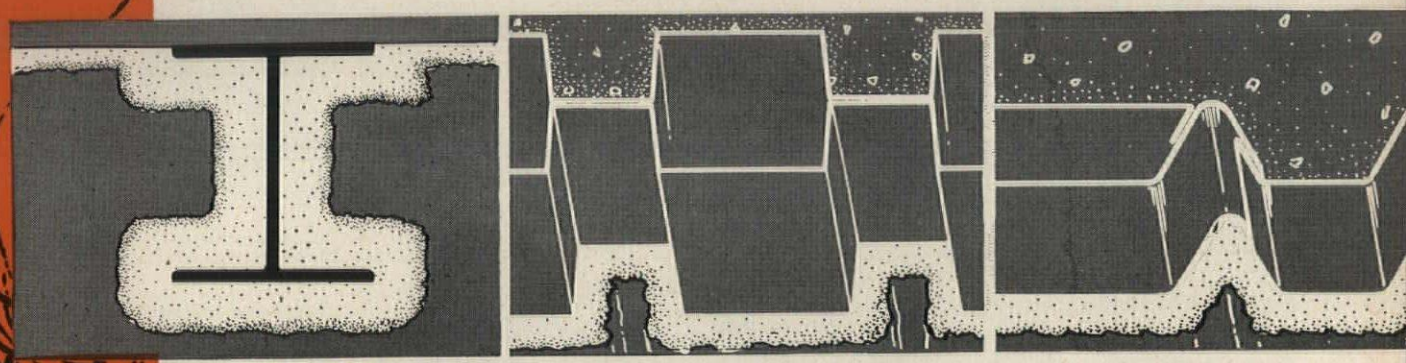
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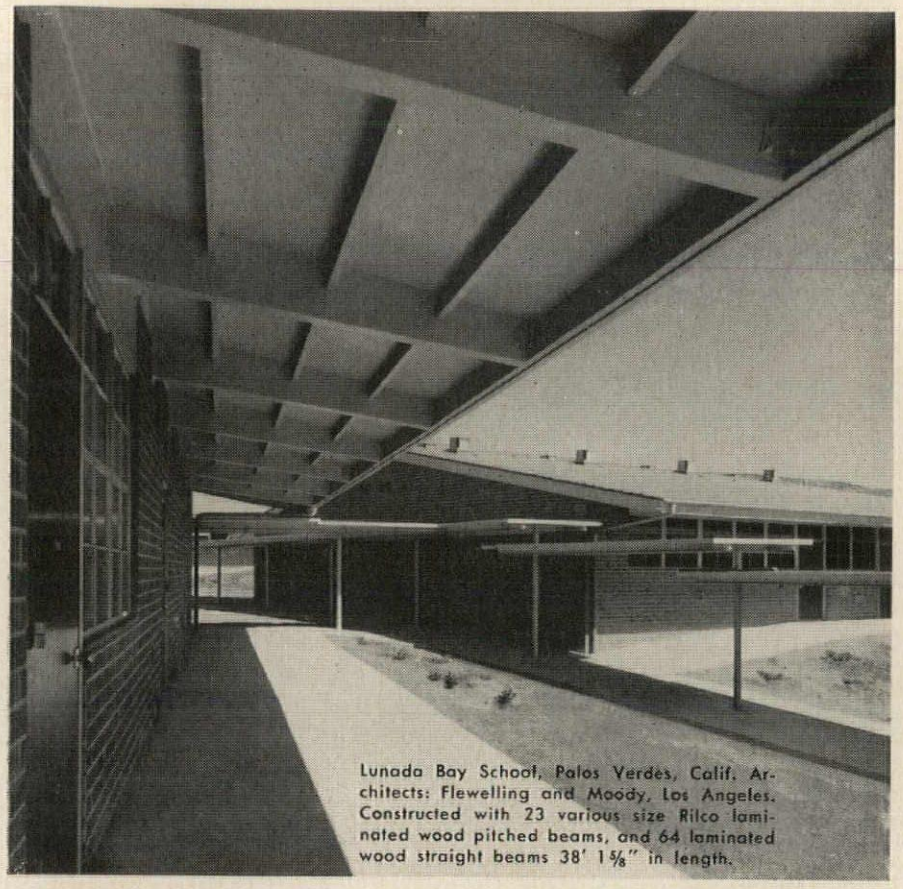
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Lunada Bay School, Palos Verdes, Calif. Architects: Flewelling and Moody, Los Angeles. Constructed with 23 various size Rilco laminated wood pitched beams, and 64 laminated wood straight beams 38' 1⅝" in length.

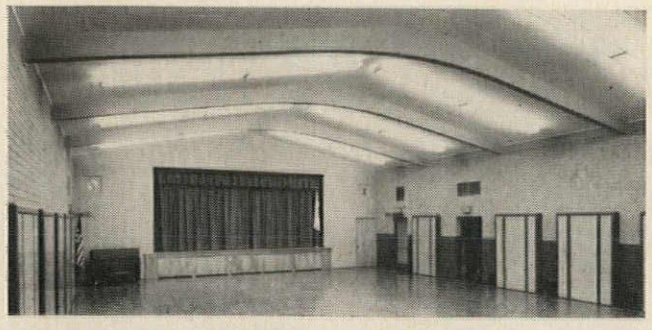
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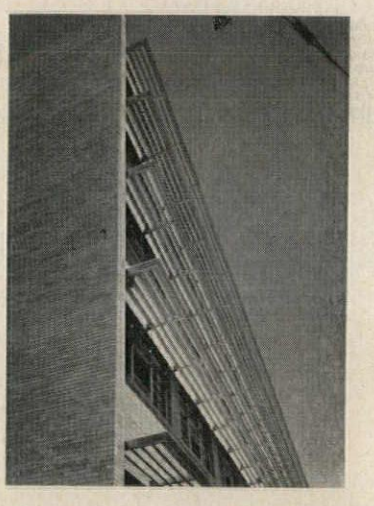
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continued from page 235



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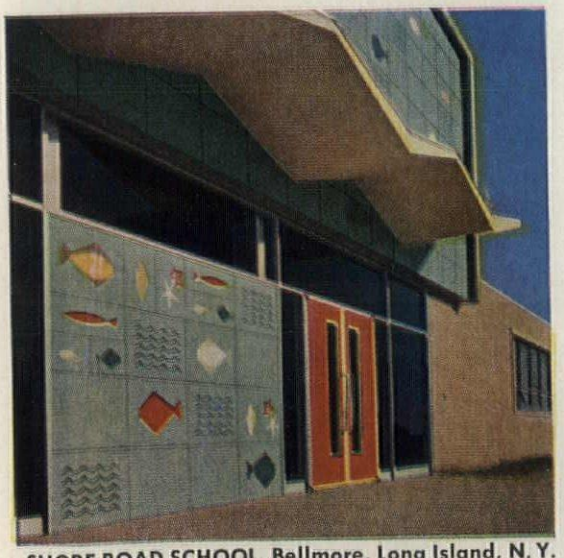


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more products on page 256



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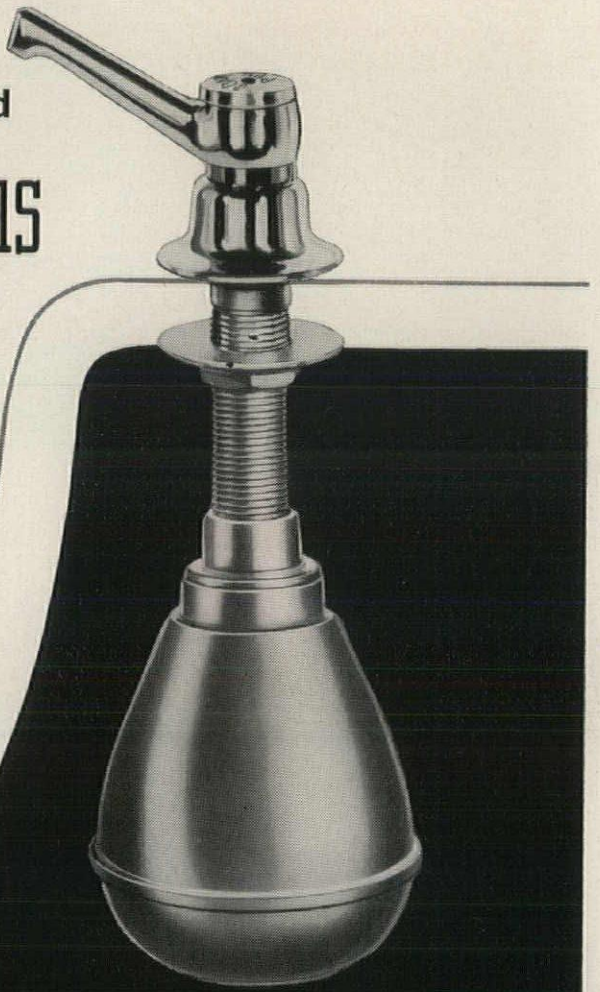
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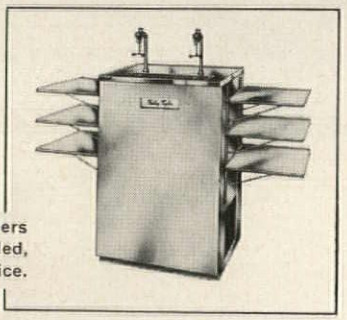
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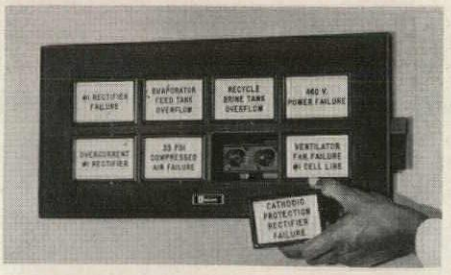
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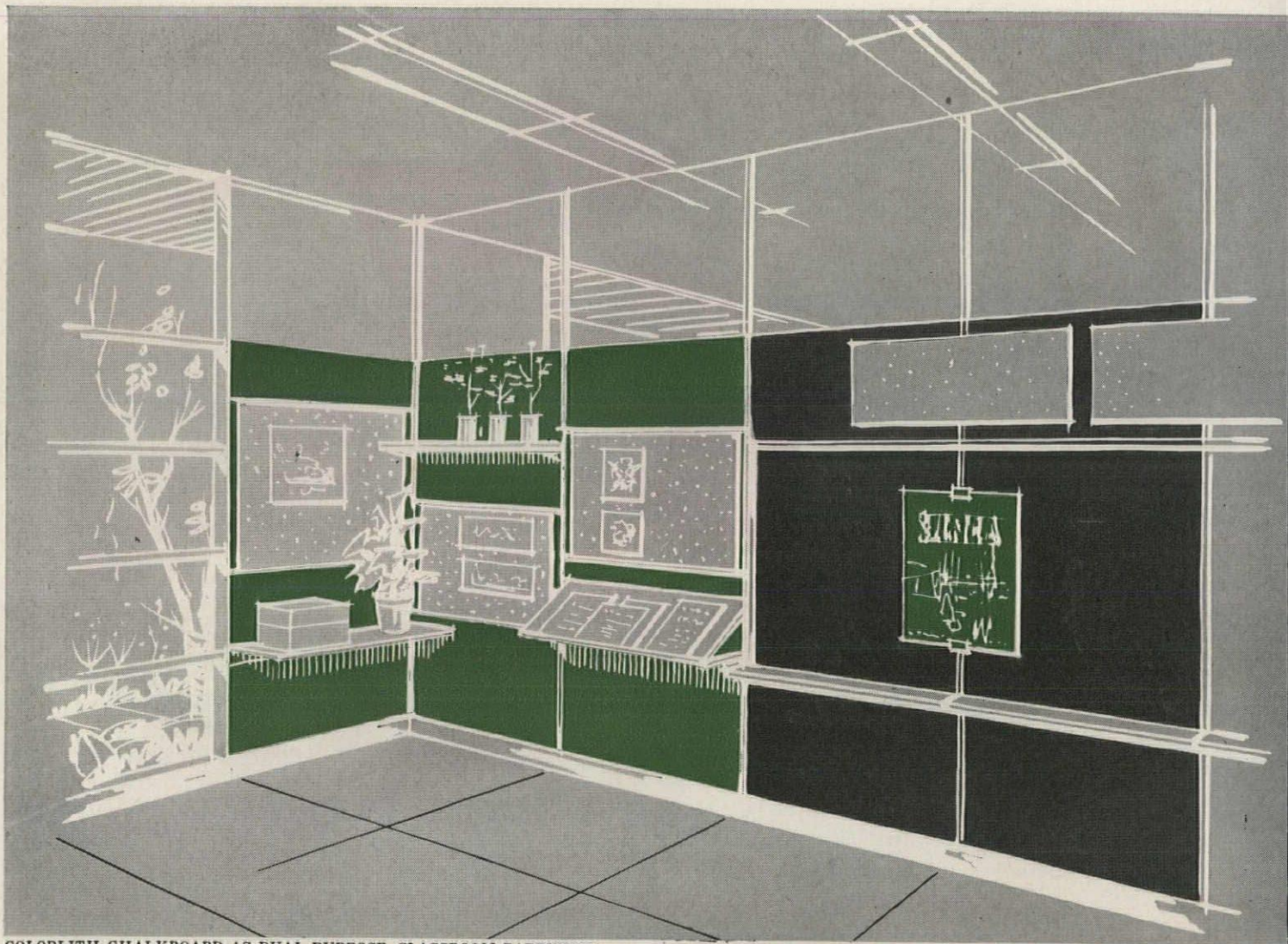
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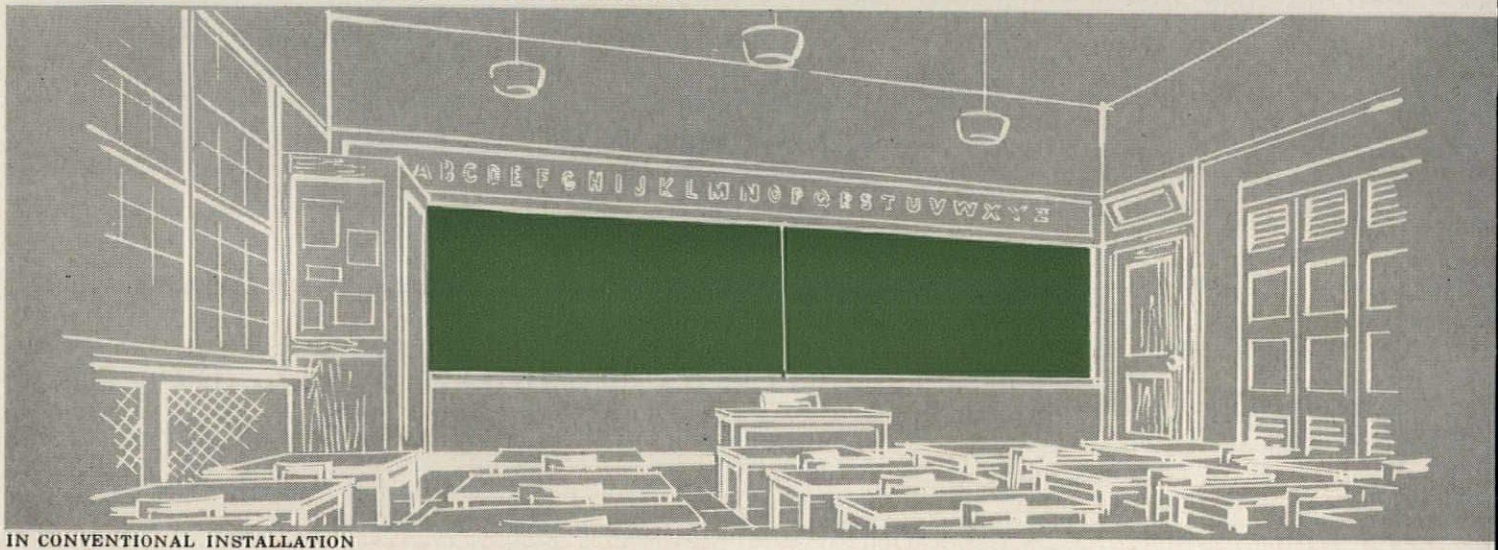
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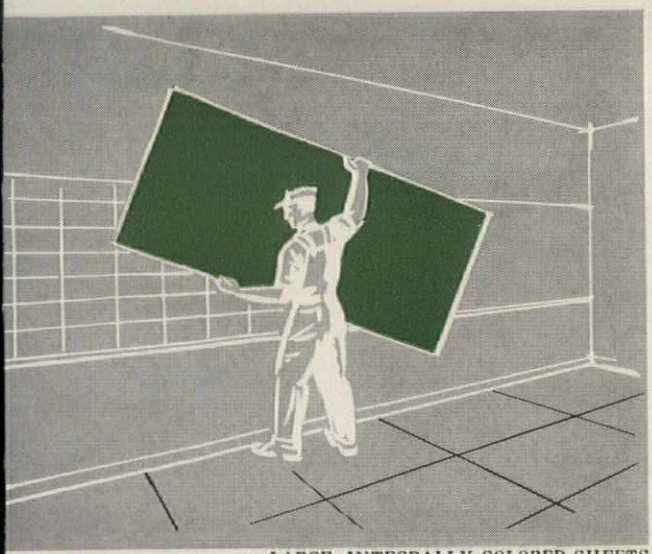
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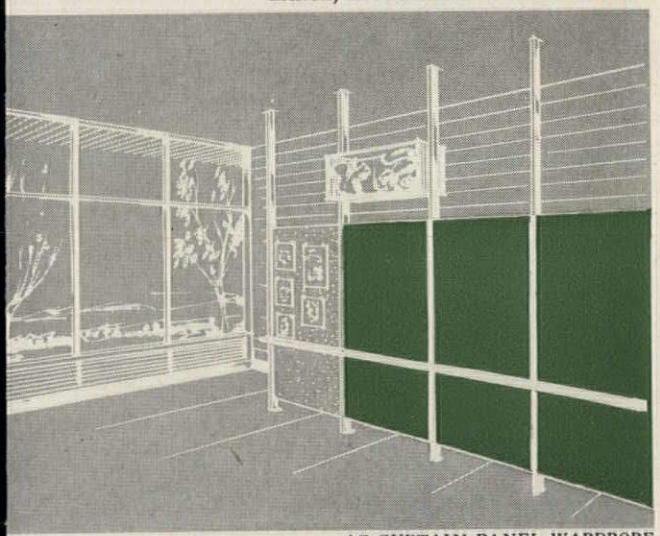
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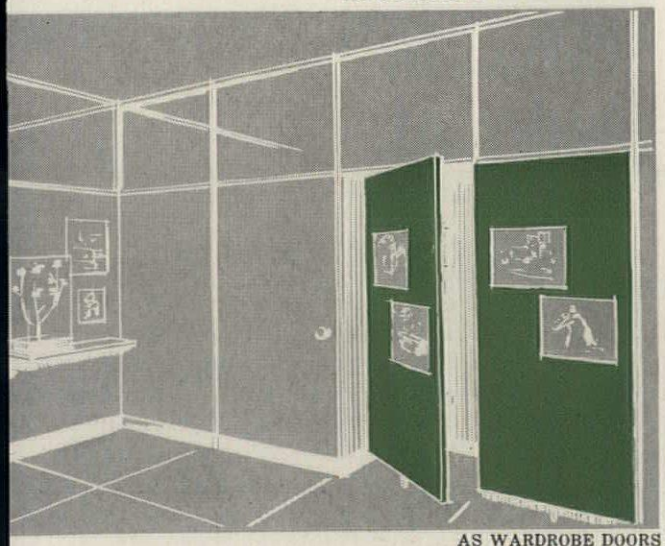
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Product Reports

Stain-Proof Marble Sealer

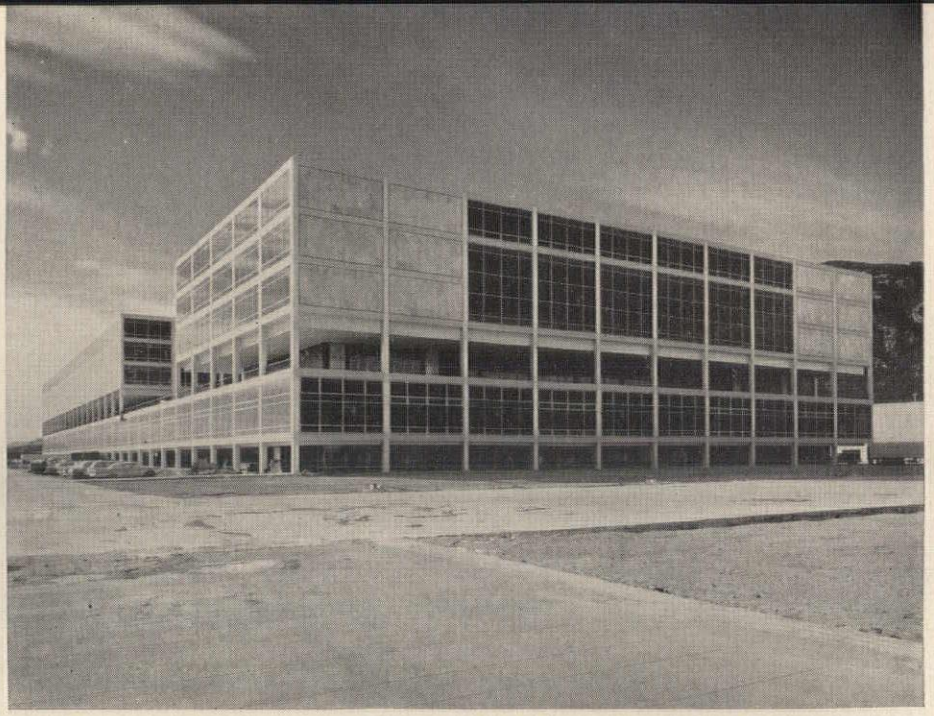
Watco *Marble Seal*, a penetrating oil and resin polymerizer that seals the porous surfaces of marble and similar stone products from within, is said to prevent staining and discoloring from food colorings and ink as well as the usual household stains. Although it is not a surface coating that can wear off or wipe away, it is applied as though it were: it is simply wiped on, allowed to penetrate, and the surplus removed. It is said to be suitable for both interior and exterior use. *Watco-Dennis Corp., 1640 20th St., Santa Monica, Calif.*



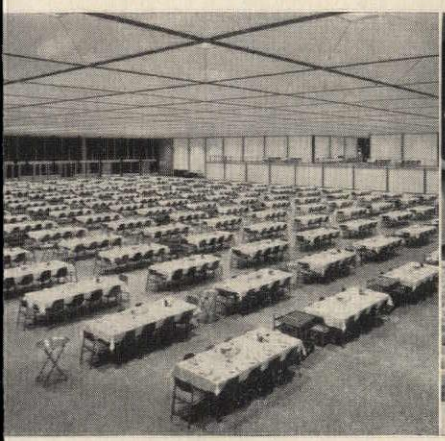
Language Laboratory

The *Electronic Learning Center* integrates classroom furniture, electronic equipment and new teaching techniques for use in foreign language instruction as well as speech therapy, remedial reading, student tutoring and public speaking. A teacher can give each member of a class individual instruction using tape-recorded lessons transmitted through earphones. The students, sitting in soundproofed cubicles, have fixed microphones through which they may tape-record their responses during the lessons and simultaneously hear their voices through the earphones. The teacher has a special monitoring control for checking or special tutoring. The teacher console-desk has four tape decks, each with four channels—a total of 16 tape channels. Student stations are constructed in units of two and four which may be combined according to classroom requirements. *American Seating Co., Grand Rapids 2, Mich.*

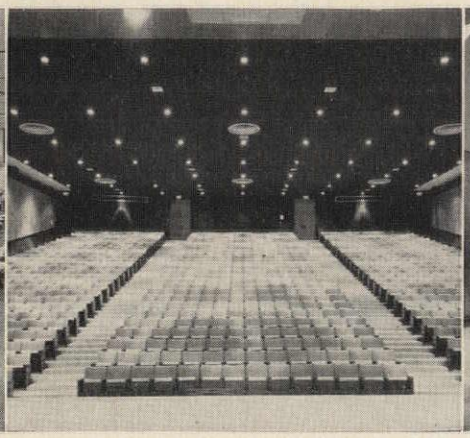
more products on page 264



Lower campus level of Fairchild Hall is primarily an arcade, the middle level, a semi-open space creating a soaring quality for each of these planes. Steel, glass and cement are blended together to make this extremely functional structure a masterpiece of modern architecture.



To attain the clear expanse 256 ft. long and 300 ft. wide needed in Mitchell Hall, sections were welded together on the ground, the entire framework then jacked up to the proper height. The large paintable surfaces were color-styled in light values to encourage light reflectance from the windows.



This auditorium seats over 950. Here contrasting texture and color add variety to this room, while recessed ceiling lights and the lack of obstructing columns provide a sense of spaciousness.



The circular staircase lends a pleasant visual surprise in contrast to the more functional lines of the design. Black wrought iron railings accentuate the painted surfaces of the stairs and ceiling. Indirect lighting becomes a compelling design element by adding a touch of the dramatic.

Architect:
Skidmore, Owings & Merrill

Painting Contractor:
Earl W. Hamman Painting Co.—for Fairchild and Mitchell Halls

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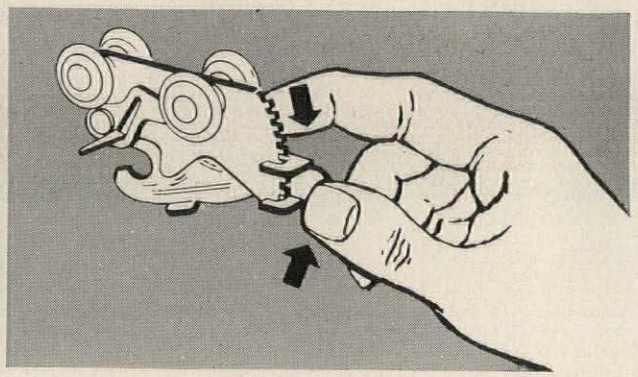
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HOW TO KEEP ALLIGATORS FROM RUINING A ROOF

Cracks that make a built-up roof look like an alligator's back are normal signs of aging due to contraction and expansion of the top "pour coat" of waterproofing bitumen. Water gets in the cracks and may start rotting the paper-roofing felt reinforcement underneath. Eventually leaks may develop and a re-roofing job is required.

Roofing felts called Perma Ply* made of Fiberglas* do not rot. They reinforce the waterproofing in a different way than paper felts because they are porous. The bitumen blends together from one ply to another, forming a solid monolithic weathershield. Alligatoring stops at the first ply. And because Perma Ply Fiberglas felts are porous, they do not trap air or moisture between layers during application . . . the common cause of premature roof failure.

Fiberglas bonded roofs are applied only by qualified Fiberglas Approved Roofers skilled in their craft—and rigidly inspected by Fiberglas roofing experts. And Fiberglas Roof Insulation is the perfect companion for Perma Ply roofing materials . . . gives you another component for a long-lasting, quality roof from top to bottom. Fiberglas Roof Insulation is now available in the new 3′ x 4′ and 4′ x 4′ sizes that cover more deck area faster. There are fewer joints and less chance for trouble due to roof traffic.

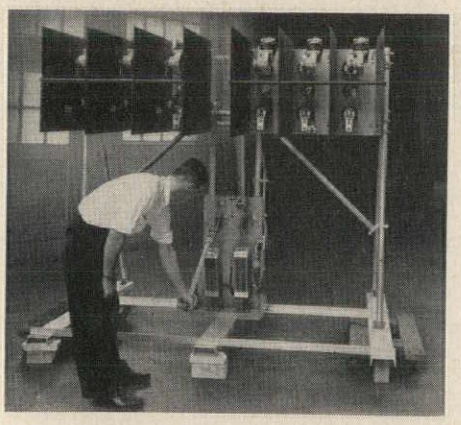
FIND OUT ABOUT the advantages of Fiberglas Built-Up Roofing and Roof Insulation. For complete descriptive literature, write to: Owens-Corning Fiberglas Corporation, Dept. 68-E, 717 Fifth Avenue, New York 22, N.Y.

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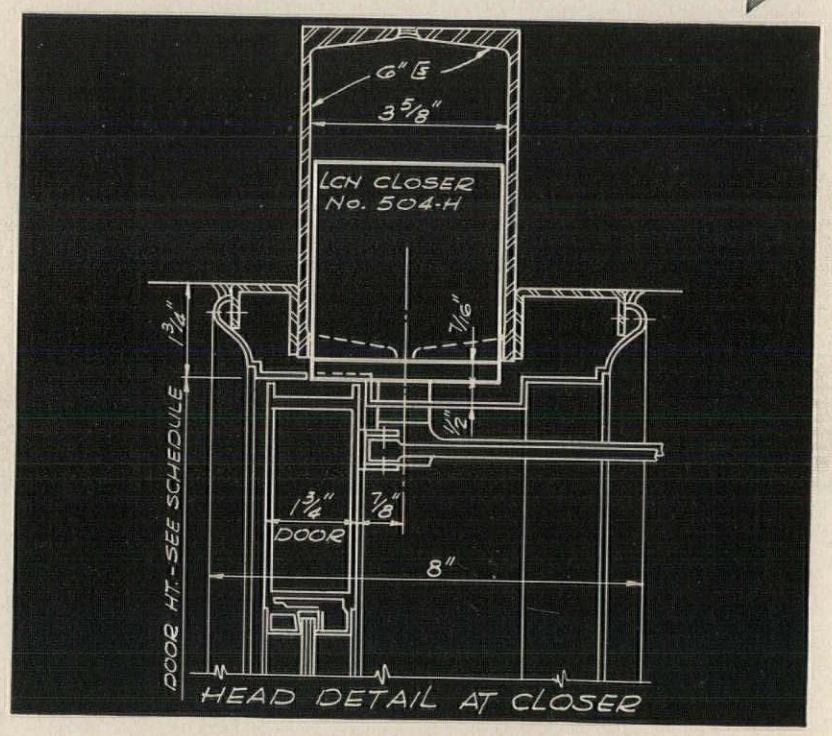
Telescoping Recovery Room Unit
Two patients can be served simultaneously from a new intensive-care nursing and service unit for hospital recovery rooms. The ceiling-mounted unit, which telescopes downward to nursing level when needed, can be raised to 6 ft 3 in. above the floor when not in use. Thus all supply lines, oxygen, vacuum and electricity can be brought directly to the bedside without crossing the floor, and beds can be located in the center of the room for better circulation. *National Cylinder Gas Div., Chemetron Corp., 840 N. Michigan Ave., Chicago 11, Ill.*



Automatic Power Transfer Switch
A dual cylinder, double throw automatic switch transfer mechanism has been developed for hospitals, freezer storage plants and other power users for whom an extended power interruption could prove disastrous. When power failure occurs, the mechanism opens the preferred source disconnect switch and cuts in the emergency power source. The cylinder for the preferred switch is activated by loss of voltage from the preferred line, which may be designated as either of two sources. *Delta-Star Electric Div., H. K. Porter Co., Inc., Chicago, Ill.*

Surfacing for Roof Decks, Floors
A new system for surfacing and water-proofing traffic decks and floors for both foot and wheel traffic features extreme light weight and low cost of materials and installation. Called the *Polyrock-Rubberite System,* this method uses a fiberglass reinforced rubbery blanket beneath a trowel applied surface of specially blended resins. *Rubberite,* the water-proofing layer, is applied in liquid form, and, when cured, bonds to the concrete slab. Its ability to "come and go" beneath the surface allows it to act as a slip agent. The surfacing is said to be unaffected by vibration, water, oil, acids, gasoline or salt and to withstand heavy wheel or foot traffic and the pressure from furniture legs. Depth of the surfacing averages ⅛ to ¼ in. Standard color is gray, although other colors are available. *Plant Maintenance, Inc., Cleveland 21, Ohio*

more products on page 268



CONSTRUCTION DETAILS
for LCN Overhead Concealed Door Closer Installation Shown on Opposite Page

The LCN Series 500 Closer's Main Points:

1. Efficient, full rack-and-pinion, two-speed control of the door
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3. Hydraulic back-check prevents door's being thrown open violently to damage door, walls, etc.
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Canada: Lift Lock Hardware Industries, Ltd., Peterborough, Ontario

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Construction Details on Opposite Page



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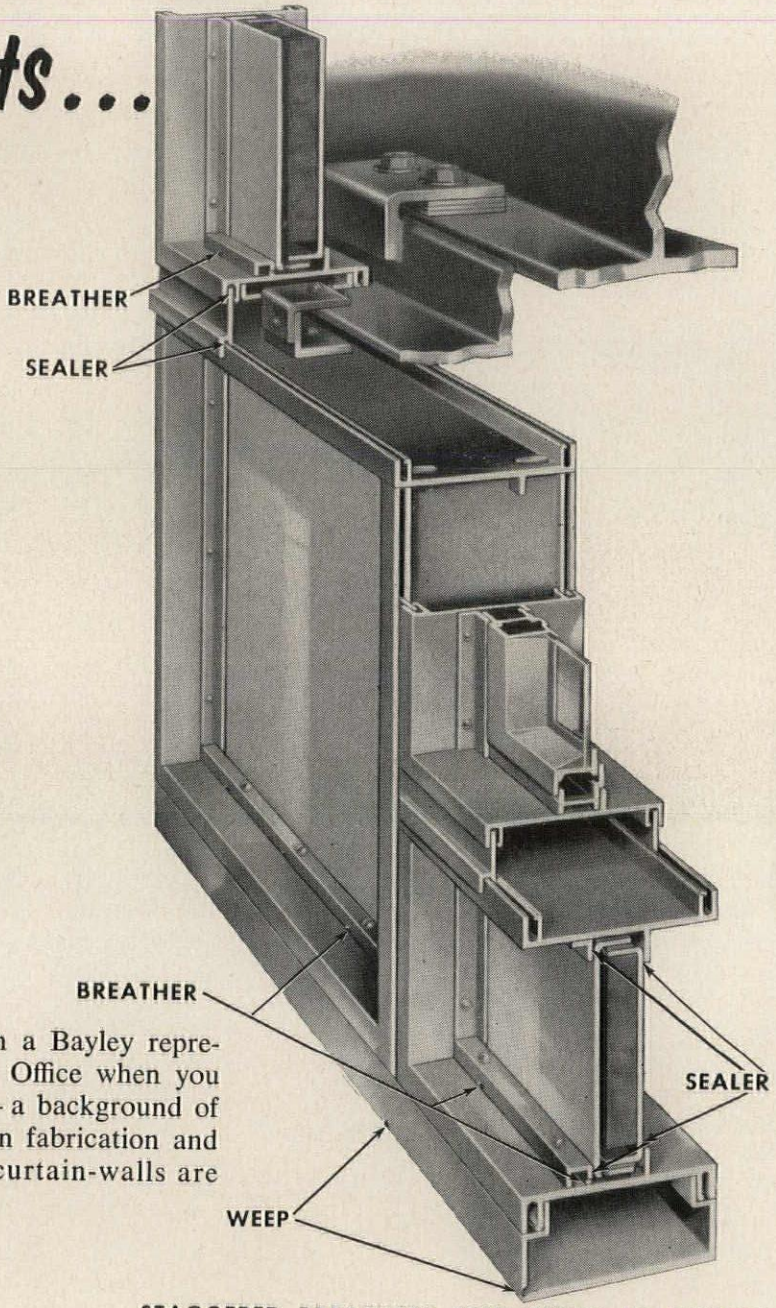
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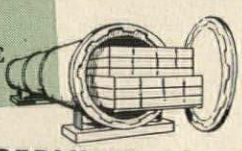
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4. All sills and plates within 18" of ground or in contact with concrete (24" in South). Also sleepers or nailing pieces under floors laid over concrete.
5. All exterior decorative wood construction.

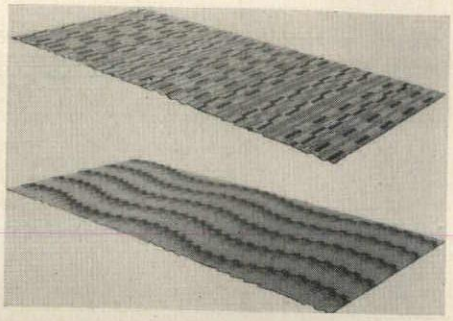
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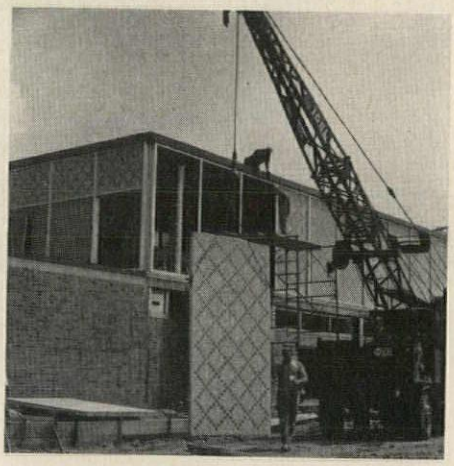
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Product Reports



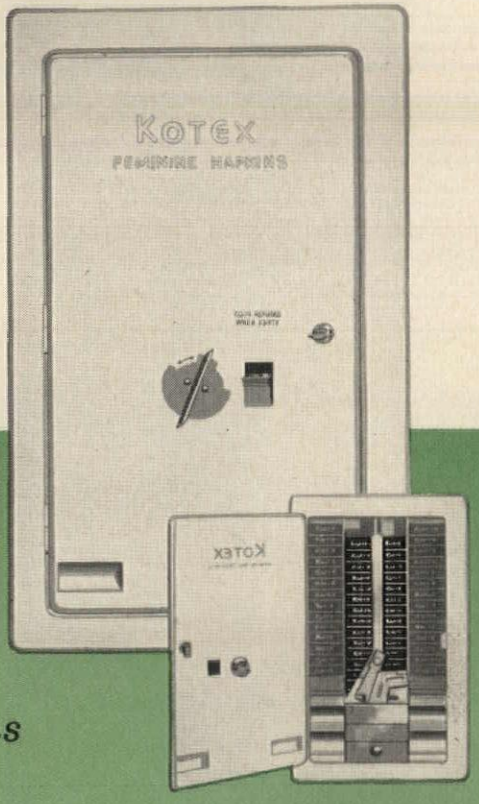
Serpentine Floor Tile
Large sheets of ceramic floor tile are now available in serpentine patterns. The new designs result from the way that the small 1-in. tiles are positioned. The tile sheets are available in right-hand and left-hand units, from which a wide variety of floor designs is possible. A brochure showing designs available in the new *Suntile Serpentile* pattern can be obtained from: *The Cambridge Tile Mfg. Co., Dept. P, Cincinnati 15, Ohio*



Mosaic Tile Wall Panels
Sandwich panels of precast concrete faced with mosaic ceramic tile are being produced in sizes up to 10 by 30 ft at factories in Marietta, Ohio and Baltimore, Md. Because of their strength and size, these panels can span from column to column or floor to floor with no intermediate steel work behind them. The panels are a finished interior-exterior wall, requiring no further work by plasterers; tile can be supplied on interior surface as well as exterior. These panels are marketed in the 18 states east of the Mississippi, south of Wisconsin, and including Tennessee and North Carolina. *The Marietta Concrete Division, American-Marietta Co., Marietta, Ohio*

more products on page 272





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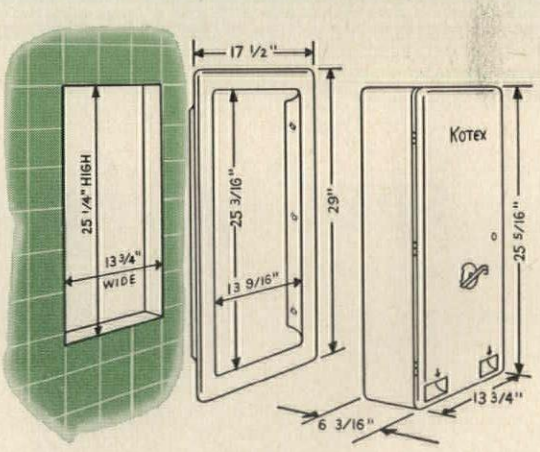
RECESSED VENDORS

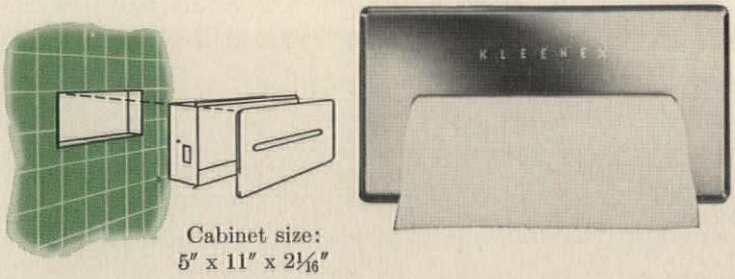
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Available in durable white enamel, satin chrome, gleaming polished chrome and stainless steel. Matching frame for recessed installation. (Other vendors that can be surface mounted are also available.)





Cabinet size:
5" x 11" x 2 1/16"

RECESSED DISPENSERS FOR KLEENEX TISSUES

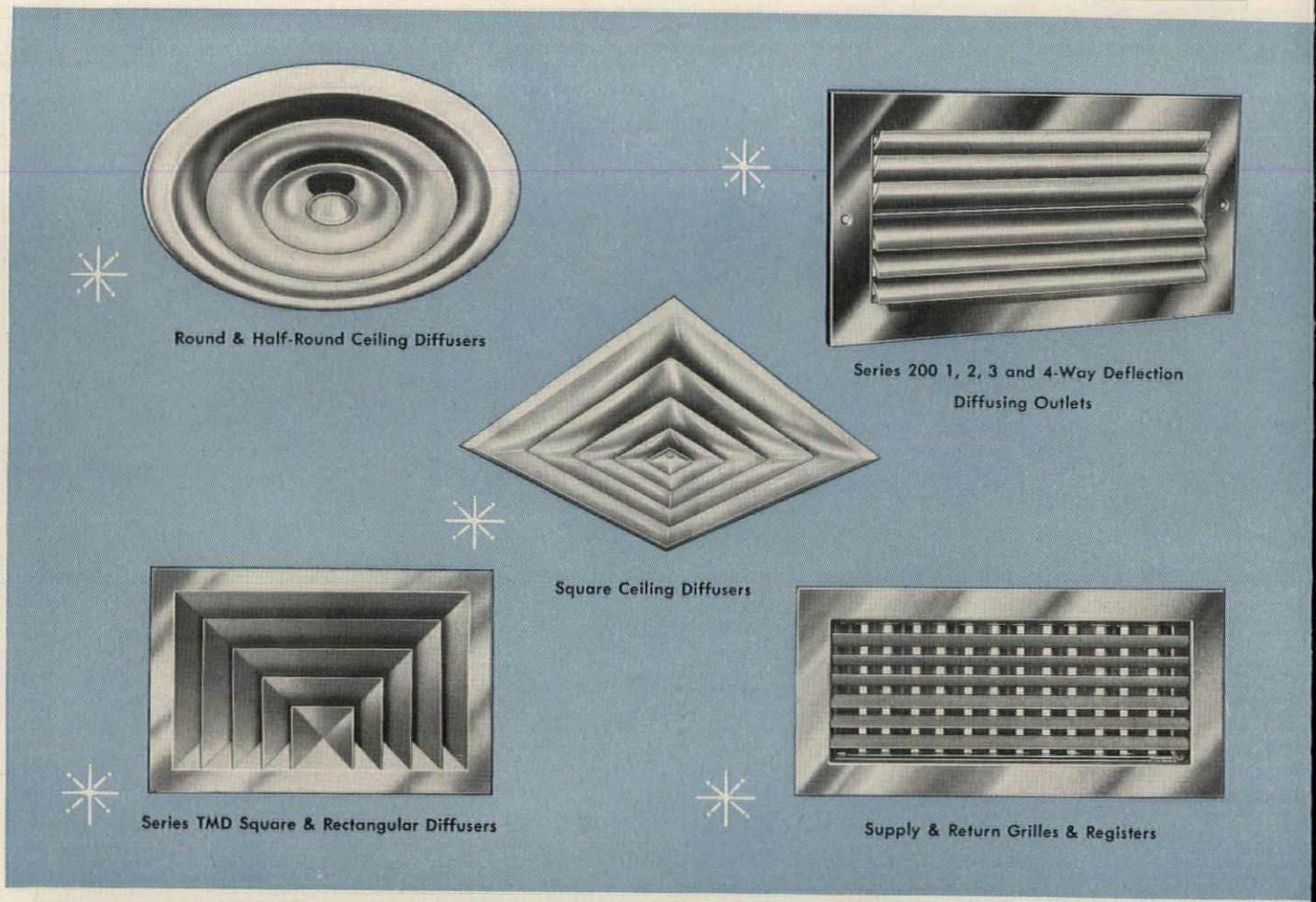
Holds full box of Kleenex 200's. Dispenses one tissue at a time. Mirror-chrome finish. Holes in back and side make it easy to fasten to studding.

For further details on how these attractive new dispensers can fit into your plans, see Sweet's 1960 Architectural File Cat., Section 19a/Ki. or write to Kimberly-Clark Corp., Dept. AR-50, Neenah, Wisconsin.

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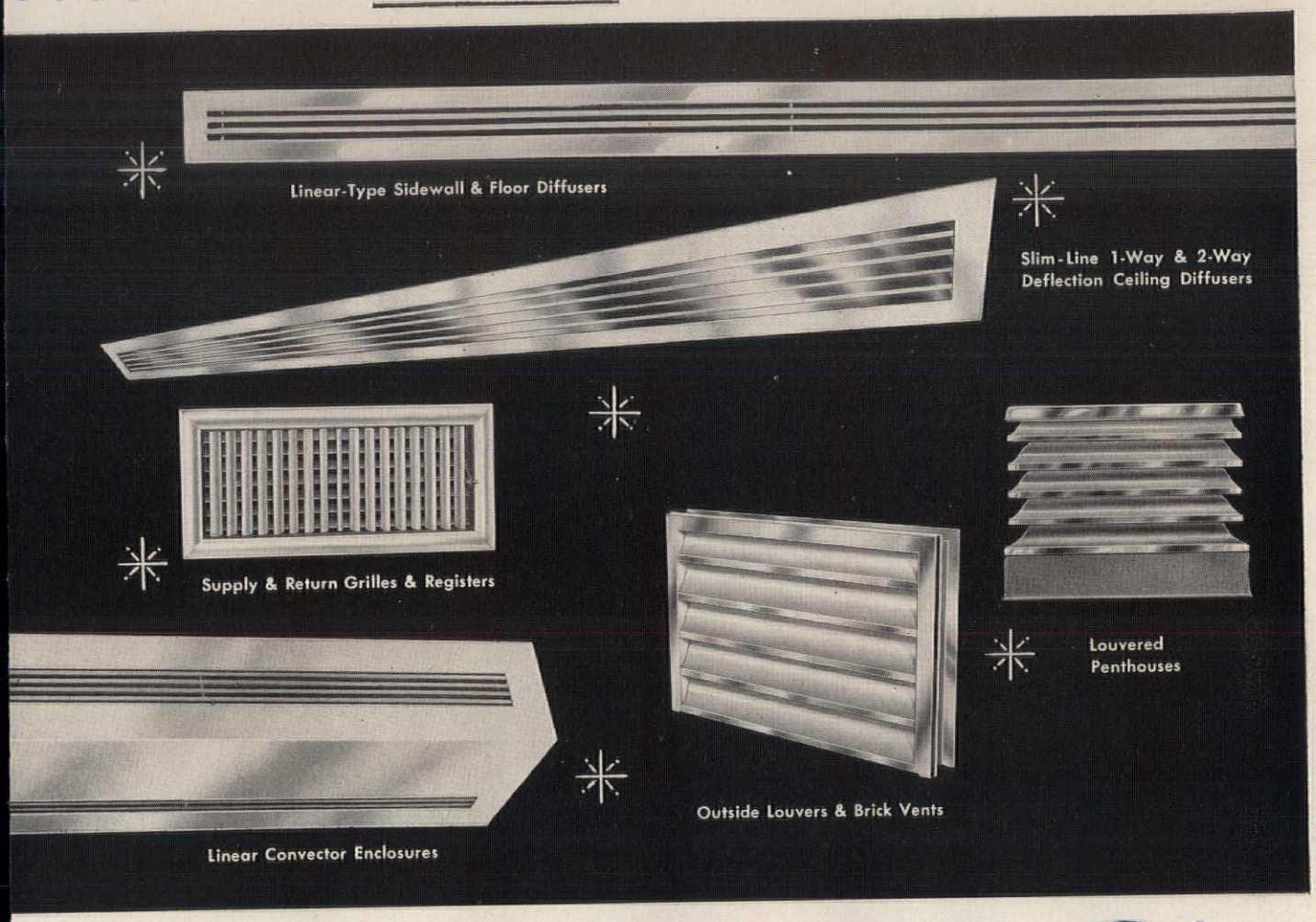
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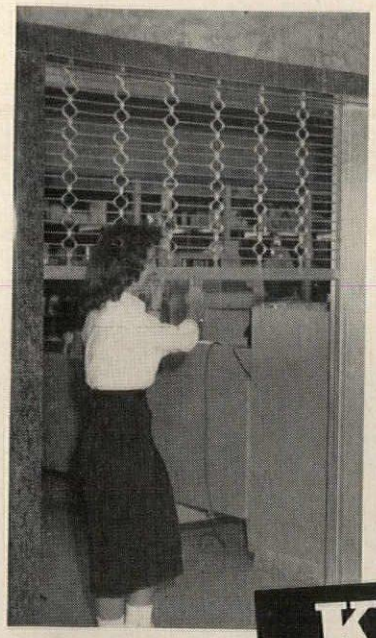
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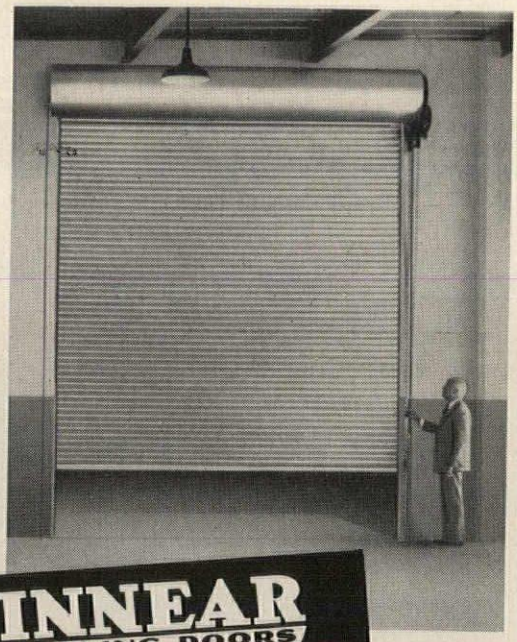
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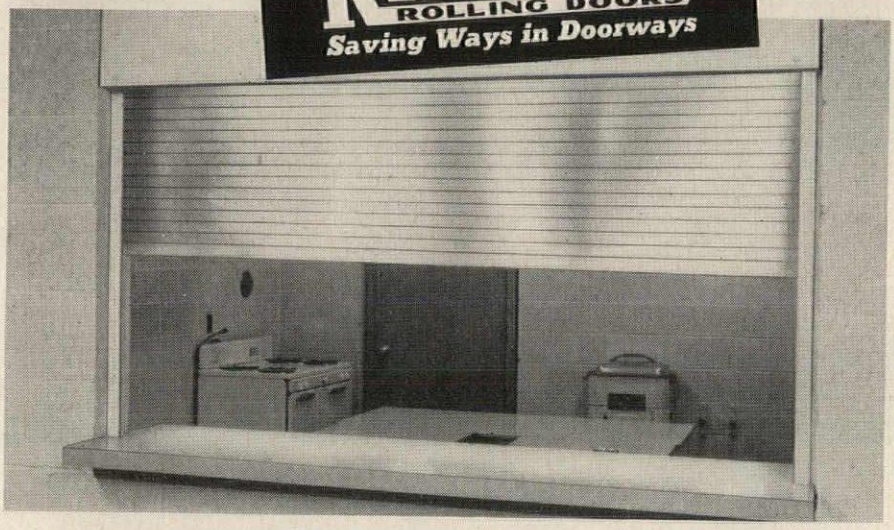
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Saving Ways in Doorways



Doorway, Counter, and "Area" Closures for Every School Need

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The aluminum or steel curtain coils compactly above the opening, wastes no usable space, stays completely out of the way, out of sight!

When closed, they block all access through the openings. The neat, flat surface of Kinnear's modern "midget" counter-shutter slats blends with any decorative scheme, wall material or architectural treatment. Kinnear Rolling Shutters are built to fit any counter.

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Kinnear Rolling Grilles (of steel or aluminum) offer the same coiling upward action in an "openwork" curtain of bars and links that block passage without cutting off light, air, or vision. The ideal "barrier" at corridors and entrances where sections of a room or building may periodically want to be cut off from use.

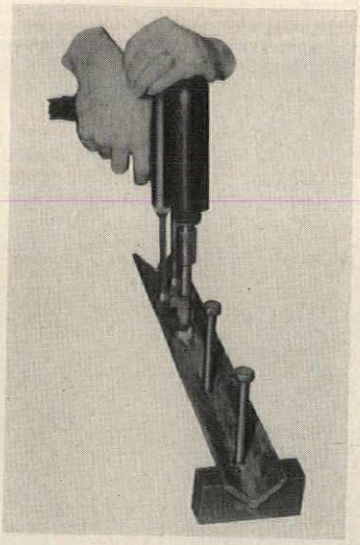
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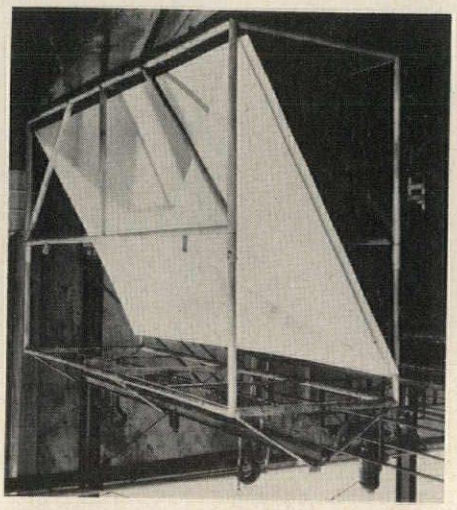
FACTORIES: 1860-80 Fields Ave., Columbus 16, Ohio; 1742 Yosemite Ave., San Francisco 24, Calif.

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Product Reports

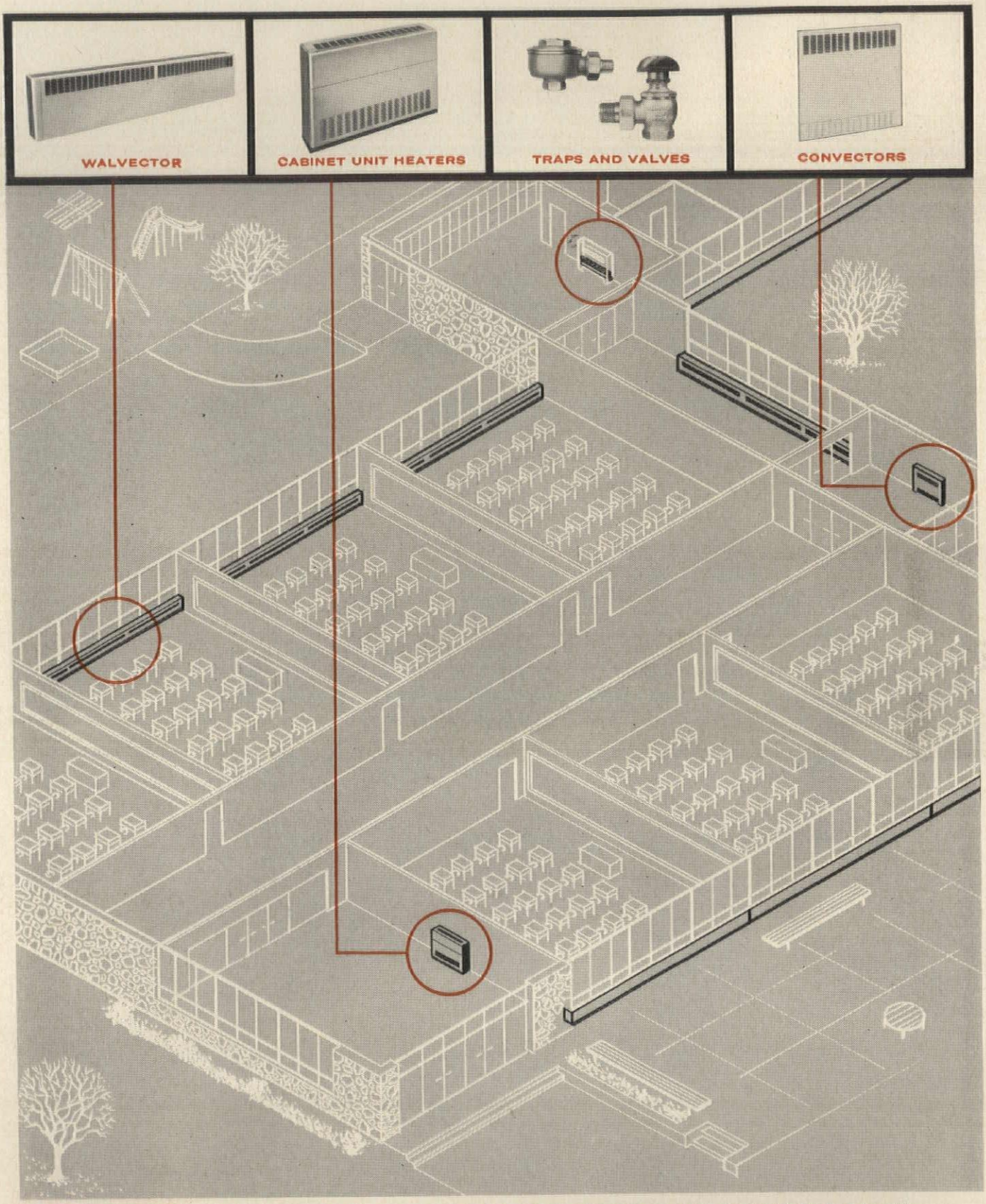


Headed Concrete Anchor
A new type of headed concrete anchor is said to have far greater holding power than conventional shapes so that smaller sizes may be specified to achieve the same results gained with larger sizes of other types. Its increased holding power is attributed to the upset head, which keeps the anchor in place even if the bond is broken between the anchor and the concrete. Available in five sizes for applications ranging from light to heavy duty, the Type H-4 anchor can be quickly end welded either to flat surfaces or in the fillets of angles as shown above. *Nelson Stud Welding Div., Gregory Industries, Inc., Lorain, Ohio*



Chemical Milling of Metal Panels
Pattern and cuts in metal as well as decorative finishes can be achieved on virtually any metal through a process called chemical milling, ac-

continued on page 276



WEBSTER SYSTEM FOR STEAM AND HOT WATER HEATING OF SCHOOLS, *Integrating classroom perimeter heating with time-proved Walvector, hallway heating with convectors, cabinet unit heaters in entranceways, traps and valves as required in piping. Ask your Websterman about these radiation products.*

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Harley, Ellington & Day, Inc.—Detroit
Associate Architect: A. R. Clas—Washington, D. C.
Gen. Contractor: John McShain, Inc.—Philadelphia

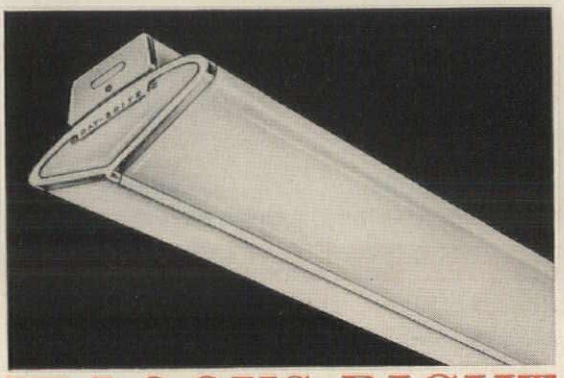
Keep Construction Costs ***DOWN*** *with* REINFORCED CONCRETE

Another outstanding example of reinforced concrete construction will be the new—soon to be completed—Department of State Building, Washington, D.C. Here the architects chose reinforced concrete flat slab construction because of its low cost. With the head room gained, architects were able to provide more stories without exceeding building heights of older buildings in the area, and to use to advantage a 31-foot grade variation to provide parking facilities for 700 vehicles. Before you begin design or construction of any new building, be sure to investigate this more economical and flexible building method.

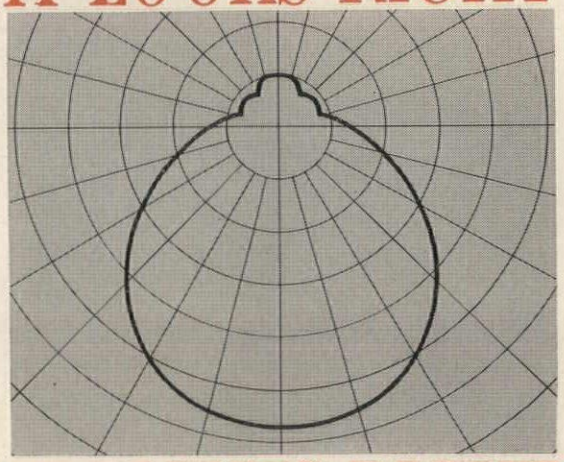
CONCRETE REINFORCING STEEL INSTITUTE
CRSI
FOUNDED 1924

Concrete Reinforcing Steel Institute
38 South Dearborn Street, Chicago 3, Illinois

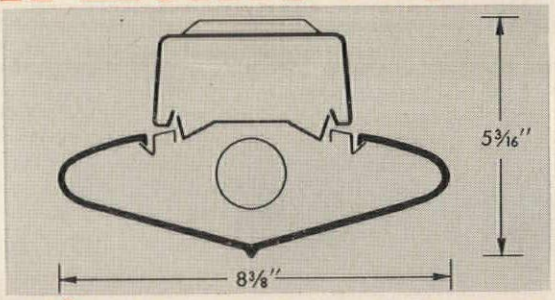
5-6



IT LOOKS RIGHT



IT LIGHTS RIGHT



IT'S MADE RIGHT WITH EVENGLO®

DAY-BRITE'S new Corralume lighting fixture has long, low, trim lines. It's available in 4 and 8 ft. lengths that are only 5 3/16" deep . . . ideal for long halls and corridors . . . **It looks right.** The wrap-around design gives well-balanced illumination; completely wipes out ceiling and side wall shadows . . . **It lights right.** The enclosure is extruded of EVENGLO polystyrene, a versatile Koppers plastic that can be molded or extruded in practically any size, shape, or color and is dimensionally stable. The plastic enclosure snaps into place without screws or fasteners; it can be easily removed or installed . . **It's made right.** For more information on EVENGLO polystyrene or for a list of manufacturers who use EVENGLO in fluorescent fixtures, write to Koppers Company, Inc., Plastics Division, Dept. AR-50, Pittsburgh 19, Pa. Offices in Principal Cities • In Canada: Dominion Anilines and Chemicals Ltd., Toronto, Ontario. **KOPPERS PLASTICS**

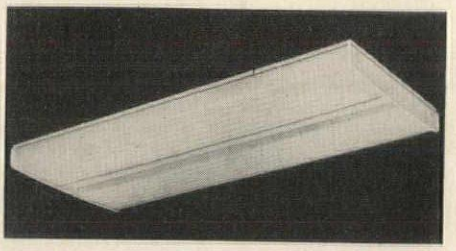
KOPPERS

continued from page 272

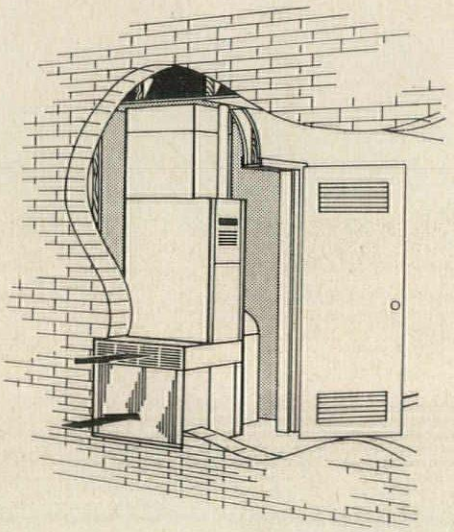
cording to a west coast concern. A recent application was to produce a satin-smooth finish on twenty-four 12- by 8-ft aluminum panels highlighting the facade of Gelson's Food Center in Encino, Calif. Architect was R. Leon Edgar. The milling company reports that one man can handle a number of parts at one time, offering economies over hand finishing. Parts can be formed into a complex shape and then chemically milled to desired finish. *United States Chemical Milling Corp., 1700 Rosecrans Ave., Manhattan Beach, Calif.*

Prismatic Fixture

A new luminaire line with acrylic, prismatic lenses for flush mounting is only $3\frac{13}{32}$ in. deep to the ceiling line. The *6000 Series* by Holophane has two lenses each 4 ft long which are held entirely without any visible frame and are separated along the center of the fixture by a 3-in. wide ballast chamber cover, recessed 1 in.



above the bottom of the lenses. Each enclosure is held on one side by a steel channel riveted directly to the plastic. On the other side, two 4-in. hinges provide simple relamping by a free-swinging attachment of lenses to fixture. *Holophane Co., Inc., 342 Madison Ave., New York 17, N. Y.*



Apartment House Air Conditioning

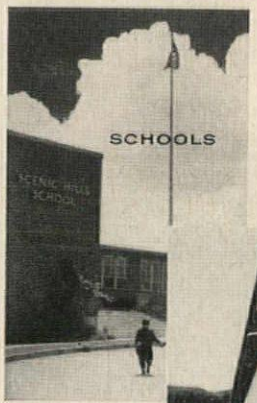
A heating-cooling package for apartments and small commercial applications includes a gas furnace, cooling coil and air-cooled condensing unit, all fitting within a 36 by 36 in. closet and requiring 89 in. headroom. The air handling face of the condensing unit extends through an outside wall and is flush with the surface. Trunk duct is taken off the side of the cooling coil cabinet. Return air can be brought back between floor joists or through grilles in closet walls. The unit provides a nominal two tons of cooling and 51,000 Btuh input of heating. Since design of the condensing unit permits intake and exhaust to be handled from the same side, the possibility of air shaft application is enhanced. In such a case, condenser supply and exhaust air is handled in separate air shafts which are a part of the building construction. *Lennox Industries, Inc., Marshalltown, Iowa*

more products on page 281

NEW!

Electrically-Operated Projection Screen Pre-engineered For Concealed Installation

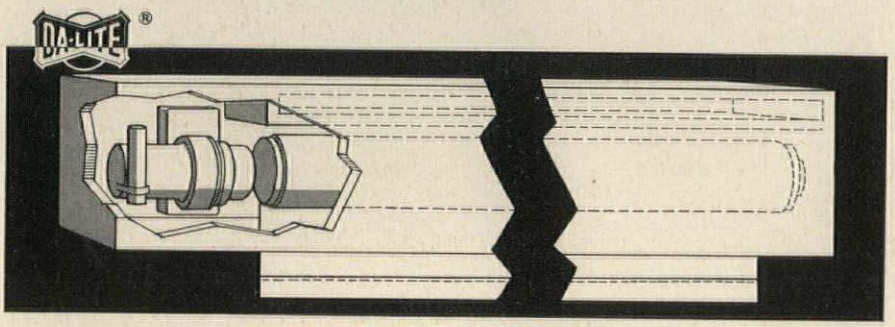




The most practical product an architect ever specified! The exclusive Da-Lite Electrol® projection screen—enclosed at the factory for simplified on-job installation. Screen may be installed in a concealed position—or mounted on wall and finished to match. Da-Lite Electrol is ready for use seconds after control button is touched.



Da-Lite's quality-controlled projection screens are your assurance of years of trouble-free service. For over half a century, Da-Lite has built a reputation as the finest in projection screens for theatres, auditoriums and conference rooms!



Electrol Screens feature Da-Lite's famous White Magic glass-beaded screen fabric. Permits big-picture vision . . . with beautiful clarity and color. Specially-engineered electric motors are totally sealed, require no further lubrication. Screens are completely assembled at factory. Control switch and plate furnished.

WRITE TODAY!

New technical bulletin gives complete details on operation and installation of electrically-operated Da-Lite projection screens and portable tripod models.

Da-Lite®

SCREEN COMPANY, INC., WARSAW, INDIANA

Gymnasium at Macopin Elementary School, West Milford, N. J. Architects: S. E. Greydanus and Son, Paterson, N. J. Contractor: Thomas Construction Company, Paterson, N. J.

Space provided: thirteen classrooms; auditorium; full size gymnasium with kitchen and storage; library and storage room; science room; home economics unit; art room; woodworking shop; band room; boys' and girls' locker and shower rooms; administrative offices; guidance office; clinic; thirteen lavatory and toilet rooms. *Structural framing:* glulam timber beams resting on steel columns. *Exterior walls:* Fenestra window walls for classrooms; brick over concrete block backup for gym and auditorium. *Interior walls:* concrete blocks; glazed blocks wainscot high in corridors; ceramic tile in shower and toilet rooms. *Floors:* asphalt tile over concrete slab. Ceramic tile in toilet rooms. *Roof:* 5-ply built-up slag roof over Tim-Deck. *Heating:* hot water system employing Nesbitt unit ventilators controlled by outside thermostat. *Lighting:* fluorescent throughout except gymnasium and special spot lighting in auditorium. *Area:* 56,000 square feet. *Cost:* $17.29 a square foot.



In natural finish, Glulam beams and Tim-Deck by Timber Structures, Inc. provide a striking appearance for this modern, flexible school that is now being considered for expansion into a 1200-pupil senior high school.

TIMBER STRUCTURES, INC.

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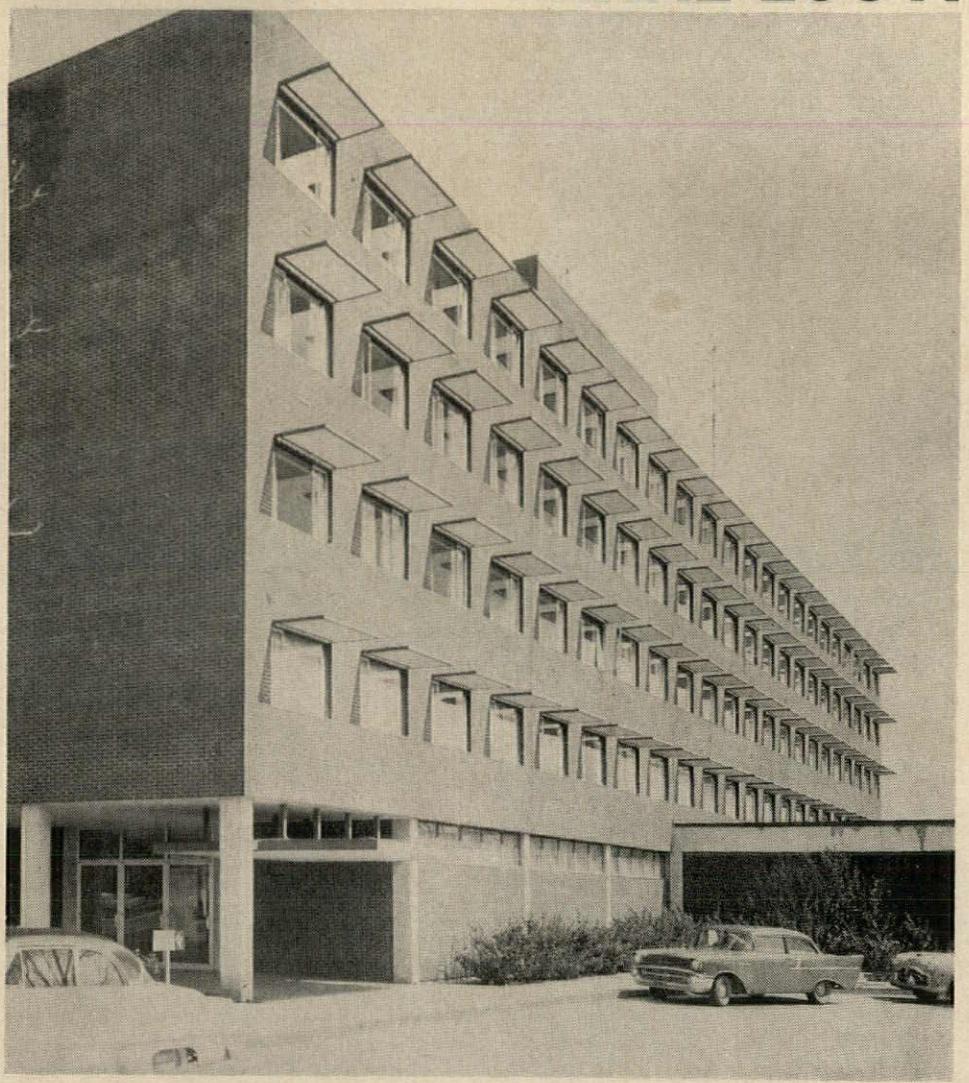
Division offices in Ramsey, N. J.; Schiller Park, Illinois; Dallas, Texas

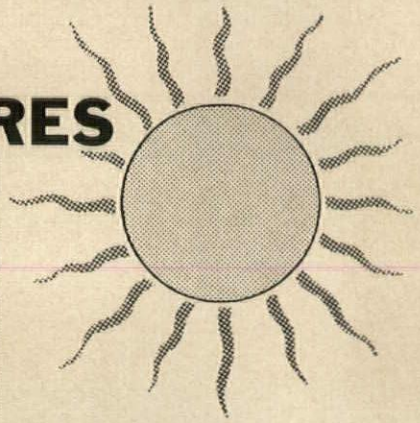
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UNIVERSITY OF GEORGIA
ATHENS, GEORGIA

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STEVENS & WILKINSON
ATLANTA, GA.

Contractors:
DeGIVE, BUNHAM & O'NEILL, Inc.
ATLANTA, GA.

Consulting Architect:
LEWIS J. SARVIS
BATTLE CREEK, MICH.

Here is a building that is a citation winner in the Progressive Architecture Award Program. It has been described as an extraordinarily self-contained structure complete in every respect with a functional design as well as one of exceptional beauty.

Providing a striking effect on the exterior portion of the hotel section are "NEO-RAY" LOUVRED SUN SHIELDS over each window on the south side. These permanent fixtures filter the sun rays without impeding the circulation of air.

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... ½" x ½" x ½" cells.
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... baked white enamel.
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the louvre with the appearance of a lens.

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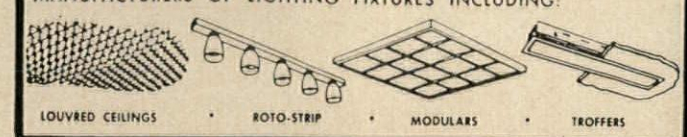
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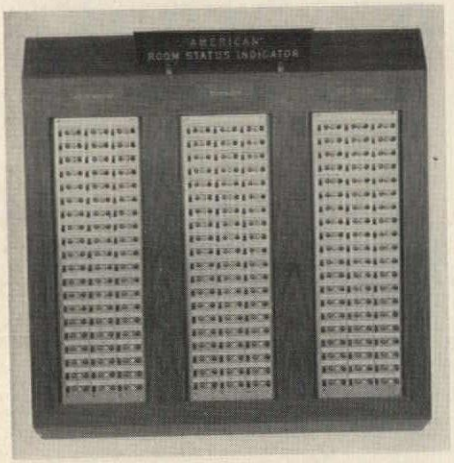


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Product Reports

Panic, Fire Protection
Bolts and mortise lock have been integrated into the automatic activating mechanism of twin panic bars on double swinging doors to meet the requirements of both panic protection and fire protection. Hardware for the new *Overly* doors was designed by Sargent. Underwriters' labels A through E have been awarded the doors, which have new channeling and framing to meet the rigid U-L tests and assure complete dependability of the actuating mechanism. Problem was this: Fire protection requires interior and exterior barrier to be securely fastened and capable of resisting near explosive forces of fires to limit spread of flame and smoke; yet doors must be opened quickly and without fail. *Overly Manufacturing Co., Greensburg, Pa.*



Room Status Indicator for Hotels
A new electronic method of room control enables the front office clerk, the cashier and the housekeeper to know instantly the status of every room in a hotel. Each of them has a control board equipped with a switch and three lights—red, yellow and green—for each room in the house. As the status of a room changes from occupied to "on change" to ready-to-rent, the person involved in the transaction records the room status by flicking a switch on his board, which lights up the appropriate signal on all the boards. The system is said to be easy to operate and virtually foolproof, is adaptable to the different requirements of any type of hotel, and can be quickly installed in a minimum of space. *American Communications Corp., 280 Broadway, New York, N. Y.*

more products on page 284



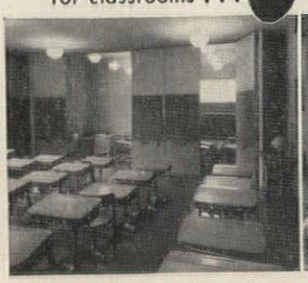
Photo above, Senior High School, Janesville, Wis. Law, Law, Potter & Nystrom, Architects.

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...dollar for dollar—feature for feature—the finest product of this type on the market

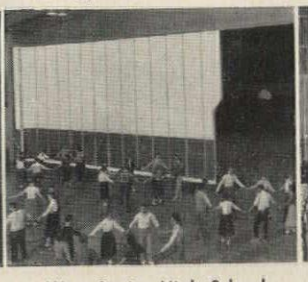
Each R-W Folding Partition is the result of years of continuous research, engineering development and practical know-how. It is this experience that assures the quality, *rugged* strength, *dependable* operation and excellent sound-retarding qualities that is *inherent* in *every* R-W Folding Partition. Available in a type and size to meet your exact requirements . . . provides years of trouble-free, maintenance-free service. You can pay less . . . you can pay more . . . but you cannot buy more actual value for each dollar invested than with an R-W Folding Partition.

for classrooms . . .



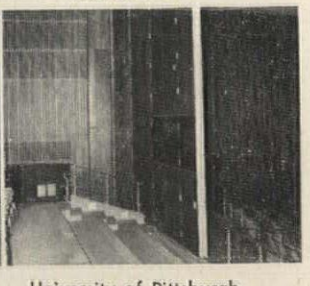
Grace McWayne School
Batavia, Illinois
Raymond A. Orput, Rockford, Architect

gymnasiums . . .



West Senior High School
Aurora, Illinois
Childs & Smith, Architects

auditoriums . . .



University of Pittsburgh
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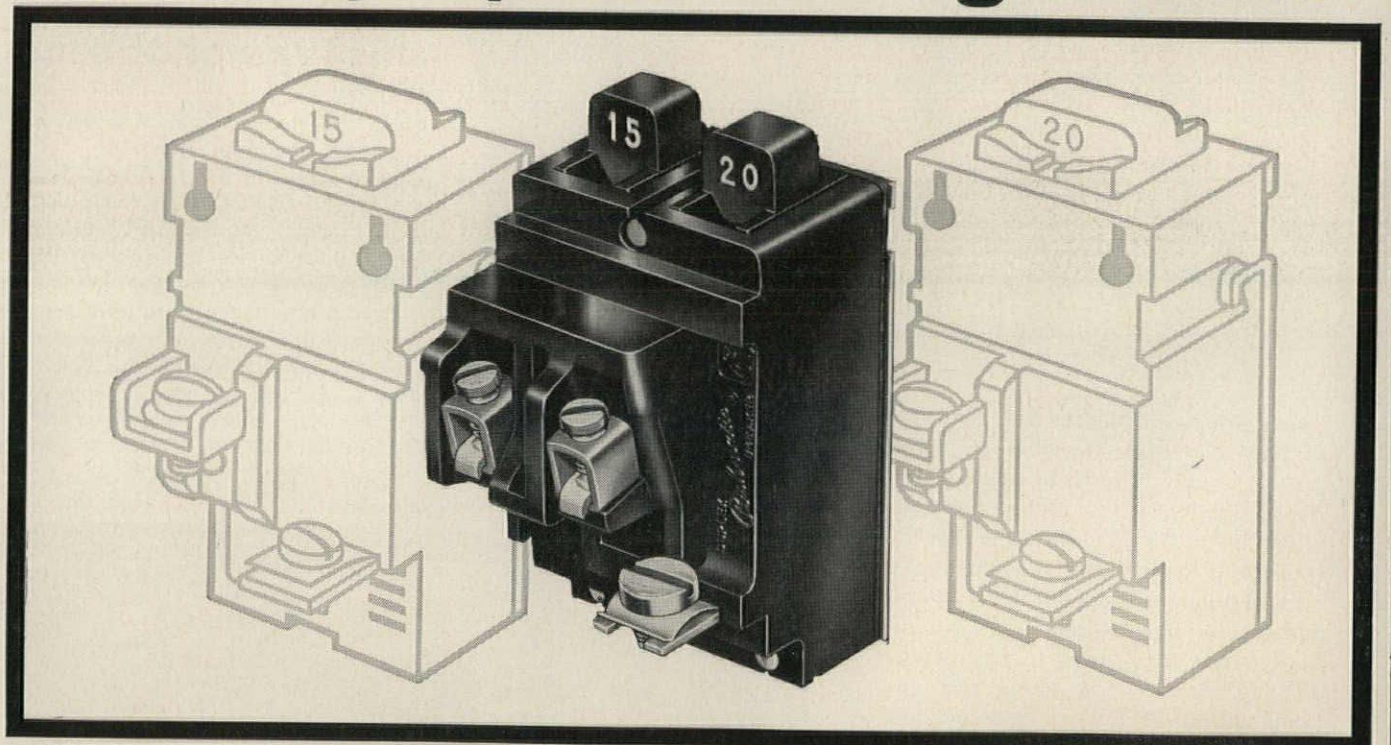
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BullDog's

NEW DUPLEX

The only space-saving breaker



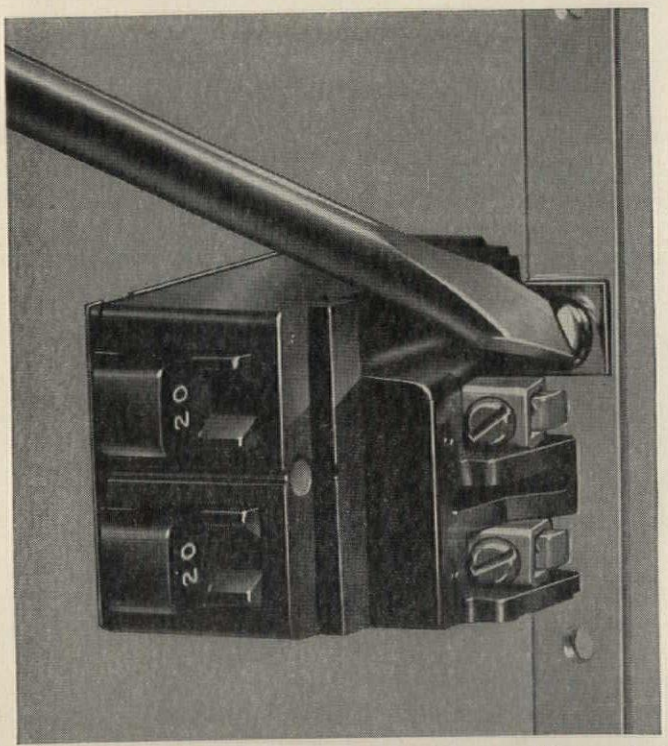
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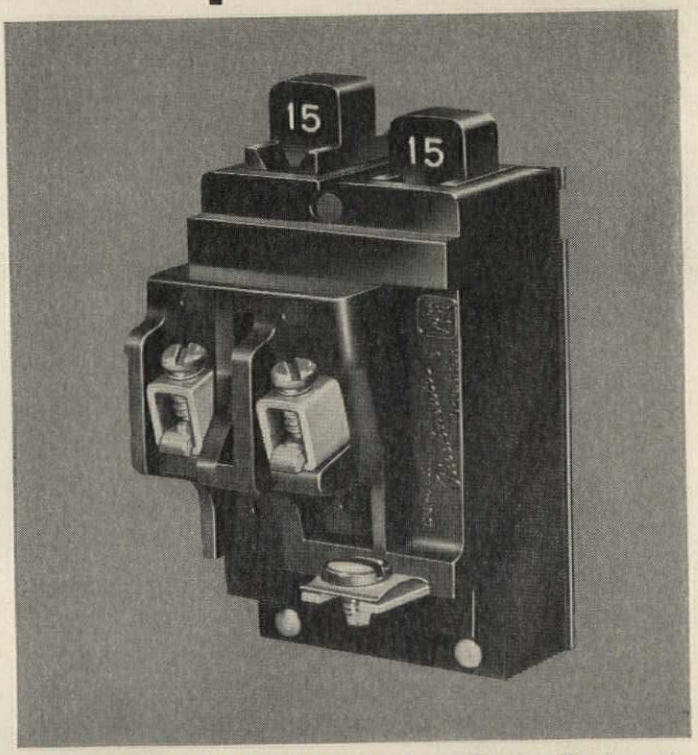


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3. ONE BOLTED CONNECTION. Duplex provides a single positive bolted connection to bus bar. Electrical contact is under constant pressure, won't work loose, won't overheat. Installation is quick and easy.



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BULLDOG ELECTRIC PRODUCTS DIVISION
I-T-E CIRCUIT BREAKER COMPANY

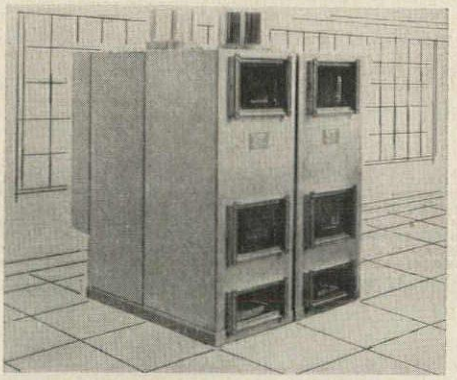
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Mineral Wool Standards

Under new standards developed by the National Mineral Wool Association, the actual insulating value of any mineral wool product in place is to be indicated by an "R" (resistance) number stamped on the batt or blanket. The higher the "R" number, the more effective is the particular insulation. One reason for the new standards, the Association reports, is to clear up confusion that might exist with insulations specified in various terms such as thickness, density or conductivity. Since there are various manufacturing processes extant, a uniform designation based on performance of insulation in place gives the most comparable basis for evaluation. There are three standards for various levels of effectiveness: The All-Weather Comfort Standard recommended by the electrical industry; and National Mineral Wool Association recommendations for (1) "Reasonable Comfort and Economy" and (2) "Minimum Acceptable Comfort." *National Mineral Wool Association, 1270 Sixth Ave., New York 20, N. Y.*

"Duty-Rated" Entrance Doors

A new line of doors "duty-rated" to meet commercial and institutional requirements consists of four aluminum doors and one stainless steel door which vary from slim, high-style designs to a massive model constructed to meet strict code specifications. Each of the five models can be purchased as a complete entrance package consisting of the door, frame, hardware, and a concealed overhead closer or automatic operator. One model, *Style Leader 125*, features extremely thin stiles, gray beveled stops that accentuate the slim lines, and cross members that enable the door to absorb heavy punishment. It is weather-stripped on all four sides, and has a positive top and bottom locking device operated from a single center-stile lock. *Kawneer Co., Niles, Mich.*



High-Efficiency Air Cleaner

The *Yerzley Scrubber*, a new air pollution control device named for its inventor, Dr. Felix L. Yerzley, obtains high absorption efficiencies through the use of a unique principle of "interphase reaction." Each unit is composed of two shallow reaction beds which divide the total chamber into three plenums. Liquid supplied at the top of the scrubber flows downward through the flooded reaction beds, while gas or air to be processed enters at the bottom of the scrubber and rises in the form of bubbles through the liquid contained within the minute spaces between the packed particles in the two reaction beds. Industrial applications of the scrubber include the removal from air of fumes from acids and other chemicals, hot grease vapors, and fine dust. *Air Pollution Control Div., John Wood Co., Essex Bldg., Bernardsville, N. J.*



HOTEL FOUNTAINEBLEAU
Miami Beach, Florida. Morris Lapidus, Architect
Stewart Tile Co., Tile Contractors

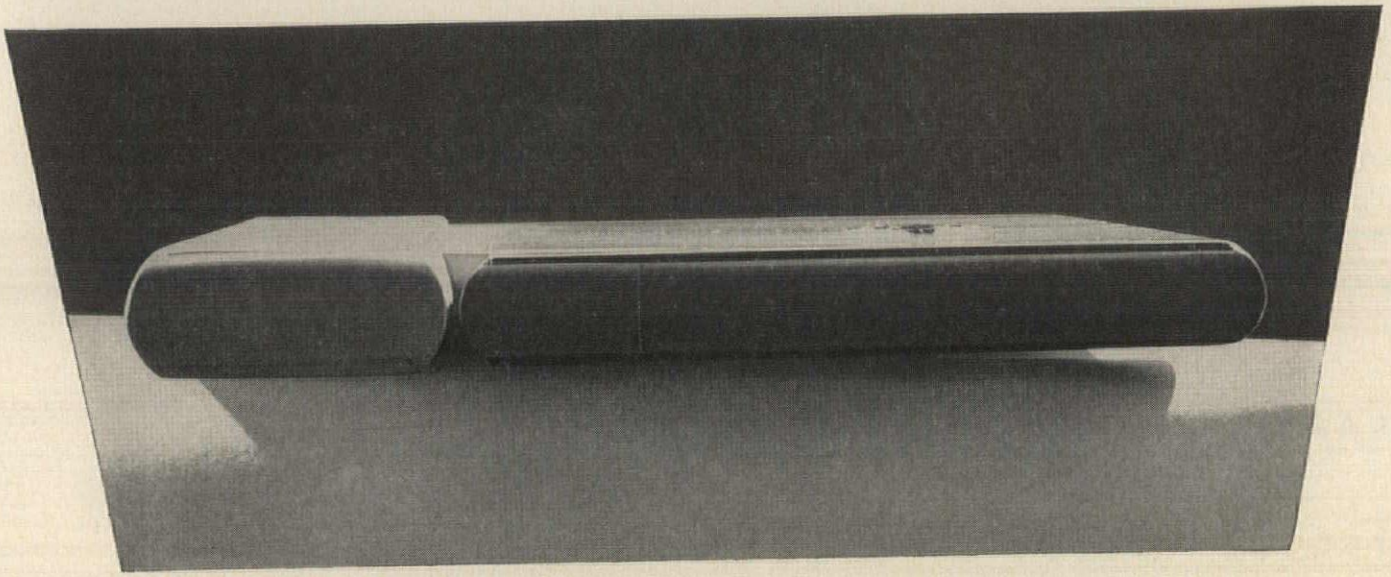
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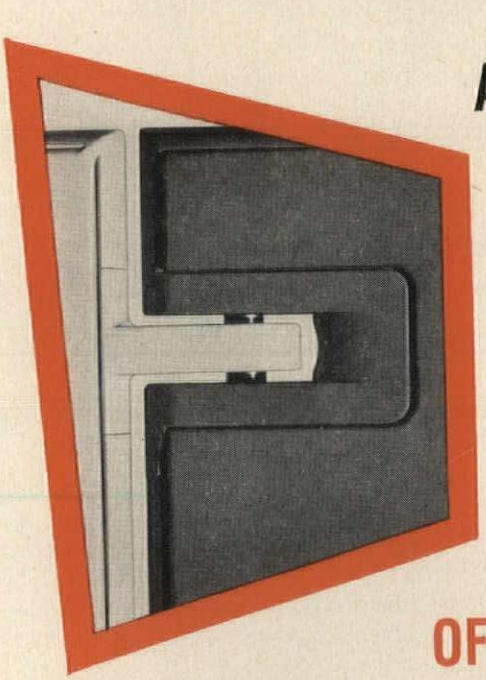
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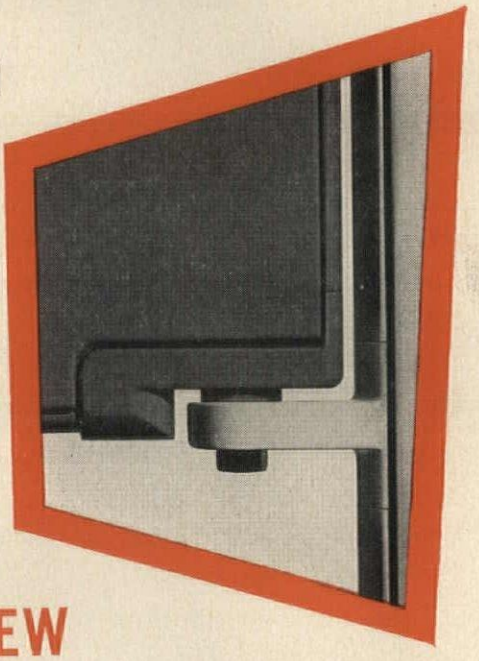


IN THIS PICTURE OF WHAT YOU CANNOT SEE

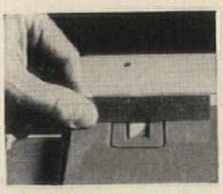
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2 ways to lick sun heat and glare!



THE TWO MEN, shown on the next page, work in new offices in different buildings. Both work close to large window areas, and are more comfortable than they've ever been in an office before.

THE OFFICE on the left is exposed to sun heat. So the architect chose L·O·F Heat Absorbing Plate for the windows. This glass transmits less than 47% of the total solar radiation (heat) to keep interiors cooler.

The office on the right is also exposed to direct sun rays. The architect, in this case, chose *Parallel-O-Grey*®. This plate glass reduces sun heat, too, but it affords greater protection from sun glare because it transmits less than 45% of average daylight.

THESE TWO KINDS of glass reduce sun heat to lighten load on air-conditioning equipment. Both are polished *plate* to provide top-quality clarity. But each of these heat-resisting glasses has another individual characteristic:

HEAT ABSORBING PLATE has a pleasing pale blue-green color that makes a room *look* cooler.

PARALLEL-O-GREY has a neutral grey color. Colors seen through it remain essentially unchanged . . . tones are only subdued.

Wherever you want to make tenants more comfortable . . . wherever you want to reduce cost of air-conditioning equipment and operation . . . consider using one or the other of these special kinds of L·O·F plate glass.

Both products are also available as the outer pane in *Thermopane*® insulating glass units to further reduce load on air-conditioning equipment and to save heat in winter.

For additional information, call your L·O·F distributor or dealer (listed under "Glass" in the Yellow Pages). Or write to Libbey·Owens·Ford Glass Company, 811 Madison Avenue, Toledo 3, Ohio.

Armco Steels / for Architecture

In Philadelphia

Stainless Steel Combines Economy and Timeless Beauty

3 Penn Center Plaza
Architects: Emery Roth & Sons

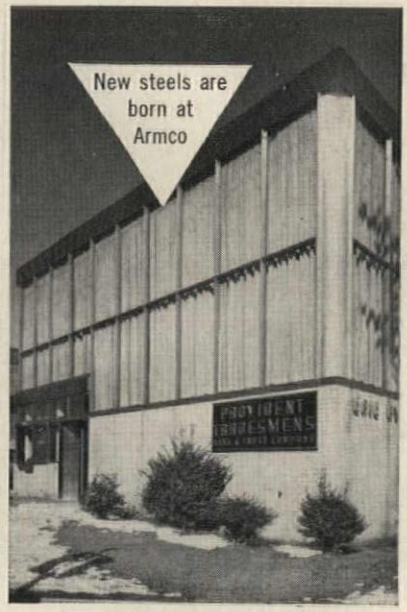




Food Fair Stores, Inc.
Architects: Thalheimer & Weitz



Philadelphia State Office Building
Architects: Carroll, Grisdale & Van Allen; Harbeson, Hough, Livingston & Larson; Nolen & Swinburne



Provident Tradesmens Bank & Trust Company
Architect: Jack S. Steele Company

In the architectural renovation of "the City of Brotherly Love," stainless steel's inherent advantages are used effectively to give the city's new buildings timeless beauty at low cost.

Long recognized as a durable, high quality building material, stainless is assuming a new importance in contemporary architecture. It is suited to modern design concepts, and now can be specified at approximately the same cost as less durable metals.

These substantially lower costs for stainless are the cumulative result of: 1. more fabricator-experience with the metal; 2. use of more efficient production methods, such as roll-forming; 3. more effective use of stainless steel's high strength, and the specification of economical sizes and finishes; 4. quantity production of standard building components; 5. lower-cost grades of stainless that adequately meet architectural requirements.

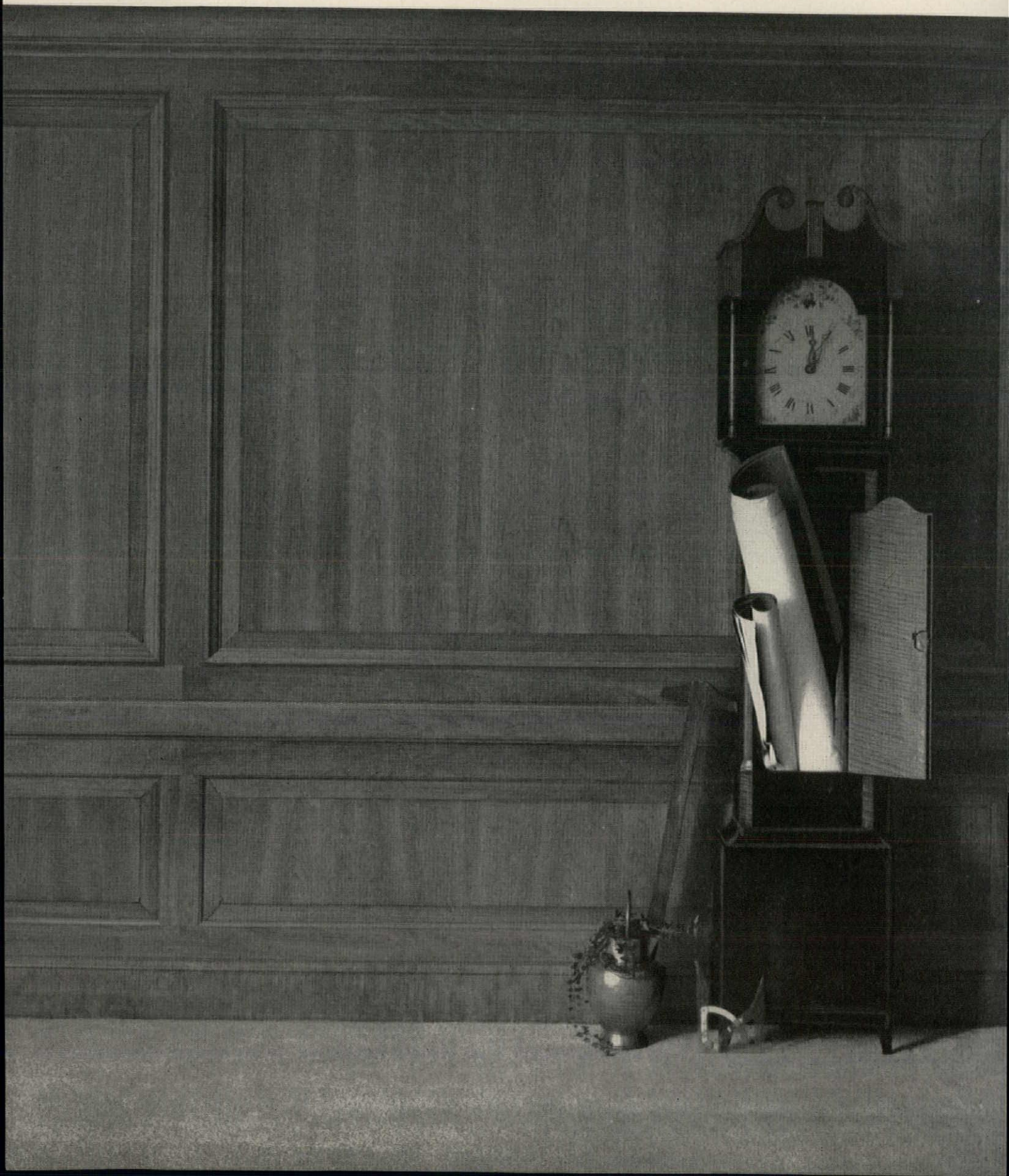
Take advantage of these new opportunities offered by the time-proved qualities of Armco Stainless Steels in the architecture *you* create.

Write us for your free copy of Armco Stainless Steels for Architecture, a new design and specification manual. Armco Steel Corporation, 1710 Curtis Street, Middletown, Ohio.

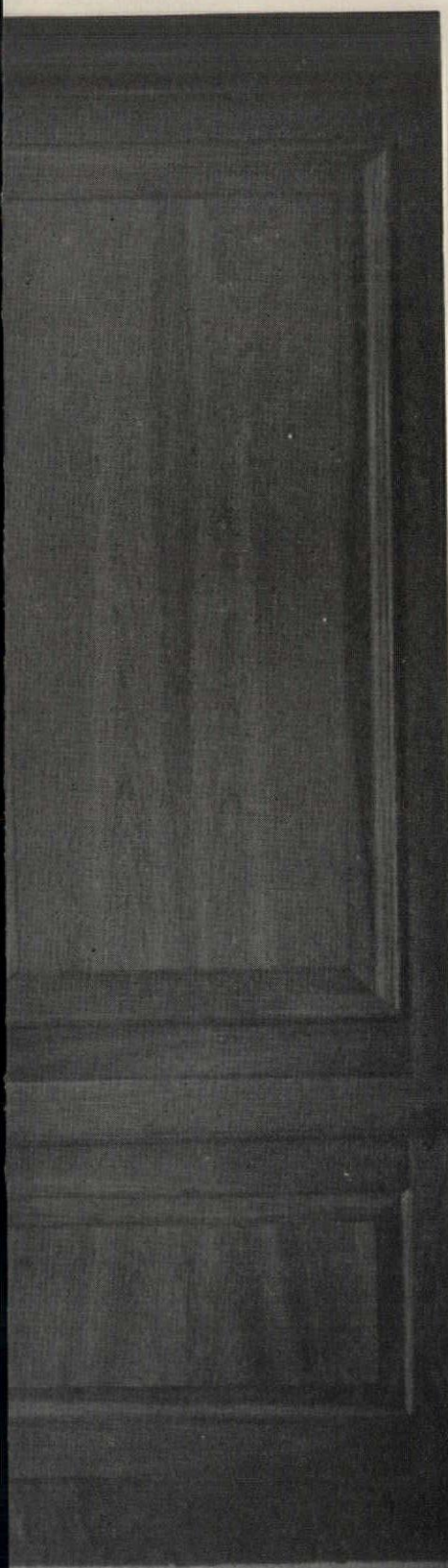
ARMCO STEEL

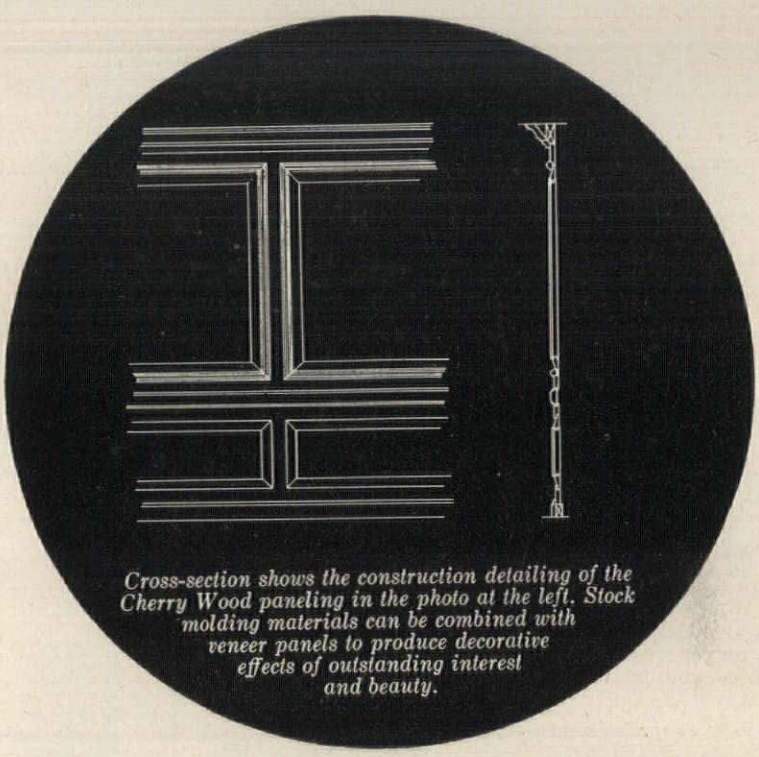
Armco Division • Sheffield Division • The National Supply Company • Armco Drainage & Metal Products, Inc. • The Armco International Corporation • Union Wire Rope Corporation

Timeless dimensions



in wall paneling .....





Cross-section shows the construction detailing of the Cherry Wood paneling in the photo at the left. Stock molding materials can be combined with veneer panels to produce decorative effects of outstanding interest and beauty.

■ Centuries have put their stamp of approval on the mellow beauty of wood. Its fascination never grows old. Keeping it new are the constant advances in architectural concepts as well as the bold use of traditional motifs.

The imaginative installation in the photo at left certainly exemplifies a style of simple elegance in wall panel design. The deft hand of the wood artisan has been at work here, blending veneer panels and molding into a timeless expression of human craftsmanship. The result is a straightforward beauty of lines and planes in dimensional depth. Whether an architectural design is traditional or contemporary, the use of veneer paneling has a way of putting the busy man at ease in his work-day setting by virtue of its warmth and dignity.

The photo and cross-section detailing shown here depict only one style of divided paneling. Single panels of any desired size can be designed. The infinite possibilities for architectural ingenuity, taking full advantage of the charm of some of Nature's most beautiful woods in veneers by Stem, are easy to see. The most extensive portfolio of architectural veneers in the United States is on hand, ready for shipment. And this Stem selection offers endless inspiration for design ideas with the creative touch of wood. Stem veneers are the most masterful accomplishment of the veneering art. You are invited to let Stem help you achieve a masterpiece of interior artistry.

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BUTTERNUT, EBONY, KOA, ENGLISH BROWN OAK, ROSEWOOD CHERRY, HAREWOOD, LACEWOOD, PEARWOOD, TEAK.

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Executive offices:
Marine Trust Company, Buffalo, New York



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A Bogen sound system is virtual insurance against obsolescence. You plan on the basis of your immediate needs, and start with a system tailored to those needs. Thereafter, as your functional requirements increase, you add the appropriate features and facilities. This is the sensible 'expand-as-you-grow' Bogen approach. For example:

IF YOU ARE PLANNING FOR TWO CHANNELS the Bogen Series II Console provides one channel for programming, and another for either intercom or independent, simultaneous programming.

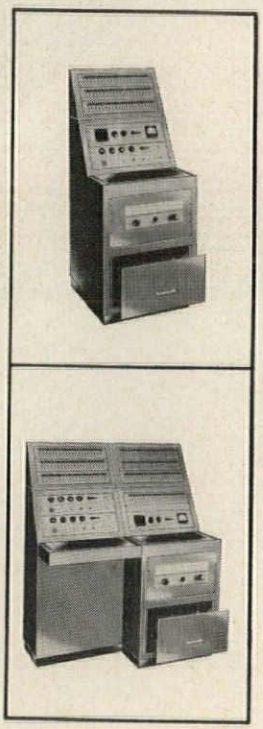
IF THREE CHANNELS ARE PLANNED the Series III console offers the choice of intercom plus two program channels or three independent, simultaneous programs.

These systems may be ordered with facilities to handle any number of rooms—from as few as 10 to as many as 180 or more—in multiples of 10. And the number of rooms to be served can be increased even after installation.

Here are only a few of the many optional features available for these systems: classroom change signals, fire-alarm or civilian defense sirens, 1-way or 2-way phone and speaker intercom, recorded tape playback, record players, FM and AM radio, vandal alarms, and others—even facilities for tieing in with independent auditorium and gymnasium sound systems. These, too, may be included in the original installation or added at a later date.

Bogen-Presto offers you other valuable advantages: a free survey of your needs, and engineering assistance—from planning through installation. Service and maintenance is available to you locally, through authorized Bogen-Presto sound installers and distributors.

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Office Literature

Structural Design
. . . *of Combination Tile and Concrete Slabs* (A.I.A. 4-E-6, 10-A) outlines design procedures, and gives detail drawings and tables of safe superimposed loads for typical tile-concrete slabs for simple, end and interior spans. 24 pp. *Structural Clay Products Institute, Department of Engineering and Technology, 1520 Eighteenth St., N.W., Washington 6, D. C.*

Air-Cooled Condensers
Gives selection data and specifications for four types of *Turbu-Flo* air-cooled condensers. Bulletin AC-102, 12 pp. *Halstead & Mitchell, Bessemer Bldg., Pittsburgh 22, Pa.*

Aluminum Sliding Glass Doors
(A.I.A. 16-E) Includes details, selection data, and specifications on three lines of aluminum sliding glass doors. 12 pp. *Arcadia Metal Products, 801 S. Acacia Ave., Fullerton, Calif.**

Simpson Products Catalog
(A.I.A. 37-B) Illustrates and describes methods of application, physical properties and specifications for complete line of acoustical, insulating and hardboard products. 24 pp. *Simpson Logging Co., 1033 White Bldg., Seattle, Wash.**

Painted Masonry Surfaces
Discusses causes of efflorescence and early chalking on painted masonry surfaces, and effective methods for preventing and overcoming such deterioration. 48 pp. *Resinous Products Div., Rohm & Haas Co., Washington Sq., Philadelphia 5, Pa.**

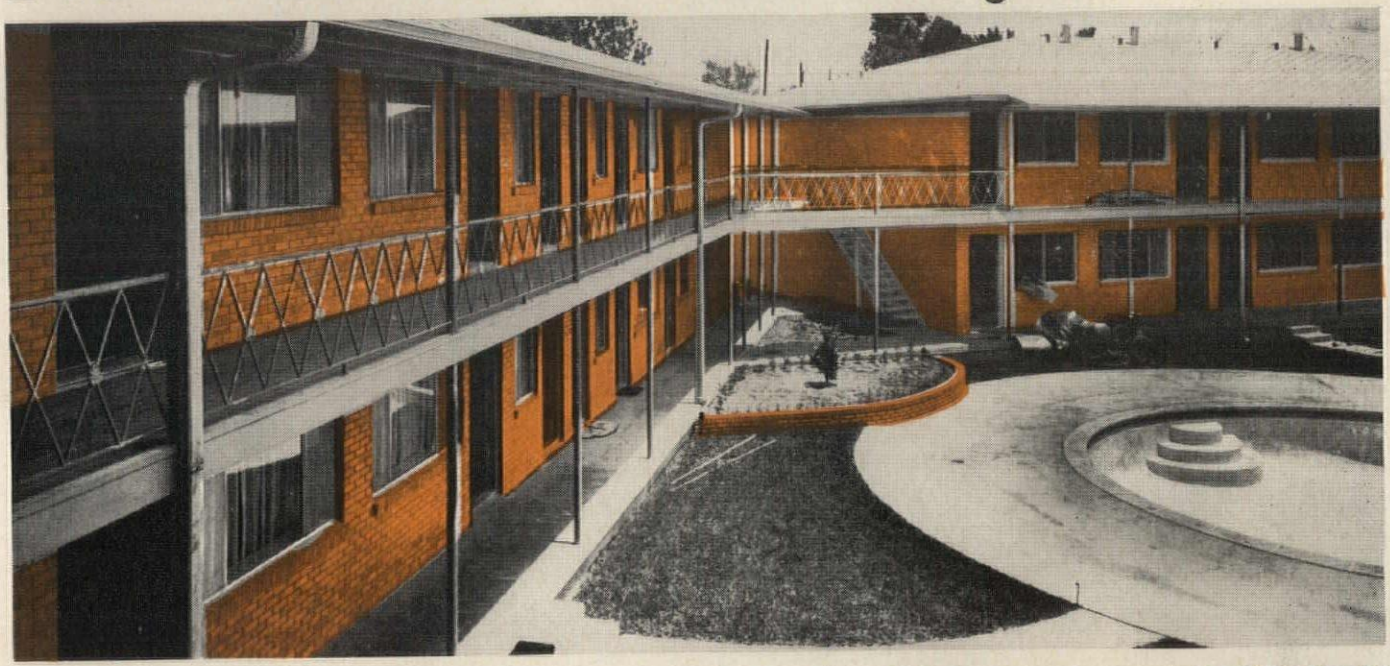
Seaporcel Architectural Porcelain
Gives technical data, details and specifications for porcelain enamel veneer panels and *Seaporclad* insulated-laminated curtain wall panels. *Seaporcel Metals, Inc., 28-20 Borden Ave., Long Island City, N. Y.**

Architectural Formica-Clad Doors
Describes, and gives details and specifications for *Formica*-clad solid core doors. 4 pp. *Architectural Products Mfg. Co., 1046 Murphy St., Shreveport, La.**

**Additional product information in Sweet's Architectural File*

NEWS from Dow Corning

Now: Brick That Stay Clean!



New Factory Applied Treatment "Builds-In" Lasting Beauty



Thanks to a major advance in chemistry, brick can now have built-in cleanliness. The new factory-applied chemical treatment is called Silaneal®, and it assures you of long-lasting beauty in brick. As a bonus benefit, it makes layup easier, too! Silaneal has been evaluated in tests prescribed by the Structural Clay Products Research Foundation, and has been thoroughly field-proven in numerous buildings.

How does Silaneal accomplish so much? By making brick water-repellent. For water is a chief source of staining trouble. Water carries soil, soot, and other dirt into the brick. Also, water leaches salts out of the brick and deposits them on the surface, forming efflorescence. Because Silaneal causes brick to shed water, staining is virtually eliminated. Even the highly decorative light shades of brick keep their original beauty . . . and in all climates. Brick stays clean in storage and after installation.



Silaneal makes brick easier to layup, because it gives brick a controlled, optimum suction rate. As a result, there's seldom any need for wetting the brick before layup. Also, more mortar can be buttered on at a time. And more courses can be laid before striking the joints is necessary. Moreover, clean-up can generally be done by simple brushing . . . the need for acid cleaning is minimized. The whole construction process of layup and clean-up is simplified and speeded.

In summary, Silaneal does great new things for that great old material, brick. Shown are a few of the buildings that have been constructed of brick factory-treated with Silaneal. If you would like more information on this new aid to constructing better brick buildings, or a list of companies supplying brick with Silaneal, write dept. 5905.

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MIDLAND, MICHIGAN

ATLANTA BOSTON CHICAGO CLEVELAND DALLAS LOS ANGELES NEW YORK WASHINGTON, D. C.



BETHLEHEM SLABFORM

cuts concrete forming costs by one-third

At the Cole Steel Equipment Co. warehouse in York, Pa., 87 tons of Slabform were used directly over the Bethlehem structural shapes. Architect: Buchart Associates; general contractor: I. Reindollar & Son, Inc., York.

At Cole Steel Equipment's new warehouse in York, Pa., some 87 tons of Bethlehem Slabform were welded directly to steel beams to support a 4½-in., poured-in-place slab.

By using Slabform in place of the usual forming material over steel beams, it is estimated that forming costs were cut by one-third. Here's why:

1. Slabform covered the floor area quicker, at less labor cost.
2. Slabform is a permanent form, saving the entire cost of stripping.

The fasteners used with Slabform project into the slab and effectively tie the slab to the steel beams—helping to insure composite action.

Reinforcing bar high chairs, specially designed for use with Slabform, are available.

Slabform Ideal as a Concrete Form

Bethlehem Slabform is a high-strength, formed steel sheet which is used both as a permanent steel form for poured concrete, and in roofs as the permanent supporting member for lightweight insulating concrete fills. In the latter case Slabform is always used galvanized. When used as a form only, Slabform is generally furnished black (uncoated) for reasons of economy.

Longitudinal Ribs for Strength

Bethlehem Slabform is manufactured from steel having a yield point over 90,000 psi. Longitudinal ribs give it exceptional strength.

Three Weights and Patterns

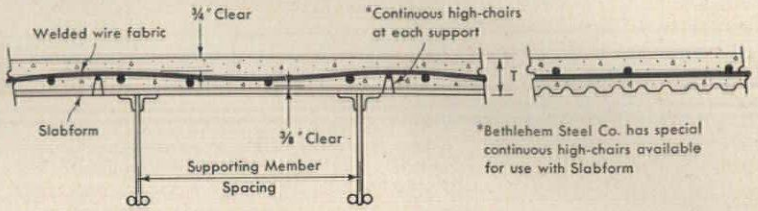
Slabform is available in three weights and patterns—Standard, Heavy-Duty and Extra Heavy-Duty—to satisfy the requirements of various spans and loads.

All three weights are available in black (uncoated) and galvanized finish.

Design load capacities, suggested specifications, and other information appear in Sweet's Architectural File. The nearest Bethlehem sales office would be glad to send you our Slabform folder, or talk with you about your job. No obligation, of course.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
Export Distributor: Bethlehem Steel Export Corporation

The table shows the load capacities for structural reinforced concrete slabs over Slabform. It shows various depth slabs reinforced with minimum welded wire fabric as required by code. This table also shows the type of Slabform recommended as a form.



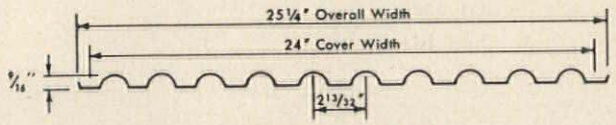
*Bethlehem Steel Co. has special continuous high-chairs available for use with Slabform

LOAD CAPACITIES OF STRUCTURAL REINFORCED CONCRETE SLABS

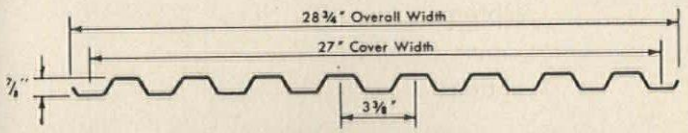
(INCLUDING REQUIRED TYPE OF SLABFORM)

Slab Thickness (Inches)	Slab Weight (Lb/Ft²)	Slab Reinf. (Welded Wire Fabric)	LOADS IN LB PER SQ FT FOR SPANS SHOWN											
			1'-6	2'-0	2'-6	3'-0	3'-6	4'-0	4'-6	5'-0	5'-6	6'-0	6'-6	7'-0
2½	27	6 x 6—10/10	366	194	114									
2½	27	6 x 6—6/6				169	117	83						
3	32	6 x 6—10/10		279	167									
3	32	6 x 6—5/5				287	181	131						
3½	36	6 x 6—4/4					300	221	167	128	85	66	51	39
4	42	6 x 6—4/4						277	209	146	113	88	68	53
4½	48	4 x 4—6/6							279	199	156	123	98	78
5	52	4 x 4—4/4								348	278	225	185	
TYPE OF SLABFORM			STANDARD				HEAVY-DUTY			EXTRA HEAVY-DUTY				

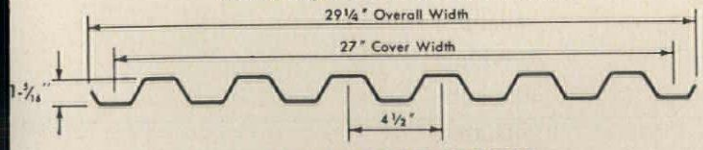
NOTES:
1. Above table gives superimposed loads which various depth slabs will carry when reinforced as shown. The type of black (uncoated) Slabform to be used is also shown. When galvanized material is used add the slab weight to capacities shown to determine allowable superimposed loads. This is based on the galvanized material carrying the dead weight of the concrete. Loads shown are for interior spans only.
2. The recommended Slabform shown in each instance will not deflect more than 1/240 span under weight of concrete only.
3. Superimposed loads were determined as follows:
   a. Bending moment $\frac{WL^2}{12}$; fc = 2500 psi, fs (welded fabric) = 28,000 psi (50% min. yield point per ACI 306(b)).
   b. Reinforcing for 2½ in. and 3 in. slabs on spans up to 30 in. based on minimum allowable for temperature reinforcing per Steel Joist Institute "Code of Standard Practice" Section 3.7.
   c. Reinforcing for 3½ in. and deeper slabs based on minimum allowable reinforcing per ACI building code 702(e) 2.
   d. Effective slab depths determined as follows:
      Standard Slabform d = T—1.28
      Heavy-Duty Slabform d = T—1.44
      Extra Heavy-Duty Slabform d = T—1.65
   e. For end spans reduce capacities shown in table by 16%.
   f. For simple spans reduce capacities shown in table by 33%.



STANDARD SLABFORM
Standard Lengths: 6'-3", 8'-3", 10'-3" and 12'-3".

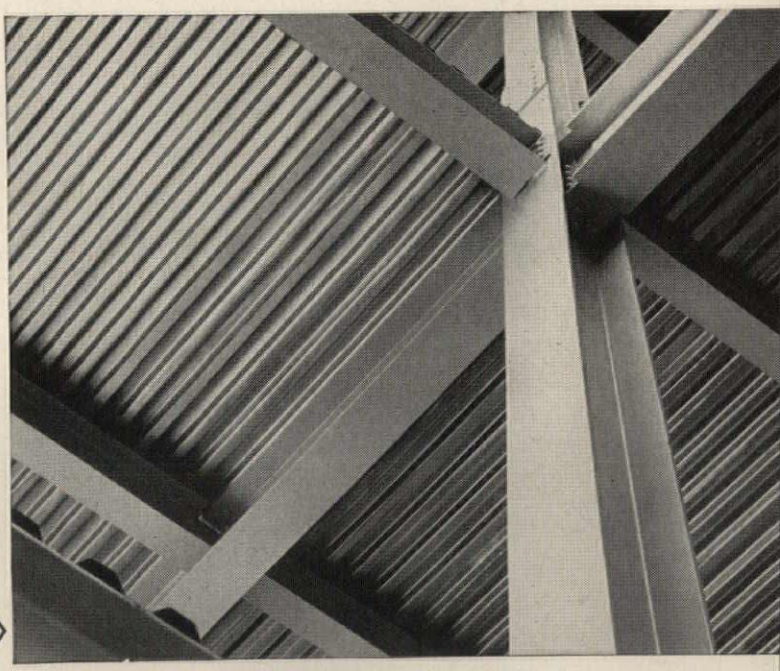


HEAVY-DUTY SLABFORM
Standard Lengths: 6'-0" to 18'-6" in 6" Increments.



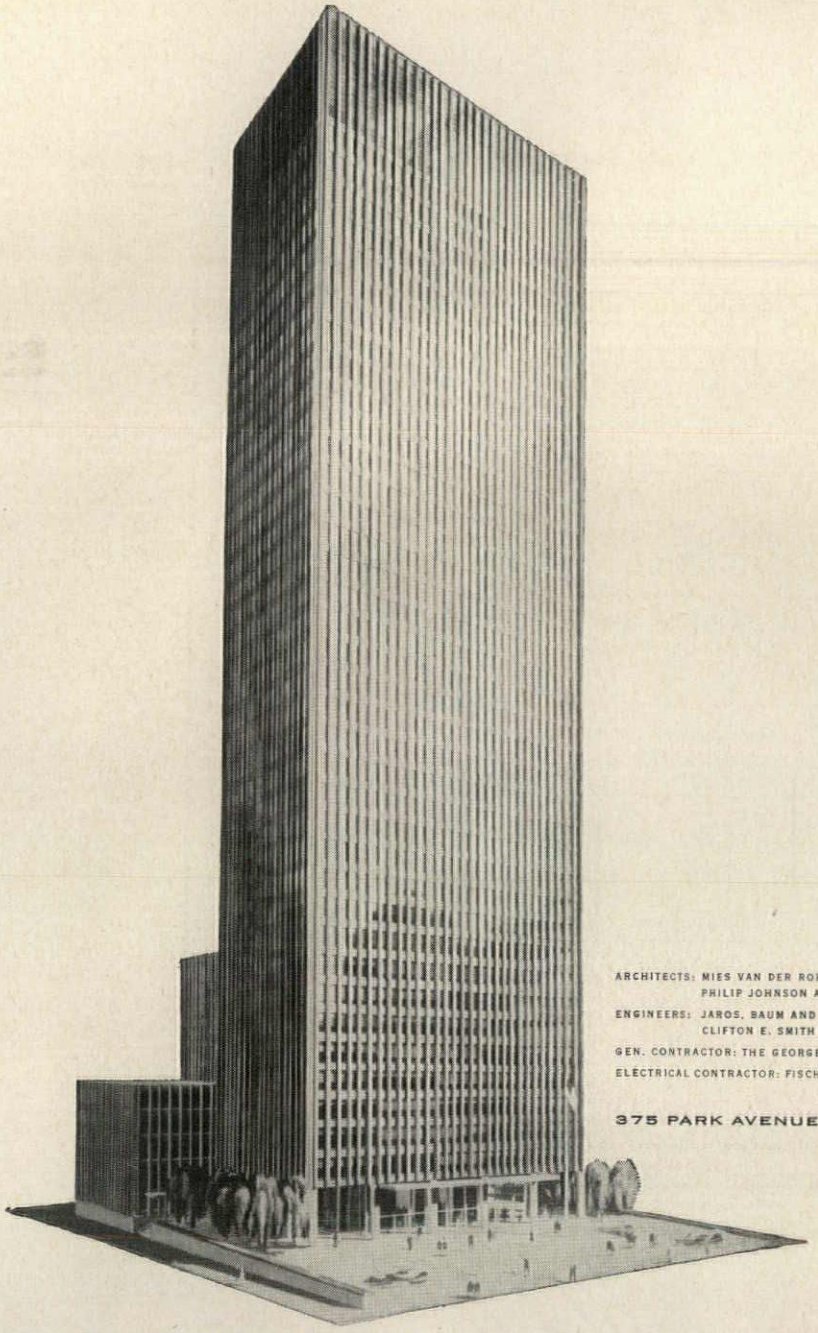
EXTRA HEAVY-DUTY SLABFORM
Standard Lengths: 6'-0" to 21'-6" in 6" Increments.

NOTE: ALL DIMENSIONS NOMINAL



After installation, the appearance from below is neat and clean

BETHLEHEM STEEL



ARCHITECTS: MIES VAN DER ROHE
PHILIP JOHNSON AND ASSOCIATES
ENGINEERS: JAROS, BAUM AND BOLLES
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Orangeburg Manufacturing Co., Division of The FLINTKOTE *Company, Manufacturer's of America's Broadest Line of Building Products*

The Record Reports

On the Calendar

May

1-3 Chicago Electrical Industry Trade Show and Exposition—Lake Front Exposition Hall, Chicago

1-4 Annual Meeting, Air-Conditioning and Refrigeration Institute—The Homestead, Hot Springs, Va.

1-4 48th Annual Meeting, Chamber of Commerce of the United States—Washington

1-7 Congress on Better Living, sponsored by *McCall's* magazine—Washington

2-7 Fourth Annual Meeting, Executive Committee and Board of Directors, Consulting Engineers Council—Gearhart Hotel, Gearhart, Ore.

9-12 Second Instrument-Automation Conference and Exhibit of 1960, sponsored by Instrument Society of America—Civic Auditorium and Brooks Hall, San Francisco

11-16 World Design Conference in Japan (followed by tours, 18-20); theme, "Our Century: The Total Image"—Tokyo

12-14 South Atlantic A.I.A. Regional Conference—Winston-Salem, N. C.

15-20 29th Annual National Conference, American Institute of Decorators—Beverly Hilton Hotel, Beverly Hills, Calif.

16-20 Annual Meeting, National Fire Protection Association—Queen Elizabeth Hotel, Montreal

19-21 Annual Meeting, Refrigeration Research Foundation—Denver

22-27 41st International Conference and Exposition, National Office Management Association—Queen Elizabeth Hotel and Show Mart, Montreal

23-26 Design Engineering Show and Conference—The Coliseum, New York

28 25th World Planning and Housing Conference—San Juan, Puerto Rico; till June 3

June

1-4 Annual Assembly, Royal Architectural Institute of Can-

continued on page 312

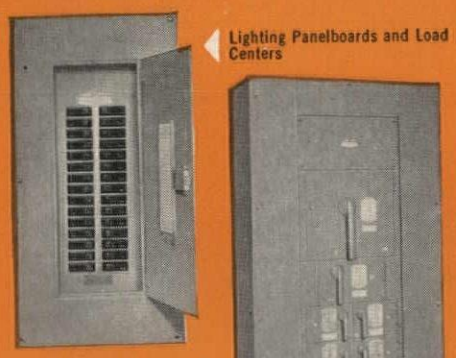
Q. Who has the right answers to every power control and distribution problem?

A. Easy!

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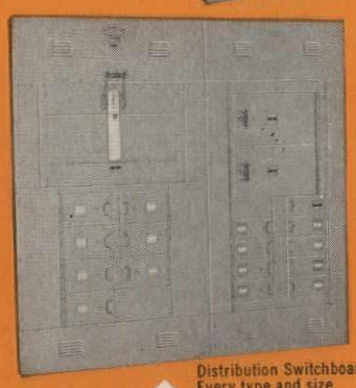


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The Union Pacific Railroad freight station, Kansas City, Kansas, uses a total of 76 "OVERHEAD DOORS" in a vast unloading system that can handle up to 96 freight cars at the same time.

Freight trains are unloaded inside the building with small hand carts. These are carried by conveyor to the proper "OVERHEAD DOOR" for reloading merchandise into trucks.

"OVERHEAD DOOR" opens a new door to traffic control

Doors channel traffic—speed movement of people, vehicles, materials

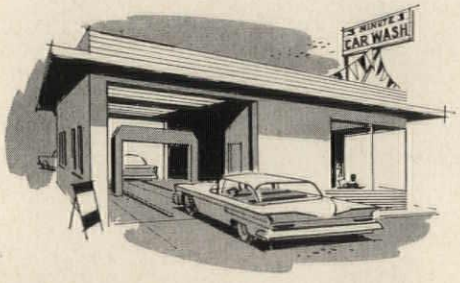
"OVERHEAD DOORS," as movable walls, give you new flexibility in designing traffic control. By *creating new outlets,* they can speed traffic through dead ends. By *opening more outlets,* they can prevent pile-ups, distribute the main flow of traffic through several openings. By *providing a selection of outlets,* they can divert the flow of traffic in a desired direction. For an unlimited variety of applications, they offer a simple, low-cost solution to more efficient movement of people, vehicles, materials.

The flexible Union Pacific Railroad freight station, shown at left, is just one example. Two banks of 38 doors serve to *sort* goods being moved from railroad cars to waiting trucks. The railroad cars enter bays inside the building and are quickly unloaded with the use of small hand trucks, which are carried by a conveyor to the proper door. This ingenious system can handle as many as 96 freight cars at once.

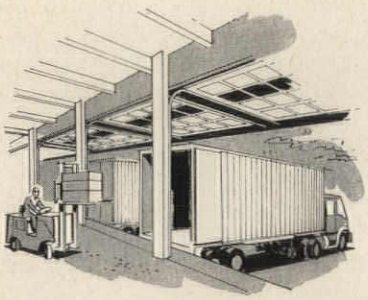
Many other new ideas in traffic control have been developed and tested by Overhead Door Corporation engineers—ideas that result from this company's 39 years of experience in the garage door field.

Get detailed information from your local distributor (see "OVERHEAD DOOR" in the white pages) for an application you may now be planning, or write to Overhead Door Corporation, *General Office:* Hartford City, Indiana—*Manufacturing Distributors:* Cortland, N.Y.; Hillside, N.J.; Lewistown, Pa.; Nashua, N.H.—*Manufacturing Divisions:* Dallas, Tex., Portland, Ore. —*In Canada:* Oakville, Ontario.

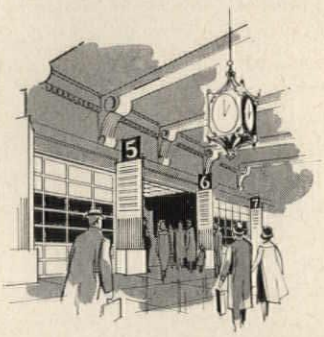
To solve many traffic control problems—



Drive-through—"OVERHEAD DOORS" front and rear (or front and sides) are frequently used by auto service centers, garages, car wash businesses and delivery companies to allow cars and trucks to *drive through* and avoid interruption of incoming and outgoing traffic.



Reverse opening—"OVERHEAD DOORS" that open outward, rather than inward, follow the contour of outside wall and canopy. Their reverse opening provides needed head-room for fork-lift trucks and similar equipment used inside to speed materials handling.

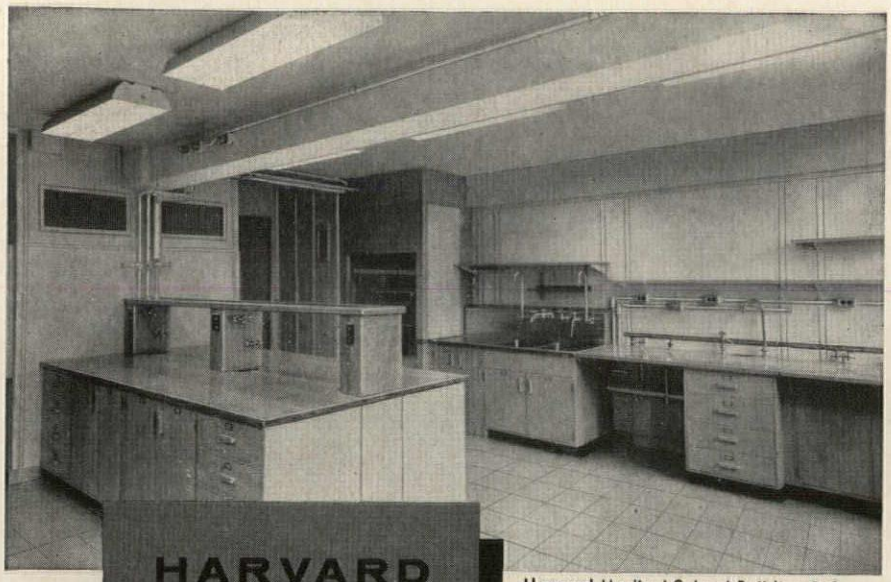


Directional control—"OVERHEAD DOORS" offer a simple, low-cost way to direct the flow of people. A typical application is a railroad passenger station using automatically operated "OVERHEAD DOORS" to open and close gates of loading passenger trains.

THE "OVERHEAD DOOR"
TRADE MARK

the original upward-acting, sectional door . . . made only by

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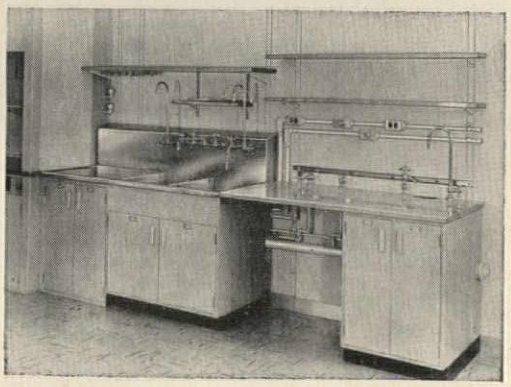
Designed to meet tomorrow's needs in medical research, the brilliant new laboratories, offices and special use areas at Harvard Medical School in Boston comprise the ultimate in modern functional construction.

This spacious facility is built to keep pace with advancing procedures and equipment in the field of medicine. In keeping with the desire for flexibility, the Administration, Superintendent of Buildings and Grounds, and Architects selected Power-Strut Movable Walls.

Over 80,000 feet of this completely flexible movable wall system has been efficiently and economically installed throughout the entire building . . . another outstanding example of the superior flexibility of Power-Strut Movable Walls to building for research.

If you would like to learn how Power-Strut can help you solve the problems of low cost space division in your next laboratory, plant or school project, write *today* for Brochure No. 580.

Power-Strut Movable Walls allow convenient attachment and support of water, gas and steam pipes, compressed air lines, electric outlets, air duct louvres, electrical control panels, shelving, benches, cabinets, sinks and any other type of laboratory equipment. Versatile Power-Strut channels and component clamping units provide economical overhead support for piping and attachments, too.



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VAN HUFFEL PRODUCTS, INC.
WARREN • OHIO

The Record Reports

ada—Fort Garry Hotel, Winnipeg

8-11 Annual Meeting, National Society of Professional Engineers—Statler Hotel, Boston

9-11 Annual meeting, New Jersey Society of Architects, New Jersey Chapter, American Institute of Architects—Berkeley-Carteret Hotel, Asbury Park, N. J.

12-24 Fourth Annual Seminar for teachers of architecture, jointly sponsored by the American Institute of Architects and the Association of Collegiate Schools of Architecture; theme: Technology in Architecture—Sagamore Lake, N. Y.

13-15 Annual Meeting, American Society of Heating, Refrigerating and Air-Conditioning Engineers—Royal York Hotel, Vancouver

13-15 Annual Meeting, American Association of Cost Engineers—Rice Hotel, Houston

15-18 British Architects' Conference for 1960—Manchester, England

19-22 Annual Convention, National Parking Association—San Francisco

19-25 National Convention (second of three in 1960), American Society of Civil Engineers—Reno

25ff First International Congress for Automatic Control; through July 5—Moscow, U.S.S.R.

27-29 61st Annual Meeting, American Society of Landscape Architects—Waldorf-Astoria Hotel, New York

July

11-18 Second World Conference on Earthquake Engineering—Tokyo and Kyoto

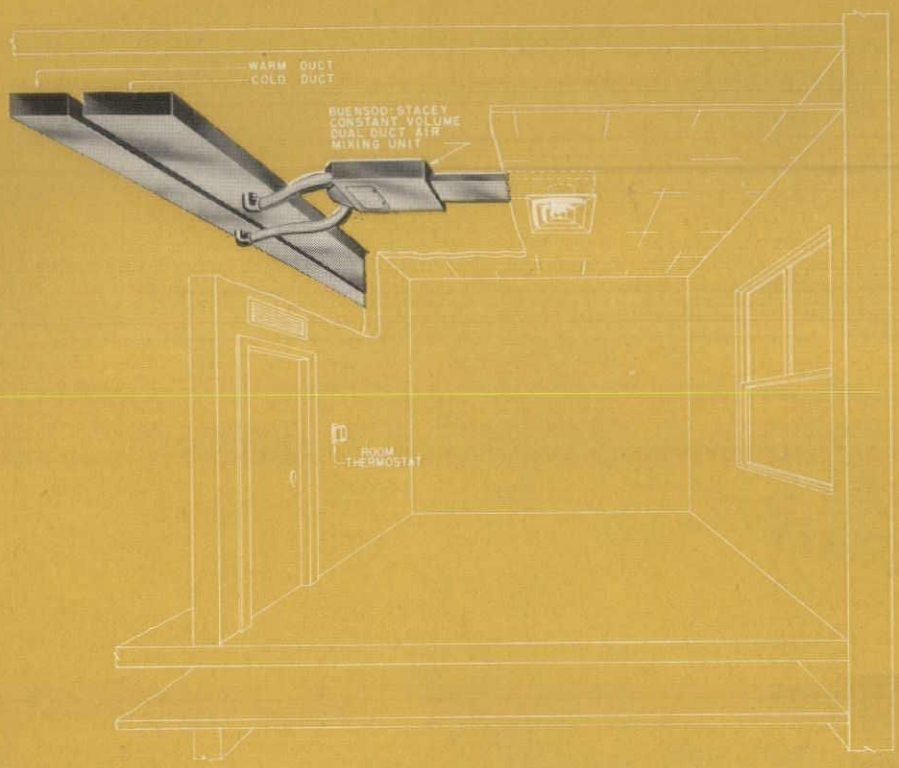
18-29 22nd Annual Special Summer Program, City and Regional Planning—Massachusetts Institute of Technology, Cambridge, Mass.

Office Notes

Offices Opened

Ralph T. Rowland and Gordon B. Griswold have announced their part-

continued on page 320



HIGH VELOCITY DUAL DUCT SYSTEM

THE LOGIC OF DUAL-DUCT DESIGN

. . . simplicity, adaptability, flexibility

The best solution to a problem is always the simplest solution. For example — the problem of maintaining selective, zoned comfort control in office buildings, hospitals, hotels, schools, apartment houses and other modern structures. In most cases, the best solution is the High Velocity Dual-Duct method, pioneered and developed by Buensod-Stacey. This one system heats, cools and provides proper humidification all year-'round. It is easily adaptable to your architectural design problems and, after installation, is extremely simple and economical to operate. The system's inherent flexibility readily handles changing zone requirements.

So for your next project, whether it's a new or renovated structure, plan on Dual-Duct, because Buensod developed it. If you'd like more information we've prepared an illustrated "Architects' Guide to Dual-Duct Air Conditioning." It's yours for the asking.

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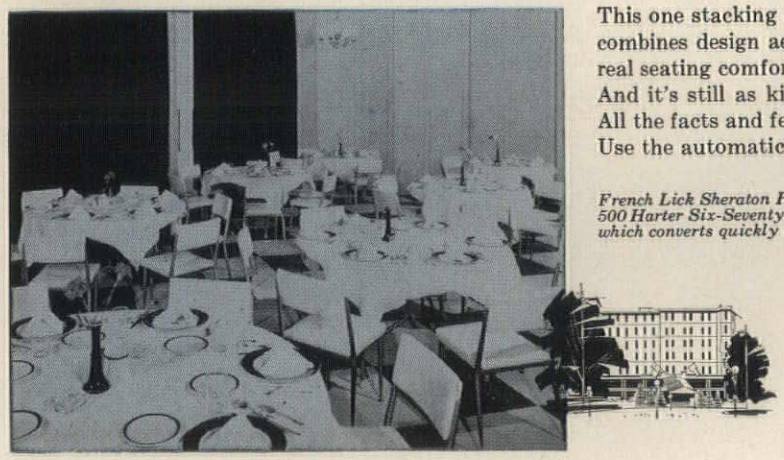


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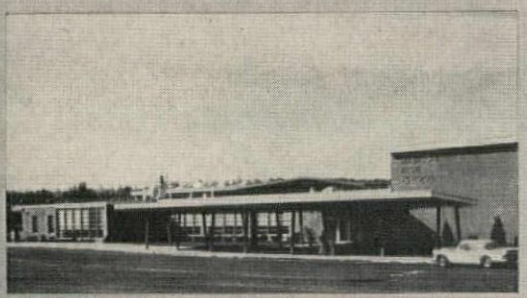
The installation of the Burgess-Manning Radiant Heating and Acoustical Ceiling at Madison High School, New Jersey, provides a dramatic demonstration of the "Six Points of Superiority" that distinguish this highly efficient comfort conditioning system.

Because it utilizes radiant energy from the ceiling that is converted into heat only when it strikes a solid object, there are no convection currents in the air.

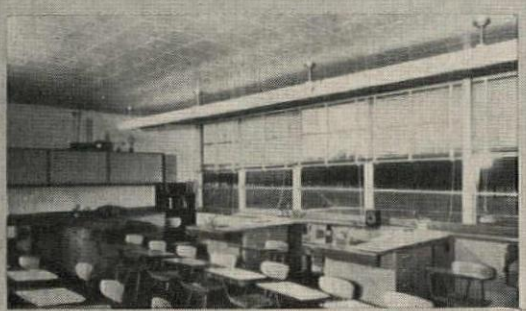
The results, according to Supt. David S. McLean, is a "pleasant and uniform type of heat which warms the room without objectionable drafts or cold spots."

"The absence of conventional under window heating units," reports Architect Frank E. Johnson, who, with Lawrence Licht of Englewood, N. J., designed the school, "opens up the classrooms and has at last liberated the school designer to make more effective and intelligent use of precious space."

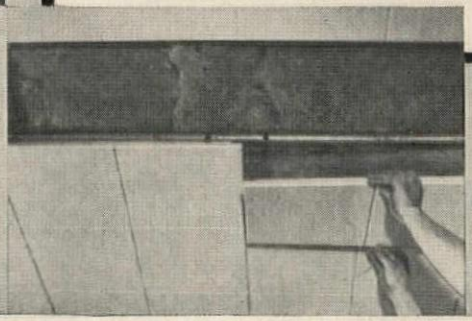
For complete, fully descriptive information about this unique and high efficient comfort conditioning system and its many advantages, write for a copy of "The Story of the Burgess-Manning Ceiling."



Modern building of the Madison High School, Madison, New Jersey.



Laboratory class room, representative of all class rooms of Madison High School. Burgess-Manning Ceiling eliminates all floor and wall convectors—100% floor space usable.



Aluminum panels of Burgess-Manning Heating, Cooling and Acoustical Ceiling, removed to show hot water coil and acoustic blanket.

3 Heating Cooling Acoustical

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*PAT. PEND.

nership in a firm to be known as Rowland and Griswold, Architects, 5 Ives Street, Hamden, Conn.

Marinas Unlimited is the new firm formed by Joseph E. Biro, engineer, and W. A. Tydeman, Jr., architect. They are located at 832 West Lafayette Street, Easton, Penn.

J. D. Dunaj, architect, has opened an office at 6257 Arches Avenue, Chicago 38.

Firm Changes

Robert W. Hegardt, A.I.A., has recently joined the New York firm of Ballard, Todd & Snibbe.

Albert Kahn Associated Architects & Engineers has appointed R. M. Doering as Chief Power Plant Engineer.

A. Whitney Murphy has been elected a partner in the architectural firm of Perkins & Will.

M. Tony Sherman & Associates announce that J. Samuel Garrison has joined their architectural firm as business administrator.

New Addresses

Victor Gruen Associates announces the transfer of their midwestern office from Detroit to Chicago: 222 North Michigan Avenue, Chicago 1.

Evans Woolen, Architect, is now located at 604 Ft. Wayne Avenue, Indianapolis 4.

Walker, McGough, Trogdon, Architects, have moved their office to North Nine Post Street, Spokane 1.

Rosengarten & Kraemer are now located at 1321 Arch Street, Philadelphia 7.

The New York Office of Tito Di Vincenzo, A.I.A., is now 136 East 57th Street, New York 22.

Wiggs, Lawton & Walker, Architects, have moved to a new address at 3285 Cavendish Blvd., Suite 490, Montreal 28, Quebec.

Herbert H. Warman, A.I.A., announces the removal of his office to the Chamber of Commerce Building, Suite 409, 39-01 Main Street, Flushing 54, N. Y.

George E. Stewart, Architect, has moved his office to 110 Genesee Street, Auburn, N. Y.

Krokyn & Krokyn are now located at 184 Boylston Street, Boston 16.

Bertram S. Warshaw has relocated his office for structural and civil engineering to 255 University Drive, Coral Gables, Fla.

Ted Arthur Homa, A.I.A., has removed his office to 25 West 43rd Street, New York 36.

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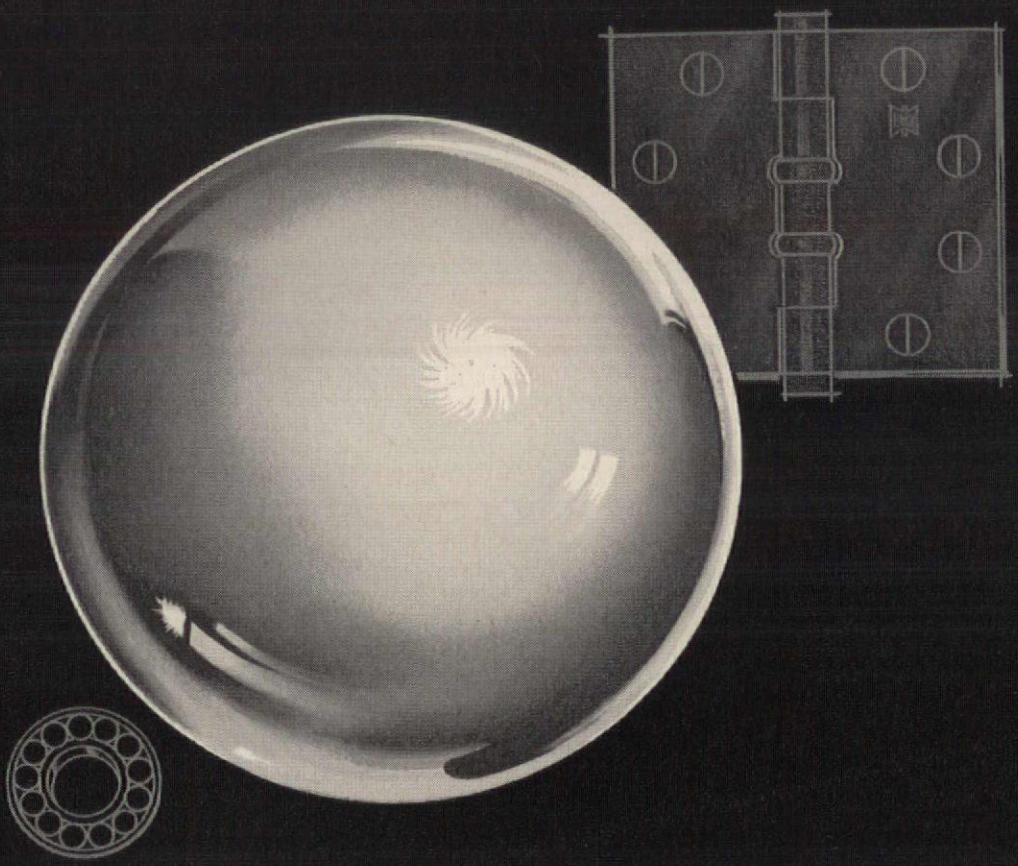
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Iron and Steel Plants Plan More Building in 1960

The nation's iron and steel plants are planning to spend $1.6 billion on new equipment and construction during 1960. This would bring to approximately $14 billion the total amount spent on new production facilities since World War II.

The Iron and Steel Institute said this would be the second highest post-war expenditure, the industry having spent nearly $1723 million on enlarging its capacity in 1957. Last year, the companies spent $961 million.



26*-Jeweled movement

All 26 *Keep Rolling Forever*—not Part of the Time—in a Hager *"Life-Time Bearing"* Butt Hinge!

The bearings *stay there* for *life!* Upper and lower raceways ride *forever*—on the *full count* of ball *bearings*—in a Hager *Life-Time Bearing* Butt Hinge!

Tough case-hardened steel ball bearing raceways are press-fitted into direct contact with knuckle on Hager ball bearing butt hinges.

No soft brass retaining jacket (or crimped shell) lies between the knuckle and the raceway . . . nothing to eventually wear away and allow the bearings to slip out.

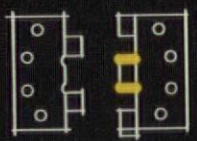
Both raceways and *all* 26 ball bearings are hard at work in Hager Ball Bearing Butt Hinges—in fine jeweled movement—forever providing life-time trouble-free silent door operation.

You'd expect finer performance from *Hager* Ball Bearing Butt Hinges, naturally—and naturally, you have a right to!

If it's expected to *stay* for *life*, then, of course

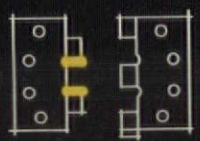
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*26 Balls in 4½" x 4½" 2-bearing Butt Hinges



NOT THIS . . .

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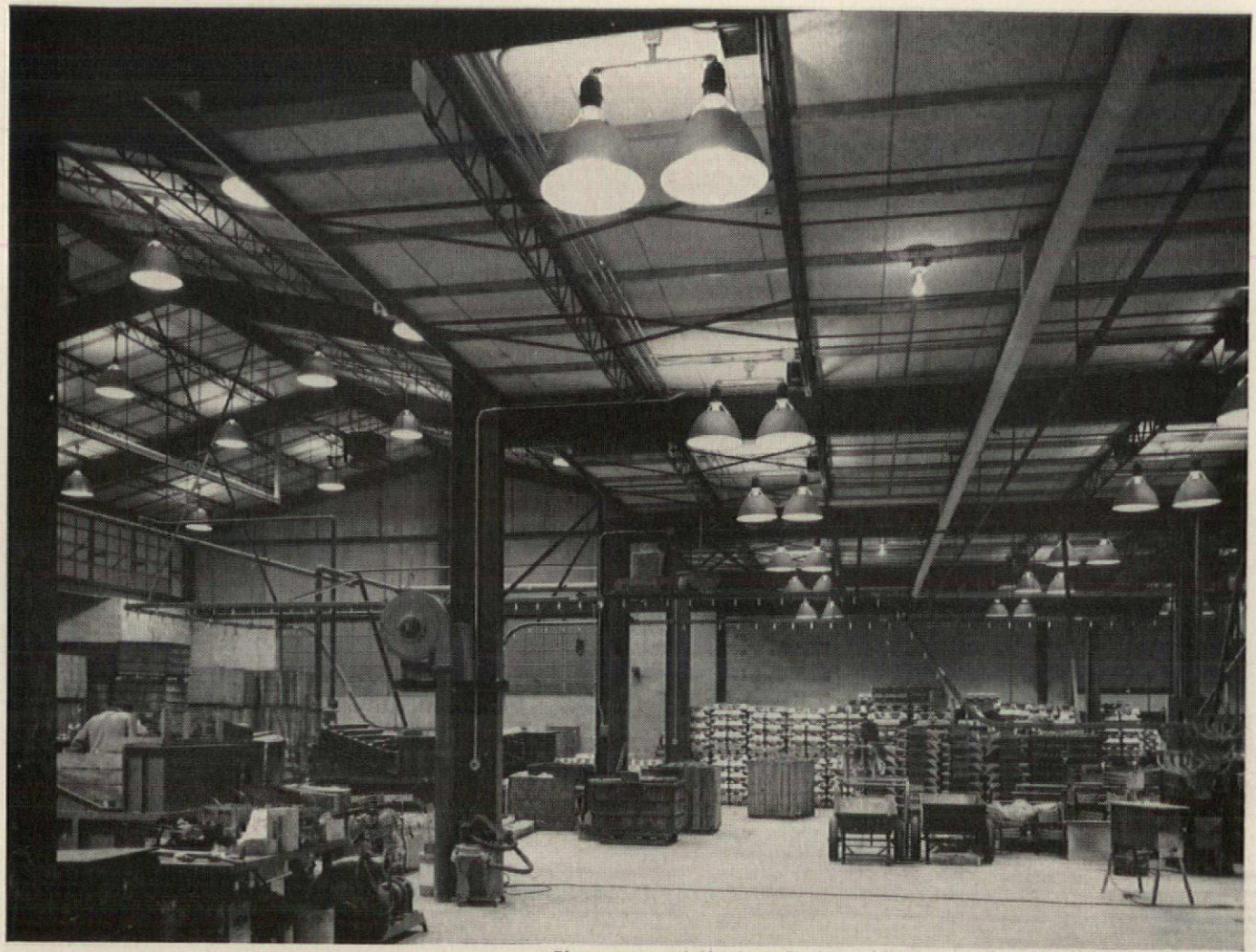


Photo courtesy of Aluminum Casting and Engineering Company, Milwaukee, Wisconsin

225 footcandles!



INSTALLATION DATA

Low bay—Twin-mounted Abolite HMFAU-1800 fixtures with 400 watt color-improved mercury lamps. Mounting height 14', with 13' x 12' spacing. Average footcandle level: 225.

High bay—Abolite HMFAU-2400 fixtures with 1000 watt color-improved mercury lamps. Mounting height 24½', with 13' x 12' spacing. Average footcandle level: 180.

Consulting Engineer:
Trester Engineering Co.

Electrical Contractor:
Bentley-Jost Electric Corp.

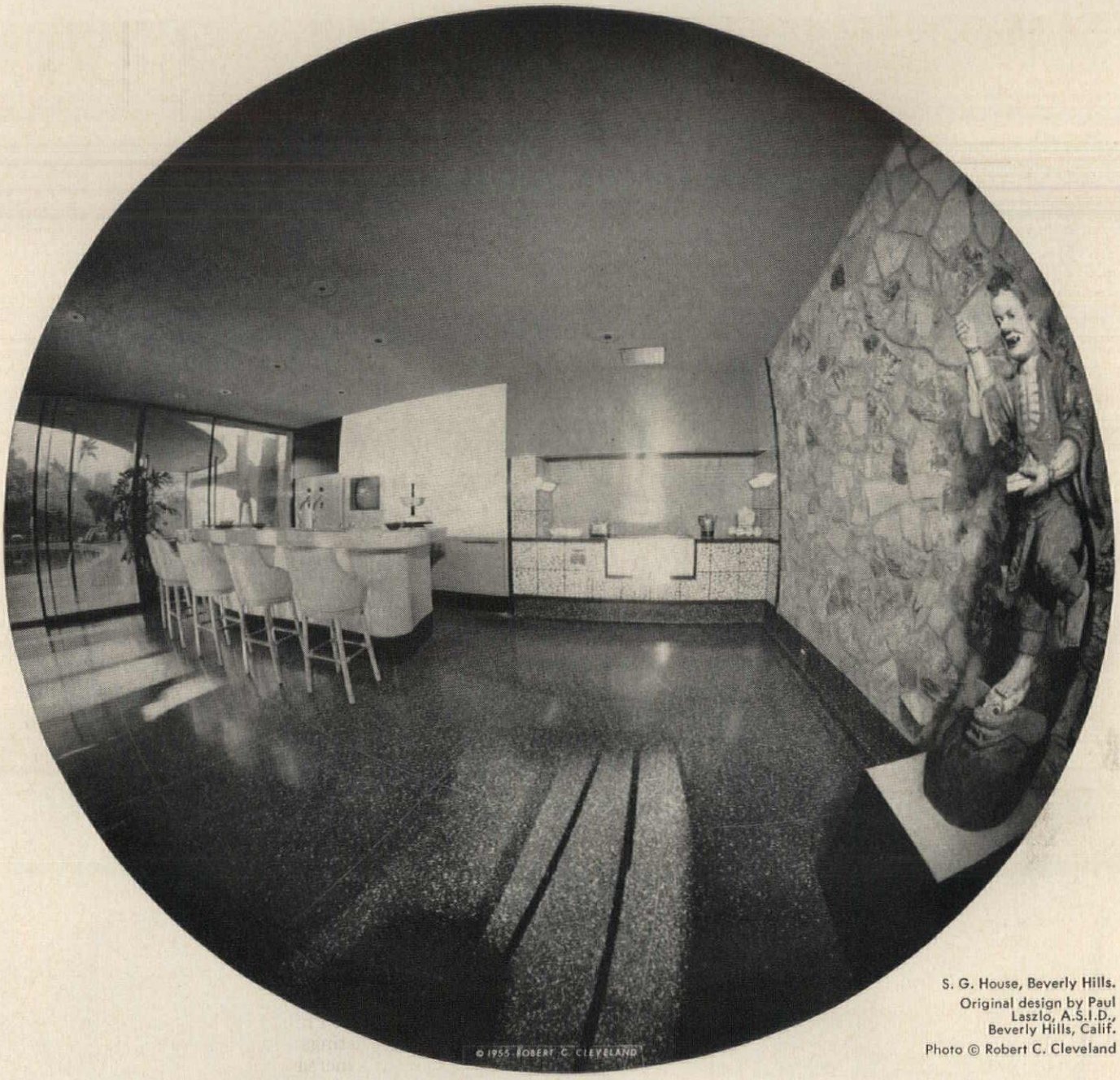
Abolite lifts the lighting level—This company makes intricate aluminum permanent mold castings. They wanted a higher level of lighting in their foundry to increase worker efficiency. They got it using Abolite fixtures in what some lighting engineers call the most outstanding mercury lighting installation in the country.

In the low-bay area, there's an average footcandle level of 225, yet there's no glare—both vertical and horizontal surfaces are lighted evenly without any deep shadows. The Abolite fixtures give 35° shielding to lamp, direct 18% of light upward through open top to wash out deep ceiling shadows.

Most important, this system costs less than a comparable fluorescent system because fewer fixtures are needed. Maintenance costs are less, too, because the chimney effect of Abolite's open-top design prevents dirt from collecting on lamp and reflector surfaces. Why not try this system with Abolite fixtures on your next job? For full information, write *Abolite Lighting Division, The Jones Metal Products Company, West Lafayette, Ohio.*

ABOLITE *Lighting*

THE JONES METAL PRODUCTS COMPANY
West Lafayette, Ohio



S. G. House, Beverly Hills.
Original design by Paul Laszlo, A.S.I.D., Beverly Hills, Calif.
Photo © Robert C. Cleveland

for modern perspectives:

Timeless Terrazzo

Terrazzo allows free play to the imagination, permits architects to create effectively, builders to construct enduringly, owners to use relentlessly.

Marble-hard and concrete-durable, Terrazzo lasts as long as the building it serves. Installations in publicly used areas are still in excellent condition after more than 25 years service and the tread of about 400,000,000 feet. Economical maintenance is assured. The smooth, jointless surface consisting of marble (70% or more); and Portland cement (30% or less) offers no place for wear or abrasion to start. Since only wet cleaning is required and refinishing and buffing are eliminated, savings of at least 20c per sq. ft. per year in cleaning cost can be realized.

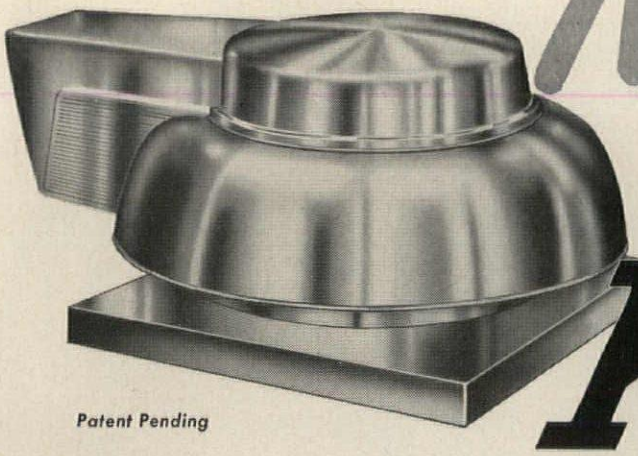
A perfect vehicle for the contemporary lanai illustrated, Terrazzo is equally appropriate in traditional settings—for walls, stairs, wainscots and floors, in virtually any combination of color and design. For detailed information write the Association.

Catalogued in Sweet's. AIA kit sent upon request. National field service association representatives available for consultation.

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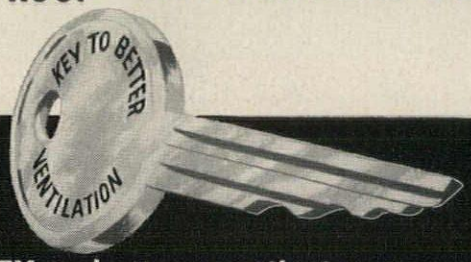


Patent Pending

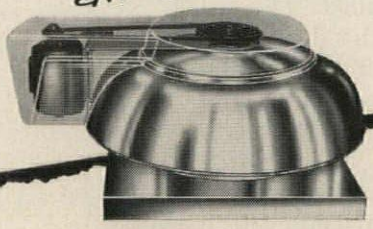
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- 70 models in a capacity range from 725 to 27,000 cfm.

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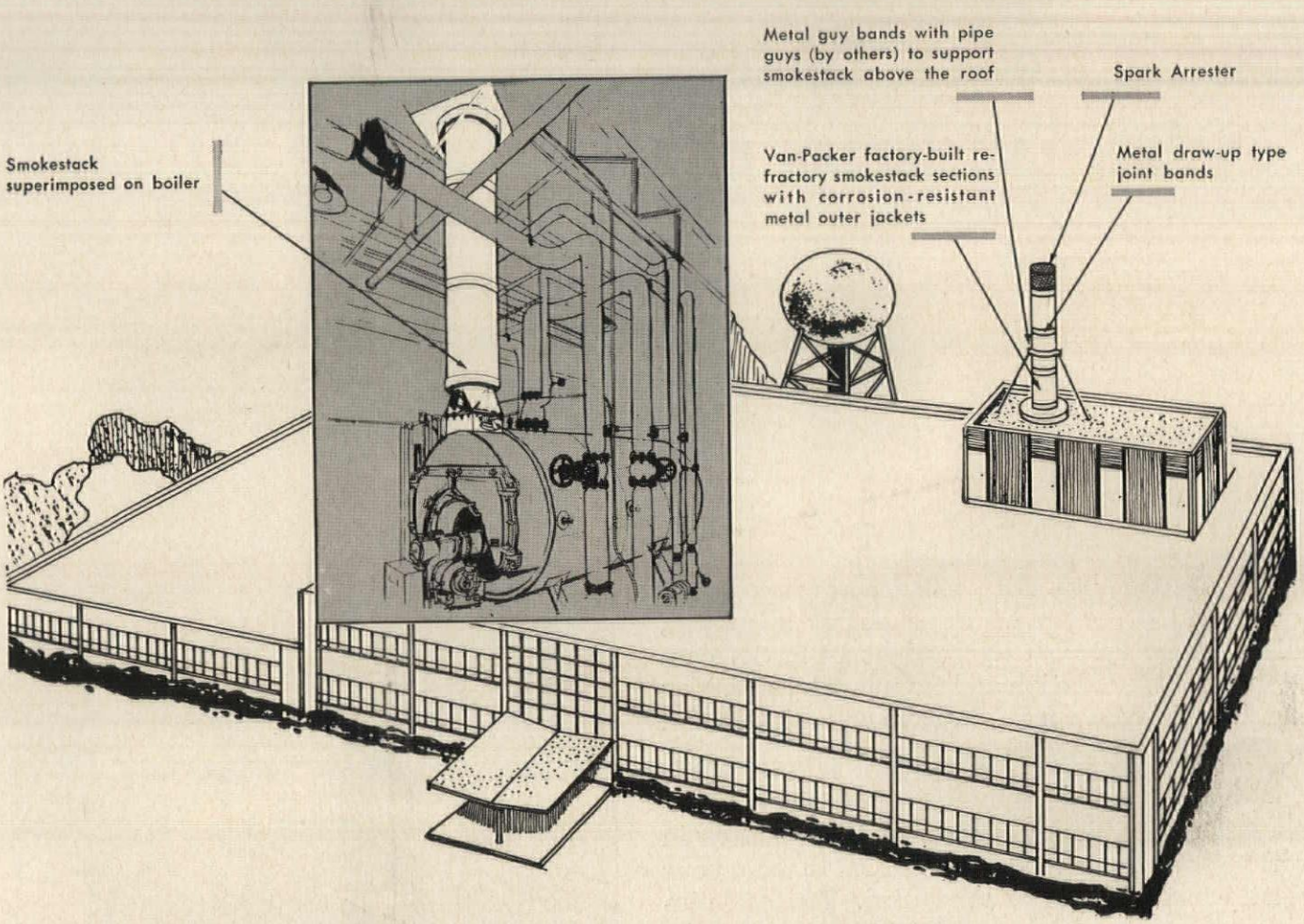
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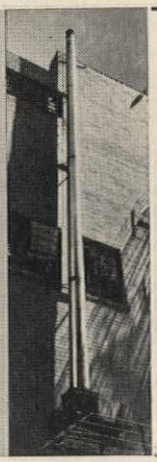
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Please send Bulletin IS-40 containing complete information and engineering data on Van-Packer Smokestacks.

My name _____

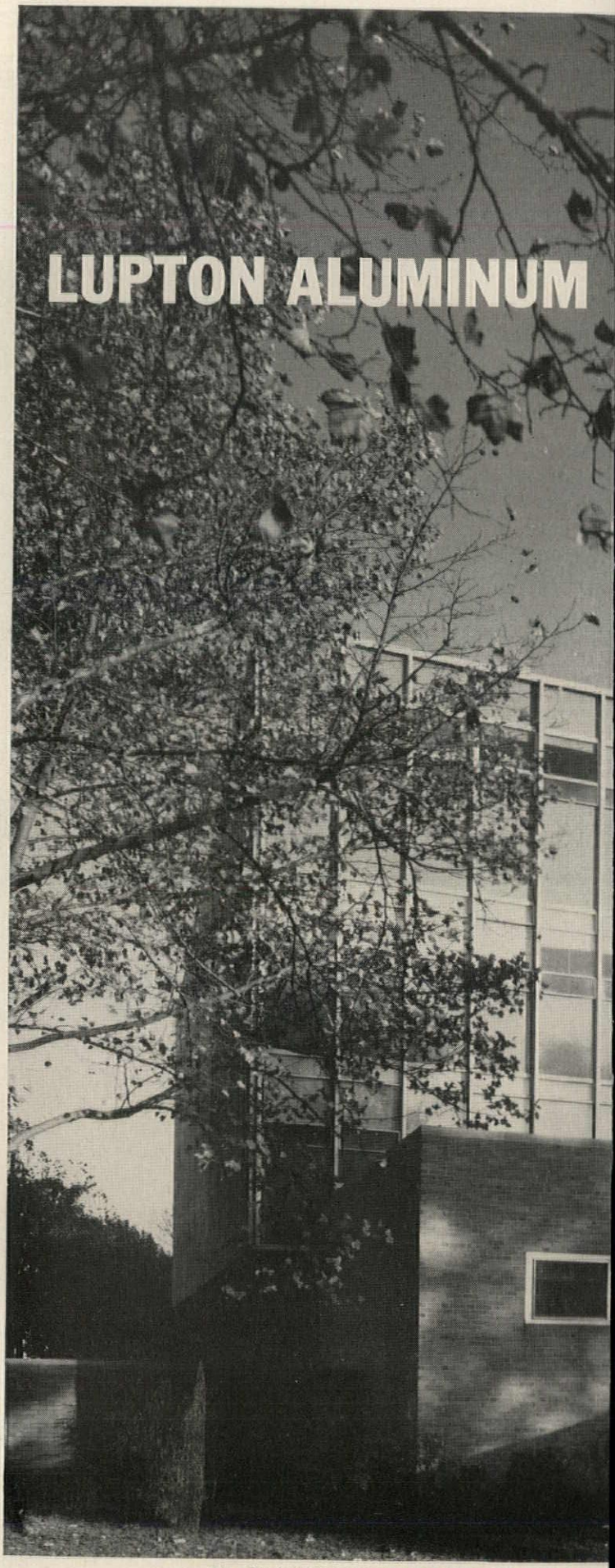
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The next time you're in Philadelphia take a good look at the

Einstein Medical Center ... another installation with



The Einstein Medical Center (Northern Division),

Take a good look at the clean, simple lines of this striking monument to modern-day medicine. Notice how beautifully everything fits—the synthesis of approximately 11,400 sq. ft. of LUPTON Type "H" curtain-wall units, 549 LUPTON "Master" projected aluminum windows, and 732 LUPTON double-hung aluminum windows with the overall architectural concept of the building.

Functionally, LUPTON aluminum construction is consistently economical. All parts are accurately prefabricated and delivered on schedule for simplified, routinized assembly. And lightweight LUPTON construction lowers foundation and framework costs. You get more usable floor space . . . save on maintenance.

Most advantageous of all, though, is LUPTON's dependability. As proven in hundreds of jobs—including the largest aluminum curtain-wall installation in the world—you can depend on LUPTON to meet your specifications, to deliver as scheduled. You can pinpoint responsibility, because LUPTON can do the whole job—even install!

See SWEET'S (Sections 3 and 17) for the Michael Flynn Aluminum Curtain Wall and Window catalogs, and write for further specific information. Inquire about LUPTON Comfort-Conditioning*—the new curtain-wall system that cools, heats, and ventilates. A call to the nearest LUPTON representative (see the Yellow Pages under "Windows—Metal") will bring fast action without obligation.

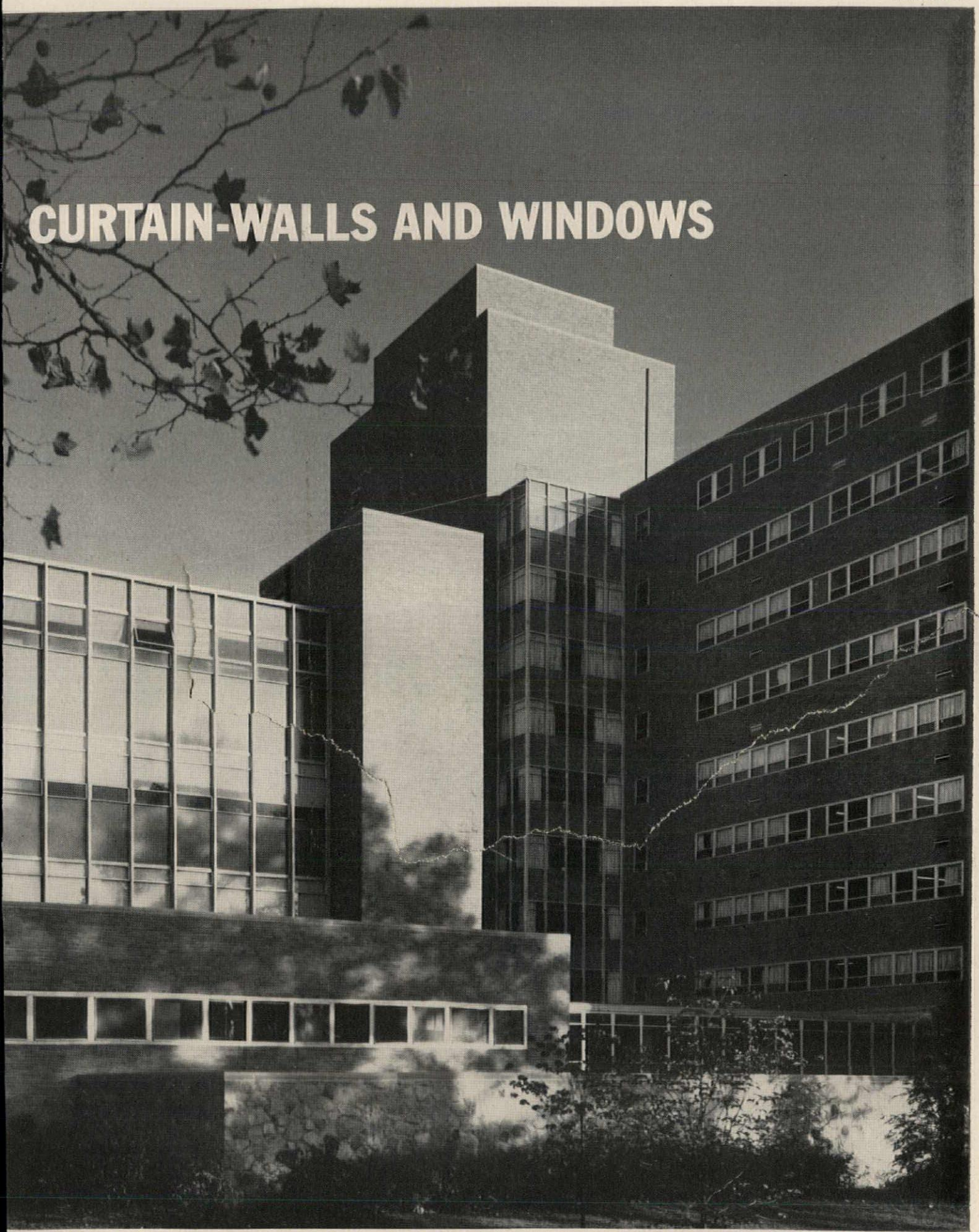
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CURTAIN-WALLS AND WINDOWS



Broad Street and Tabor Road, Philadelphia, Pa. Architect: Abraham Levy, Philadelphia. Contractor: James McGraw Co., Philadelphia.

Washington Topics

continued from page 56

Sweeping Changes Proposed in Architectural Education

Robert F. Hastings, executive vice president, treasurer and director of the architectural firm of Smith, Hinchman and Grylls Associates, Inc., Detroit, voiced some controversial criticisms of architectural education in Washington, D. C., a few weeks ago. He was addressing a construction industry conference sponsored by the Construction and Civic Development Department of the United States Chamber of Commerce.

The quickly changing needs of the building industry are imposing new demands on the architect and both the curricula in architectural schools and the attitudes of the practicing architect are failing to keep pace, he charged.

The result: the building industry suffers in efficiency and prestige.

Should the colleges adopt such a program, the profession itself must then be ready to accept the graduates as equal members of the design team, he said. It is his belief that the architectural profession is not now ready to receive "this new group, either at a level of equality or recognition with [the] professional societies, nor yet with the financial reward and public acceptance which their oftentimes 40 per cent contribution to the finished structure should command."

He contends that the building industry needs from its architects materially expanded functional skills in mechanical and electrical systems, as well as structural knowledge.

Mr. Hastings asserted that "Not in almost 50 years has so wide a cleavage developed between the architect and the allied engineers. More dramatically, the cleavage is occurring at a time when the interrelation between these men, with mutual interest in structure and sympathy for each other's objectives and viewpoints, is more necessary than in any previous period in the history of the building industry, for today the interrelated engineering phase of a structure represents 40 per cent to 50 per cent of the whole. However, the individuals charged with the execution of it are not affording the proportion of education or recognition."

If a student wishes a sound education in the engineering arts, he now must turn to the engineering colleges where there is little interest in the building structure, Mr. Hastings maintained. He added that today's engineers are being prepared to build missiles and space ships, but are not being educated to build the very factories where such vehicles and devices must be manufactured.

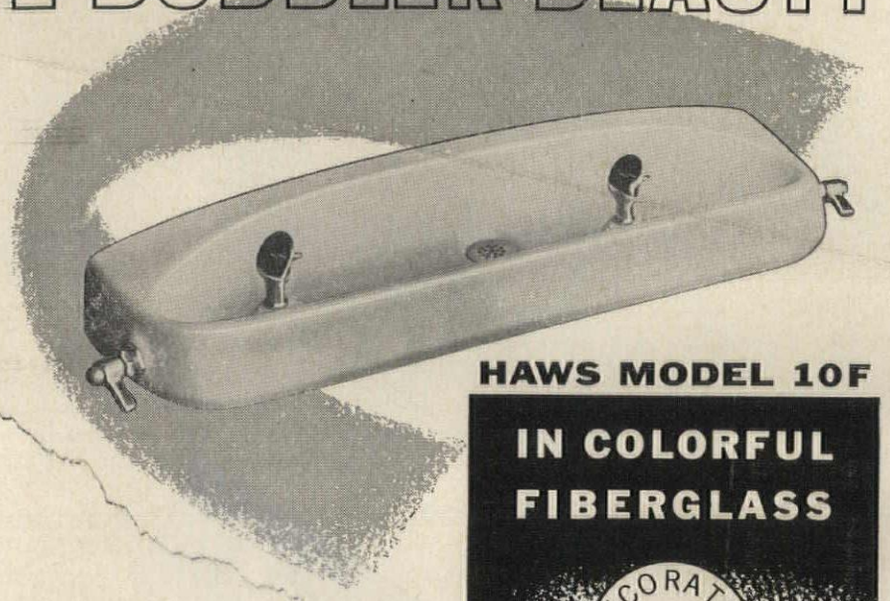
He proposed the establishment of a six-year course. The first three years would be devoted to a sound architectural background. The latter three could be spent on specialities within the field of design, along structural and building equipment lines; in community planning, landscape architecture; and the allied arts.

A.G.C. Launches New Effort To Curb Bid Shopping

The new recommended procedures for curbing bid shopping and ped-

continued on page 336

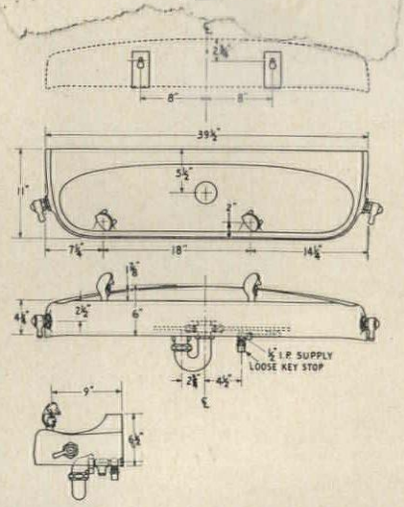
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Quickly, easily Steeltex goes down at superbly designed Canevin High School, Pittsburgh, where 60,000 square feet of Steeltex support concrete floor slabs. Architect: Celli-Flynn, McKeesport, Pa. Contractor: Navarro Corp., Pittsburgh. Steeltex from Pittsburgh Steel Co. was specially commended for its installation features on this project.

Architect, Contractor Find . . .

Steeltex Saves 35 Cents per Square Foot

"I estimate we saved about 35 cents per square foot by using Steeltex instead of another material on the Baptist Hospital addition in Pensacola. Steeltex' quick installation also helped us meet our construction timetable easily."

Man speaking: President Raymond C. Dyson of Dyson and Company, Pensacola, Fla., general contractors.

Job: $1¾-million addition to Baptist Hospital. Here, Pittsburgh Steel Company supplied 70,000 square feet of Steeltex, the waterproofed, paper-backed wire mesh reinforcing used in the concrete floors and roof slabs.

Like Mr. Dyson, Architect Charles H. McCauley has used Steeltex for more than 20 years. He, too, knows Steeltex helps provide better construction at lower costs.

"I specified 100,000 square feet of Steeltex when the main hospital building was erected eight years ago," said Mr. McCauley. "Naturally, I specified it again when the addition was built. I think this shows I am enthusiastic about the qualities of Steeltex."

• **Cost 30-40 Percent Less**—Similar comments came from Cleveland where Architect Eugene W. Gray and Contractor William Passalacqua were responsible for constructing the new $600,000 Child Welfare Division Building.

Mr. Gray and O. E. Kronenwetter, chief engineer for Passalacqua Builders, estimated that 30,000 square feet of Steeltex in floor slabs cost 30 to 40 percent less than methods generally specified.

• **On Pittsburgh Job**—When Steeltex was combined with Pittsburgh Steel's wire mesh to support 60,000 square feet of concrete floor slabs at Canevin High School in Pittsburgh, Steeltex was specially commended for its installation features.

Joseph V. Cutuly, job superintendent for the general contractor, Navarro Corporation of Pittsburgh, likes Steeltex because "it takes more punishment during installation than a sheet metal, goes down faster and is much easier to handle."

Dean Regan, foreman of the crew that installed Steeltex in the $2½-million building, has used Steeltex on more than 55 jobs in ten years.

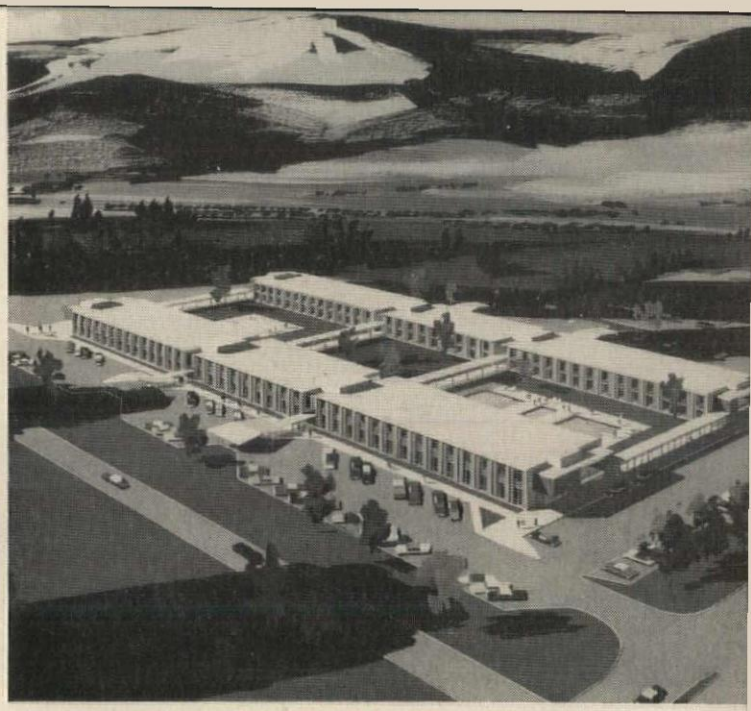
"Steeltex is very easy to install. Just unroll it, cut, tighten and clip," he said.

• **Makes Stronger Slab**—William B. Tabler of New York City, architect for the $2½-million Hilton Inn at the San Francisco Airport where 65,000 square feet of Steeltex supports the floors, pointed out additional Steeltex features. Said Mr. Tabler:

"Steeltex retains moisture and cement to a greater degree than lath. This makes a cleaner job. Also, the sag from the concrete cradled in the Steeltex gives additional lateral resistance which aids earthquake construction."



Snug fit of Steeltex around drain pipe at Canevin High School is shown by Joseph V. Cutuly, job superintendent (l.), and Foreman Dean Regan. Mr. Cutuly says, "Steeltex takes more punishment during installation than a sheet material, goes down faster and is much easier to handle."



At luxurious Hilton Inn, San Francisco Airport, 65,000 square feet of Steeltex in floor slabs aid earthquake construction. Architect: William B. Tabler, New York City. Contractor: Cahill Construction Co., San Francisco.

• **New Users Like Steeltex**—Steeltex also is endorsed by new users such as the architectural firm of Charles Bacon Rowley and Associates, Inc., and Ernst Payer, and Contractor Albert M. Higley Company, both of Cleveland. They teamed up on building the $805,000 Western Reserve Historical Society Museum in their city.

Superintendent Albert M. Higley Jr. estimated "perhaps a four percent savings was realized by using 11,500 square feet of Steeltex instead of placing conventional roof structures."

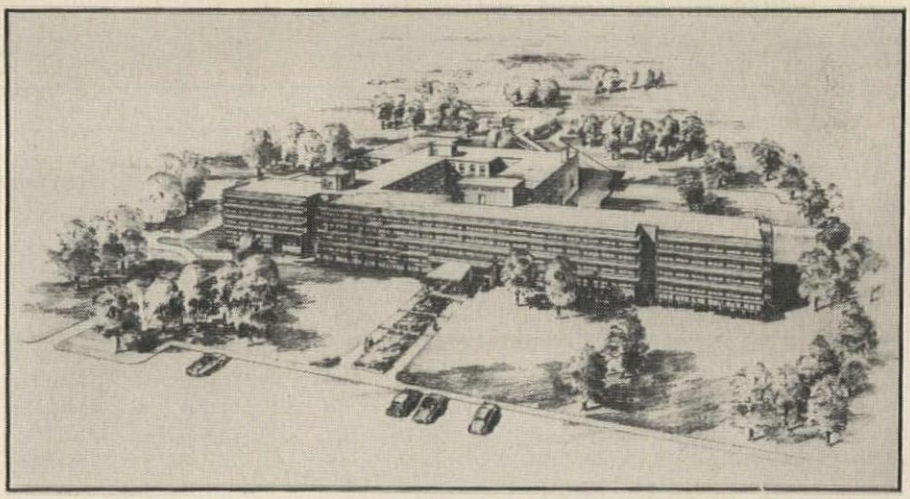
• **Will Use Again**—Another satisfied new user is Irving D. Robinson, architect for the new $325,000 Luria Brothers Building in Cleveland.

Mr. Robinson said: "This is the first time I specified Steeltex and I am sure I will use it many times again. Steeltex permitted work to continue on the floors without planking or scaffolding, although the concrete slab was not poured for many weeks after the 12,000 square feet of Steeltex were installed." Contractor for the job was J. L. Hunting Company, Cleveland.

Whether you are a veteran Steeltex user or a newcomer, you cannot afford to pass up using Steeltex on your next construction job.

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$24,500 was saved on cost of material and labor by using 70,000 square feet of Steeltex in the Baptist Hospital addition in Pensacola. Architect: Charles H. McCauley, Birmingham. Contractor: Dyson and Company, Pensacola.

▶ See Sweets Catalog Section 2-B

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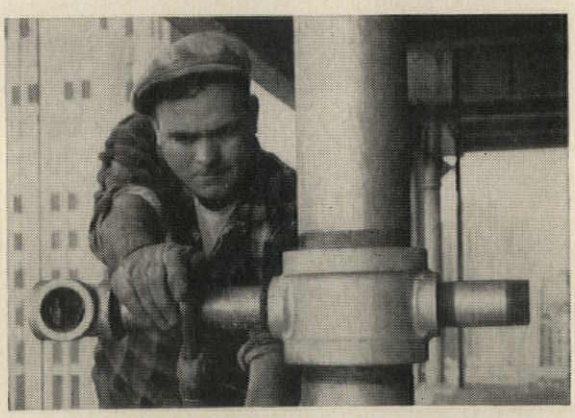


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Evaluated on the basis of performance, service life, original cost, installation cost—calculation showed that *steel pipe* could best serve the new Travelers Life Insurance building in Boston for vent and drainage lines, the fire protection sprinkler system and stand-pipe fire lines.

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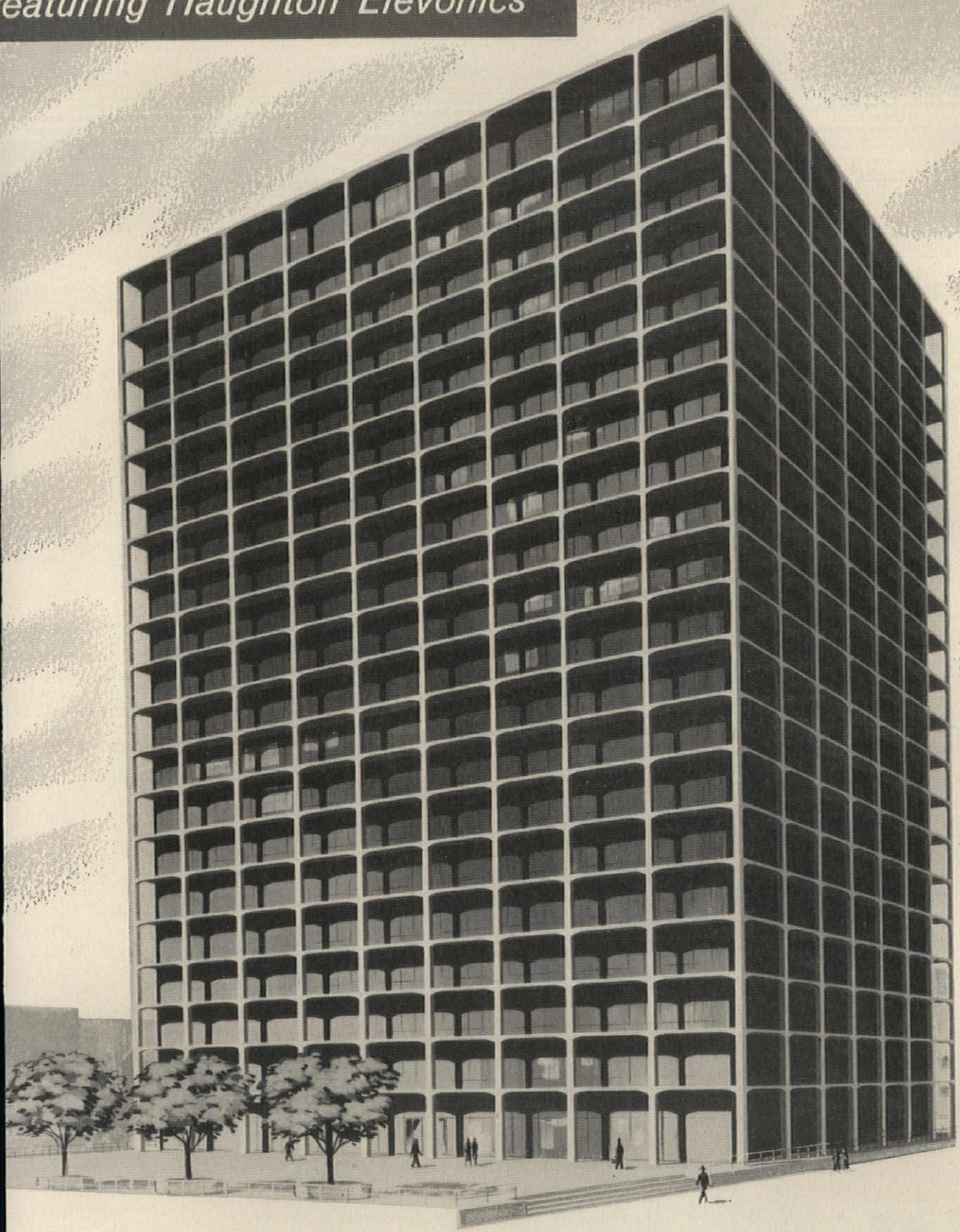
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dling practices in the construction industry were rejected by the National Association of Plumbing Contractors even before the Associated General Contractors of America had disposed of the matter at its annual convention in San Francisco.

These suggested procedures, involving a bid and price listing formula, were put into their final form by the National Joint Cooperative Committee of the A.G.C. and the Council of Mechanical Contracting Industries, Inc., the latter representing four major subcontracting groups of which N.A.P.C. is not one.

(The A.G.C. at San Francisco decided to make no recommendations to the national American Institute of Architects and to push the plan in its local chapters only where subcontractor cooperation was assured.)

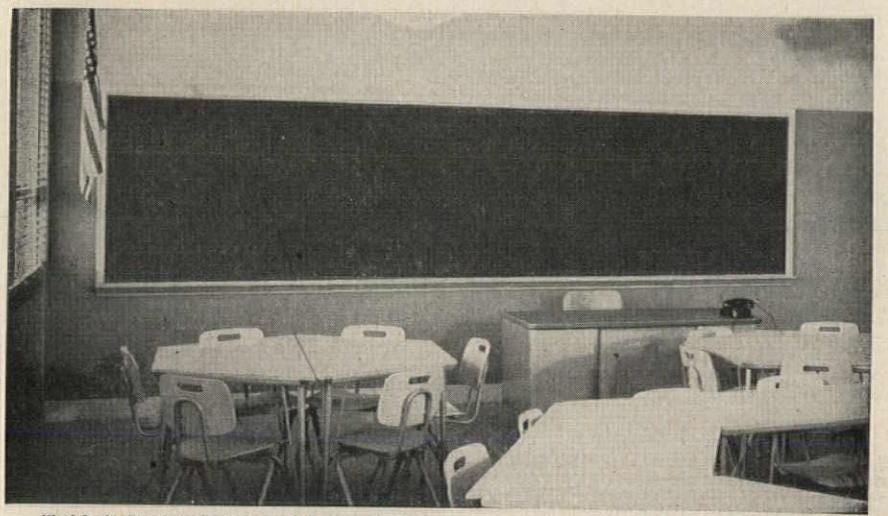
The plumbing contractors long have been on record for the separate contract method of building, whereas the general contractors support the single contract system as one of the cornerstones of their announced principles.

The architect has been caught in the middle of the crossfire to the extent that both factions have from time to time considered the architects' support for their positions. One of the original points in the recommended procedures was a proposal that the Institute review the plan and recommend its adoption by A.I.A.'s local chapters.

But, as with many association structures, the A.I.A. chapters have an autonomous identity and anything bordering on dictation by headquarters is not acceptable.

The national joint committee had urged that local A.I.A. chapters incorporate into their bid forms and instructions to bidders a requirement that subcontractors be listed on all building construction contracts.

Much more will be heard of the effort, and its attempt to include the architectural profession, in the months ahead.



West Springfield High School West Springfield, Mass. Arch., Warren H. Ashley West Hartford, Conn.

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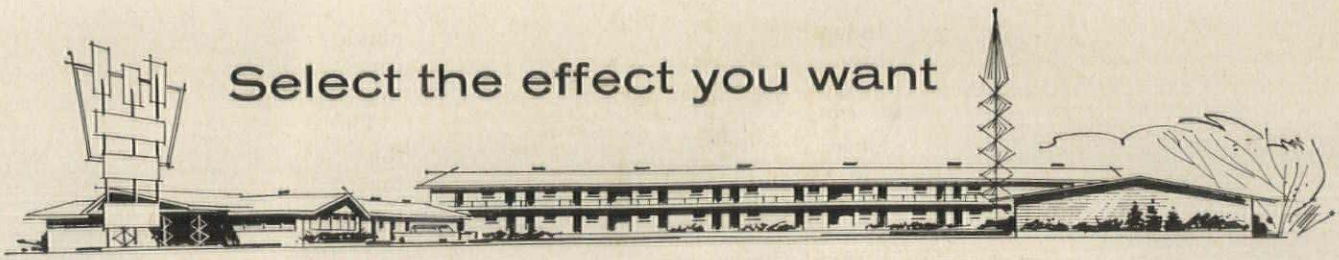


More or Less U. S. Aid for Pollution Control Facilities?

Congressional refusal to pass over Presidential veto the bill providing increased assistance from the Federal government for construction of water pollution control facilities has stirred up protest statements in many quarters. Latest among these was that of Senator Hart of Michigan, who predicted this country would have to spend some $171 billion in the next 15 years for water resources development. As for the President's veto, Senator Hart commented, "It is a completely incomprehensible position to anyone familiar with the performance of state and local governments under the existing law, a law which has provided an outstanding example of intergovernmental cooperation to help solve a national problem vital to the national welfare and which H. R. 3610 would have continued and expanded."

The Michigan legislator suggested the Congress decide what it wants to do, then come up with the funds to do it. He supported a bill to establish a joint committee on resources and conservation with advisers in the White House, and a joint committee

continued on page 344



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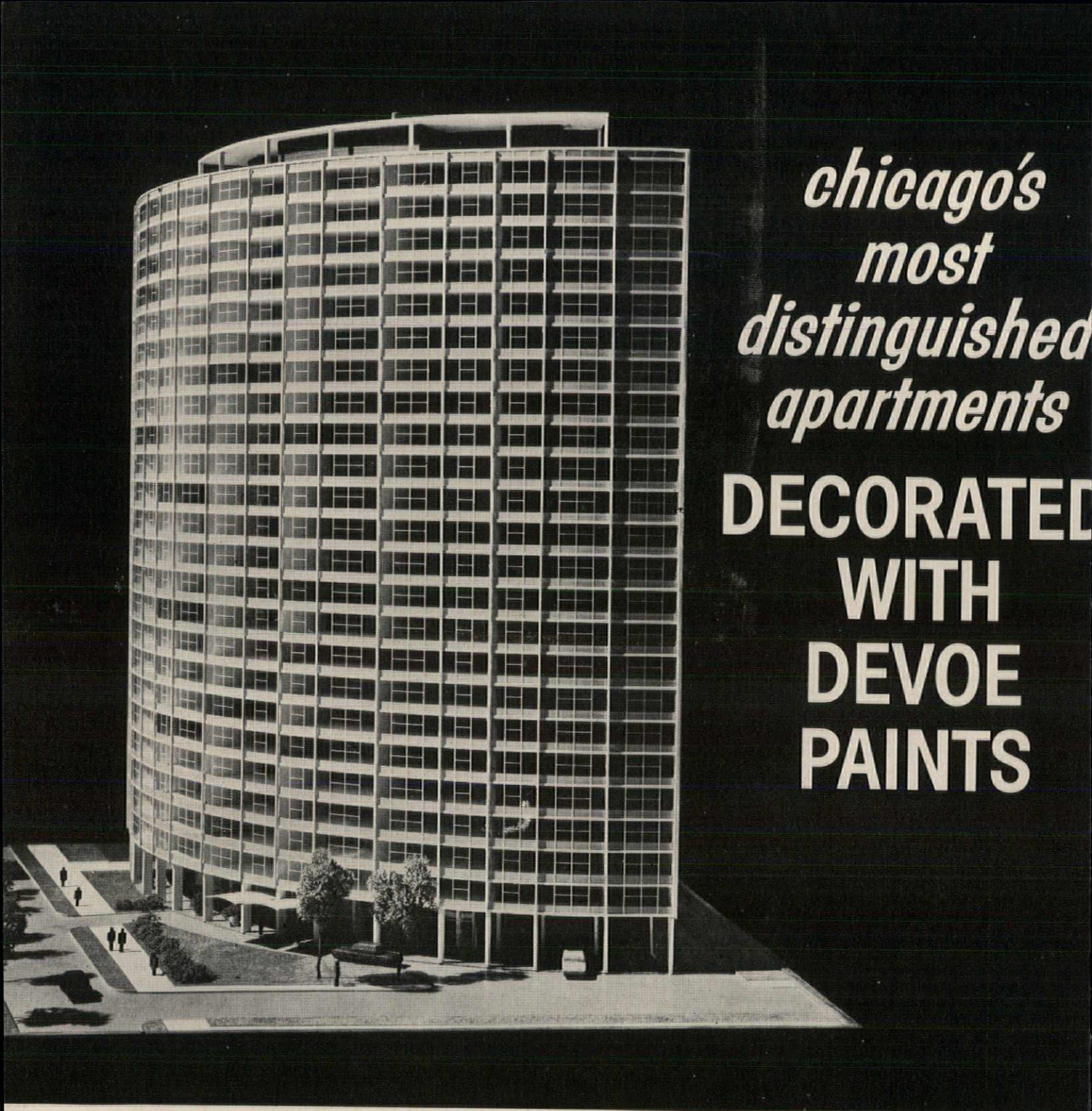
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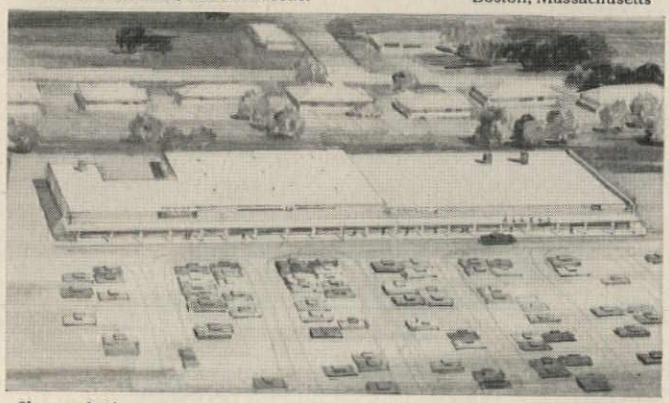
Stainless Steel

McLOUTH STAINLESS STEEL



Orbit Department Stores, Inc.
Dorchester (Boston) Massachusetts.

Architect: William Krokyn
Boston, Massachusetts

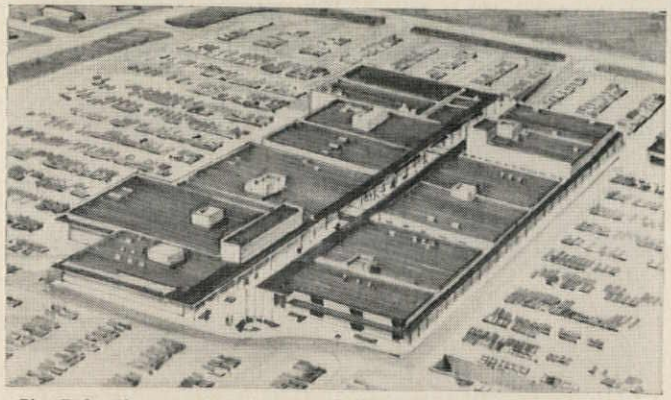


Shamrock Shopping Center
Decatur, Georgia.

Architect: Finch, Alexander, Barnes, Rothschild, and Pascal, Atlanta, Georgia.



18 ACRES OF



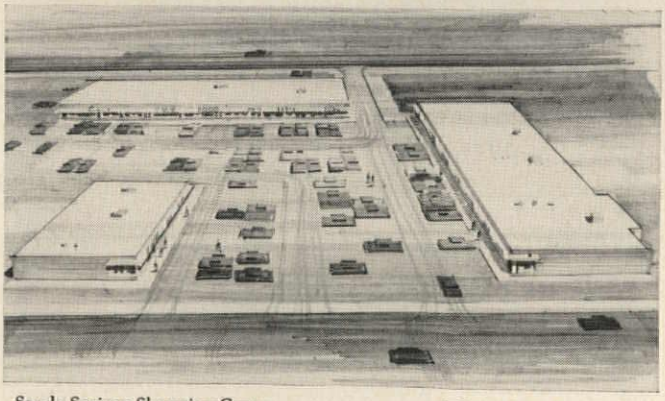
Blue Ridge Shopping Center
Kansas City, Missouri

Architect: J. F. Lauck Associates
Kansas City, Missouri



Mid-City Plaza Shopping Center
North Tonawanda, New York

Architect: John G. Schwartz
Buffalo, New York



Sandy Springs Shopping Center
Sandy Springs, Georgia

Architect: Ivey Enterprises
Atlanta, Georgia



Southgate Plaza Shopping Center
West Seneca, New York

Architect: Joseph J. Geigand
Buffalo, New York



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in Congress to appraise annually the nation's resource development needs.

He made the point that these programs are not going to be cheaper next year or five years hence. The cost sometimes increases by millions of dollars through postponement, he said.

The bill vetoed by the President and killed when the House refused to over-ride by a vote of 249 to 157 (22 short of the two-thirds majority) would have boosted the present assistance program to a total $900 million in Federal aid for construction of water pollution control facilities. The grants would have increased from the present $50 million per year to $90 million over a 10-year period.

Vetoing the measure, Mr. Eisenhower took the view that water pollution is a uniquely local problem. The primary responsibility for handling the question lies with state and local governments,, he maintained. "The Federal government can help," the message stated, "but it should stimulate state and local action rather than provide excuses for inaction, which an expanded program would do."

The White House proposed four steps:

1. A national conference to be held next December under auspices of the Health, Education, and Welfare Department, to provide a forum in which all concerned can confront and better appreciate their mutual responsibilities for solving the problem.

2. Where the issue is of an interstate nature and the problem is beyond the powers of a single state, the Federal government should have authority to move more quickly and effectively in directing the application of control measures that will swiftly correct pollution.

3. The Federal government should continue to provide modest financial assistance for the administration of control programs by states and interstate water pollution control agencies.

4. The Federal government, through research and technical assistance, can be of material help in contributing to knowledge of water pollution—its causes, its extent, its impact and methods for its control. The President has provided for this increased Federal effort in his fiscal 1961 budget, it was noted.

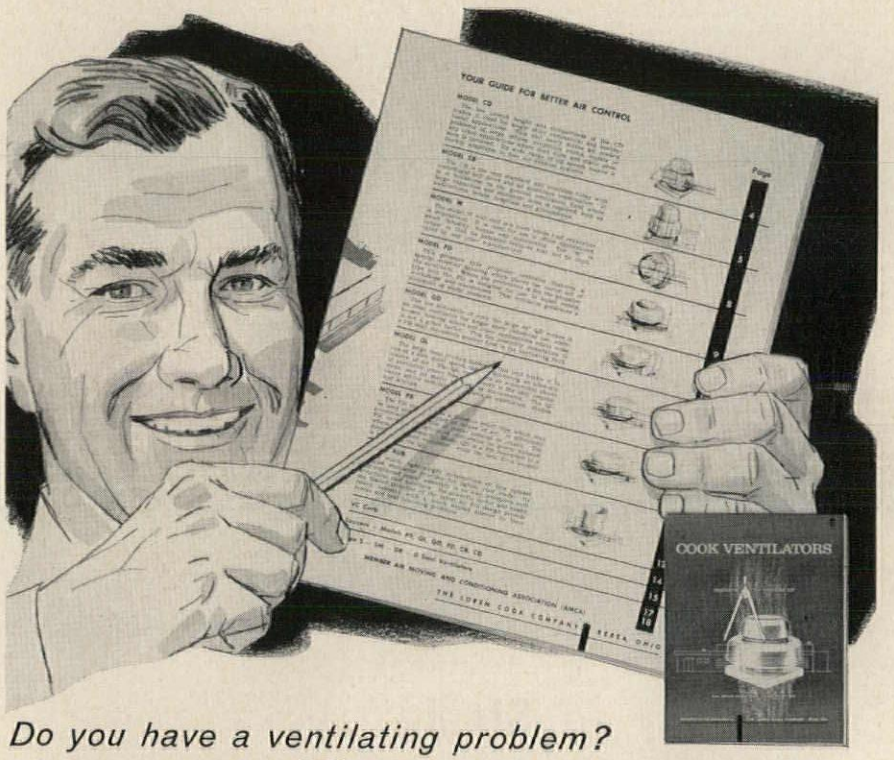
Local Action on City Planning Promoted by U. S. Chamber

The United States Chamber of Commerce, at its construction industry conference last month, unveiled its new blueprint for local community action in the field of urban development.

This outlines methods by which local groups can take command of orderly city planning and entails a philosophy of switching more responsibility for urban planning and development from Federal to local sources.

The program is outlined in seven volumes, each directed to a specific facet of organized community planning. The primer titles are: Balanced Community Development; Community Analysis—Foundation for Decision Making; Comprehensive Planning—Guide for Commu-

continued on page 351



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Cook CONTROLLED VENTILATION WILL SOLVE IT FOR YOU!

SPECIFY COOK VENTILATORS

- Right for the job
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We've taken the doubt out of ventilator selection in this new approach to your ventilating problems. Write today for your copy. Find out how the complete Cook line is engineered for top efficiency and top economy—your best answer for any ventilating problem.

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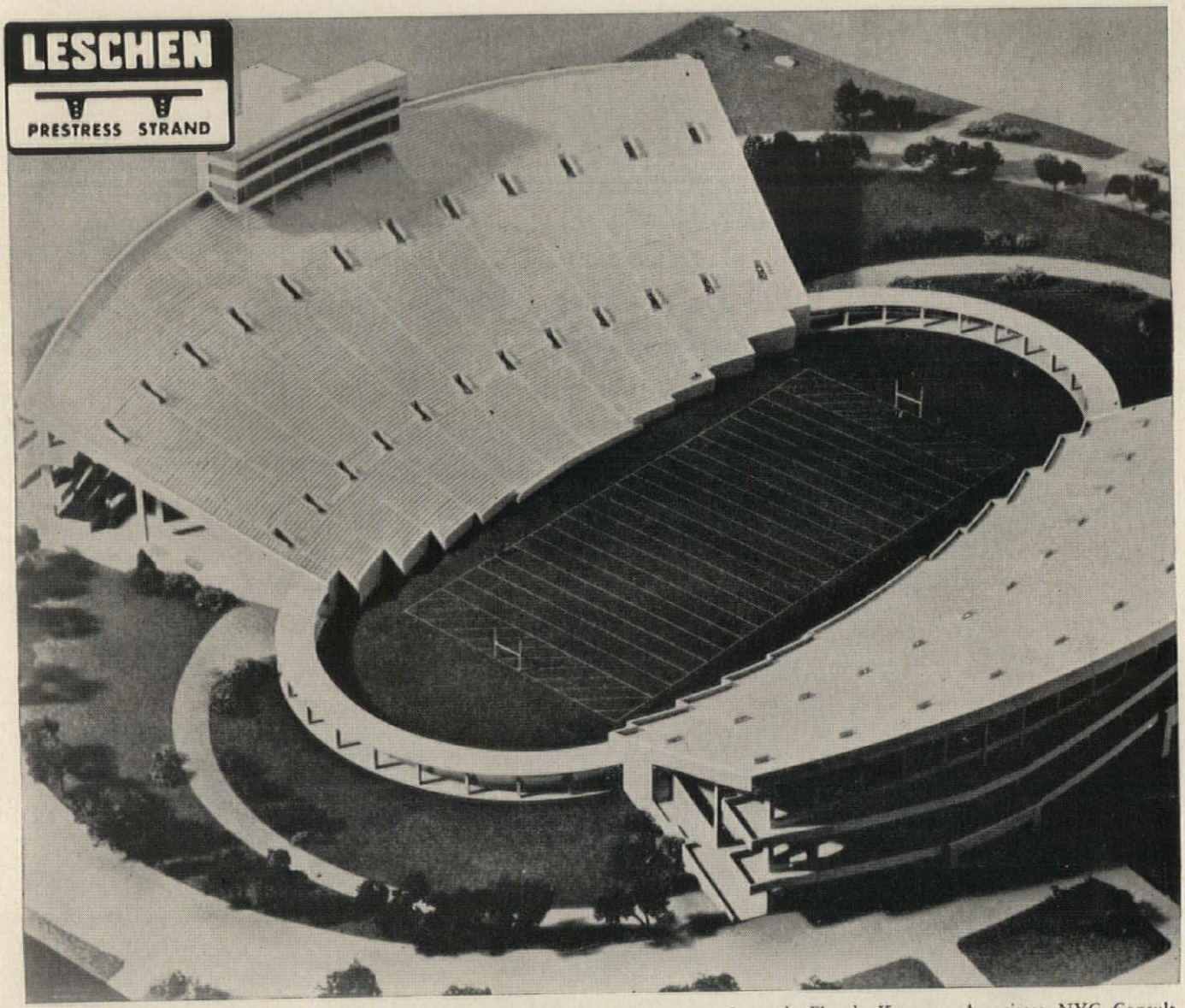
Position_____

Street Address_____

City_____ Zone____ State_____

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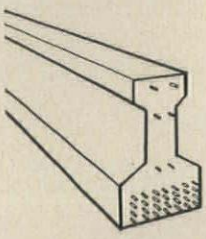


$300,000 contract for the stadium's seat foundations was awarded to Stress-Con Division of Shute Concrete Products, Inc., Richmond, Indiana. Architects—Eggers & Higgins, NYC. Structural Consulting Engineers—Severud—Elstad—Krueger—Associates, NYC. Consultant on Prestressing—Philip Ostendorf, Dayton. O. General Contractors—Hubert, Hunt and Nichols.

Prestressed Concrete Cuts Indiana Stadium Maintenance

Nearly 14 miles of prestressed concrete channels have been used for 70,000 seats in Indiana University's new stadium at Bloomington to be completed this Fall. These channels average 23 feet long. Leschen Prestress Strand was used in their fabrication.

A most versatile building material, prestressed concrete is receiving ever-increasing acceptance. Its unique properties such as thinner sections, longer spans, lower depth-to-span, minimum maintenance, less weight and economy appeal to architects and engineers striving for design freedom. In this stadium, economy through mass production in the prestressing plant was a key element in the decision.



TALK WITH A NEARBY PRODUCER OF PRESTRESSED CONCRETE—He can discuss technical problems, point to examples of prestressed construction in your area, and advise on costs and delivery of beams from his yard.



OR WRITE LESCHEN—Leschen supplies producers with the tensioning material—prestress strand. To insure uniform production of highest quality tensioning steel, Leschen has installed the world's newest and most modern wire mill and other specialized equipment. Write for literature giving typical uses and engineering data. Leschen Wire Rope Division, H. K. Porter Company, Inc., St. Louis 12, Mo.

LESCHEN WIRE ROPE DIVISION PORTER **H. K. PORTER COMPANY, INC.**

PORTER SERVES INDUSTRY with steel, rubber and friction products, asbestos textiles, high voltage electrical equipment, electrical wire and cable, wiring systems, motors, fans, blowers, specialty alloys, paints, refractories, tools, forgings and pipe fittings, roll formings and stampings, wire rope and strand.

Glass makes a grand entrance—

Doors should be more than just openings. They should be a better way of doing business. PPG doors are like that. They complement the inviting window wall look of modern commercial architecture.

PPG offers you three styles of entrances specially designed to fit into any type of architecture. There are PPG HERCULITE®, West and TUBELITE® doors—each with a smart, distinctive look, each with the rugged strength that is the trademark of Pittsburgh doormanship.

PITTCOMATIC®. All Pittsburgh doors can be mat or handle operated by the PITTCOMATIC automatic door opener—a simple, hydraulic, motor-driven unit. PITTCOMATIC is easy to install, easy to maintain. Its instant response and smooth, gentle action make it the nation's number one buy in automatic door openers.

For complete information on Pittsburgh Doors, see Sweet's 16a, 16d or write for our Pittsburgh Door catalogs today. Pittsburgh Plate Glass Company, Room 0150, 632 Fort Duquesne Blvd., Pittsburgh 22, Pennsylvania.

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TUBELITE DOORS installed in a PPG Open-Vision front—Harris' Super Market, Waycross, Georgia. PPG's heavy-duty, high-traffic Tubelite entrances have concealed channel type anchors which keep frame seams to a hair line. Door frames have an exclusive interlocking feature that insures rigidity. For shopper convenience, doors are mat operated by PPG's Pittcomatic automatic door opener. Contractor: Business, Inc., Waycross, Georgia.

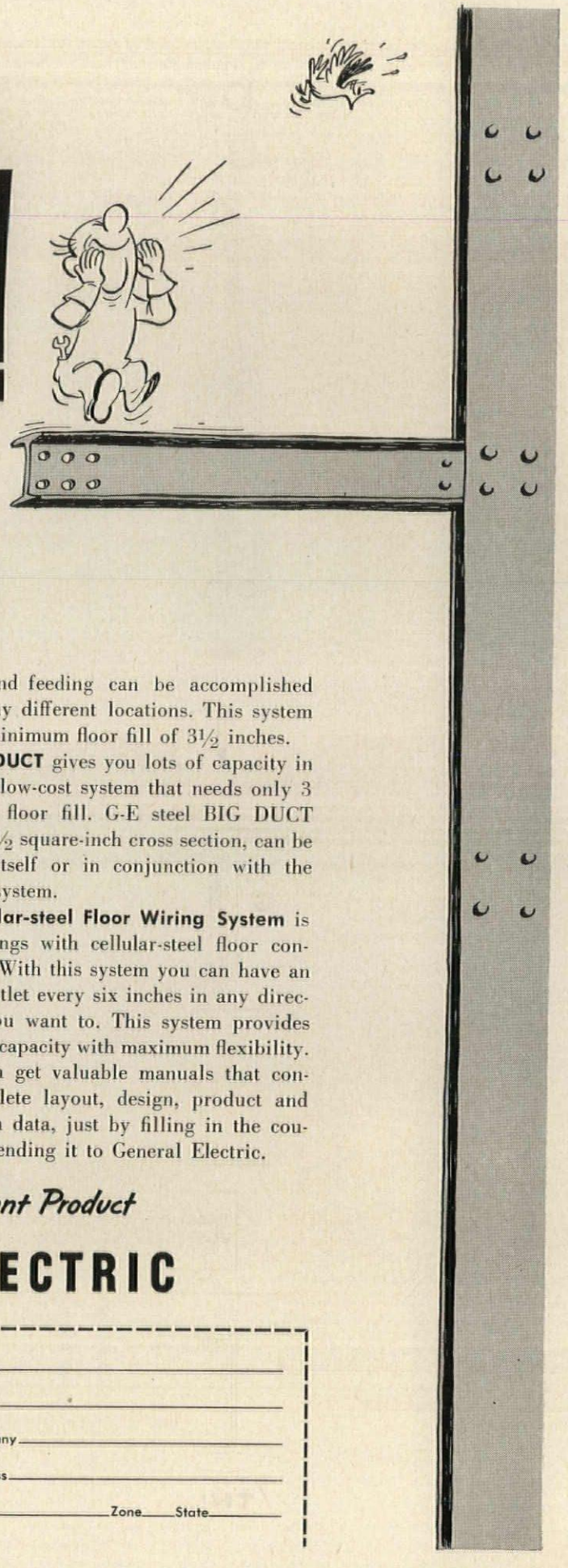
WEST TENSION DOORS add style and beauty to the entrance of the I.B.M. Corporation Office Building, Chicago, Ill. Narrow stiles of West doors give that pencil line look without sacrificing strength. Their ½" thick glass held under compression in the metal frame makes a completely solid unit that won't sag or rack. Architects: Eliot Noyes & Associates, New Canaan, Conn. Associate Architects: McClurg, Shoemaker & McClurg, Chicago, Ill. Glazed by Cadillac Glass Company, Chicago, Ill. Contractor: B. W. Handler Construction Company, Chicago, Ill.





HERCULITE DOORS set in bronze Herculite door frame assemblies and sidelights—First National Bank of Topeka, Topeka, Kansas. Herculite tempered plate glass doors will last a building's lifetime without maintenance. These doors are handle operated by Pittcomatic—PPG's exclusive automatic door opener. Architects: Kiene & Bradley, Topeka, Kansas. Contractor: M. W. Watson, Topeka, Kansas.

FOUR!



General Electric offers a choice of four types of underfloor wiring systems.

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G-E BIG DUCT gives you lots of capacity in a simple, low-cost system that needs only 3 inches of floor fill. G-E steel BIG DUCT with its 8½ square-inch cross section, can be used by itself or in conjunction with the standard system.

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- ☐ Please send me your bulletin on cellular-steel floor wiring.
- ☐ Enclosed is a description of my underfloor wiring problem. What do you suggest?

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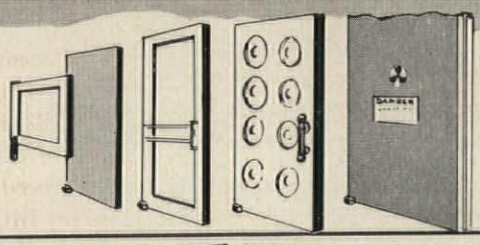
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you can be *REALLY* specific when you specify from the

81 RIXSON® DOOR CLOSER styles and variations

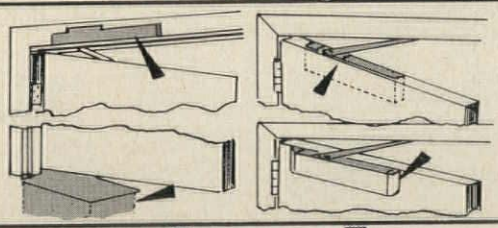
to meet every requirement and preference

DOOR WEIGHT requirements



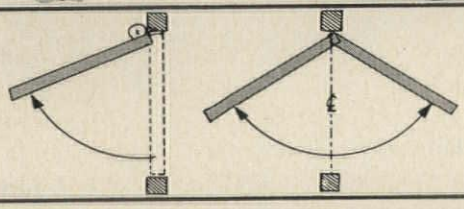
styles for doors, 12 lbs. to 1200 lbs. — light office rail gates to extra heavy lead-lined doors.

CLOSER MOUNTING requirements



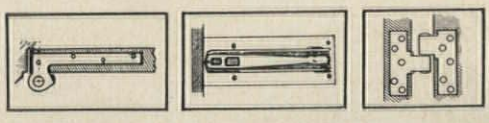
styles for mounting in the floor, in the jamb, in the door, on the door.

DOOR ACTION requirements



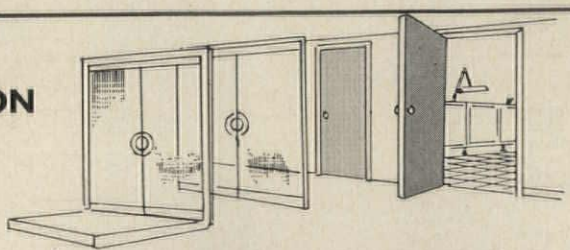
styles for single acting and double acting—both light and heavy doors.

DOOR HANGING preference



styles for offset hung doors, center hung doors and butt hung doors.

DOOR LOCATION requirements



styles for entrance, vestibule, corridor, all interior doors, toilet stall doors and office rail gates.

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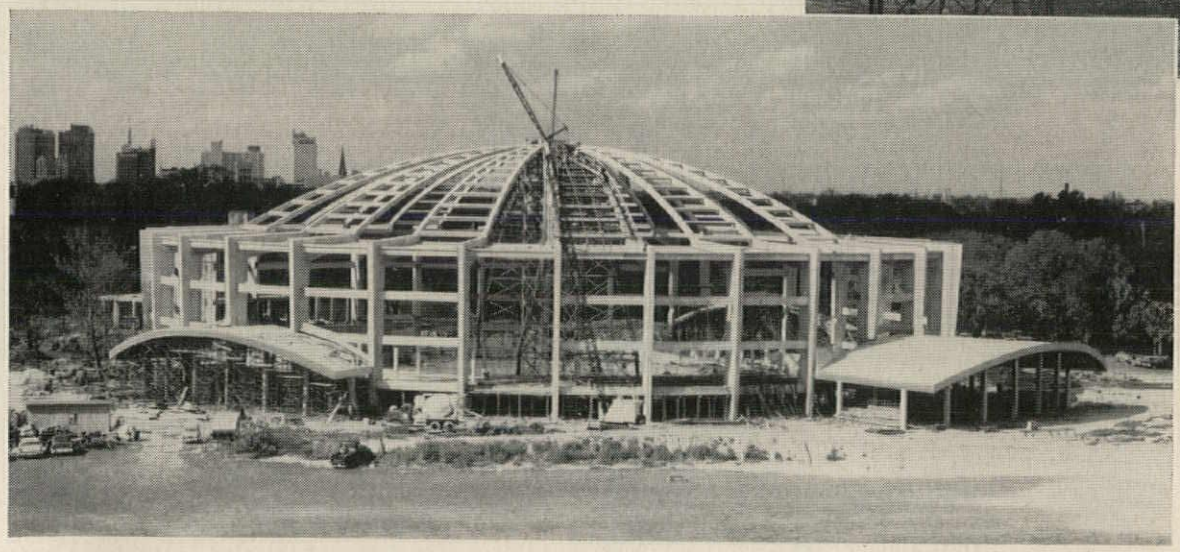
CONCRETE FRAME FOR NEW JACKSONVILLE COLISEUM

Lehigh Early Strength Cement Used in Unique Roof Structure

• Rising next to the famed Gator Bowl in Jacksonville, Florida, is a reinforced concrete frame providing a support free area 302′ in diameter for the new 12,000 seat Sports Coliseum. Lehigh Early Strength Cement and Lehigh Portland Cement are being used throughout.

A concrete ring 25′ in diameter was poured first atop the center support of this huge two-pronged form. Then the circular roof ribs were poured in pairs in prong forms (only one visible), tying the center ring and outer roof together. After each pour, prongs were lowered 3′ hydraulically and rotated to next position.





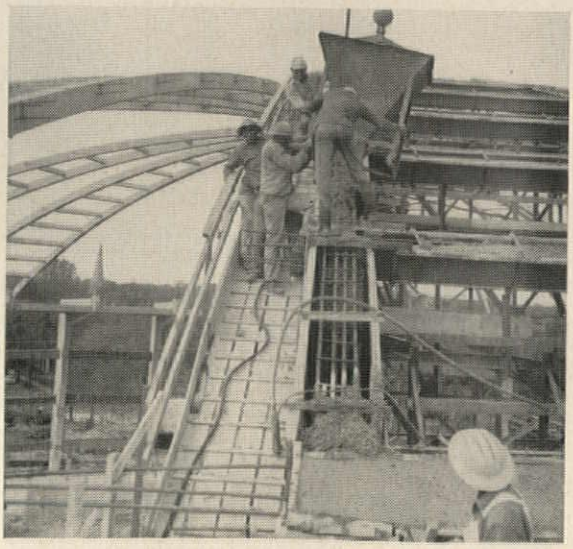
Clear span at base of structure is 302′. Height to center roof ring is 95′. Height to perimeter roof is 65′. Circular roof rib radius is 250′. Two of three entrances take shape in foreground.

Use of Lehigh Early Strength Cement in the perimeter roof made it possible for Daniel Construction Company to use fewer sets of forms while meeting a fast construction schedule. In the circular roof ribs, this cement provided the high early strength concrete necessary for most efficient use of the huge two-pronged form (see pictures).

This is another example of why we say, "Somewhere on nearly every job, Lehigh Early Strength Cement can save time and money." Lehigh Portland Cement Company, Allentown, Pa.

LEHIGH CEMENTS

Owner: City of Jacksonville, Florida • *Architect:* A. Eugene Cellar and George Ryad Fisher, Jacksonville, Fla. • *Structural Engineer:* Gomer E. Kraus, Jacksonville, Fla. • *Contractor:* Daniel Construction Company of Florida, Jacksonville, Fla. • *Ready Mix Concrete:* Southern Materials Company of Florida, Jacksonville, Fla.

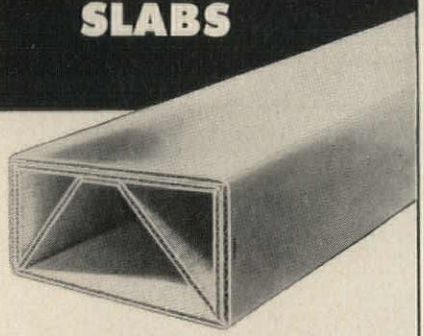


Placing concrete for roof ribs high above coliseum floor.

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PREVENT CRACKED SLABS



JAY-VOIDS offer builders a more positive void than now available through conventional methods. These TESTED and PROVED forms help prevent cracked slabs by providing space underneath the slab for movement of the earth.

JAY-VOIDS lightweight, simple one-piece form folds easily for fast assembly and placement . . . are shipped and stored flat.

JAY-VOIDS are made of patented FREEZURBOARD . . . the heavy-duty asphalt and wax impregnated corrugated board . . . assures top quality and greatest strength under adverse weather conditions. (Not to be compared with ordinary corrugated board.)

JAY-VOIDS are your cheapest insurance against cracked slabs. They save you money and assure top quality concrete construction.

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Washington Topics

nity Growth and Change; Planning Urban Renewal Projects; Modernizing Local Government; Financing Community Development; and Community Leadership—Key to Local Development.

The seven pamphlets are to be made available for general use, an the Chamber hopes to supplement these with additional corollary material to make their use easier. Local organizations will be urged to prepare supplementary material.

The project was under auspices of the Construction and Civic Development Department of the Chamber, with Howard Evans in charge.

One of the approaches in the overall program was a request made to various industry groups to enlist their aid in helping to persuade local groups to take a more active interest in planning and developing communities. These organizations included the American Institute of Architects, the National Association of Home Builders and the National Association of Real Estate Boards.

The associations are being asked to advise their chapters to cooperate with local chambers of commerce throughout the country in applying the principles laid down in the pamphlets.

The long-range plan calls for instituting test programs in five or six selected cities well distributed geographically and as to size to illustrate in performance exactly what the U. S. Chamber is advocating.

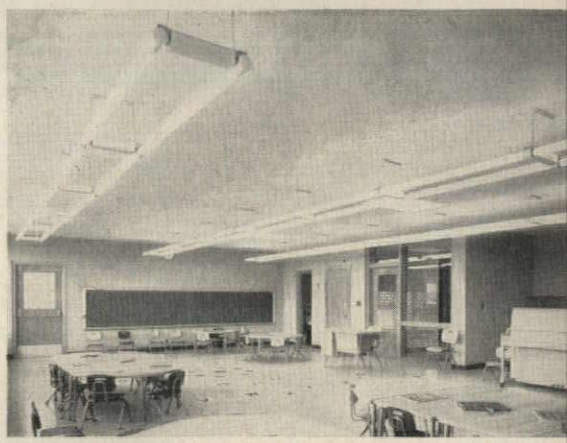
Labor Asks Public Works "Shelf" As Recession Hedge

Suggesting that the country must be ready to fight another economic recession aggressively and quickly, organized labor has proposed a number of preparatory measures, among them that of preparing an extensive "shelf" of ready-to-go public works plans. A statement issued following the AFL-CIO executive council meeting in Miami Beach earlier this year called for preparation of such a catalog of detailed public works plans.

All public works programs should be examined, the council urged, to determine which of them could be made ready and available for imme-

continued on page 356

Ainsworth BUDGETLITE



ROOSEVELT ELEMENTARY SCHOOL, WELLINGTON, KANSAS
ARCHITECTS, RAMEY & HIMES
(NOW UEL C. RAMEY & ASSOCIATES)
ELECTRICAL ENGINEER: CARL GREEN & ASSOCIATES

balanced low brightness for schools

Low contrast is achieved because T17-40W low brightness lamps are used, properly spaced to provide a wide, well lit area on the ceiling as a background. This increases the diffused light, too.

Very high efficiency (98%) is confirmed by tests of a well-known laboratory.

Low maintenance effort is required because the only place light absorbing dust can settle is easily reached from the floor with a duster.

Low installation costs are possible because Ainsworth BUDGETLITE is prewired and light-weight assemblies make handling and hanging easy and fast.

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No compromise with quality in Rō-Way overhead doors

In Ro-Way overhead doors for commercial and industrial applications, you'll always find just one standard of quality—the finest.

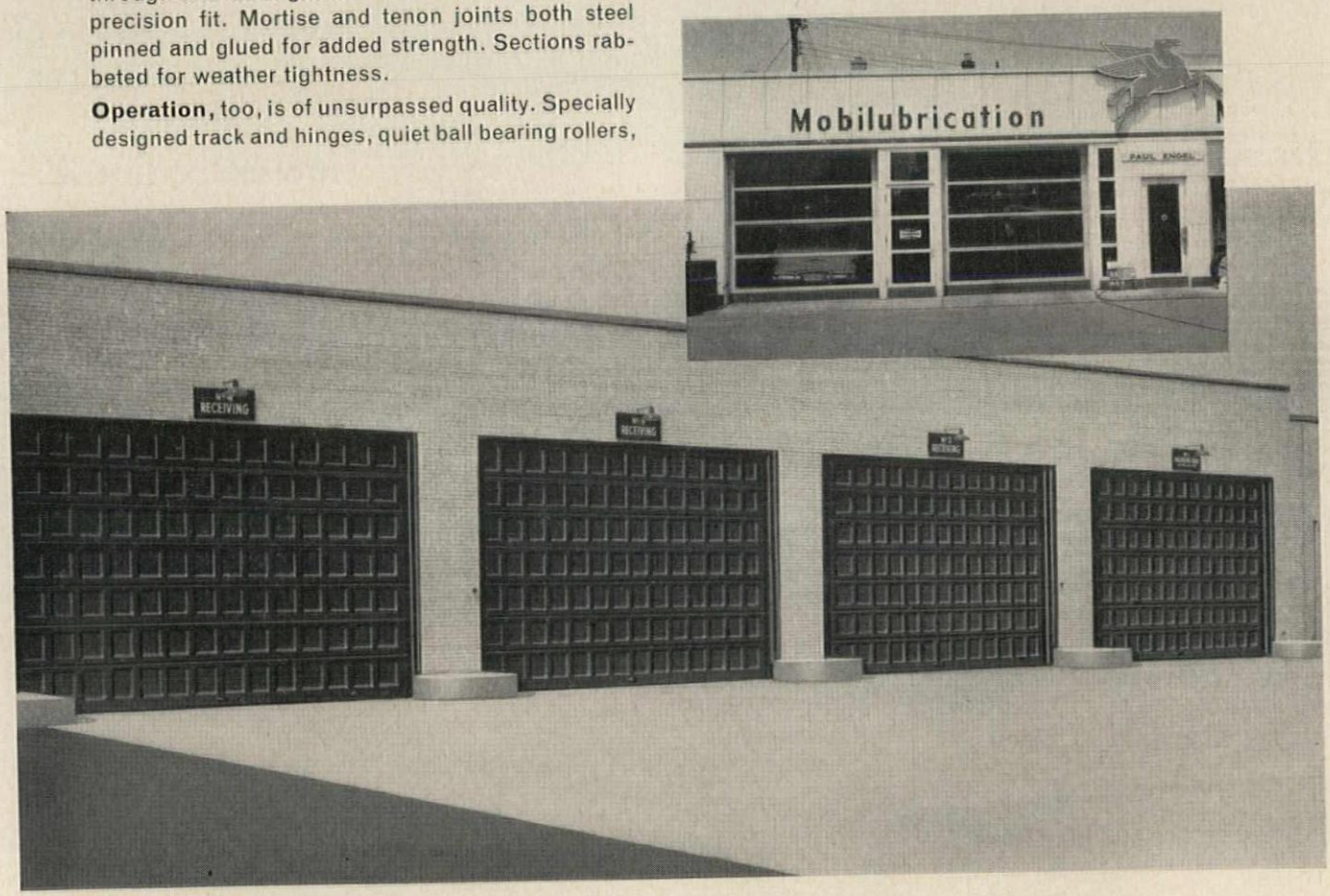
Take Ro-Way materials, for example. Sections are made from selected, kiln-dried West Coast woods. Panels are exterior grade Masonite® Dorlux®, guaranteed for the life of the door. All hardware is heavy gauge, roll-galvanized steel, beefed up to stand up under commercial use.

Ro-Way construction is second-to-none quality through and through. Muntins, rails and stiles are precision fit. Mortise and tenon joints both steel pinned and glued for added strength. Sections rabbeted for weather tightness.

Operation, too, is of unsurpassed quality. Specially designed track and hinges, quiet ball bearing rollers, and individually tension-balanced springs assure easy-does-it operation, time after countless time.

That's why we say Ro-Way is the door with built-in client satisfaction . . . the door you can depend on to be a credit to *you*. For full details, consult your helpful Ro-Way distributor whose name is listed in the Yellow Pages.

For maximum client convenience, specify the famous Ro-Way Electric Operator for commercial doors



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OVERHEAD DOORS

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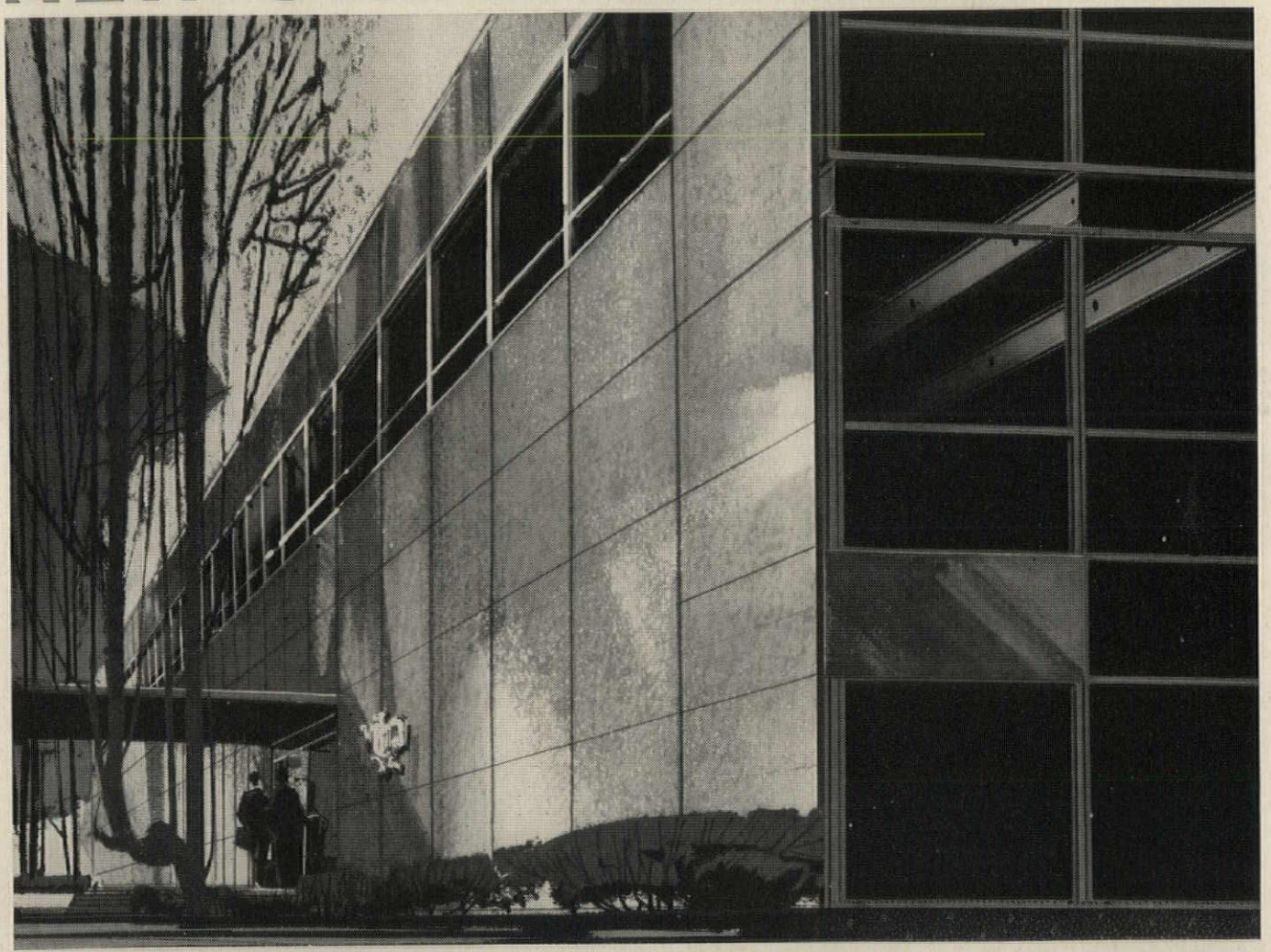
there's a Rō-Way for every Doorway!

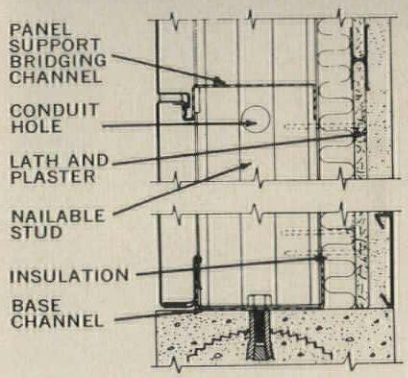
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Here's a complete modular wall system which integrates lightweight nailable steel framing with architectural porcelain panels and aluminum extrusions. The steel framework is load-bearing and specially designed to hold the thermally efficient panels without additional framing or attachment operations. This skeleton-and-skin coordination not only saves during construction, it provides unlimited design possibilities. ■ Foundations or footings need not be heavy or complex. The structural load-bearing framework of Stran-Steel has a high strength/weight ratio. Architectural panels and other collateral materials attach without secondary members. Panels are hung from the integral "j" girts and simply snap in place without exposed fastenings—without welding, riveting or mispositioning. Windows, available in a variety of designs, slip in place quickly. And the integrated fit of joists and beams eliminates the need for dropped ceilings or boxed beams. ■ The complete Stran-Wall system—including panels, insulation, nailable steel framing, and aluminum mullions for doors and windows—is available from one source, your Stran-Steel architectural products dealer. For specifications and details, mail the coupon or call him. He's listed in the Yellow Pages under Steel.

NEW STRAN-WALL SYSTEM





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ARCHITECTURAL PORCELAIN PANELS: FLAT, COLORFUL, MAINTENANCE-FREE—Extremely flat panel surfaces reduce reflection patterns. Porcelainized both sides, Stran-Wall panels come in 72 colors, 3 textures (smooth, ripple, stipple), 3 finishes (gloss, semi-gloss, matte).

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Stran-Steel Corporation, Dept. AR-11, Detroit 29, Michigan

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DOW | BUILDING PRODUCTS



Memorial Student Union Building, Southern Connecticut State College. Architect: Carl R. Blanchard, Jr., A.I.A., New Haven, Connecticut.

STYROFOAM®

delivers permanently low "K" factor, lower costs for Connecticut college building

Low thermal conductivity—"K" factor—was a major point in the choice of Styrofoam† to insulate the Memorial Student Union Building at Southern Connecticut State College. The building—which will house dormitories, apartments, cold storage areas, dining rooms, and activities rooms—required permanent insulation.

The application required an insulation with low moisture absorption, a low thermal conductivity factor, and one that would act as its own moisture barrier. Styrofoam was specified as the sole insulation material in the building—for all exterior cavity walls, for the foundation perimeter, and for all interior low temperature rooms.

Labor cost savings were also an important benefit from using Styrofoam. For example, one use of Styrofoam was in the exterior wall which was designed as a plenum chamber. Inside this 10" plenum cavity, the interior face of the exterior wall was insulated with Styrofoam applied by means of a water base adhesive.

The use of Styrofoam helped save construction costs by eliminating the need for battens, i.e., nailing of 2 x 2's over the insulation, as would be required with other insulation materials.

Because of its unique water and water-vapor barrier properties that bar moisture and won't absorb water, Styrofoam provides permanent, low-cost insulation efficiency for comfort and low temperature space. And its light weight makes installation fast and easy. For more information, write THE DOW CHEMICAL COMPANY, Midland, Michigan, Plastics Sales Dept. 1701N5.

Other Dow building products

SCORBORD*—(Pat. applied for) Superior rigid insulation for foundation perimeters, slab floors. Exclusive pre-scored feature speeds installation.

ROOFMATE*—Lightweight rigid insulation for built-up roofs serves as its own moisture barrier. Reduces blistering, resultant leaks.

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†Dow's registered trademark for its expanded Polystyrene



Both walk-in refrigerators are insulated with Styrofoam.



Main dining room, showing exposed concrete roof structure.

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permanently
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DUPONT PLAZA CENTER, MIAMI, FLORIDA

Plaster-Weld is the amazingly versatile, patented liquid bonding agent today specified on hundreds of remodeling and new construction projects by leading architects the country over. In the case of the Dupont Plaza Center, shown above, Plaster-Weld was used to permanently bond finish plaster to interior concrete surfaces and stucco to exterior concrete surfaces. *Archt.:* Frank H. Shuflin & Associates, Miami; *Genrl. Contr.:* Arkin Construction Company, Miami Beach; *Plstg. Contr.:* E. L. Thompson Co., Atlanta, Ga.



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With Plaster-Weld you can permanently bond gypsum, lime putty, acoustical plaster and cements to themselves . . . or *directly* to any sound surface . . . even glass. Applied with brush, roller or spray gun. No costly surface preparation. You cover Plaster-Weld with new material as soon as touch dry (about an hour). In case of Marriott Motor Hotel, billed as "World's Largest Motel," Plaster-Weld was sprayed on smooth concrete ceilings to bond lime putty plaster finish. *Archt.:* Joseph G. Morgan, Washington; *Genrl. Contr.:* Charles H. Tomkins Co., Inc., Washington; *Plstg. Contr.:* Novinger Company, Inc., Brentwood, Maryland.

A Plaster-Weld bond is ageless . . . never lets go! Plaster-Weld is approved by New York City Board of Standards & Appeals, and protected under U.S. Patent No. 2,760,885. For technical data, and job proof, see Sweet's or write us direct. Address Box 5756C, Larsen Products Corp., Bethesda, Maryland.

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Washington Topics

diate action at the first signs of a recession. Detailed planning, blue printing and land purchases should be made well in advance of a recession, the statement continued, adding that a comprehensive program of this type should include Federal technical aid and long-term loans to make possible state and local government planning. This was described as "essential for the development of a Federal shelf of public works."

Bureau of Public Roads Adds Urban Highway Division

Municipal officials reportedly were pleased with the recent action of the Bureau of Public Roads organizing a new division of urban highways. This was done by the Federal agency to provide maximum assistance to states and cities in the construction of urban roads and streets, it was said.

The American Municipal Association hailed this as a move in the right direction and a recognition of the increased importance of urban highway development.

The Bureau has regrouped the urban highway function of the Office of Engineering under a new Urban Highway Division, naming D. W. Loutzenheiser to head it. The new unit will coordinate all Washington office activities in connection with urban highway matters, and will help the Bureau to provide concentrated attention on the important elements of planning, location, design, construction, and operation of Federal aid urban highway projects.

The long-range program and greatly increased expenditures involved in the completion of the interstate system have intensified the need for quicker decisions on planning city highways, the A.M.A. noted.

Under the new system, the responsibilities of the various offices and divisions of BPR will not be changed, it was explained. The BPR field offices will continue to receive technical assistance and administrative guidance from the Bureau in Washington. Both the Office of Research in the planning field, and the Office of Engineering in

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THE MODERN ENTRANCE

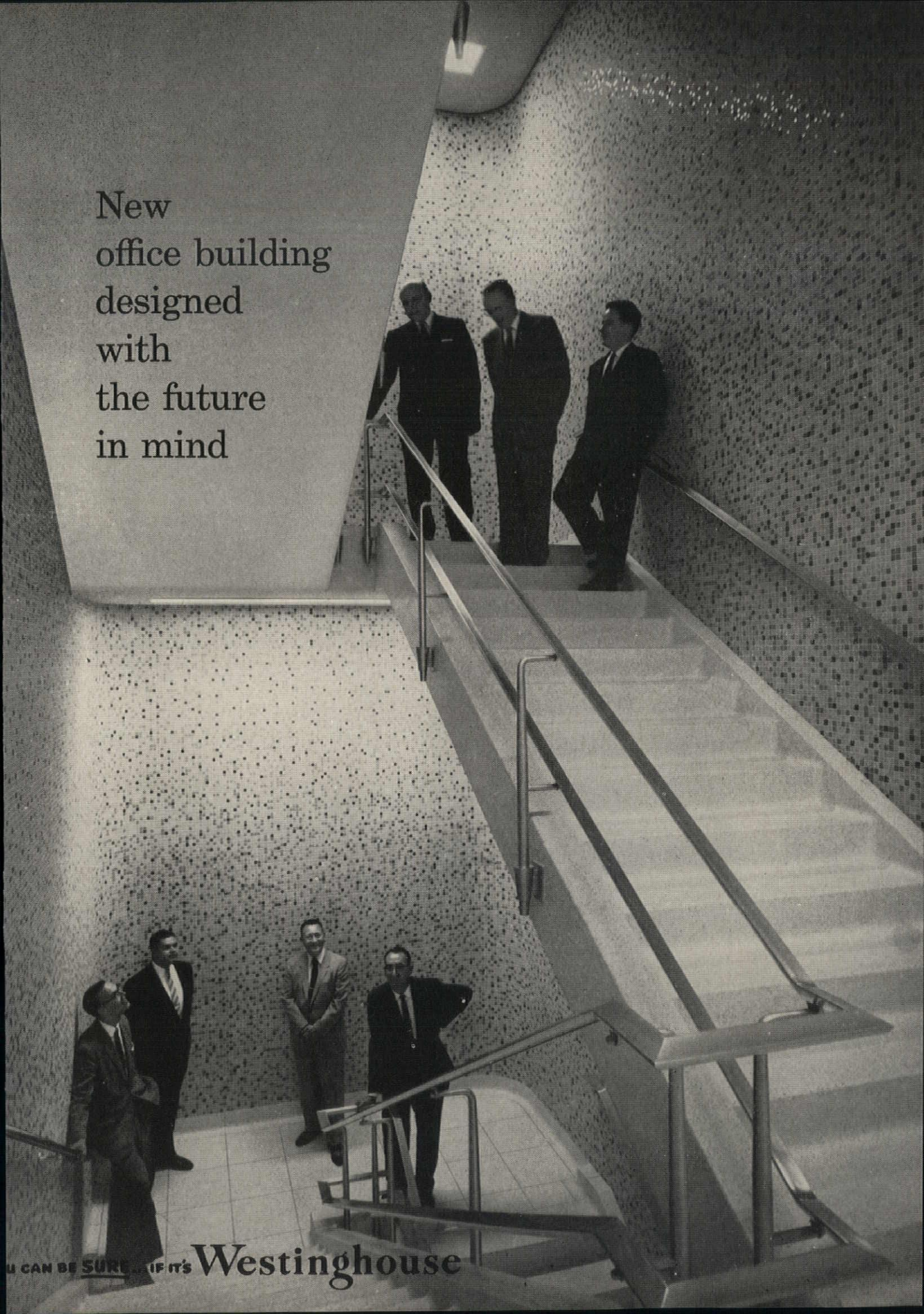


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New
office building
designed
with
the future
in mind
U CAN BE SURE... IF IT'S Westinghouse

Exterior view of new home offices of Bankers Life Insurance Company of Nebraska, in Lincoln. Two different lighting systems are provided for the building, one for day and periphery lighting for night.



COVER PHOTO: Westinghouse Mainliner recessed fluorescen luminaires light the spacious stair wells which are finished wit ceramic tile and terrazzo stairs. Shown here are C. E. Pickering Westinghouse Construction Specialist; W. F. Sterbens, Wesc Omaha; J. P. Anderson, James P. Anderson Company, Cor sulting Engineers; J. O. Unthank, Unthank and Unthank, Ar chitects; R. W. Changstrom, Branch Manager, Wesco, Omaha P. J. Assenmacher, President, Assenmacher Construction Com pany, General Contractor; and T. G. McBride, Sales Manage Market Planning, Wesco, Pittsburgh.

Bankers Life Building designed for comfort, convenience, economy and expandability

The home office building of Bankers Life Insurance Company of Nebraska, in Lincoln, was planned and constructed to provide maximum efficiency and future expansion. It incorporates many ideas which resulted from a study of other home office insurance buildings throughout the country, plus a careful study of the company's operation and plans for future growth.

Careful consideration was given to the selection of easily maintained materials for efficient maintenance and low operating costs. This was accomplished through use of permanent materials which require no painting, such as Westinghouse decorative Micarta® surfaces; large areas of ceramic tile; terrazzo floors; glare-reducing, heat-absorbing glass; movable walls; changeable fixtures and complete flexibility of heating, lighting and communications facilities.

One of the most important considerations in plan- ning and construction of the building was the selection of an adequate electrical distribution system and the electrical comfort and convenience components such an electrical system made possible. Westinghouse was specified throughout for the distribution system, light- ing, elevators, motors and controls. The expandability inherent in the building itself is ample for the present electrical needs and provides for 100% future elec- trical expansion.

(*contd.*)

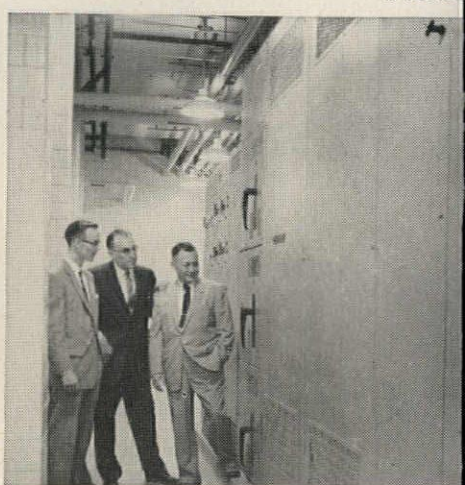
YOU CAN BE SURE...IF IT'S
Westinghouse
J-94136-2



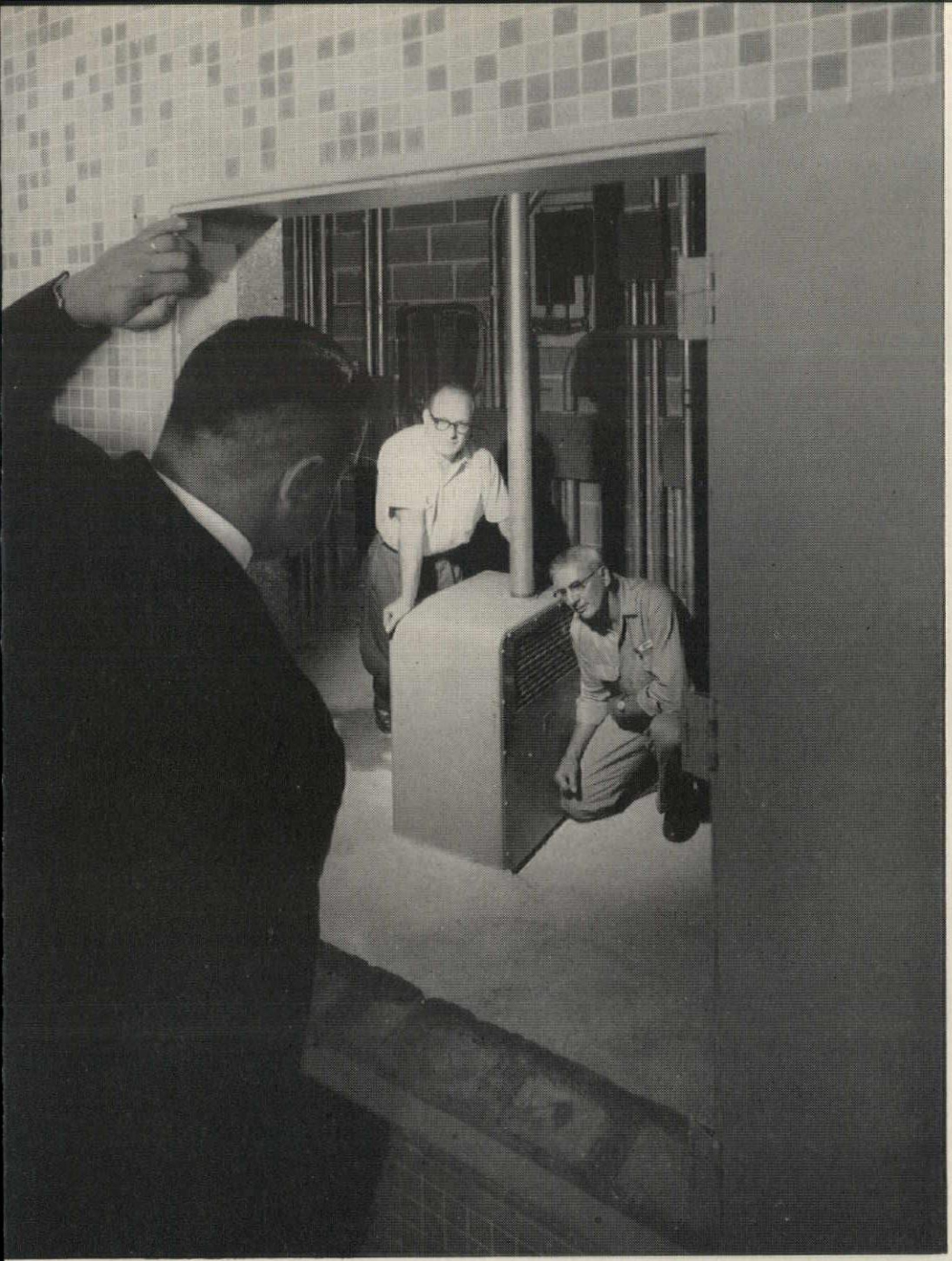
View of one of the scientifically planned work areas where the latest equipment is combined with planned use of space to make work easier and more productive. Complex electronic equipment necessary for accurate computations and record keeping requires special facilities including auxiliary air conditioners and humidifiers.



Office areas are illuminated with Westinghouse Mainliner recessed fluorescent luminaires. Modern functional furniture made with durable Westinghouse Micarta laminates was designed and built by Herman Miller of Zeeland, Michigan.



C. E. Pickering, J. O. Unthank and J. P. Anderson are shown in front of Westinghouse 1500-kva dry-type ASL power center. This power center steps incoming voltage down from 5 kv to 277y/480 for distribution through three Type DB-50 air circuit breakers.



W. F. Sterbens looks through the only opening of central ventilator-power duct shaft located in immediate office area of each floor. A compact 75-kva Westinghouse Type DT-3 dry-type transformer steps down voltage at point of utilization feeding underfloor duct. K. W. Bell, Building Superintendent, and Jacob Dietrich, Building Engineer, check noise level of transformer which must be inaudible to operate in office area. Size was also a prime consideration in fitting transformer through available opening. Only a Westinghouse DT-3 dry-type transformer combined small size, 75-kva rating and guaranteed silence.

J-94136-3



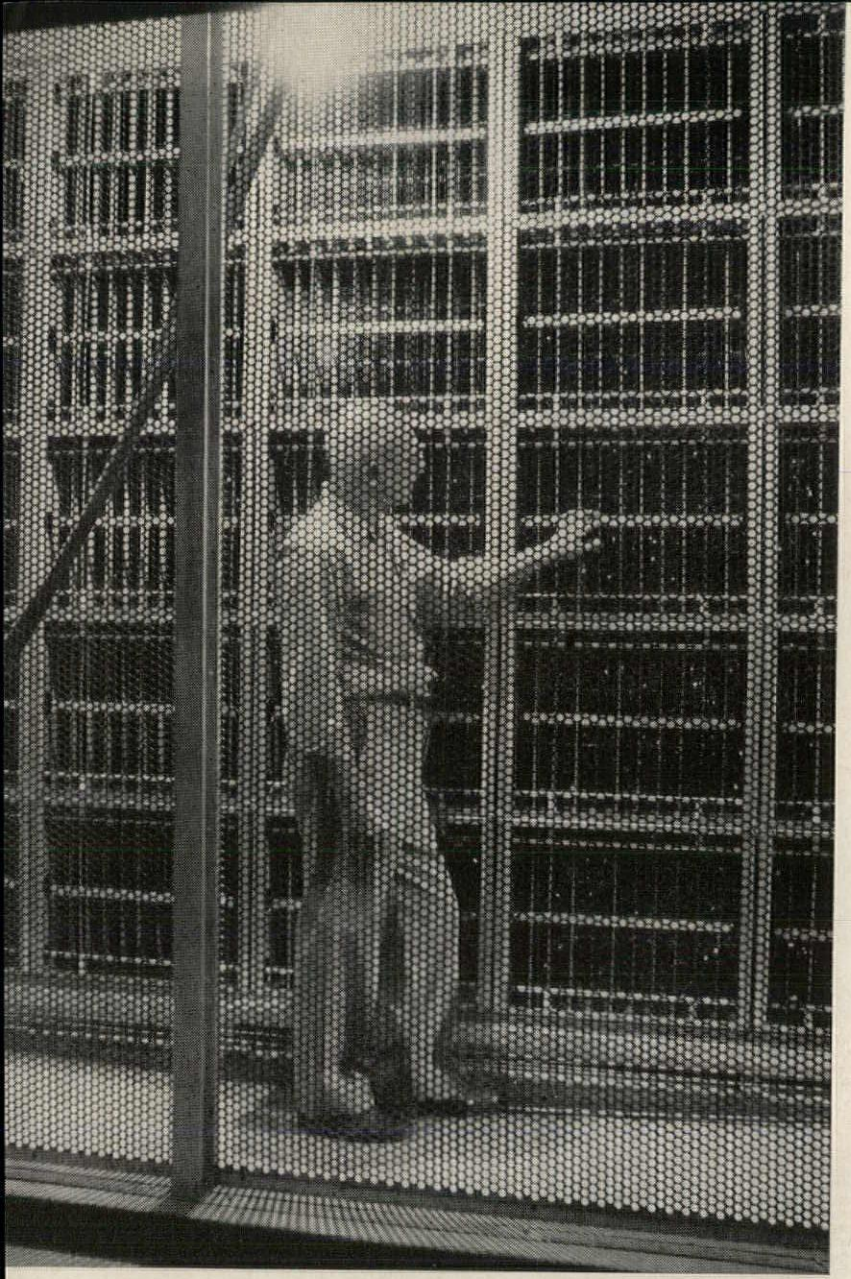
acob Dietrich, Building Engineer, Bankers Life f Nebraska; A. J. Whitmer, President, ABC lectric Company, Electrical Contractors; and V. F. Sterbens operate pushbutton of one of the ombination Life-Line® starters in the motor ontrol center portion of the 1500-kva power enter. This control center feeds, protects and ontrols all motors and feeder circuits in mehanical equipment room.



One of two Westinghouse 200-hp Life-Line motors which drive compressors in air conditioning system. Westinghouse motors from 1 to 200 hp were specified for all auxiliary equipment drives. Having a single source of supply simplifies maintenance and spare parts problems for operating equipment. Discussing the installation are J. P. Anderson; C. E. Pickering; J. O. Unthank; and Harold Stebbins, Vice President, Bankers Life of Nebraska.

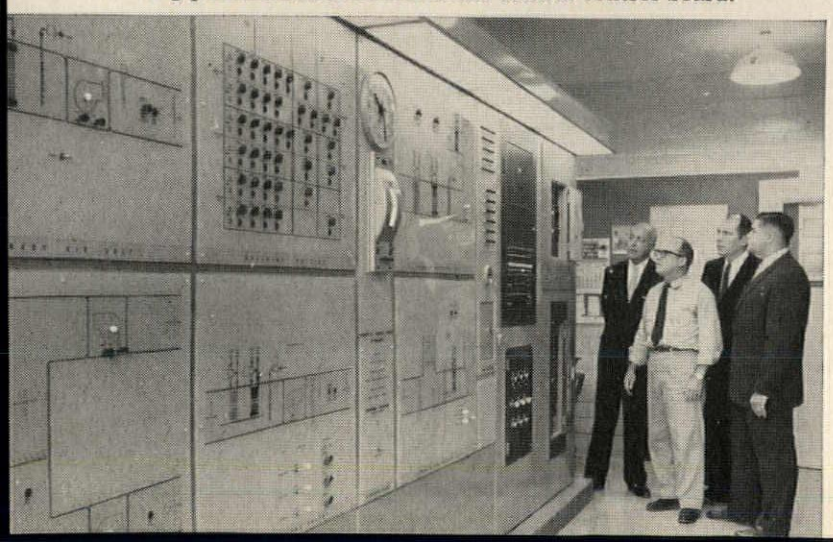


Harold Stebbins, C. E. Pickering, A. J. Whitmer, G. R. and J. O. Unthank are shown on one of the Westinghouse Selectomatic®-Automatic elevators which are traffic controlled to match, automatically, elevator service to traffic demand.



Jacob Dietrich views Westinghouse PRECIPITRON®, the Electronic Air Cleaner which removes up to 95% of all dirt particles, smoke and pollen in the air circulating throughout the building. This improves working conditions and also protects employe's health. The PRECIPITRON traps microscopic particles that cause streaks, smudges, damage to interior furnishings and office equipment, thereby reducing cleaning and maintenance costs.

This Supervisory Data Center in the Bankers Life Building is an electronic service board which registers temperatures and humidities throughout the building and automatically operates interior and exterior lighting, air conditioning and heating and even automatically turns on the sprinkling system for the landscaped grounds. Harold Stebbins, K. W. Bell, A. J. Whitmer and W. F. Sterbens inspect two Westinghouse NPLAB lighting panelboards included in the central control board.



Building designed for comfort, convenience, economy and expandability (*contd.*)

The planners and builders also recognized that, in specifying Westinghouse, they would enjoy the economics possible when buying from a single source of supply and later being able to minimize maintenance, spare parts inventory, replacement and expansion problems.

Westinghouse welcomes the opportunity to work with you in finding the best solutions to your own special electrical requirements. Call the Westinghouse Construction Specialist nearest you, or write to Westinghouse Electric Corp., Box 868, Pittsburgh 30, Pa.

OWNER:	Bankers Life Insurance Company of Nebraska, Lincoln, Nebr.
ARCHITECT:	Unthank and Unthank, Lincoln, Nebr.
CONSULTING ENGINEER:	James P. Anderson Company, Omaha, Nebr.
GENERAL CONTRACTOR:	Assenmacher Construction Company, Lincoln, Nebr.
ELECTRICAL CONTRACTOR:	ABC Electric Company, Lincoln, Nebr.
WESTINGHOUSE DISTRIBUTOR:	Westinghouse Electric Supply Company, Omaha, Nebr.

J-94136-4

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WATCH "WESTINGHOUSE LUCILLE BALL-DESI ARNAZ SHOWS"
CBS TV ALTERNATE FRIDAYS

On Building Schools . . .

THE GORDIAN KNOT!

*by Benjamin B. Loring, President, Seaporcel Metals, Inc.**

The response was overwhelming. We published a paid public service advertisement discussing the pressures created by the new building materials (Arch. Record—March, 1960). We were swamped.

Hundreds of distinguished, articulate architects across the nation wrote offering their views of the problem.

Over 95% of the architects agreed with our approach. The balance did not. All, however, were concerned with the problems created in specifying the new architectural materials.

Most pressing of the problems, said the architects, was the ubiquitous "OR EQUAL" clause in Public Works and the confusion it creates.

This confusion, this intricate tangle, this "Gordian Knot" stifles architects. It hangs a millstone around their necks that grows heavier daily.

Who, after all, in this day and age can say what is equal? Can anyone inspect an installed or completed product and view its equality? Can mere surface dimensions furnish testimony to the excellence of manufacture? Of course not.

This is indeed, as architects tell us, a "Gordian Knot."

WHAT, THEN, IS THE SOLUTION?

From forward-thinking architects comes the cry: "Cut the Gordian Knot" . . . as Alexander The Great did.

Cut it first with air-tight specifications, received from reputable manufacturers, is the demand of many architects. Up-to-date, minutely detailed information concerning all the new architectural products is available from every reputable manufacturer.

Conscientious architects can emasculate the "OR EQUAL" type of substitution clause by drawing up specifications that leave no room for products that do not exactly meet the architect's needs. They can make it virtually impossible to use products of lesser function or quality than those planned.

Cut the knot next with the swift stroke of more carefully prepared contracts say other courageous architects. Write contracts to insure that any savings made by using products other than those specifically named be credited to the public agency.

Cut it again sharply by demanding more complete bids for public projects is a solution offered by some architects. Require that bidders on public projects name all the subcontracting firms supplying the materials included in such bids.

The severest . . . and most effective cut of all, say several architects themselves, is to insist upon direct specification. In their privately financed jobs, most architects would defend to the core their right to specify by product name. Yet many find it hard to resist such demands in public projects.

Finally, and most difficult by far, say the architects, is the direction in which we must all try to head. That includes all of us who want to build better public projects . . . the engineers . . . the architects . . . the manufacturers . . . the suppliers . . . the contractors . . . the public. We must all do what we can to educate the various contracting public agencies to allow omission of the "OR EQUAL" clause.

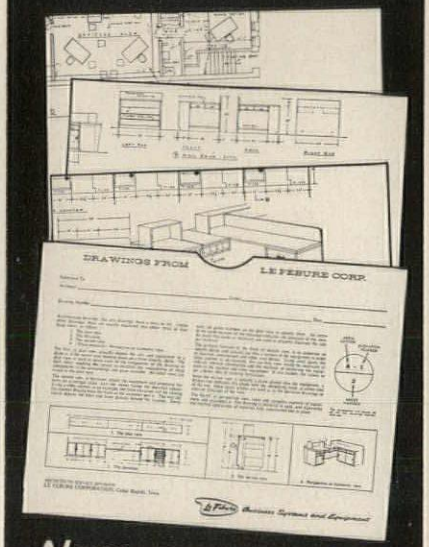
The architect's professional stature demands no less.

With every single advance in the building materials field, the "OR EQUAL" clause becomes less a protection, more a profit-maker; less a procedure for savings, more a product-substituting device; less a prudent practice, more a proviso for public loss.

*Benjamin B. Loring is President of Seaporcel Metals, Inc., 28-20 Borden Avenue, Long Island City 1, New York, manufacturers of architectural porcelain products, laminated curtainwall panels since 1931, with licensees in 22 countries throughout the free world. He has prepared this additional paid public service advertisement in the interest of the architectural profession. He invites your comment. (Reprints of this editorial and the previous one are available upon request.)

For Designing and Remodeling

BANKS and SAVINGS & LOAN ASSOCIATIONS



New

FREE KIT of PLANS

Financial building and remodeling is booming . . . and is going to continue at a record pace! This new kit, prepared by LeFebure's Architects Service Division, contains architectural drawings and chronological case histories of actual financial projects where LeFebure and the architect worked hand in hand.

LeFebure, with over 60 years' experience, is a recognized leader in the development of systems and equipment for banks and savings/loan associations.

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CITY & STATE

Washington Topics

the engineering field, have added to their staffs to permit a greater amount of technical aid where and when it is needed.

FHA Asks Closer Policing on Home Improvement Program

The Federal Housing Administration has called for closer policing of its Title I home improvement loan insurance program. A check of 1959 activities showed that some lenders failed to investigate fully the dealer-contractor applicants and that as a result, FHA suspended the contracts of a number of lending institutions and terminated the contract of others. An examination of the portfolios of those institutions led to the removal from insurance coverage of $1 million in transactions due to ineligibility.

All property improvement lenders were urged by the agency to analyze and evaluate carefully every new dealer-contractor applicant. Operation records should be checked constantly after an applicant is approved, FHA said.

Advisory Group Would Spur Pollution Control Program

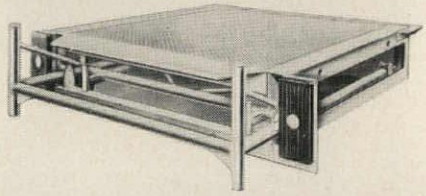
The Water Pollution Control Advisory Board to the Surgeon General has recommended "additional incentives" to meet the backlog of municipal waste treatment facility construction. Meeting in Washington for two days in January, the board also recommended extending Federal government jurisdiction to cover pollution of all interstate and navigable waters, provided that state concurrence is obtained before the Federal government enters into an intrastate pollution situation.

Regarding the program of waste treatment facility construction, the board said a careful analysis showed that these grants had significantly stimulated and increased construction of needed facilities without slowing down the rate of construction of such plants financed entirely with non-Federal money.

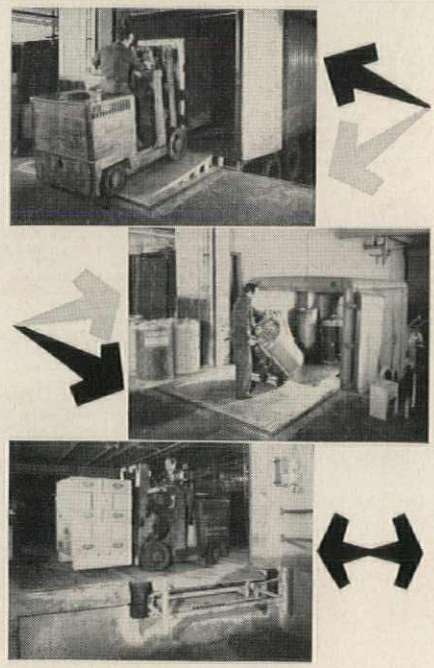
It was felt the budget should contain a separate and distinct item for

continued on page 366

SHORTEST SPAN TO PEAK PERFORMANCE



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Specified Most Frequently Because of Installation Ease, Adaptability and Proficiency

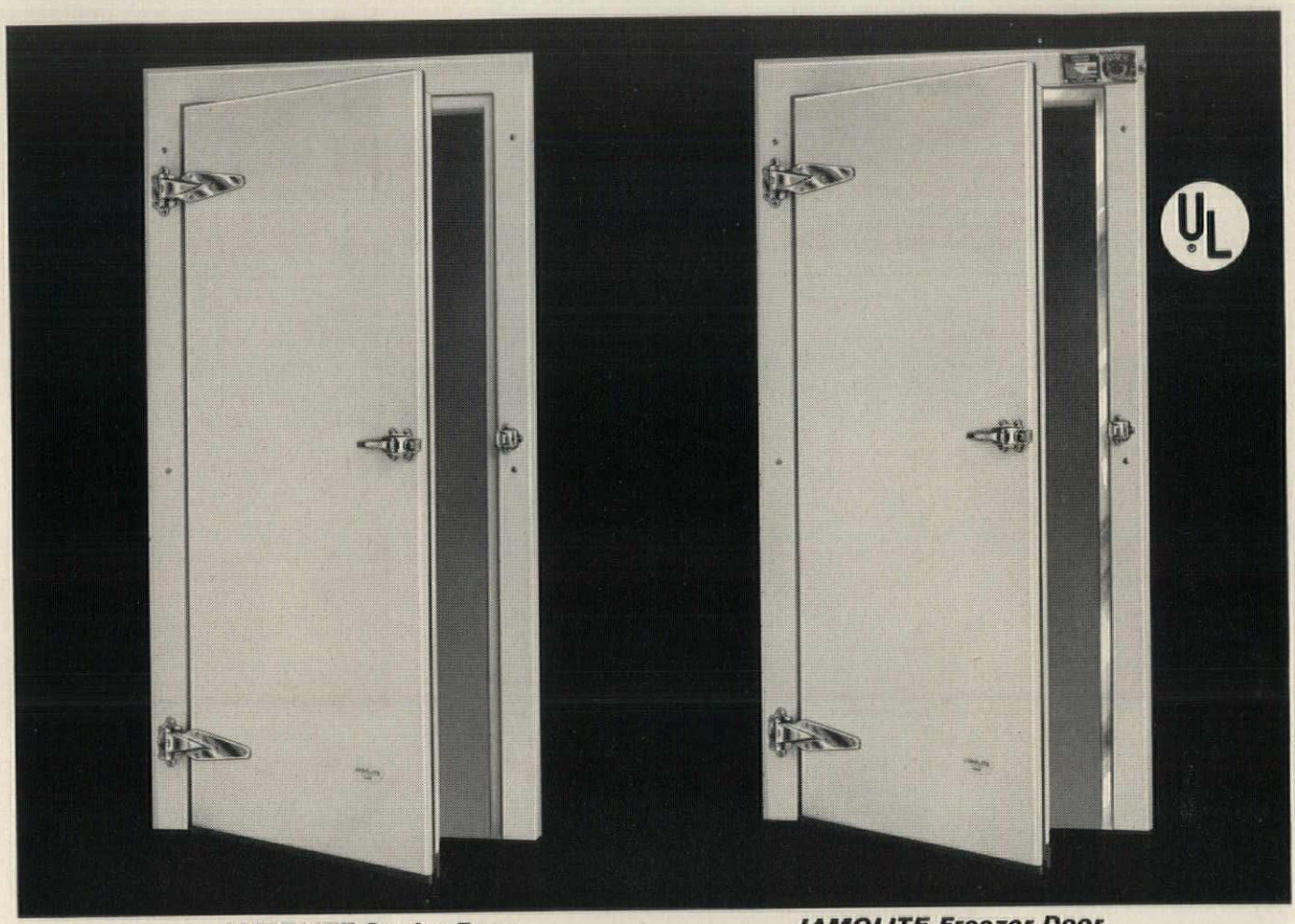
You can stake your reputation on "DOCKBRIDGE" with utmost confidence. Throughout industry this fully-automatic, truck activated loading ramp is keeping trucks rolling and producing — eliminating wasted man hours. It accepts trucks up to 16" above and down to 10" below dock level. Provides for full cross traffic when not in use. No need for costly, complicated hydraulics or jury-rigged mechanisms. Only self-contained package ready to install in a prepared dock pit 17½" deep. Where pit is impractical, addition of four sturdy legs make "Dockbridge" a free-standing unit. Adaptable to either existing dock or new construction. Three models available: 6' x 6', 6' x 8', 6' x 10'. **Write for free catalog.**

AMERICAN DOCKBRIDGE, INC.

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NEW FOR COOLER AND FREEZER ROOMS:

Lightweight, Colorful JAMOLITE Plastic Doors*



JAMOLITE Cooler Door

JAMOLITE Freezer Door
with Jamison Frostop®

Lightweight: Weight is 1/5 of metal clad cold storage doors.

4" Thickness: Cooler and Freezer doors are both 4" thick.

Impervious to moisture and vapor — easy to keep clean.

Colorful JAMOLITE doors come in gleaming white and four colors.

Frostop prevents ice formation at area of gasket contact.

● THE JAMOLITE DOOR is a completely new development in cold storage doors for the Food Service Industry. In hotels, restaurants and institutions JAMOLITE Doors are transforming interiors with new brightness and color.

Both cooler and freezer doors are flush-fitting and only 4" thick with new lightweight framing. Foamed-in-place polyurethane plastic provides highly efficient insulation, is permanently bonded to rigid fiber glass shell. Installation details for each door are practically identical.

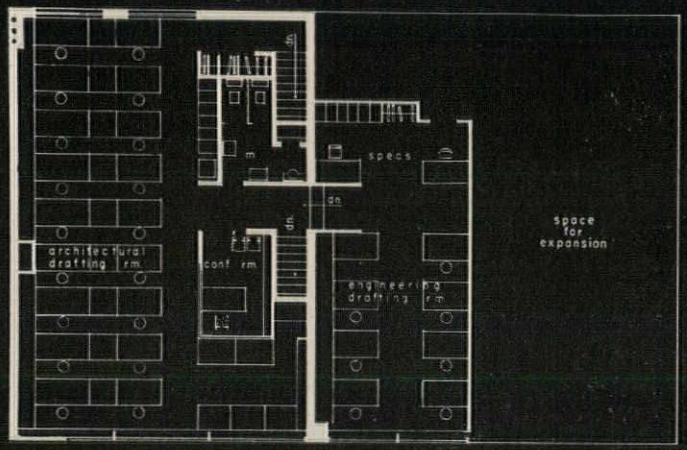
Complete data on new, lower-cost JAMOLITE is available in Sweet's; or write today for Catalog FS to Jamison Cold Storage Door Co., Hagerstown, Md.

*Jamison Trademark

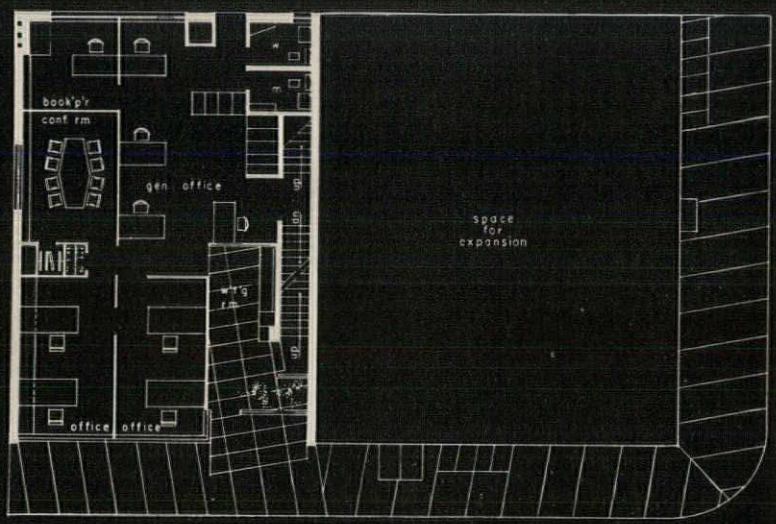
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COLD STORAGE DOORS

A REPUTATION FOR SERVICE

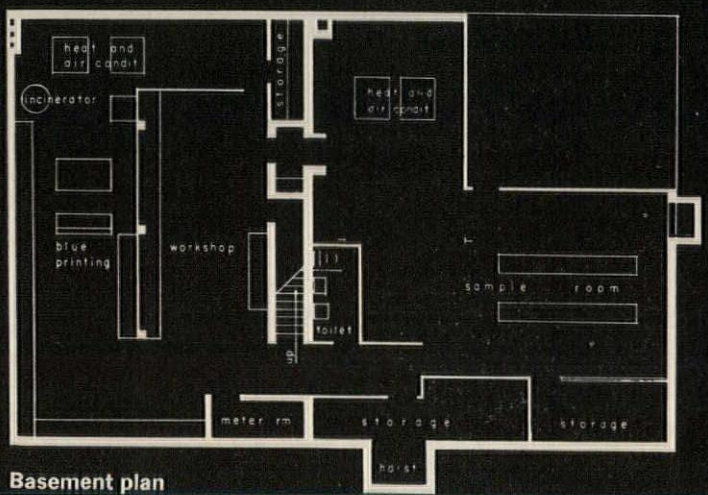
Offices of Celli-Flynn, Architects and Engineers, McKeesport, Pa.



Second floor plan



First floor plan



Basement plan

Quartered in a handsome building of their own design, Celli-Flynn carries on one of the largest architectural and engineering practices in Western Pennsylvania. Ten years of business have established the firm's reputation for high professional competence and services.

Celli-Flynn is noted, for example, for the thoroughness of their preliminary analyses and estimates — and for the complete documentation they present to clients in these critical phases. Among the interesting features of the office layout is a sample room in which specified products and materials are displayed for the approval of clients. Services like these exemplify the firm's concern for good architect-client communications and understanding.

In the area of communications with suppliers and contractors, Celli-Flynn places a great deal of importance on its cooperation with F. W. Dodge. One of the three Associates is assigned to provide pertinent data on all jobs in progress to the Dodge Reporter as it becomes available. Through Dodge Reports, this data is channelled to firms offering vital services and supplies . . . in each area where a project is to go up. Together with plans and specs filed in Dodge Plan Rooms nearest the building sites, the Reports expedite contract awards, buying decisions, and construction. They also help create bidding situations most favorable to Celli-Flynn's clients.

In addition, Dodge Reports relieve the staff of Celli-Flynn of the nuisance of many "cold" sales calls by directing the attention of vendors to current projects for which they may have applicable products or services to offer.

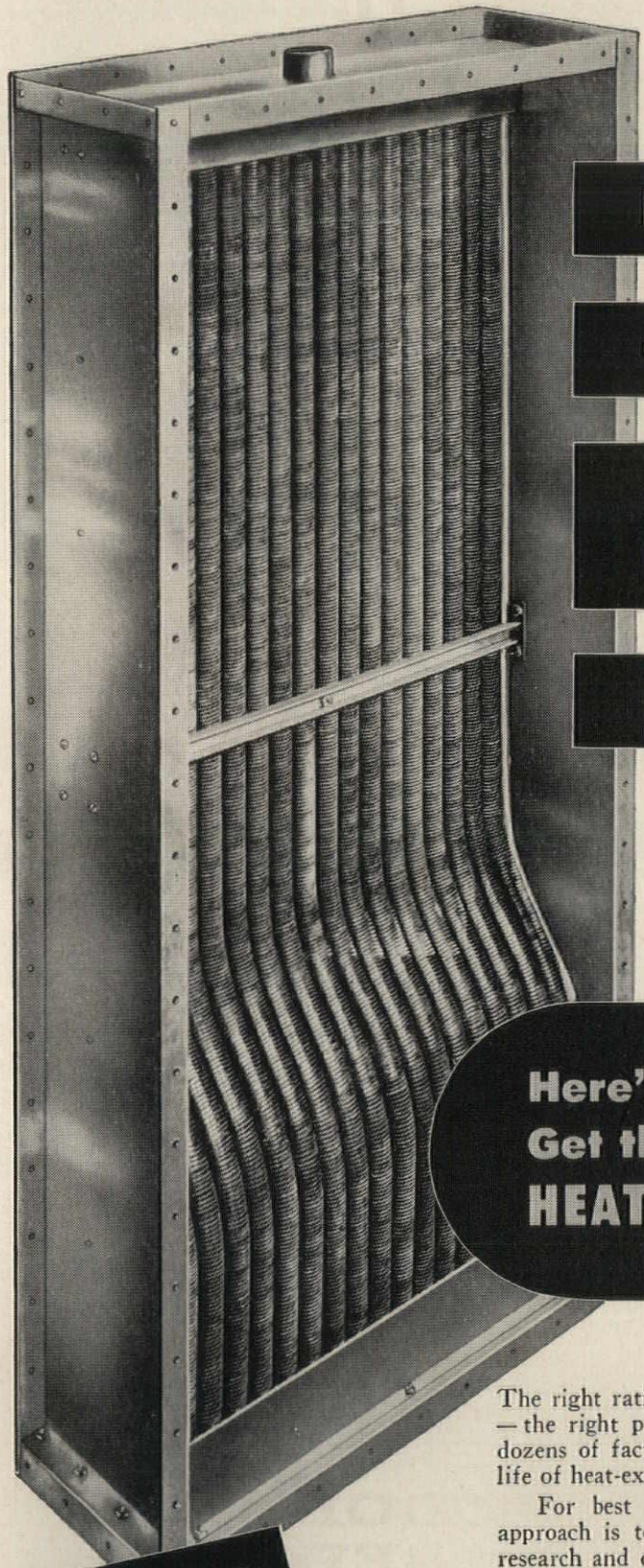
The practice of this progressive firm again testifies to the fact that DODGE REPORTS ARE A VALUABLE COMMUNICATIONS LINK BETWEEN THE ARCHITECT AND THOSE WHO SERVE HIM.

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For best performance in your own application, the practical approach is to take full advantage of the unequalled engineering, research and design skill – the unequalled manufacturing and testing facilities – which Aerofin offers you.

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Aerofin is sold only by manufacturers of nationally advertised fan system apparatus. List on request.

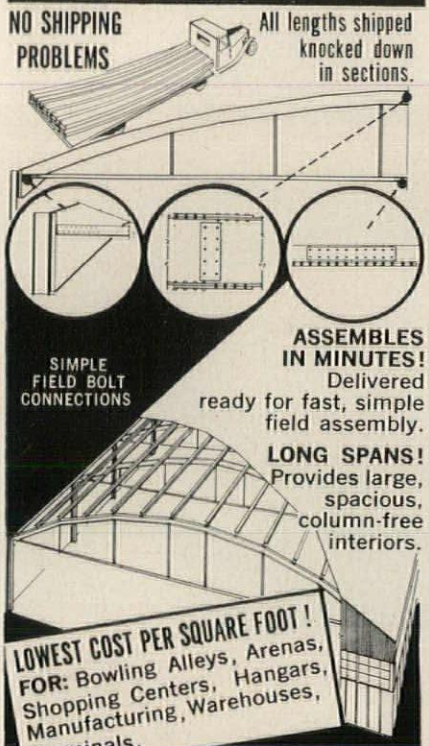
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AR-5

Please attach to your professional letterhead and mail to:
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Washington Topics

water pollution control activities for ready identification at all stages of the budget and appropriation process. All Federal and other public installations having waste disposal problems were urged to set an example to the rest of the country by better cooperation with state water pollution control agencies and the Public Health Services in installing needed waste treatment facilities.

The quality of the nation's water needs improvement, the board's report said, and enforcement provisions of the Federal Water Pollution Control agencies should be strengthened to assure both preservation and improvement. At the same time, it called for amendments to assure that sources of pollution will not be exempt from the provisions of the Act simply because of fortuitous geographic location.

The establishment of additional cooperative State-Public Health Service basic data stations was urged in view of the increased discharges of new products and wastes. Population and industrial growths as well as increased urbanization contribute to the problem, the Board contended.

A sufficient number of these stations should be established, it advised, to enable states, localities, industries and the Federal government to protect the public health and conserve waters for all uses. Such stations provide information on the quality of the nation's water.

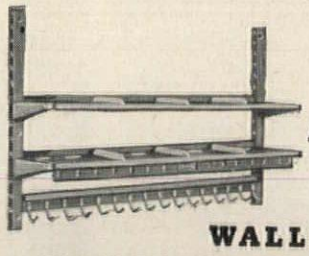
Meanwhile, Interior Secretary Fred A. Seaton, in his report on the 1959 activities of his Department, warned that the availability of water—just plain, ordinary water—was rapidly becoming a major concern to America and to the world. He predicted that by 1975-1980 it may well be the number one domestic problem for the United States.

Interior is sponsoring construction of five saline and brackish water conversion plants; demonstrators in the process of changing salt water into fresh.

Here's the problem—America now uses 240 billion gallons of water daily. With anticipated population increases, Interior estimates that within 20 years the need will be 500 to 600 billion gallons each day. Said

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Schooline®
WARDROBE SYSTEMS

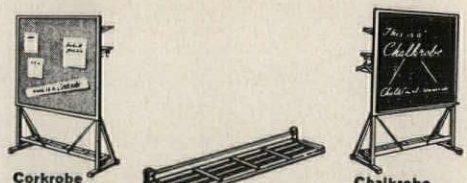


Fixed columns • adjustable shelves

Adjustable Height

WALLMOUNTS

Solve the pupil wraps problem efficiently with Wallmount Coat and Hat Racks. Mount on any available wall space. Hat shelves and hanger bar adjustable on permanently attached columns to height for any age group. Double hat shelves and double row of spaced coat hooks accommodate 6 pupils per running foot. Basic 3' 2" or 4' 2" units interlock to make continuous racks to fit any space or capacity requirements.



Corkrobe—combination wardrobe rack and corkboard

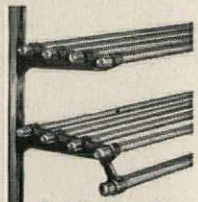
Chalkrobe—combination wardrobe racks and chalkboard

CUSTOM-LINE



Aluminum
Coat and Hat Racks

Tailored to fit any given open or closeted wall area. Smart in design and modern in "clear", "gold" deep etched anodized finishes and combinations. Quality built—closed-end aluminum tubing, rigidly held in cast aluminum brackets that are adjustable for height in dovetailed mounting extrusions. Brackets also adjustable to any desired centers.



Detail shows how dove-tail extrusions (which mount on any centers) hold brackets at any desired height.

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Bring checkroom efficiency to the church and Sunday School. Keep wraps in an orderly manner—aired, dry and "in press". No. 3 wall racks come in any length to fit; 4 spaced coat hangers and hat spaces per running foot. Mount on wall at the desired height for each age group.

The 5 ft. Portable No. 50 Checker accommodates 50 people, goes wherever needed on large ball-bearing-swivel casters. Answers the wraps problem, in vestibules or for meetings, dinners, etc. Efficient, sanitary, fireproof and quality built for lifetime service of welded, heavy gauge steel with square tubular columns.

Write for Bulletin CK



Wardrobe units for every church need including portable umbrella and overshoe racks for entrances, and storage racks for robes.

Write for Complete Catalog #52

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THE Nation's Schools

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"G-E Remote-Control Wiring has saved money since the day it went into this building in 1953," says Mr. Donnelly, standing in front of 3-story, block-long office building, Menands, N. Y.

"G-E Remote-Control Wiring saved us $20,561 in this N. Y. Telephone building - on installation alone!"

... Mr. H. J. Donnelly, Supervising Electrical Engineer New York Telephone Company, Albany, N.Y.

"We compared General Electric Remote Control with an ordinary switching system that would give us the kind of lighting control we wanted," says Mr. Donnelly. "We were surprised to find that, in addition to its other advantages, the G-E low-voltage system cost $20,561 less to install!

"On top of the initial savings, we reduced our operating costs, because G-E master switching makes it easy for maintenance crews to turn ON only those lights needed, rather than lighting up whole floors. Switches at convenient locations save our men extra steps, too.

"These savings were all in addition to the original reason we considered Remote-Control. That was extra safety in controlling the 480Y/277-volt power system we chose for its saving in branch circuit copper. Remote-Control relays in the ceiling control the 277-volt lighting circuits, so there's only a low, 24 volts at the switches. Of course, the lightweight, 24-volt switch wiring makes it easier to relocate office partitions, too. And the elimination of switch-loop voltage drops that can cut the life and efficiency of lamps, is still another feature."

General Electric would appreciate the opportunity of working with you on the design of a Remote-Control Wiring System tailored to fit your particular needs. Write Commercial Engineer, General Electric Company, Wiring Device Department, Providence 7, Rhode Island.



"Douse the lights you don't need!" is standard procedure for maintenance crew, in building from 5:00 to 11:00 p.m. G-E Remote Control makes it easy.

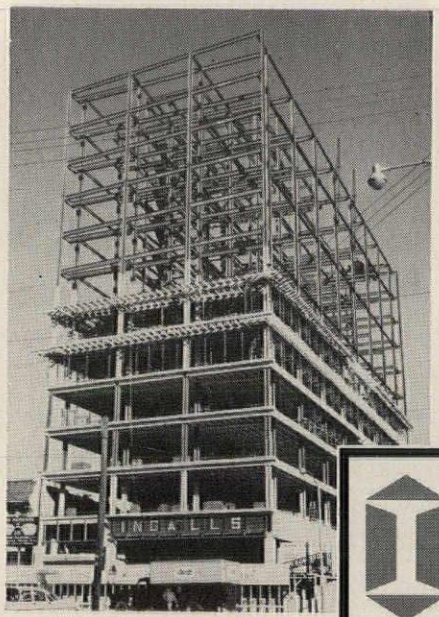


G-E master selector switches at ends and center of each floor control lighting separately for each ½ floor. Building contains 2000 fluorescent lamps.

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Washington Topics

Secretary Seaton's report—"One day—sooner than many people believe—the United States will have to follow a new trail for its water supply, at least in certain areas."

Existing-House Sale Changes Activated by FHA

The Federal Housing Administration finally placed in effect in all of its 75 field offices the program for easier trade-in financing and sale of existing housing authorized in the Housing Act of 1959. Under the new provisions, persons or firms, such as builders, owners of houses for sale and other third parties (including real estate brokers) can receive maximum mortgage insurance commitments for existing homes. Once qualified and approved, the temporary non-occupant owner is in a position to offer for sale the existing home with a maximum mortgage and minimum down payment. When a new owner-occupant is found, there will be a substantial savings in settlement costs.

Now at least 15 per cent of the maximum mortgage money is set aside in escrow with the lender for as long as 18 months. In this period the existing home must be sold and occupied by a new owner-occupant if the maximum mortgage insurance is to continue in effect. Otherwise, the escrow fund is used to reduce the mortgage principal.

Applications for qualifications under the program now are being taken in the agency's district offices. Fee is $20.

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HHFA Issues New Statement On Nondiscrimination

The Housing and Home Finance Agency is applying its racial rules on nondiscrimination rigidly in all states forbidding any segregation policy in housing. Purchasers of land in urban renewal areas in these states have been notified they must comply fully with the statutes.

Under the instructions sent out by Urban Renewal Commissioner David M. Waler, local redevelopment agencies in those affected states will present to prospective redevelopers a formal notice citing the applicable laws and reading further:

"Developers of urban renewal project land are expected to conduct their operations in conformity with state and local laws. A final determination by a state or local tribunal that a developer has used such land in violation of the provisions of any such state or local law prohibiting discrimination may result in the refusal of URA to concur in the disposition of any other project land to that developer."

Housing Administrator Mason commented:

"The purpose of this notice is to make clear to those undertaking redevelopments of urban renewal areas that the Federal government stands ready to support valid enforcement actions of state and local authorities with respect to anti-discrimination statutes, just as we do with respect to other applicable state and local laws."

The URA notification system is similar to that instituted four years ago by the Federal Housing Administration relative to the insurance of private housing mortgages.

This *Young* REGULATOR controls 2 dampers *over 250 feet away!*

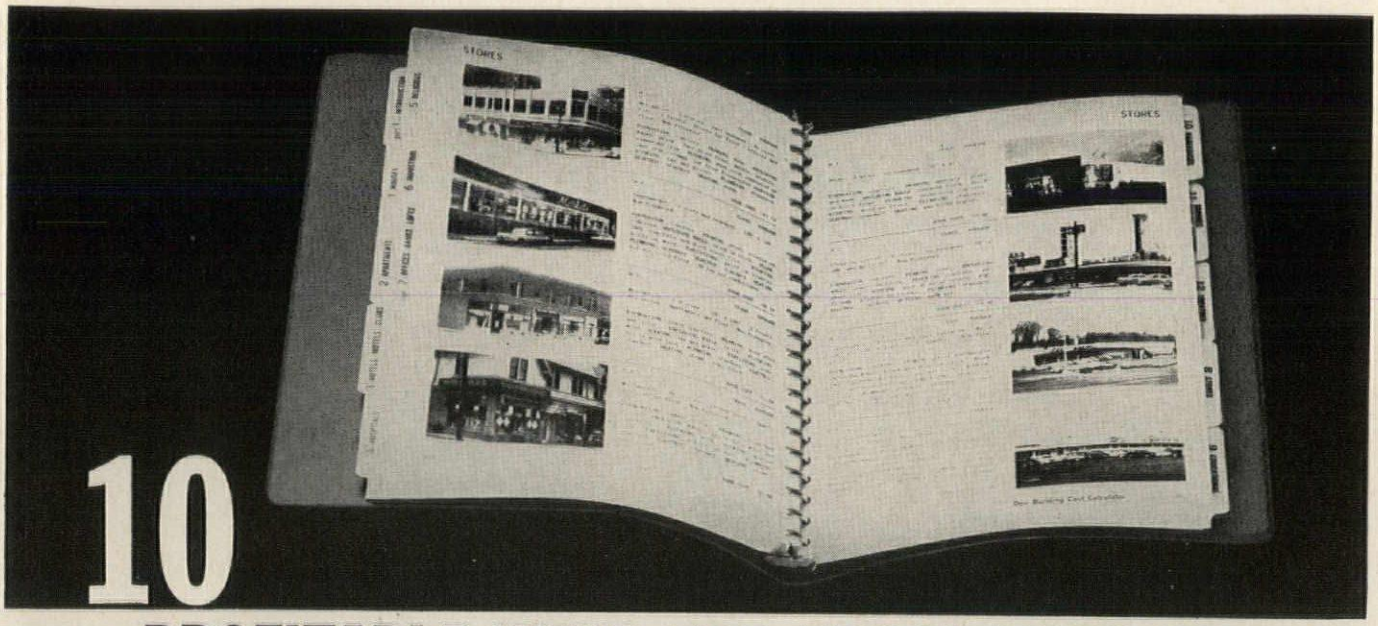


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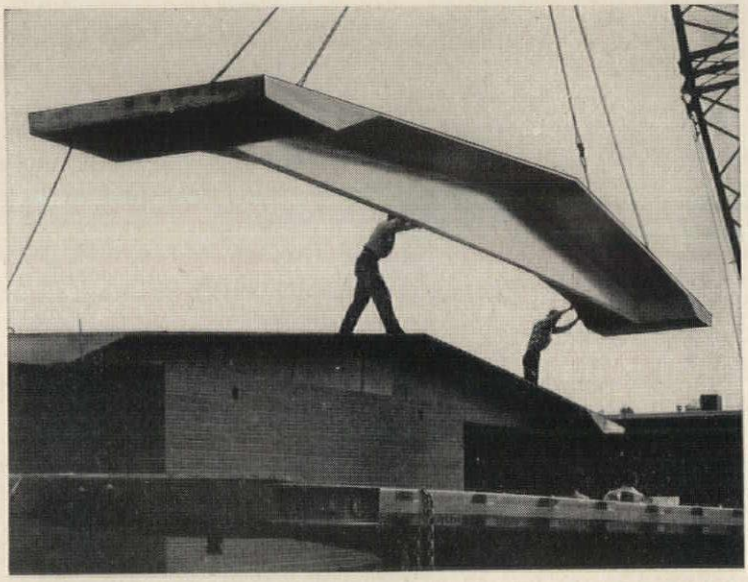
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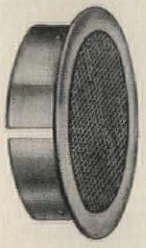
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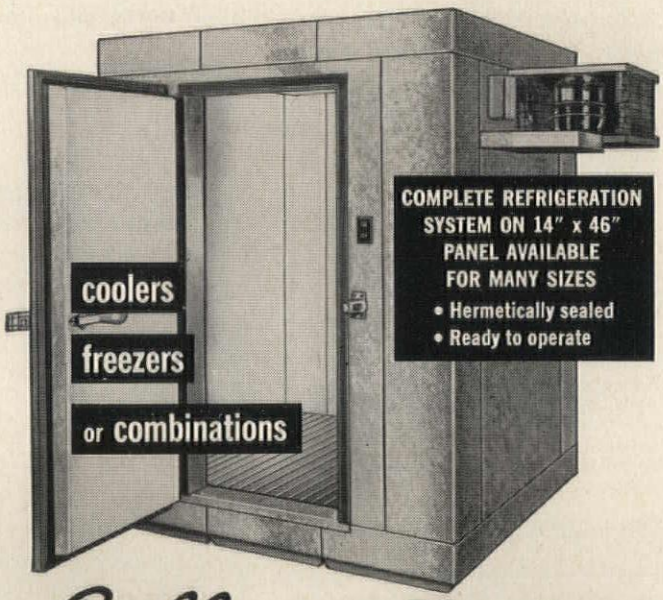
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Required Reading

continued from page 64

Mars . . .

Later findings by the wee men from Mars include a world "divided into two great regions: one, to judge its name from the most prevalent signs, is called Coca-Cola and the other Vodka."

The U. N., the Guggenheim Museum, current architecture in general, the electronic age with its high IQ mechanical minds, and we poor dumb earthlings take quite a beating. A friendly one, however. The book is fun from cover to cover as would be expected of its author. The Dunn bulldozer levels the building site effectively, but without unnecessary damage.

This is Alan Dunn's best to date in the opinion of at least one reviewer. It is an overdue, yet gentle, slap at our 20th Century smugness. Maybe we are not quite so smart as we think we are! Read and re-read; decide for yourself. Mr. Dunn, artist and cartoonist *par excellence*, proves also to be a philosopher.

—*Florence A. van Wyck*

Index Time, Again

THE ARCHITECTURAL INDEX. *Edited by Ervin J. Bell. The Architectural Index, 517 Bridgeway, Sausalito, Calif. 56 pp. $5.*

This edition marks the tenth year of issue of this useful index. As usual, it covers *Arts and Architecture, Architectural Forum,* ARCHITECTURAL RECORD, *House & Home, Interiors, Progressive Architecture and the Journal of the American Institute of Architects.*

Received and Noted

ARCHITECTURAL RENDERING: THE TECHNIQUES OF CONTEMPORARY PRACTICE. *By Albert O. Halse. F. W. Dodge Corporation, 119 W. 40th St., New York 18. 304 pp., illus. $15.75*

MODERN EUROPEAN ARCHITECTURE. *By A. Dorgelo. Elsevier Publishing Co., Amsterdam. Distributed in U.S.A. by D. Van Nostrand Co, Inc., 120 Alexander St., Princeton, N. J. 243 pp., illus. $27.50.*

A large format picture book, which,

continued on page 380

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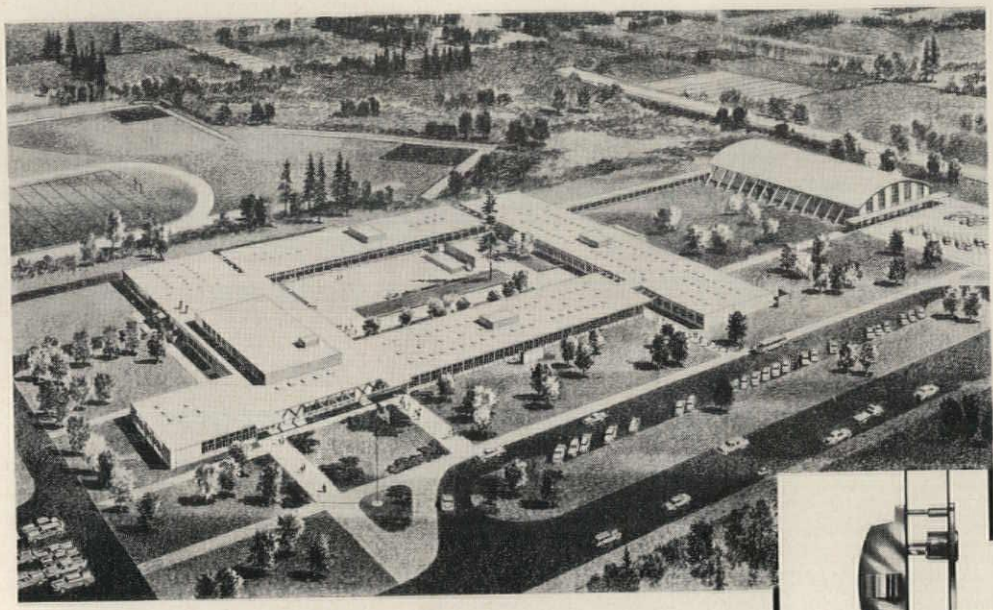
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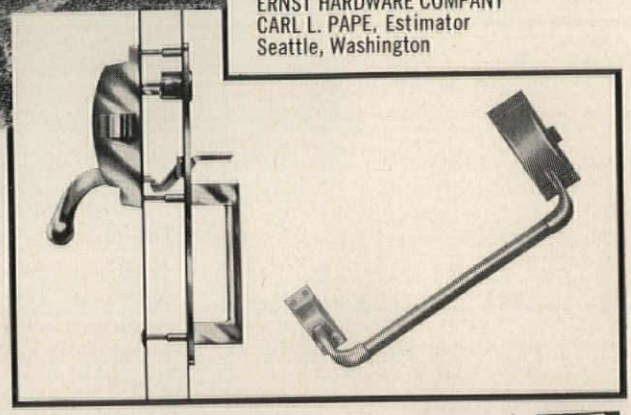
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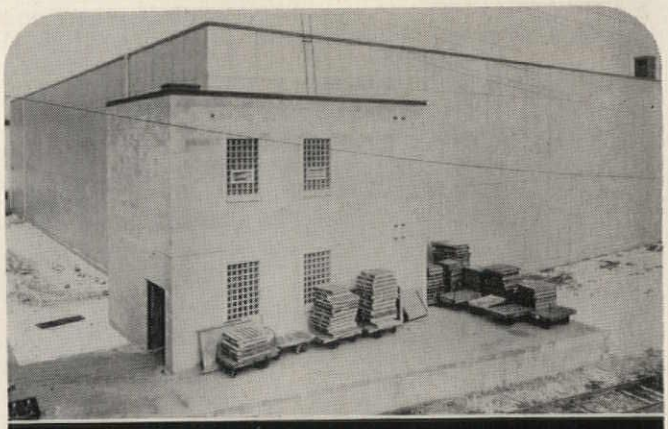
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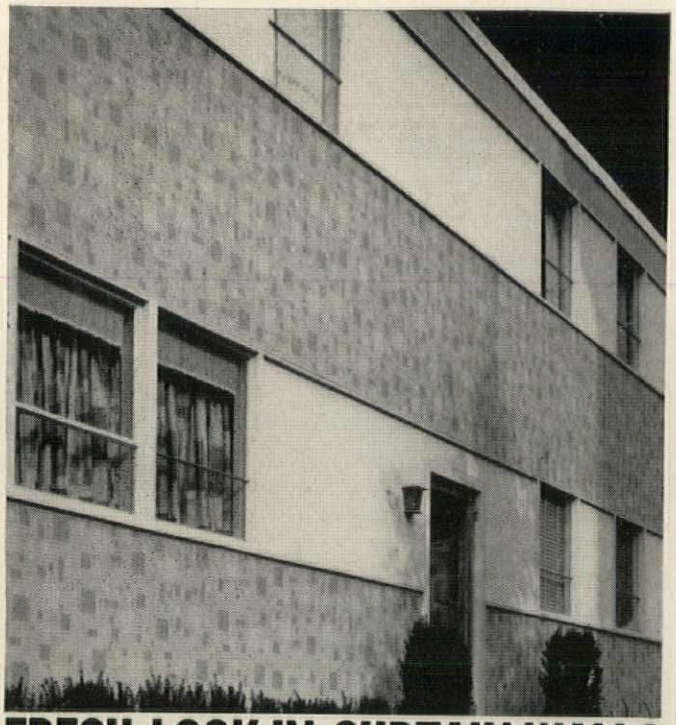
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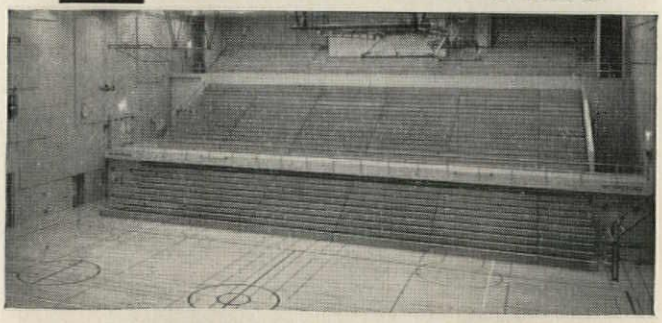


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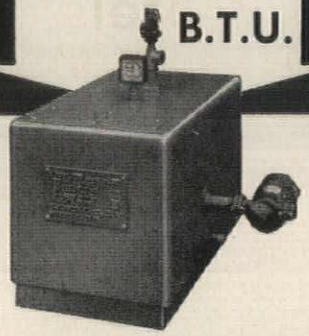
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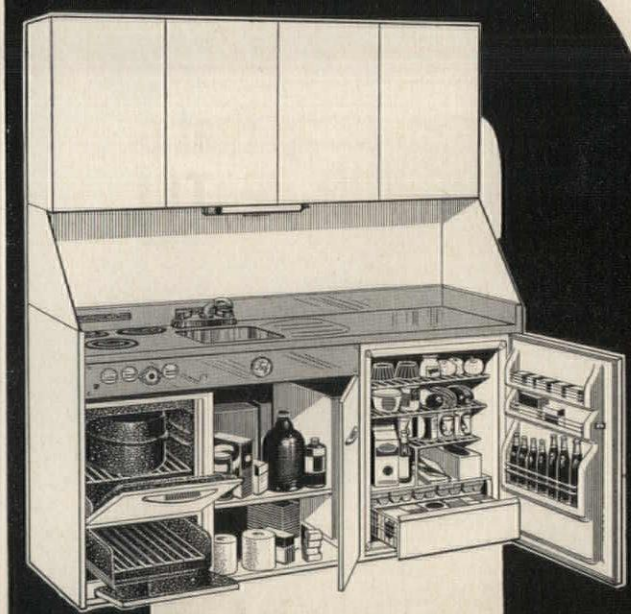
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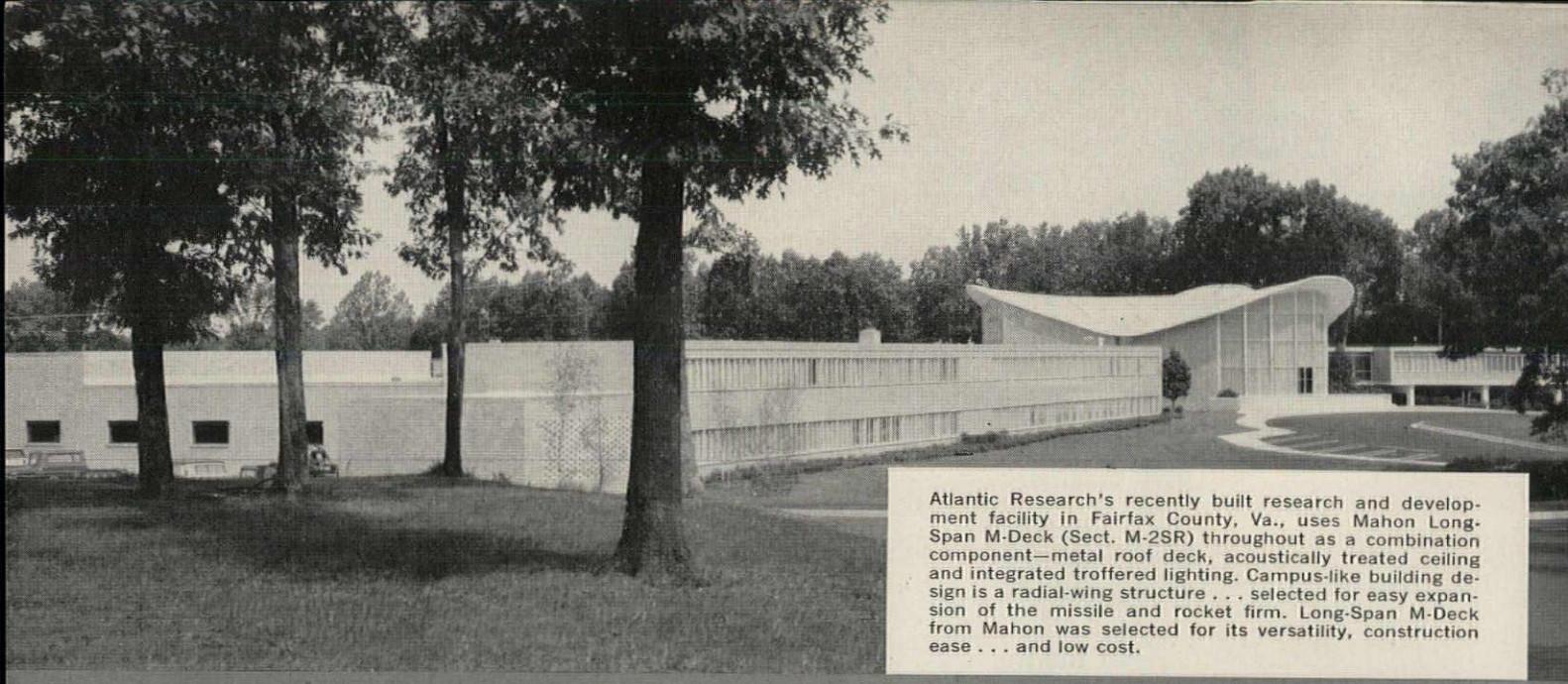
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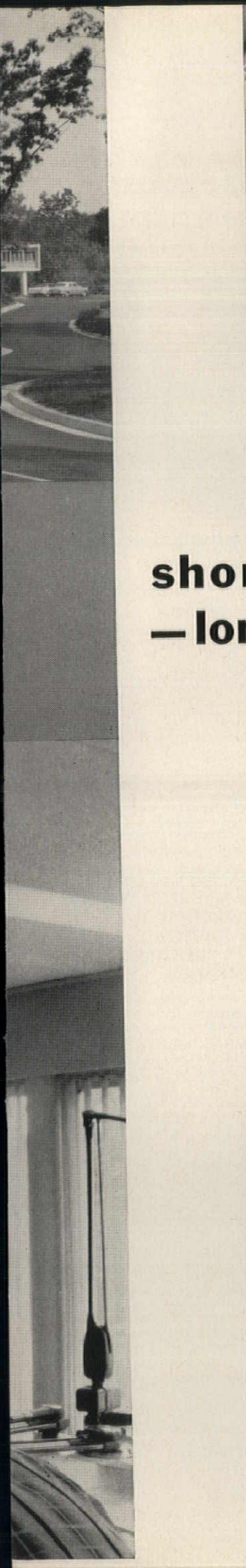
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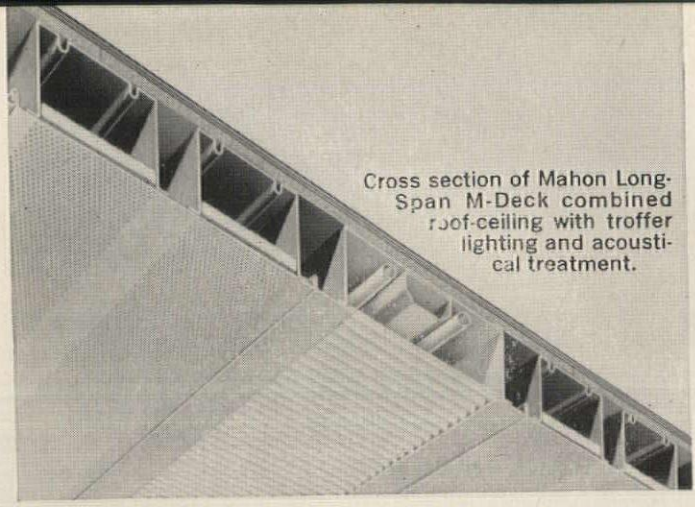


Atlantic Research's recently built research and development facility in Fairfax County, Va., uses Mahon Long-Span M-Deck (Sect. M-2SR) throughout as a combination component—metal roof deck, acoustically treated ceiling and integrated troffered lighting. Campus-like building design is a radial-wing structure . . . selected for easy expansion of the missile and rocket firm. Long-Span M-Deck from Mahon was selected for its versatility, construction ease . . . and low cost.

MAHON MULTI-USE LONG-SPAN M-DECKS

Interior view of one of Atlantic Research's engineering sections showing ceiling side of Mahon Long-Span M-Deck —attractive, functional and noise proofed. Troffer lighting M-Deck sections harmonize with surroundings—provide diffused, glare-free illumination.





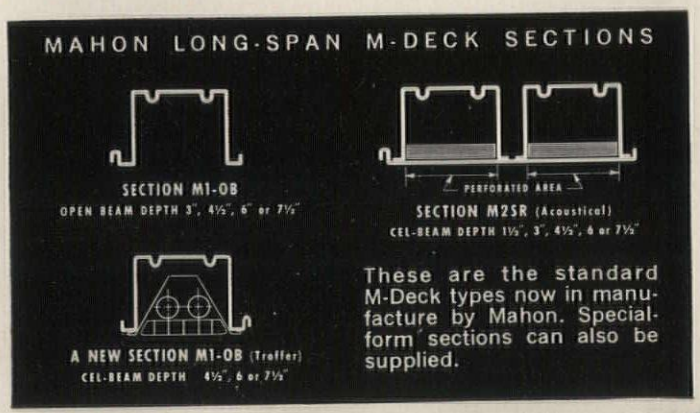
Cross section of Mahon Long-Span M-Deck combined roof-ceiling with troffer lighting and acoustical treatment.

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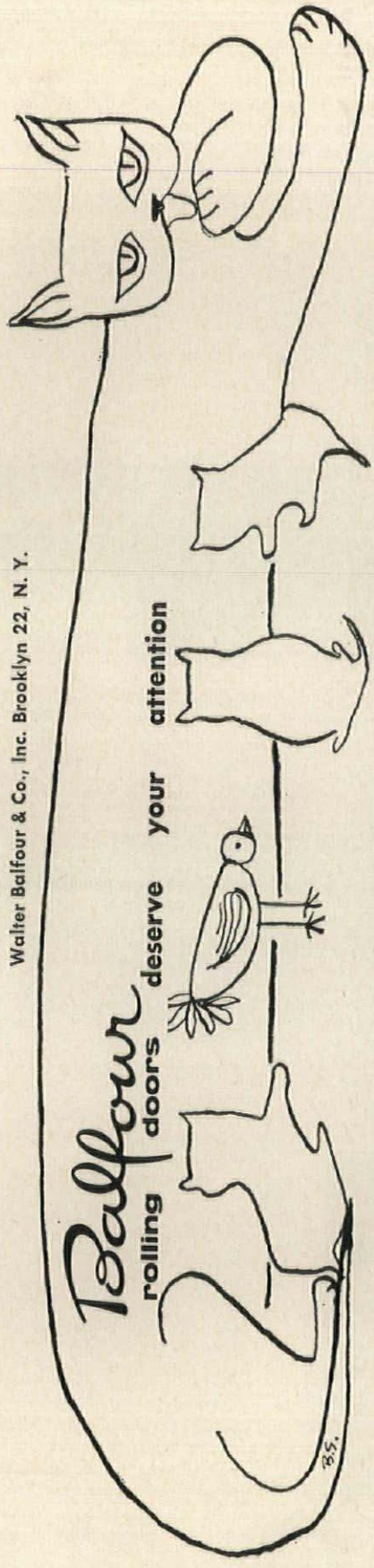
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besides photographs, includes plans, details, considerable information on structure, materials, equipment and costs, as well as periodical references for each building.

TOWN DESIGN. *By Frederick Gibberd. Frederick A. Praeger, Inc., 64 University Place, New York 3. 316 pp., illus. $15.*

A new edition of the author's 1953 study of town planning as an art, revised, enlarged and brought up to date.

RESTAURANTS, CAFES, BARS. *By Alexander Koch. Verlagsanstalt Alexander Koch, Gmbh., Haupstätter Strasse 87, Stuttgart 5, Germany. 412 pp., illus. 105 DM ($27.50).*

A picture and plan collection of eating establishments, mostly in Europe and the U.S., including Stuttgart's unusual television tower restaurant and Zurich's oddly named "Tabaris Whisky Galore." Text and captions for the very satisfactory photographs are all in German, French and English.

TRIUMPH ON FAIRMOUNT: FISKE KIMBALL AND THE PHILADELPHIA MUSEUM. *By George & Mary Roberts. J. B. Lippincott Co., E. Washington Sq., Philadelphia. 321 pp., illus. $6.*

An account of the career of one of that generation of men who were erudite, energetic, opinionated, colorful and dedicated; by combined techniques of persuasion, publicity, charm and sheer force of conviction, Kimball induced the public—particularly the moneyed public—to help him build a fine museum.

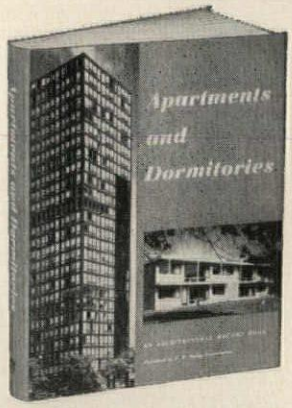
CLEAN AND DECENT. *By Lawrence Wright. The Viking Press, 625 Madison Ave., New York 22. 282 pp., illus. $4.95.*

A scholarly, if not exactly serious, history of the bathroom and the water closet, in which the antique illustrations outclass the text.

GUIDE TO ART REFERENCE BOOKS. *By Mary Chamberlin. American Library Association, 50 E. Huron St., Chicago 11. 448 pp. $10.*

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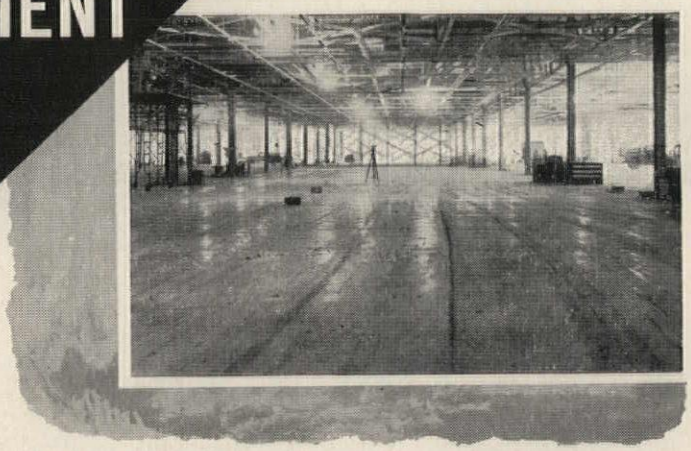
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		New York State	Combined Statewide Studies
NON RESIDENTIAL	Projects	77.6	83.5
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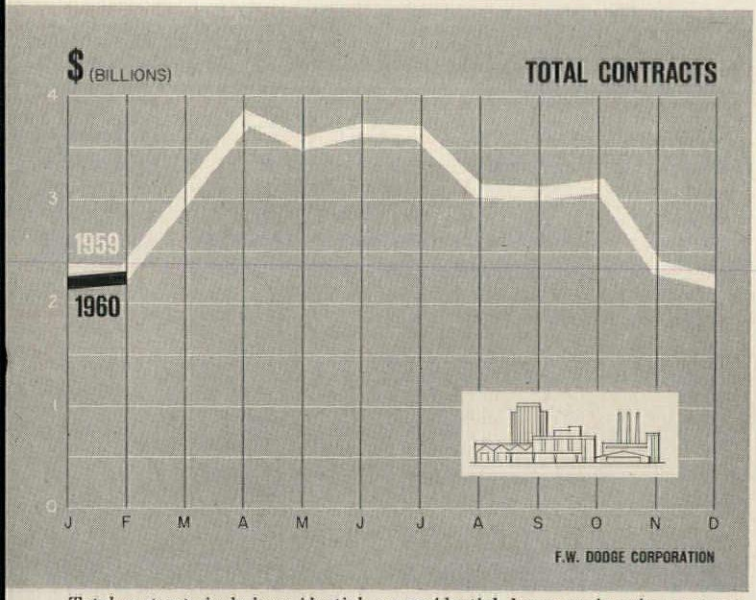
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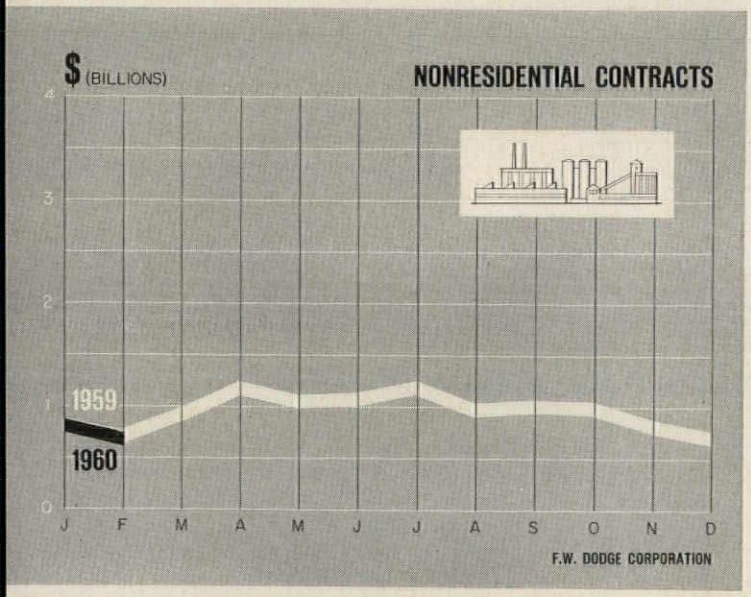
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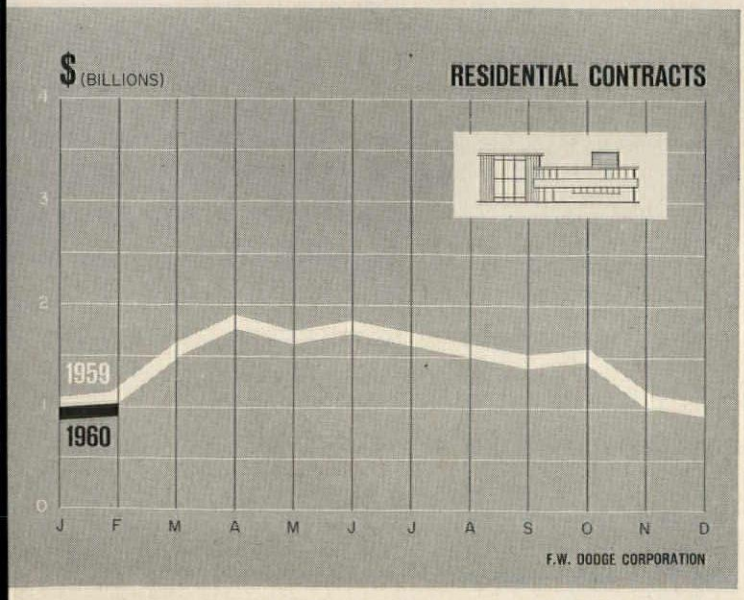
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Current Trends in Construction



Total contracts include residential, nonresidential, heavy engineering contracts





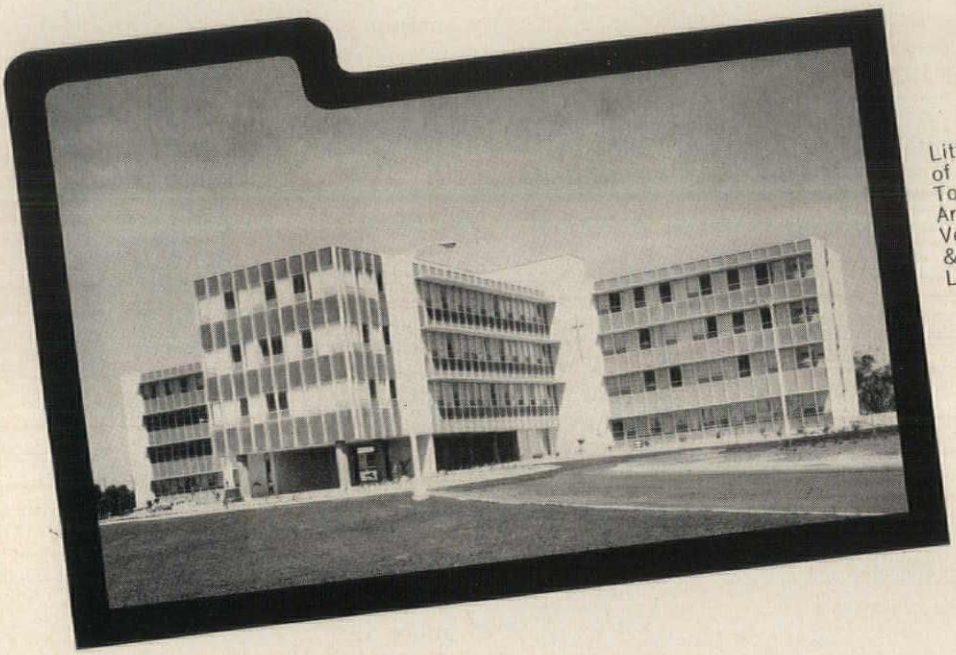
SCHOOLS in 1960 continue to make up the third largest market for the services of architects, as well as for all the other materials and services that go into building. Only single-family houses and commercial buildings outrank schools among the residential and non-residential building categories. In fact, if all construction, including heavy engineering, is considered, schools still constitute the fourth largest market, ranking behind housing, highways and commercial buildings in that order.

THERE seems to be no reason to expect this situation to change radically in the next decade or so. "Schools" as used here is a broad term encompassing all educational and related buildings, including colleges. In this sense the school market promises to be in a continuing boom. The wave of children now going through elementary and secondary schools will progress through college during the 1960's. Consider this fascinating fact: in one year, during the mid-sixties, the number of persons reaching age 18 will increase by one million. In September 1965, there will be approximately one million more 18-year-olds than there were a year earlier. Assume that half of these people want to go to college; then in September 1965 our college registrars will find 500,000 *more* prospective freshmen banging on the doors than they had only a year earlier. And that day is barely five years away. If this is a hair-raising thought, just remember that the same problem is going to hit our high schools four years earlier—and that's next year.

BUT the population growth figures alone tell only a part of the story. There is some ground for believing that we will need even more school facilities—at secondary and higher levels—than population growth alone would require. In the first place, education is steadily becoming more respectable. This is not something new; between 1940 and 1959 the educational attainment of the average working man in the United States rose from 9.1 years to 12.0 years. In other words, each student stays in school now about 1/3 longer than in 1940, and thereby requires at least 1/3 more classroom space during his educational career. One of the more interesting aspects of the new emphasis on education is that the average professional or technical worker now has 16.2 years of education, the equivalent of some post graduate work.

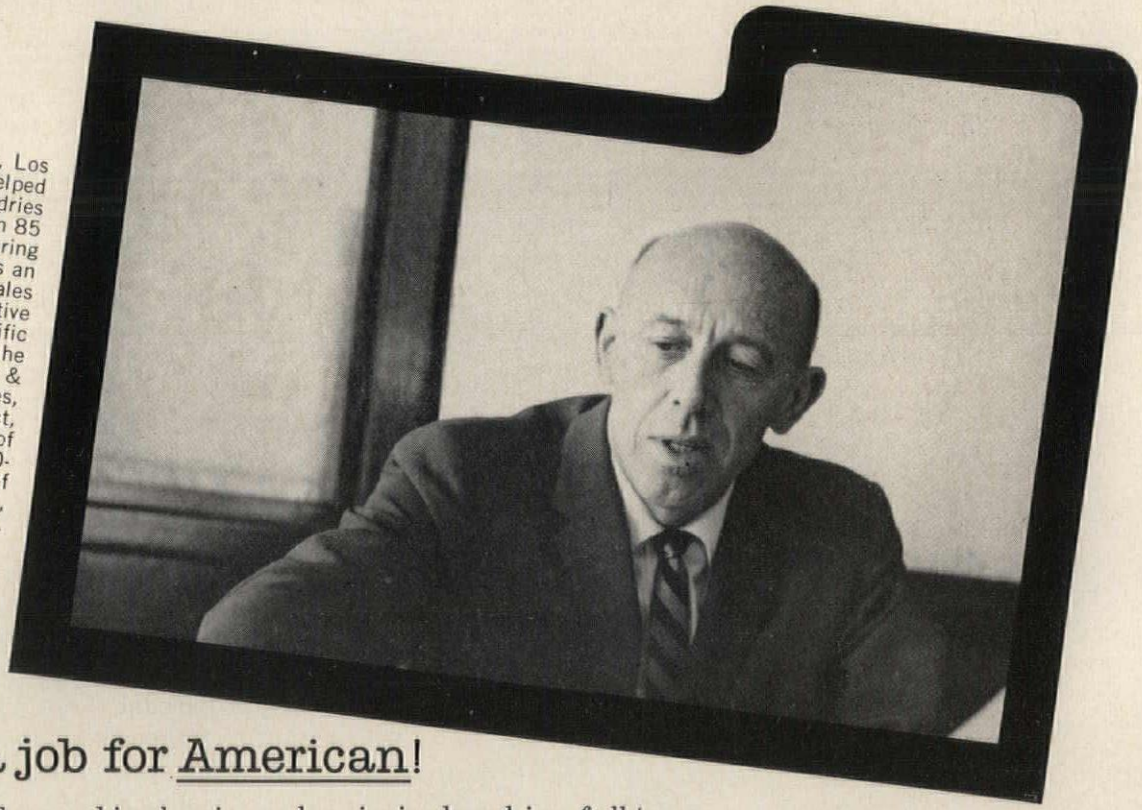
THIS lengthening of the educational period took place in the era before the sputnik-engendered emphasis on education had any real effect. We can expect that the future will put more stress on length of schooling as well as on better quality. High school diplomas will become the minimum for many more types of jobs, and advanced college degrees will become common. All this adds up to the promise of continued demand for additional school buildings. The greatest emphasis will be on secondary and higher levels of education. The demand for elementary school buildings should remain strong, however, to take care of population growth, the development of new areas, and the replacement of existing buildings which are sub-standard or obsolete.

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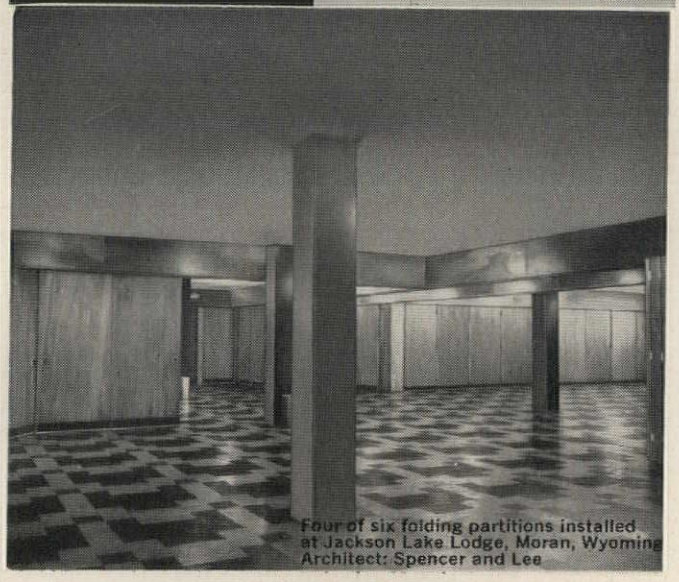
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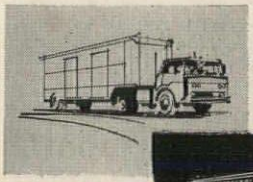
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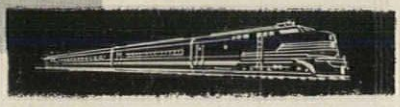
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