ARCHITECTURAL RECORD

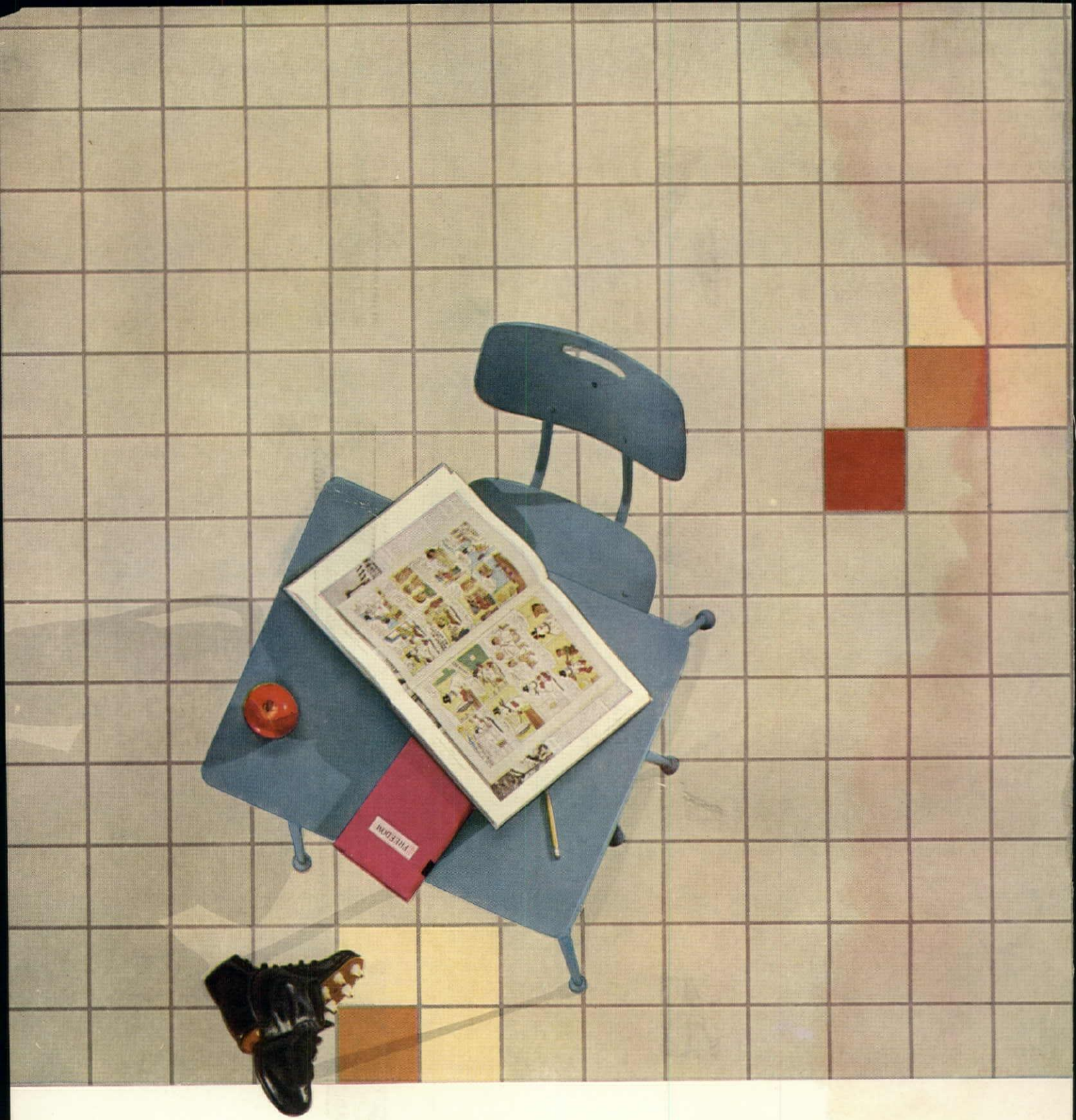
11 *November 1961*

Building Types Study: Industrial Buildings

Churches by Breuer and Belluschi

Five Houses for Enjoyable Sites

Full Contents on Pages 4 & 5



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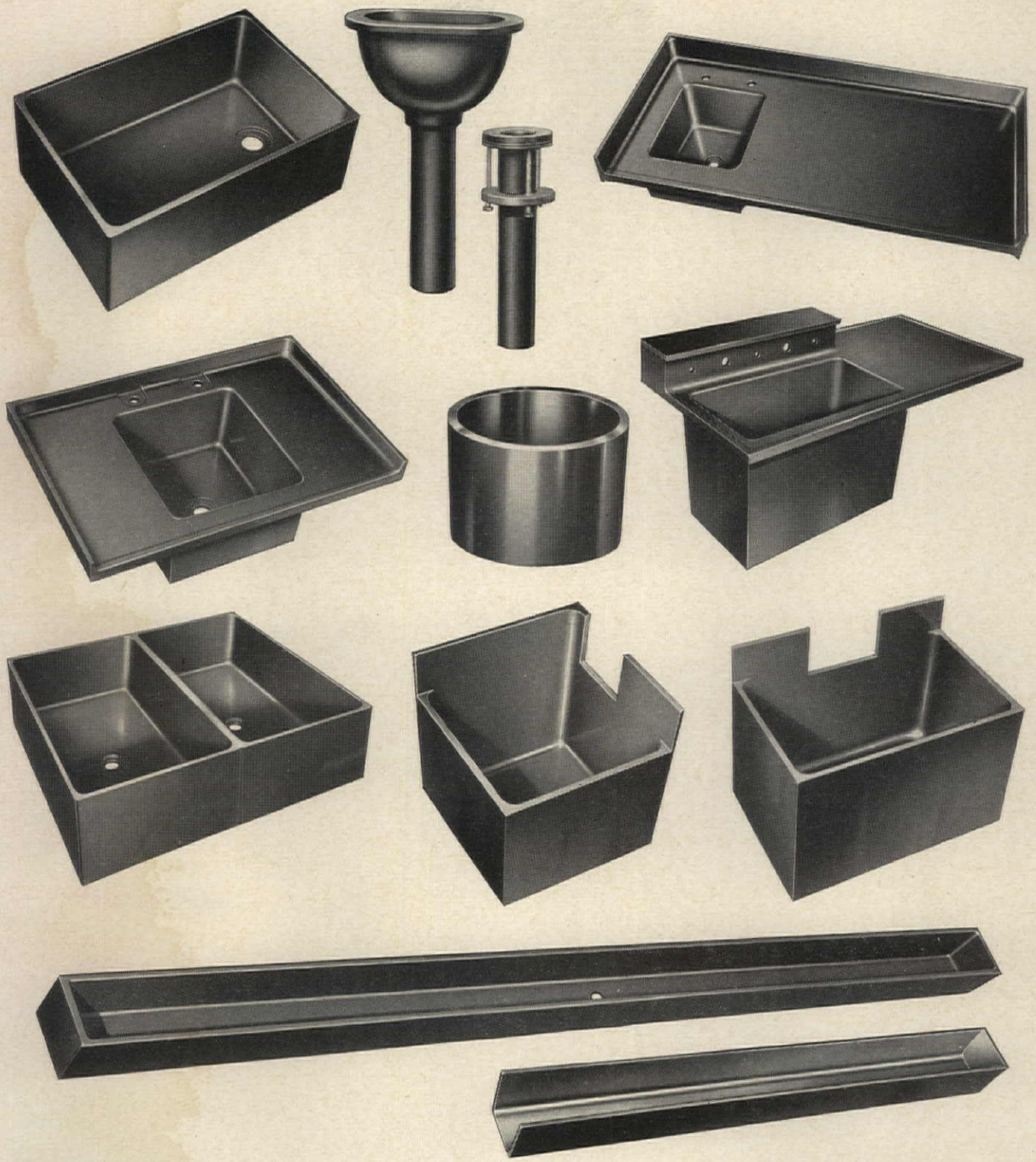

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Left: SOUTHERN GARDENS APARTMENTS, Denver, Colo. Architect: Leon Brin, A.I.A. Contractor: F. R. Orr Construction Co., Inc. Four Rotary Oildraulic Passenger Elevators sold and installed by Dover Elevator Company.

Below: ALLSTATE INSURANCE COMPANY, Dallas. Architect & Engineer: George L. Dahl. Contractor: Inwood Construction Co. Rotary Oildraulic Elevator sold and installed by Hunter-Hayes Elevator Company.

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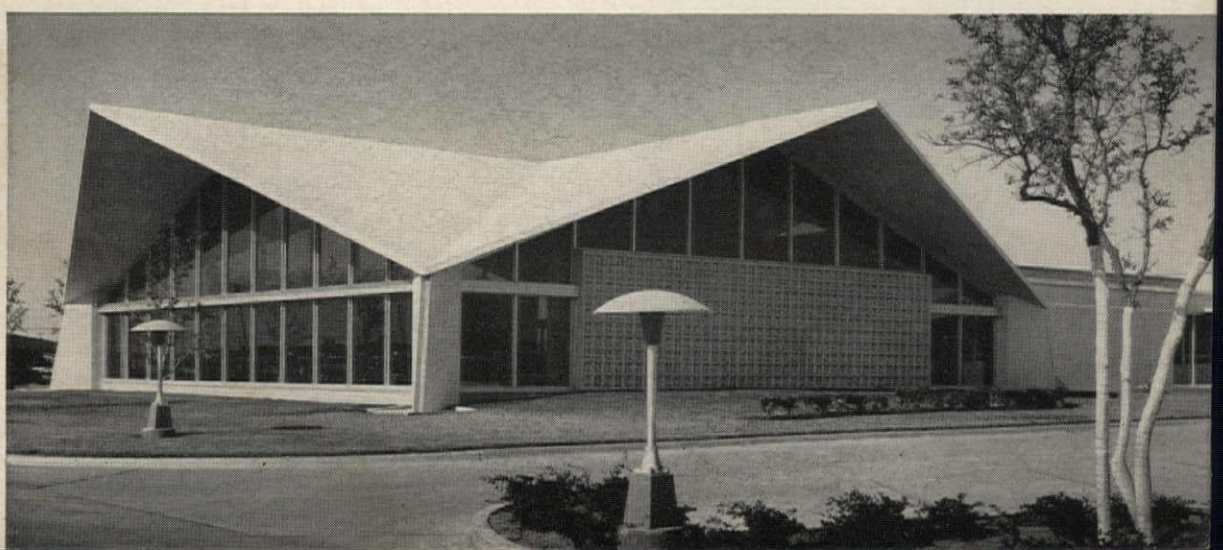
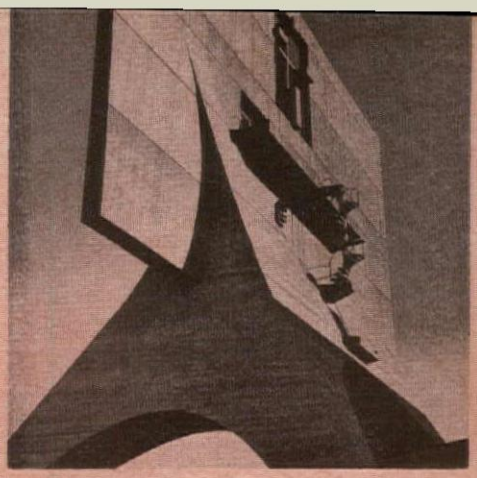


Architectural Engineering



Cover:

Bell banner, St. John's Abbey. Marcel Breuer, Architect. Photo by Shin Koyama

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ARCHITECTURAL

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RECORD

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November 1961

Building Types Study 300: Industrial Buildings

Coming in the Record

ARCHITECTURE FOR A CORPORATE HEADQUARTERS

A mature corporation with buildings of many kinds in many parts of the world may want a special function from architecture when it builds an administrative headquarters for all of its operations. The Upjohn Company did; and its new headquarters on a suburban site outside Kalamazoo, Mich., not only provides effectively for a multiplicity of administrative functions but visually suggests the quiet, competent sophistication of the client. The roof is a steel space frame of considerable technical interest, and next month's RECORD *coverage will include technical data on the space frame as well as a major feature on the building.*

CURRENT TRENDS IN HOSPITAL DESIGN

As hospitals continue strong in construction activity, the RECORD *plans to present next month a Building Types Study on Hospitals which will examine some of the most important current trends in hospital design, with a group of examples analyzing such trends in current practice—for example, progressive patient care, inclusion of psychiatric units in general hospitals, and the community general hospital for small communities.*

CRITICISM: CHURCH ARCHITECTURE IN ENGLAND

Continuing its series of critiques on architecture around the world, the RECORD *will offer a thoughtful article on English church architecture by Peter Hammond, a leading British critic and author of the well-known book* Liturgy and Architecture. *Some of the directions—many of them rather unorthodox—found by contemporary English architects to express liturgy in architectural terms, and some of the churches which have resulted, will be presented.*

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The Death and Life of the Housing Project

As America proceeds with a great program of urban rebuilding, pushed with great energy by the federal government, I should like to suggest as required reading a new book, "The Death and Life of Great American Cities," by Jane Jacobs. Mrs. Jacobs' book is a refreshing burst of sense, and it couldn't have come at a better time.

She has taken a long look at cities to see what makes them work. And she concludes that many of the most generally accepted ideas about city planning and city housing are so naive as to be simple-minded. She demolishes the simple ideas behind such concepts as the Garden City, the City Beautiful and the Radiant City, which have "harmoniously merged into a sort of Radiant Garden City Beautiful." The trouble is that cities, and the people in them, don't seem to behave like the planners thought they should. "From beginning to end, from Howard and Burnham to the latest amendment on urban-renewal law, the entire concoction is irrelevant to the workings of cities. Unstudied, unrespected, cities have served as sacrificial victims."

Her common-sense observations are quite cogent when she points out that the busiest streets are the best streets, safest for adults and children alike, policed as they are by the watchful eyes of thousands of interested busybodies. Why those streets, too, offer the most in the right kind of human contact. Why the planned spaces in the planned housing projects are scary "jungles," and why the grass plot that the planners make so much of is just a patronizing gesture to the people who live there. Why human relationships work so naturally in the crowded streets, so confusedly in the housing development.

Mrs. Jacobs believes in cities, and likes them. And she offers much comment and some advice on how they might be saved for the people in them.

This observer applauds especially her remarks on the ineptness in planning that is represented by the planned housing project. I have always considered public housing as overly regimented, dismal and unwanted, most of all by the people who live in them. Mrs. Jacobs does not distinguish between public housing and private, low-rental or middle-income; she damns them all. But I should say that public housing has the least reason for being what it is, and represents an especially dismal example of what happens when government calls the turn in design. I am sure that architects went happily along with most of the planning ideas that Mrs. Jacobs scorns, if indeed they didn't originate them. But public housing makes them more apparent, makes them bigger, more plentiful, more blatant.

While most of the architectural and building world applauds the efforts of the government to clear slums and renew the city, I think there is reason to be wary of government-directive-oriented leadership in determinations to revamp whole sections of the city. We have been doing it for years and years and years, and nobody is happy with the results.

Now we have a new burst of federal activity toward clearing slums and developing new "projects"—bigger and better projects. But as Mrs. Jacobs insists, "one of the unsuitable ideas behind projects is the very notion that they *are* projects, abstracted out of the ordinary city and set apart."

And soon we are to have a new federal department of urban affairs, or some such, to deal at the federal level with the problems of city planning and building. Urban renewal has already been heavily pushed and heavily financed, so that soon we shall have rebuilding projects going in small cities as well as large.

We shall need a great deal of building to house our rapidly growing population; and we shall need it in the city. Let us be sure that we are organizing a country-wide effort to plan along the right lines. If Mrs. Jacobs is right—and her book is mighty persuasive—it looks like some changes in direction are indicated.

—Emerson Goble

BALANCING THE WORK LOAD FOR ARCHITECTURAL AND ENGINEERING DRAFTSMEN

How a simple idea—using architectural and engineering draftsmen interchangeably—saves time and produces better results in a moderate sized office

by Clinton Gamble, A. I. A.
Gamble, Pownall & Gilroy

Like everyone else who has an architectural practice, we have had to face the problem of coordinating ever increasing engineering phases of building with architectural phases. Our work has consisted mainly of commercial buildings, where extensive lighting requirements, large air conditioning systems, and a technological rash of restaurants, bars, ice cream parlors, and miscellaneous shops spring up to complicate the architect's life. We were becoming more and more concerned about the diversity of technical requirements and their attendant difficulties, including even the production of the work itself in our office.

We were suffering from a common ailment: We weren't able to support, during architectural phases, a large enough engineering staff to finish the work when we needed it under the pressing schedules that exist during engineering phases. And if we put on extra engineers at that time, we couldn't hold them while we were making architectural preparation for the next job.

Somehow, our architectural draftsmen and project managers always seemed to be kept busy developing sketches, setting up schedules, making sections to find out what the building really would look like. But the engineering sections were not about to "waste time" doing any of these things "because it was going to be changed anyway." The engineers wanted to wait until the architectural elements were firmly determined before they went to work. The result, as you might expect, was that the engineering was always being finished in a mad scramble about four days later than the schedule.

We had about concluded that the best solution was to abandon our own engineering department and hand the whole problem over to eager young consultants who were ready to take over and produce all the engineering drawings at fees lower than our own office costs. We realized, of course, that this was not a real solution and would undoubtedly introduce new problems by the very nature of the architectural process. We rejected it.

What, then? One day we timidly suggested to our electrical designer that an architectural draftsman might be able to draw the hundreds of little circles with connecting dotted lines and numbers—if, of course, the electrical man would supervise him carefully. Reluctantly the electrical designer agreed, and sure enough the architectural draftsman did a good job. He even pointed out several beam interferences, a better panel location, and a few minor adjustments, because he had just been working on the architectural plans and knew the project intimately.

Within a few months, we managed to get our whole drafting force reoriented. It turned out that most of the architectural draftsmen and some of the engineering men were capable of doing both architectural and engineering drafting. The effect of spreading the work was to take down the wall between the two drafting rooms. Amusingly enough, this we did in a real way. For some reason, the engineering department, over the fifteen years of its development at this location, had barricaded itself into a far corner of the general office. As a dramatic gesture, we actually took down a dividing partition to convince ourselves we had a common job to do.

Naturally, there are a few on the staff who continue in their own specialties. The air conditioning designer still does that exclusively, as do our electrical and plumbing and piping designers, our delineator, specification writer, and so on. But we no longer have engineering personnel sitting around waiting.

This arrangement has many advantages. Obviously, a man who has just worked on the structural diagrams is very conscious of the location of the air conditioning ducts. He keeps such details in mind, because he may next be laying out those ducts under the direction of the air conditioning designer.

And, wonder of wonders, we find the whole project finished the day the schedule calls for it. We have reason to believe our job costs are going down, too, although this has not been an objective.

I do think perhaps a smaller office may find the procedure even more useful, especially where they can persuade engineering consultants to incorporate their design into working drawings with the architect's own staff. This would be a particular advantage if the architects on the staff were the architect, himself, period.

I don't say we have solved all the problems of our professional practice. As a matter of fact, our particular solution seems so simple that I am sure dozens of architects over the country may have been using this method for years. Each office, of course, has its own traditions and personalities to cope with. There is still some kind of built-in antagonism even between engineering designers themselves. When I try to pinpoint the difficulty, I usually come back to the idea that the design of mechanical equipment is a matter of making a lot of empirical decisions which take on the aspect of personal opinions. Even catalog information sometimes seems to fall into this category; so a fierce personal defense by the designer is constantly necessary.

Actually, we have moved so rapidly into extensive mechanization of our spaces that we have borrowed a lot of engineering services from other fields. Many of these fields are not building oriented. Perhaps when mechanical designers have been at work on building problems long enough, they will feel more comfortable in the architectural office environment and not be constantly antagonized by the interference and probing of "laymen" like myself. This cannot happen overnight, but I would like to think our changeover is a small step in the right direction.

PITTSBURGH HILTON HOTEL, Pittsburgh, Pennsylvania. Architect: Wm. B. Tabler, N.Y.C.; General Contractor: Turner Construction Company, N.Y.C.; Mechanical Engineers: Jaros-Baum-Bolles, N.Y.C.; Plumbing Contractor: Sauer, Inc., Pittsburgh.

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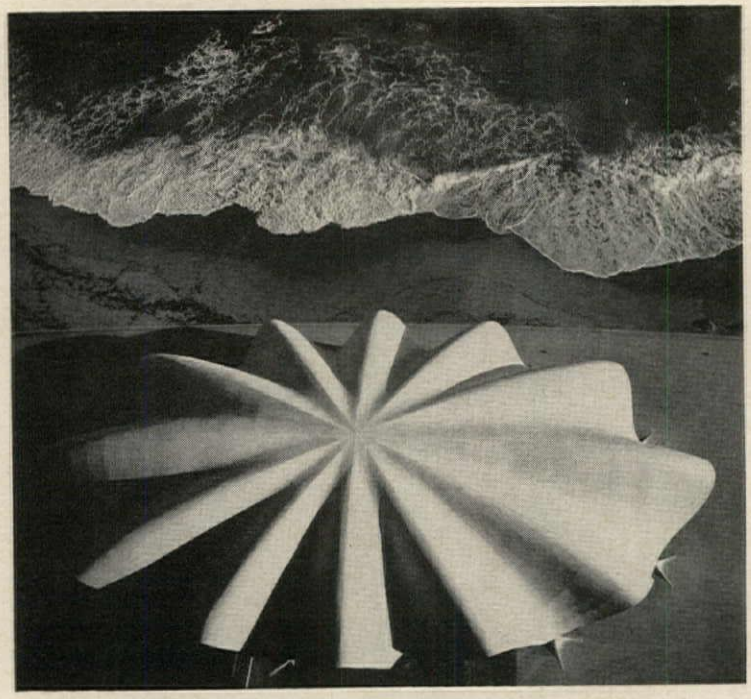
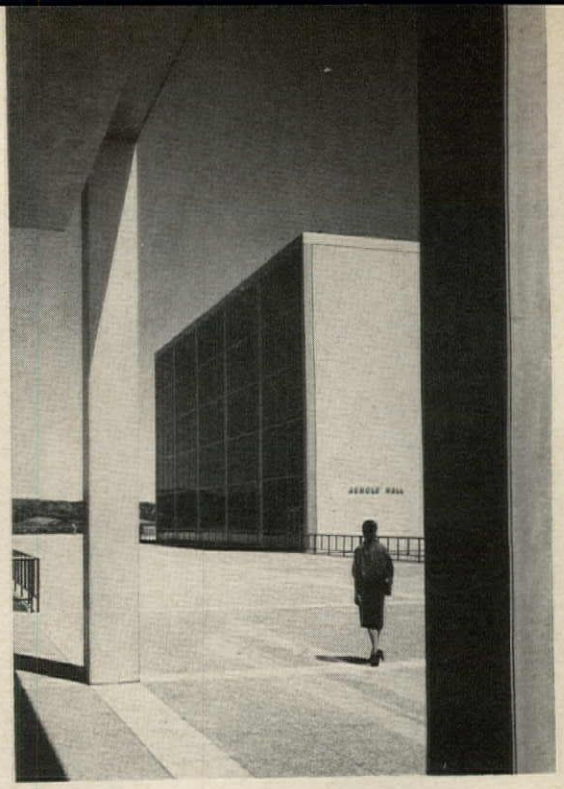


First Prize: Beach House, La Concha Hotel, Puerto Rico. Photographer: Alexandre Georges. Architects: Toro & Ferrer



Second Prize (tie): Arnold Hall, U.S. Air Force Academy, Colorado Springs. Photographer: Guy Burgess. Architects: Skidmore, Owings & Merrill

Second Prize (tie): Orchard Hills Elementary School, Novi, Mich. Photographer: Mason Pawlak. Architects: Charles W. Lane & Assoc.

Third Prize: Guggenheim Museum, New York City. Photographer: Louis Reens. Architect: Frank Lloyd Wright

ARCHITECTURAL PHOTOGRAPHERS PICK 4 WINNERS

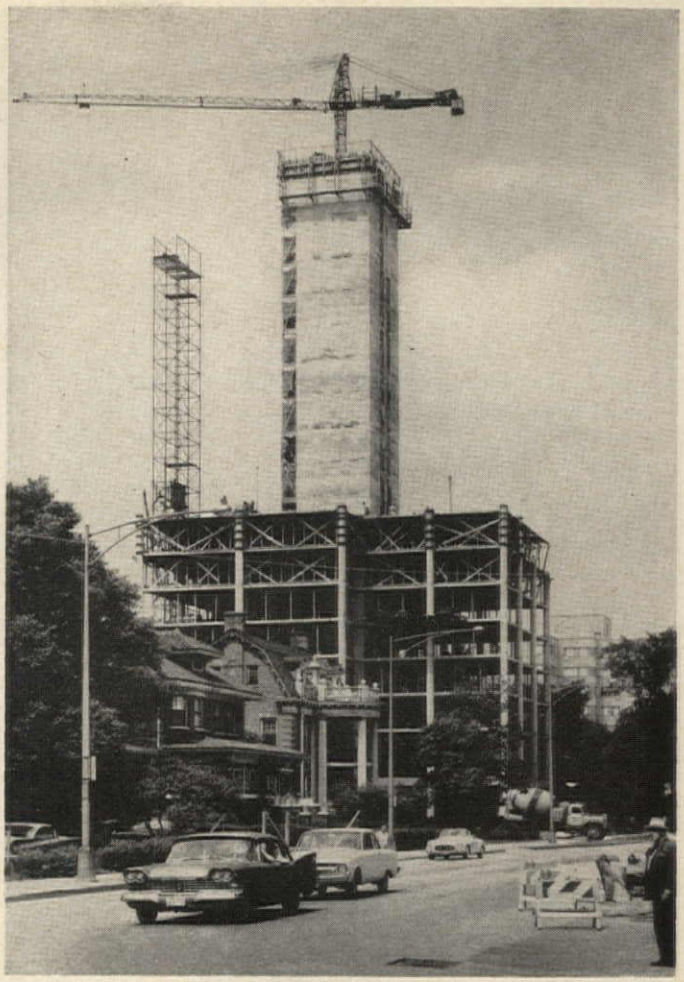
Four prize-winning photographs (all shown above) were selected in the Architectural Photographers Association member competition held in conjunction with this year's annual convention of the Association.

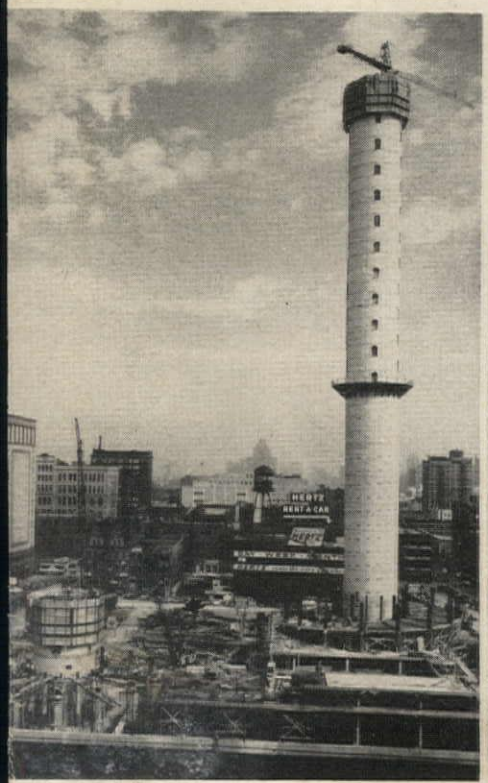
First prize was awarded Alexandre Georges, New City, N.Y. Tying for second prize were Guy Burgess, Colorado Springs, Colo., and Mason Pawlak of Lens Art Photographers, Detroit. Third prize winner was Louis Reens, New York City.

The Architectural Photographers Association is a nationwide professional society of approximately 60 members comprising most of the country's leading architectural photographers. The Association's avowed purpose is "to promote and maintain the highest ethical, technical and artistic standards in the profession. A.P.A. strives to promote understanding between photographers and architects, clients, builders, advertising agencies and publishers through forums, roundtable discussions, monthly meetings, exhibitions and through exchange of technical and esthetic criteria."

SLIP-FORM CONCRETING ERECTS 170-FT TOWER IN EIGHT DAYS

The 24- by 26-ft service core for a 17-story apartment building at 5740 Sheridan Road in Chicago was erected in less than eight days by slip-form concreting. Wooden stave slip-forms attached by a yoke arrangement to the metal reinforcement were raised by hydraulic jacks as the concrete was placed. Three crews worked around the clock, and progress averaged a foot an hour. Structural engineer is Frank N. Kornacker, through the office of Bertrand Goldberg Associates, Architects; J. Marion Gutnayer is consulting engineer; and subcontractor for this phase of the work was Mid-Continent Construction Company of Chicago





CHIMNEY-FORMING BUILDS TALLEST CONCRETE FRAME

One of the two circular service cores of the twin 60-story towers of the Marina City apartment project under construction in Chicago rose above the 507-ft mark last month and surpassed the tallest reinforced concrete frame building in the world (Banco do Estado, Sao Paulo—507 ft). Chimney-form concreting is the structural technique being used: concrete is being placed in stages rather than continuously as in the slip-form method, and at intervals the mast is raised by hydraulic jacks to a higher floor inside the core. The crane continues to rise with the building to its full height, is then dismantled and the parts brought down. When completed each core will rise 588 ft above the ground; diameter is 32 ft. The buildings were designed by Bertrand Goldberg Associates, Architects; general contractor, James McHugh Construction Company

Buildings in the News

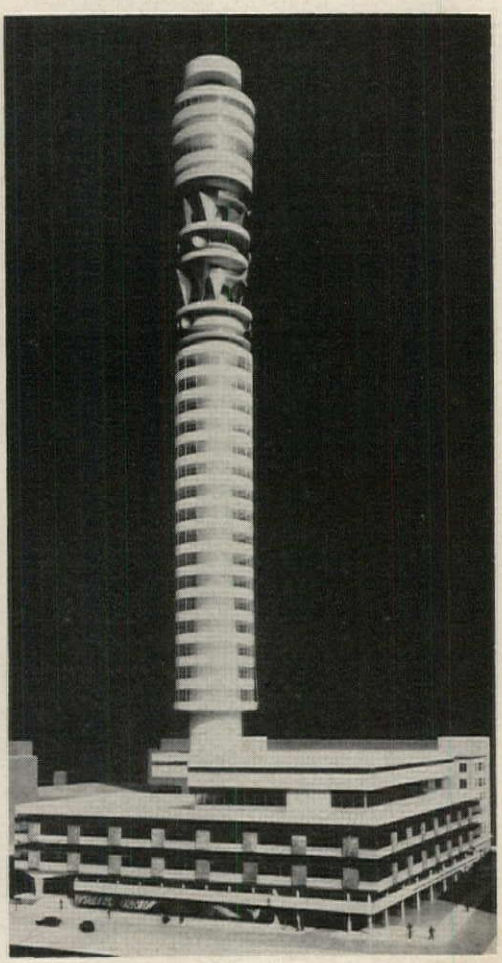
Wagner-International

Two New Towers in New York City

(Far left) Skidmore, Owings & Merrill designed the 42-story aluminum and glass home office of the Equitable Life Assurance Society. Structural engineers were Weiskopf & Pickworth; mechanical and electrical engineers: Meyer, Strong & Jones; general contractor: Turner Construction Co.

(Left) Nineteen engineering organizations now occupy the 20-story, $12 million United Engineering Center. Architects for the tower of stainless steel, limestone and glass rising from a two-story granite base were Shreve, Lamb & Harmon. General contractor was Turner Construction Company

Herbert Maschke

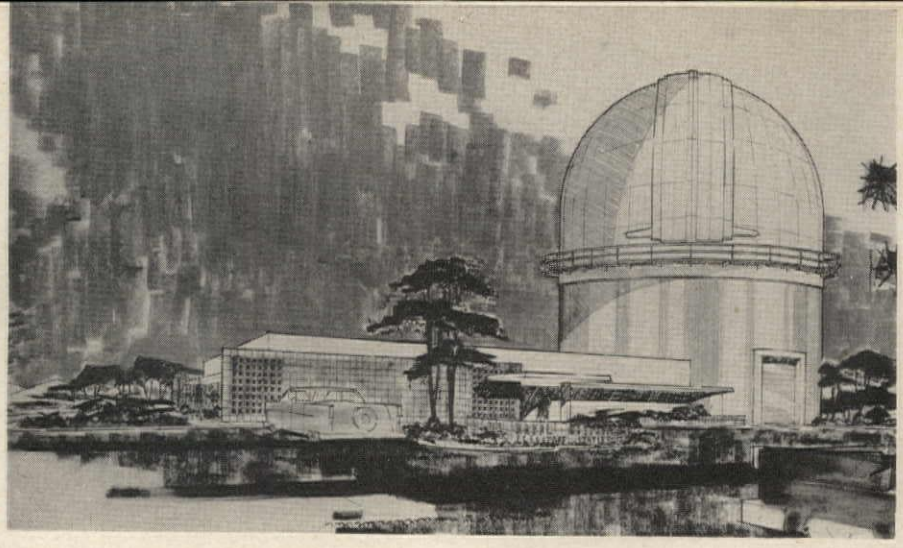


Architecture Abroad

(Upper far left) R.I.B.A. Triennial Bronze Medal for Architecture was awarded the head office building of Australian overseas airline Qantas, Sydney. The 150-ft-high metal and glass structure, with a base of New South Wales green granite, was designed by architects Rudder, Littlemore and Rudder

(Lower far left) Photo of Freie University Library, Berlin, shows portion of the low element adjacent to a 9-story structure in the rear. The library, which has an exterior of reinforced concrete and Bavarian stone, was designed by Sobotka and Muller, Architects. Francis Keally, F.A.I.A., was consultant; Charles M. Mohrhardt, library consultant

New London landmark will be a 500-ft television and radio tower for the Post Office (which administers British telephone system) to transmit and receive micro-wave links. Chief architect for the Ministry of Works is Eric Bedford; structural engineer: C. G. Greetham



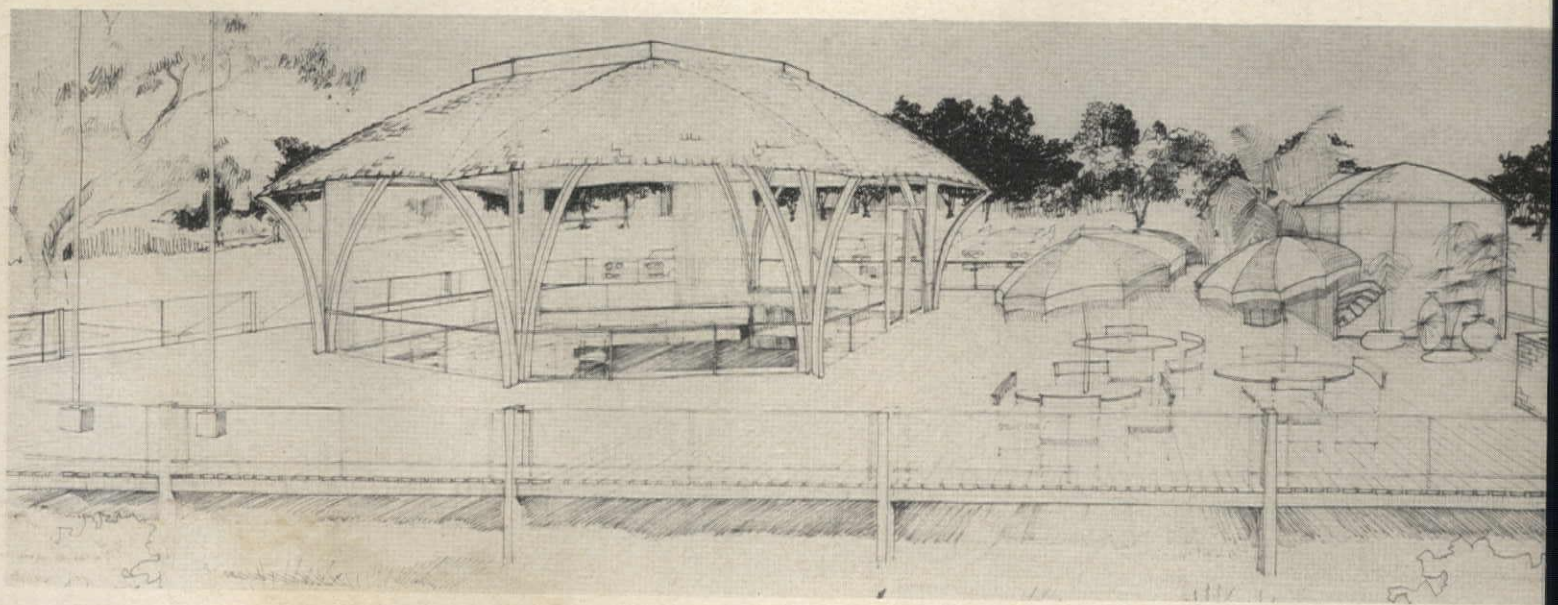
Construction has begun at U.S. Naval Observatory, Flagstaff Station, on a building to house the largest quartz mirror telescope ever made. The $1,750,000 project, which includes observing instrument and 8-story-high sheltering structure, was designed by mechanical engineer, Charles W. Jones, in association with Rochlin & Baran, A.I.A.

Ira Wright Martin

Cooper Union's $4,750,000 Engineering Building was designed by Voorhees Walker Smith Smith and Haines. The 6-story and basement structure of steel and concrete faced with brick and stone will provide 100,000 sq ft of space for 25 laboratories, shops and drawing rooms and 22 classrooms. Contractor was Vermilya-Brown, Inc.

(Right) Kelly and Gruzen are architects for proposed Litho Central City, sponsored by Amalgamated Lithographers of America. The $250,000,000 project to be located over New York Central West Side Freight Yard tracks will encompass 9 high-rise residential structures

(Below) Dallas Polo Club includes octagon reception room and separate building for players. The two structures sit on a 100- by 65-ft redwood deck. Later, two units will be joined with entry, dining area, kitchen. Architects are Bolton and Barnstone, Houston



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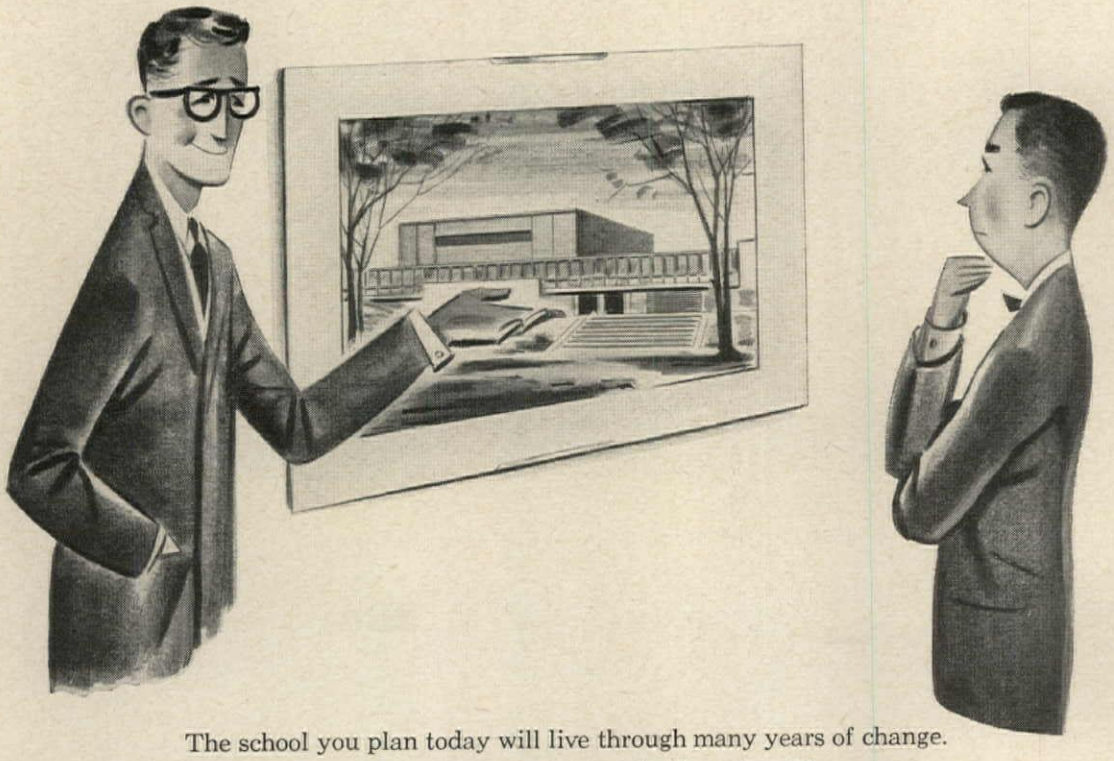

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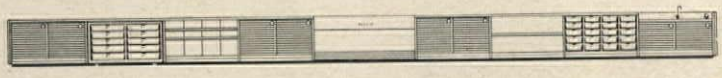

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Not limited to facades, the Borden Architectural Decor Panels are used as interior partitions, grilles, window guards, stair rails, doors, entryways, sunshades, and are especially adaptable in the refacing of existing buildings.

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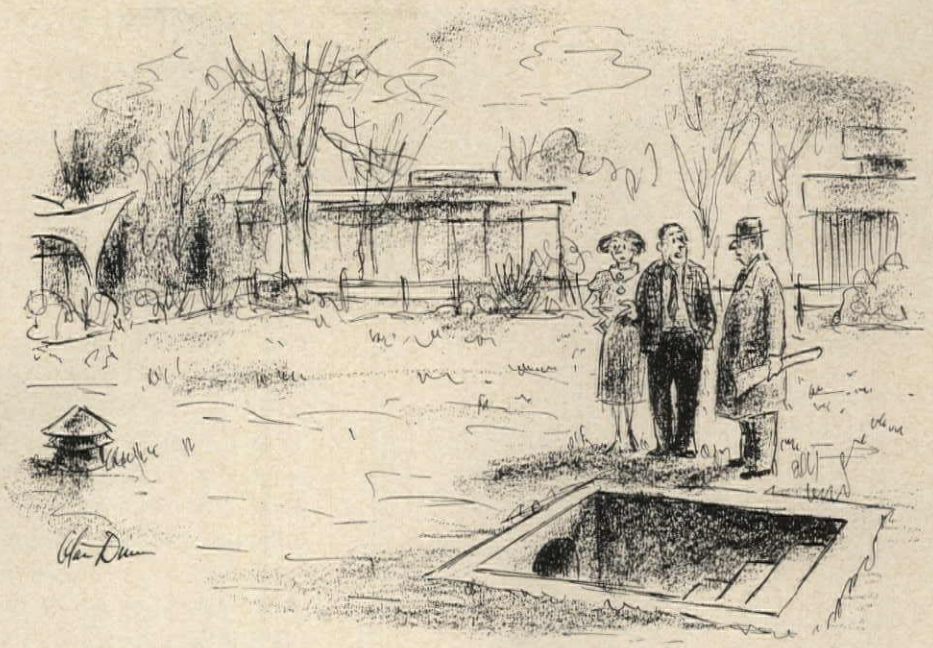


—Drawn for the RECORD *by Alan Dunn*

"But it doesn't 'communicate'!"

Boston City Hall Competition Announced

A major competition to select the architect for Boston's new City Hall has been announced by Mayor John F. Collins and the Government Center Commission. The building will be the most important one in the Government Center, a project of the Boston Redevelopment Authority to revitalize the oldest part of the city.

The competition, open to all licensed architects who are residents of the United States, will be conducted in two stages. Professional adviser will be Lawrence B. Anderson, professor in the Department of Architecture, Massachusetts Institute of Technology. The Jury for the preliminary stage consists of: Pietro Belluschi, F.A.I.A., Boston; Harold D. Hodgkinson, Chairman of the Board, Wm. Filene's Sons, Boston; Walter A. Netsch, A.I.A., Chicago; Ralph Rapson, A.I.A., Minneapolis; William W. Wurster, F.A.I.A., San Francisco. The Jury for the final stage consists of the above five members and O. Kelley Anderson, President, New England Mutual Life Insurance Company, Boston, and Sidney R. Rabb, Chairman of the Board, Stop and Shop, Boston.

By discussion and majority vote not more than eight entries will be selected in the preliminary stage and paid $5000 each to prepare final entries. The author of the winning entry shall receive the additional sum of $5000.

Registration forms must be received by the professional adviser on or before Dec. 11. Preliminary entries must be sent or delivered before 5:00 P.M. on Jan. 17. Preliminary judgement begins Jan. 23.

For further information, write: Professional Adviser, c/o Government Center Commission, 1 Court St., Boston 8, Mass.

BRI To Become Independent Technical Society

The Building Research Institute, a unit of the Division of Engineering and Industrial Research of the National Academy of Sciences-National Research Council, will assume the status of an independent, nonprofit technical society of building science during the coming year.

The change of status, according to Leon Chatelain Jr., F.A.I.A., BRI president, has been contemplated ever since BRI came into being ten years ago. Mr. Chatelain said, it will ". . . make no changes in the organization except to enable BRI to further broaden its activities in the stimulation of needed new building research, to administer cooperatively sponsored research projects, and to accept grants for the execution of valuable projects consistent with its purposes."

Franklin Institute's Brown Medal Awarded Corbu

The Frank P. Brown Medal of the Franklin Institute, Philadelphia was awarded in absentia to Le Corbusier in October.

He received the medal "for a lifetime of creative leadership in the teaching and the practice of architecture as exemplified by his modular concept of human scale, free plan, pillar foundations, glass walls, sun breaks and roof terraces; his city planning as exemplified by the vertical city concept and for his outstanding contributions as a sculptor and painter."

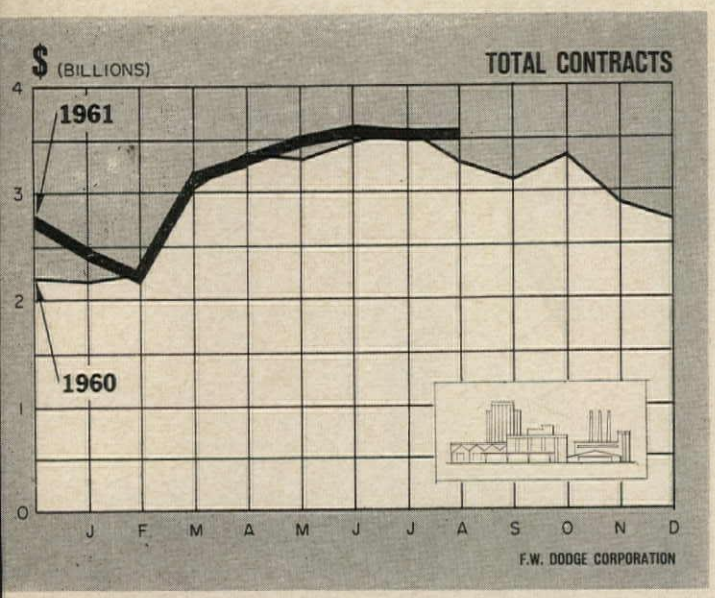
The award was set up by the will of Franklin P. Brown, a member of the 137-year-old scientific organization, for "discoveries and inventions involving meritorious improvements in the building and allied industries."

Planners Institute To Meet in Detroit

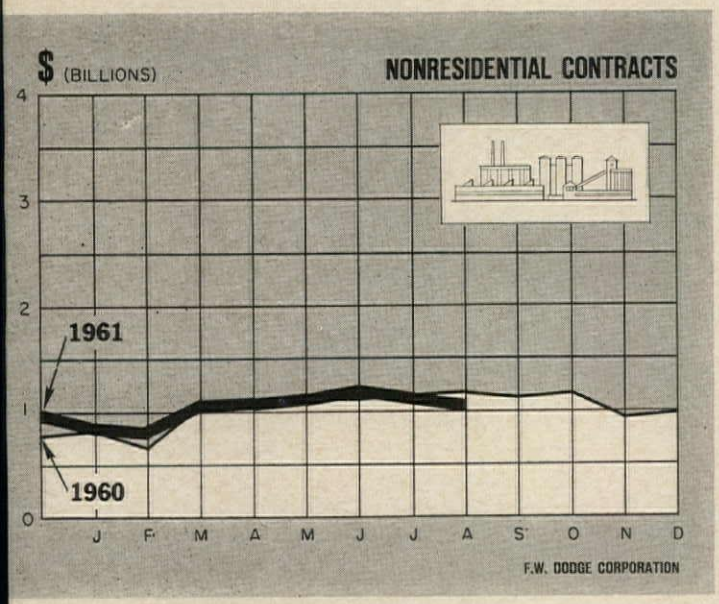
"Goals for Urban America" is the theme for the 1961 National Conference of the American Institute of Planners to be held in Detroit during the week of November 26-30.

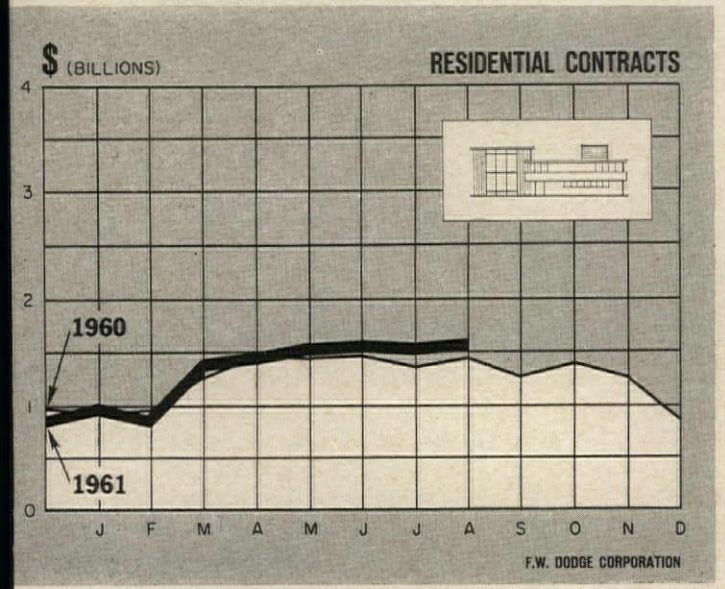
Mrs. Catherine Bauer Wurster, specialist in housing and urban problems, is the scheduled keynote speaker.

continued on page 26



Total contracts include residential, nonresidential, heavy engineering contracts





INDUSTRIAL BUILDING ACTIVITY EXPECTED TO INCREASE IN 1962

THE INDUSTRIAL BUILDING outlook is a tough nut to crack. The volume of contract awards in this important category is still subject to violent fluctuations despite the more moderate swings of the typical postwar business cycle. For instance, in 1958 when the economy was undergoing a troublesome but hardly disasterous recession, manufacturing building contracts plunged a distressing 35 per cent below their 1957 level. During the upturn in general business in 1959, factory awards bounced back with a 34 per cent increase. Again, the very mild setback in the overall economy of 1960-61, now a shadow of the recent past, helped produce a 16 per cent decline in industrial building contracts during the first eight months of this year. As a result, manufacturing building awards have taken as much as 26 per cent of the nonresidential building market in 1956 and as little as 13 per cent in 1958.

SUCH GYRATIONS are not surprising considering the crucial role of business expectations in making capital investment commitments. If the general outlook is a little cloudy, businessmen still tend to clamp a tight lid on plant expansion. When things clear up a bit, fears for the worst are exchanged for rosy optimism, and capital spending is apt to go off on another binge. But although the direction of a change in plant building trends is fairly predictable, the *extent* of the change is not.

CURRENT BUSINESS prospects definitely appear to support a revival in manufacturing building. As indicated in our annual forecast of construction contracts (opposite page 8 of this issue), we estimate a 10 per cent gain in floor area of industrial construction during 1962. The increase in dollar volume of contracts should range a little higher —about 11 per cent. This would put the level of contract activity at approximately $2.02 billion for the year as a whole. You may note that manufacturing buildings next year are expected to score both the sharpest percentage gain and the largest absolute increase of any nonresidential building type. However, if our forecast is borne out, 1962 contracts will still be below the 1960 mark and considerably below the peak year of 1956 when total dollar volume amounted to $2.88 billion.

A SUPERBOOM in plant expansion is not anticipated for the immediate future mainly because of excess capacity in many industrial lines. Much of the emphasis in the quite optimistic capital spending plans for 1962 seems to be on the equipment sector rather than on new plant. This picture could change very rapidly, however, if the overall economy significantly exceeds its projected advance. In such case, manufacturing building contracts could easily soar to new heights. In any event, the long-run prospect is very bright.

EDWARD A. SPRAGUE, *Economist*
F. W. Dodge Corporation
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WHO LOOKS AT THE ROOF?

The Solomon R. Guggenheim Museum is one of the most interesting architectural innovations in years. Art lovers often look up to admire the *ceiling* of this building . . . but no one looks at the *roof*—or *has* to! It's a special Ruberoid roof, expertly built-up with Ruberoid special roofing bitumen.

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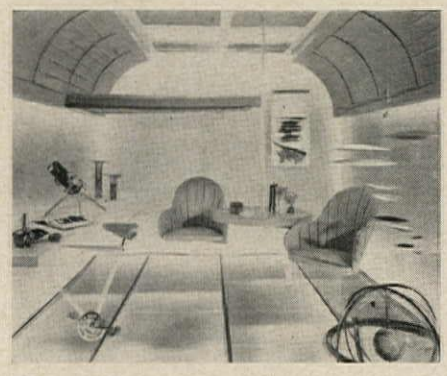
Meetings and Miscellany

continued from page 23

"Astrotel": A Room With a View of the Future



This is a space transition room, situated at a Space Port; its purpose is to prepare the astronaut for the new environment of interplanetary travel by affording him a place to experience a quiet period before the flight in which he can adjust to conditions such as sounds, sights and weightlessness. The room was a presentation of the Upholstery Leather Group at the Decoration and Design Show, sponsored by the American Institute of Interior Designers and the Resources Council of the A.I.D., held in mid-October in New York.

Designed by Evelyn Jablow, A.I.D., the room is constructed entirely of glass and contains "floating" furniture, storage ceiling and cabinets covered in leather.

Since outer space is black, Mrs. Jablow has derived her "earth" color scheme from colored photographs taken from outer space and from reports by Commander Alan Shepard—blue, green, orange, yellow.

Says Mrs. Jablow, "The role of the interior designer in tomorrow's world will be as it is today—to accommodate and acclimatize people to changing needs of life with grace and art."

$25,000 Reynolds Award Nominations Invited

Nominations are now being received and will be through Dec. 18, 1961 for the 1962 annual $25,000 R.S. Reynolds Memorial Award, the largest award in architecture. According to William H. Scheick, executive director of the American Institute of Architects which administers the awards program, "This international award, now in its sixth year, is conferred on an architect who has designed a significant structure in which aluminum has been used creatively."

The award, which includes an original piece of sculpture designed by a prominent contemporary artist, is conferred by a jury of distinguished architects named by the A.I.A.

An architect may be nominated by anyone, including himself or his firm. Preference is given to buildings completed during the past three years. Nominations, which should include the architect's name and address, name and location of the structure, the date completed and the name and address of the person making the nomination, may be made by writing: The Reynolds Award, American Institute of Architects, 1735 New York Ave., N.W., Washington D.C. The award will be conferred during the A.I.A. convention May 7-11, 1962 in Dallas.

Seminar on Architecture For Dallas School Teachers

The Dallas Chapter of the American Institute of Architects conducted a group of eight seminars on architecture for Dallas school teachers in September. Principals and teachers attending the full course of two-hour sessions were to receive Board of Education credit.

The first four sessions, conducted by John Harold Box, covered the total scope of architecture, architecture related to the individual, the community and an architectural field trip.

The fifth seminar, conducted by Royden S. Bair and Frank Campbell, Dallas contractor, discussed form in architecture. The final three sessions were devoted to the design process, Harwell Harris discussing residence architecture, Donald Jarvis, office building architecture, and Enslie O. Oglesby Jr., school buildings.

Rome Prize Fellowships Offered for 1962-1963

The American Academy in Rome is offering a limited number of fellowships for mature students and artists capable of independent work in architecture, landscape architecture, musical composition, painting, sculpture, history of art and classical studies.

Fellowships, which will be awarded on evidence of ability and achievement, are open to citizens of the U.S. for one year beginning Oct. 1, 1962, with possibility of renewal. The award carries $3000 a year; a senior research fellowship, offered only in classical studies, carries $4000.

Applications and submission of work, in the form prescribed, must be received by Dec. 30, 1961. For details, write the Executive Secretary, American Academy in Rome, 101 Park Ave., New York 17.

"SONGS FOR ARCHITECTS AND THEIR GIRL FRIENDS": A NEW ALBUM BY ROBERT SCHMERTZ

Afficionados of Robert Schmertz—i.e., all who have heard him—will be delighted to hear that there is a new recording of his songs. It is candidly and appropriately entitled "Ladies Beware of an Architect: Songs of Architects and Their Girl Friends"; and in the opinion of this particular afficionado, it is the best record of all.

Those who have never heard him should know that Robert Schmertz is an architect (F.A.I.A., in fact) in Pittsburgh; and a member of the faculty of the School of Architecture at Carnegie Institute of Technology, who has been for years lovingly and knowingly making ballads about architects and architecture (among other things) and singing them to the accompaniment of his banjo.

The new songs in the current album ought to provide some reassurance for people who fear that architectural criticism is dead (or at any rate dispirited). The Schmertz approach is always amiable, but often pretty direct: "When that architect comes to Jordan will he cross?" (reflections on certain deviations in current architectural practice): or "Walter and Mies and Corbu"—"if you can endure just pure architecture, get Walter or Mies or Corbu!" One of the most memorable of the new songs is a wistful recollection of Beaux Arts days in Paris "When I Was a Young Nouveau."

Altogether the new album has 13 songs, of which seven are published for the first time. The album can be ordered at five dollars from Mrs. Robert Schmertz, 5910 Howe Street, Pittsburgh 32, Pennsylvania.

more news on page 83

Alcoa V-Beam solves architect's predicament to taxpayers' delight

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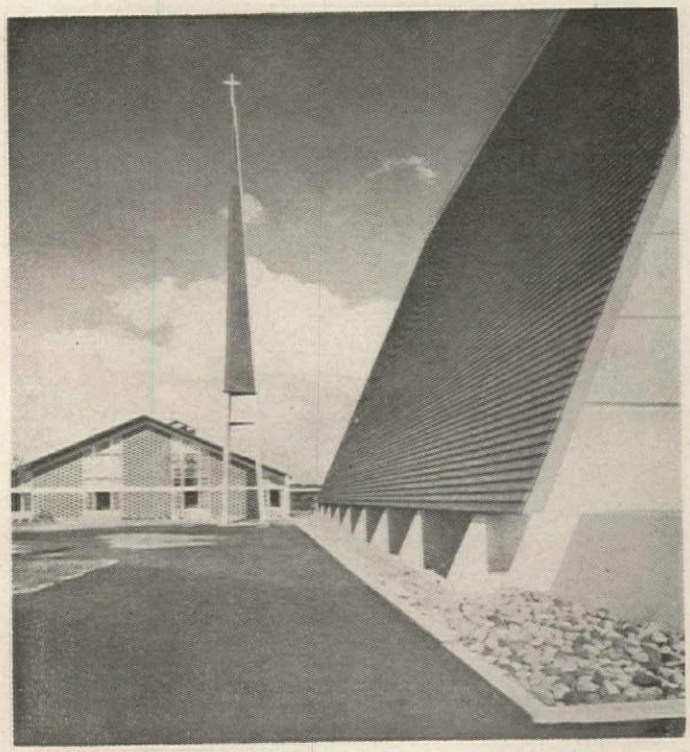
Required Reading



Concordia Senior College, Eero Saarinen, architect
—from *Architecture Today & Tomorrow*

Modern Architecture To Date

ARCHITECTURE TODAY & TOMORROW. *By Cranston Jones. McGraw-Hill Book Company, Inc., 330 W. 42nd St., New York 36. 243 pp., illus. $17.50.*

As the title indicates, Mr. Jones has tried to catch modern architecture on the wing. Such an effort requires not so much a scholarly critic as a sensitive journalist, and this is journalism in the best sense—fair, comprehensible, and colorful without being yellow. The layman should find it interesting, and the architect should certainly not find it boring. In his introduction, Mr. Jones declares that "architecture is the great adventure of our time," and in the course of his exposition makes this statement seem no less than the truth.

The organization does not follow a pattern of "schools" and "trends," but rather of the accumulation of the work of individual architects. Part One comprises the undoubted "Form Givers" of the modern movement (Sullivan, Wright, Perret, Corbu, Gropius, Mies and Aalto), and Part Three the engineering geniuses (Maillart, Torroja, Candela, Nervi and Fuller).

Part Two is entitled "Modern in Transition." It ranges from Neutra through Rudolph, from Breuer through Kahn, and covers, indeed, virtually every "name" in the roster of modern American architects (Tange and Niemeyer are the only non-Americans covered). The "transition" of the subtitle is clearly not meant to mean a transition to the structural orientation of the last section. Mr. Jones describes it only in vague terms of "experimentation," "vitality," "emerging cities" and indications of a general optimism that it *is* leading somewhere. It is doubtful whether a scholarly critic, looking at the assembled evidence, could make a more detailed prognosis.

Wright Biographized

FRANK LLOYD WRIGHT. *By Finis Farr. Charles Scribner's Sons, 595 Fifth Ave., New York 17. 293 pp., illus. $5.95.*

Published initially, in abbreviated form, in *The Saturday Evening Post*, Mr. Farr's sympathetic biography is, as a popular biography should be, more anecdotal than critical. Some space is naturally devoted to Wright's architectural philosophy, and major buildings are duly recorded in terms of critical acceptance and historical place. But Mr. Farr is more interested in people than in buildings, and thinks of commissions in terms of clients. This is fair enough; Wright's early clients were rather remarkable, and in addition to according Wright both their faith and their funds, they gave him friendship and support in time of need.

Mr. Farr also takes delight in debunking some of the Wright legends; *e.g.*, his "leaky roofs," and his "arrogance" with clients (stories of which, says Mr. Farr, only rarely come from clients, and then often as apocryphal jokes.)

With Wright's name so prominently featured on the jacket, the biography may well be, not undeservedly, a seller. But architects who have read the *Autobiography* and other writings by and about Wright will not learn much that is new.

Buildings in Two Dimensions

PHOTOGRAPHY AND ARCHITECTURE. *By Eric de Maré. Frederick A. Praeger, Inc., 64 University Place, New York 3. 208 pp., illus. $13.50.*

The author is both an architect and a photographer, and has divided his book into two sections: one describing his enthusiasm for the esthetic implications of photography and architecture, and the other giving how-to information. The photographs were taken by the author.

continued on page 54

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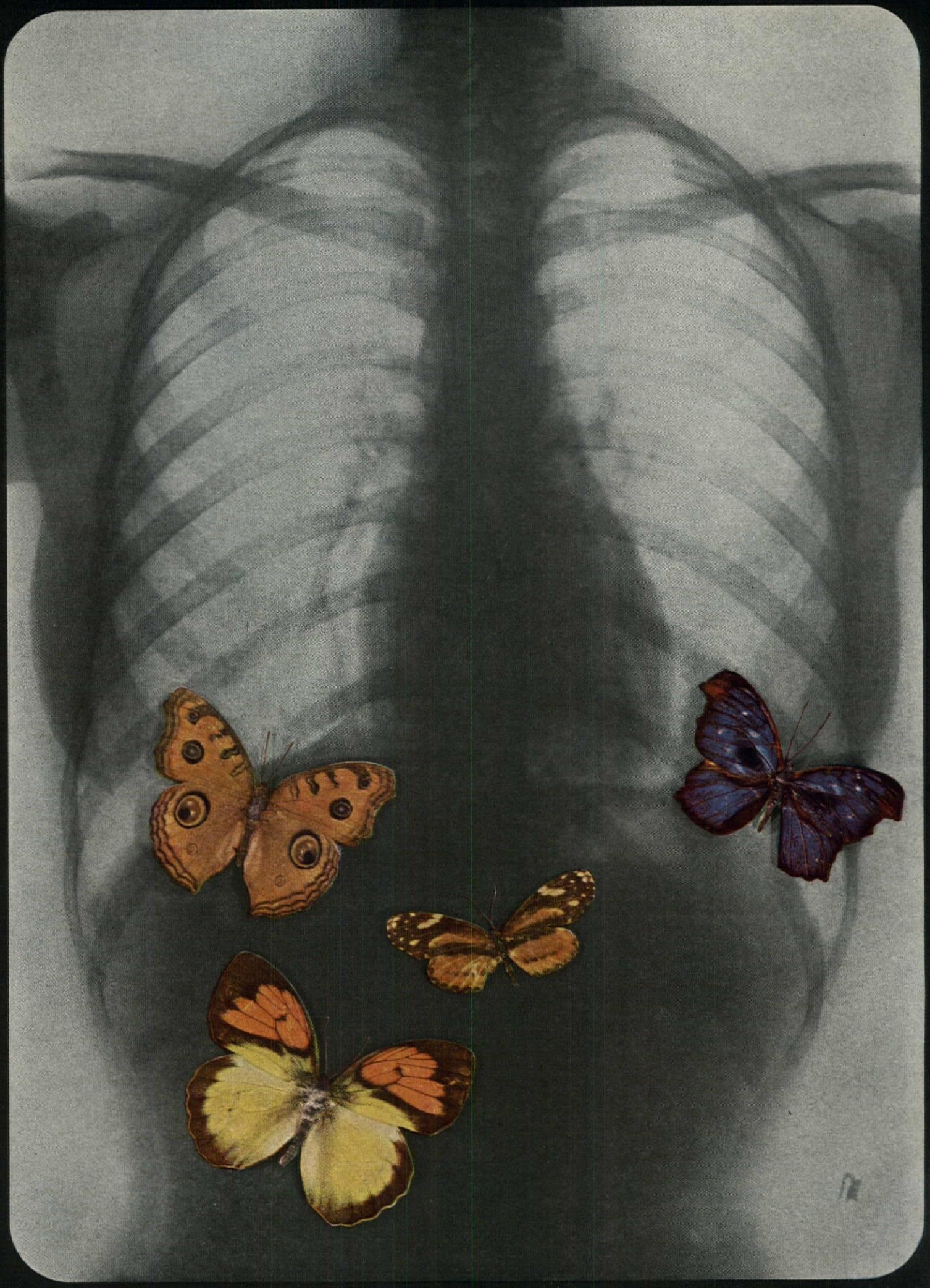
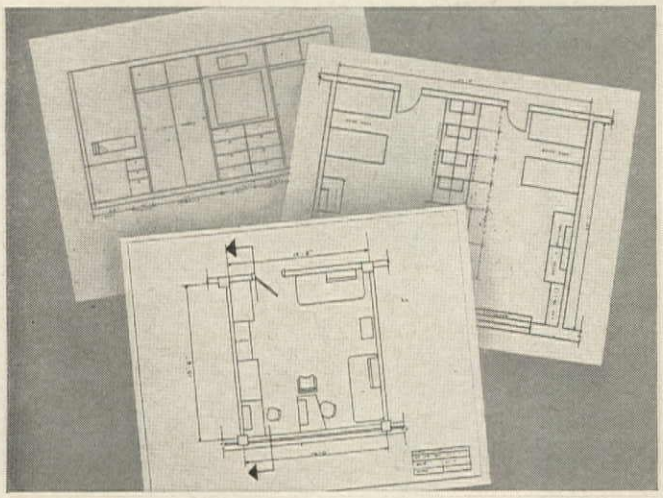


DESIGN WITH DORM LINE
for these economies:



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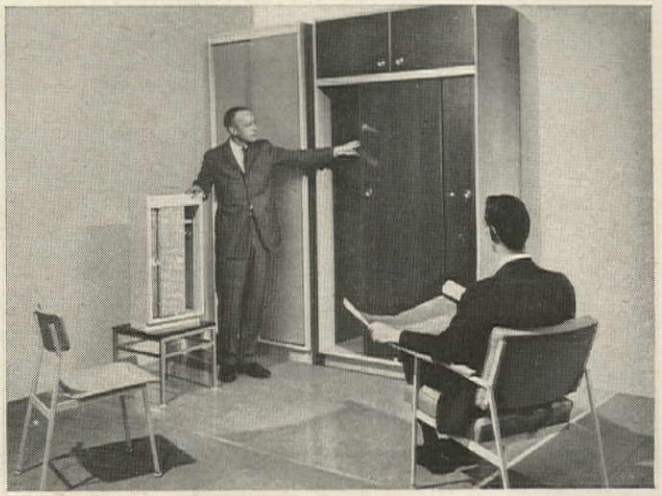

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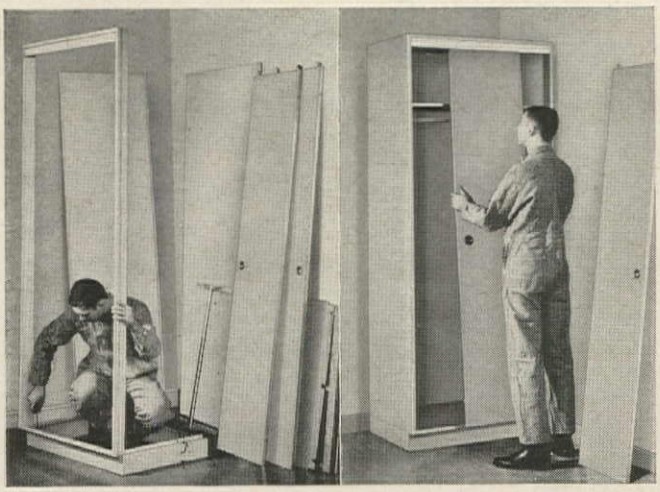

3. You *save substantially* on Dorm Line wardrobe installation—from k.d. to completion in as few as 15 cost-cutting minutes! Compare this with hours or days required for other installations.

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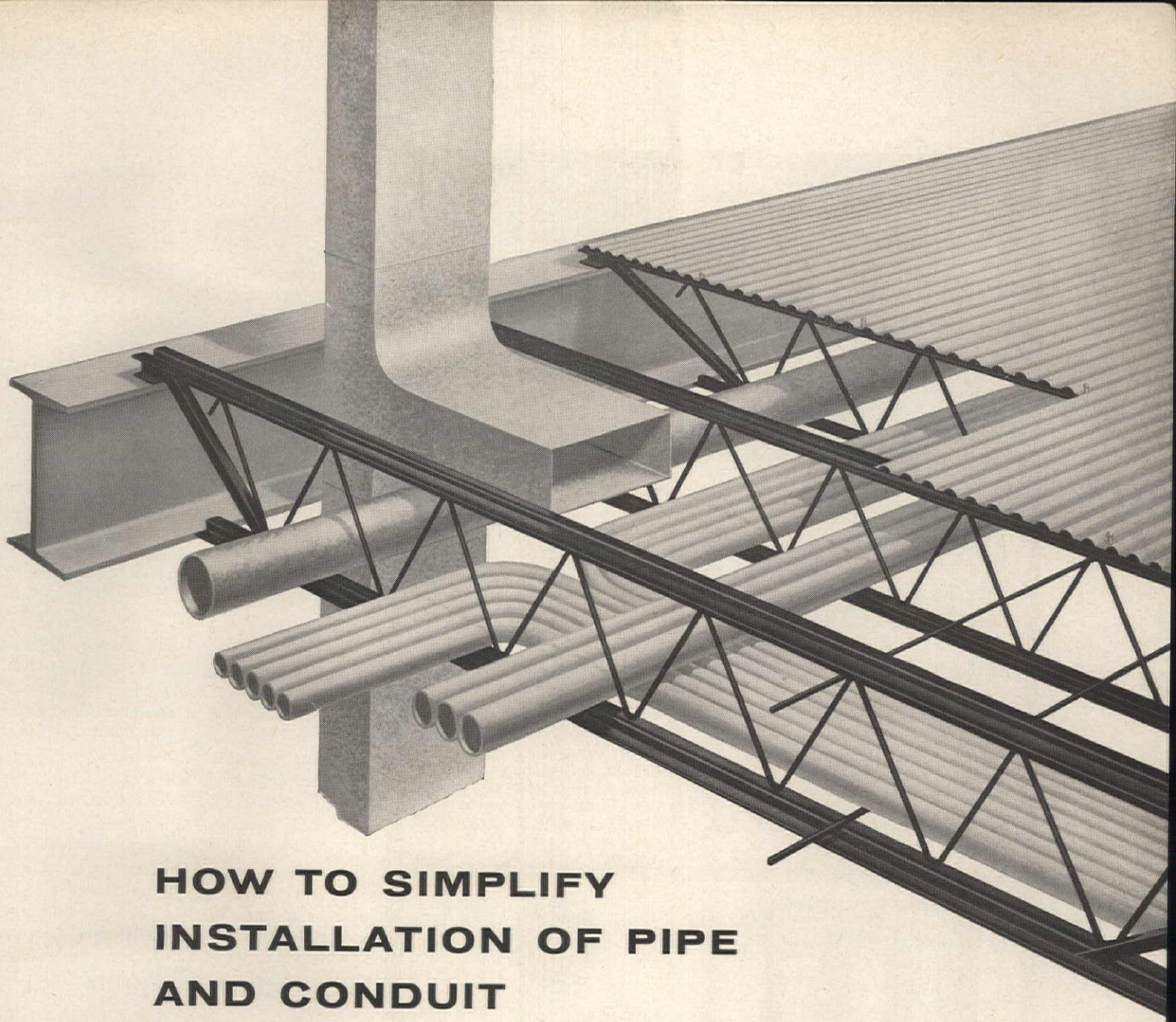

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Required Reading

continued from page 48

and by other noted architectural photographers, are accompanied by captions including photographic details, and are so consistently superior as to be almost exhausting.

Japan Yesterday

JAPANESE HOMES AND THEIR SURROUNDINGS. *By Edward S. Morse. Dover Publications, Inc., 180 Varick St., New York 4. 372 pp. illus. $2.*

Edward Morse was a 19th century scholar who went to Japan to study the structure of paleontological brachiopods and stayed to study the structures of man. Although he was neither abjectly awed nor romantically silly about Japanese architecture, he did have a solid respect for it and, indeed, found it difficult to give it fair criticism without at the same time complaining about Western "enslavery to tawdry upholstery." And he was a wonderfully curious and observant man, recording in notes and sketches (300 of which are published here) facts about Japanese houses, gardens, interiors, amenities, structures, carpentry details, plumbing, *et al.*

Japan has changed even more rapidly than Morse was afraid it might in 1886, and the book now has little of "practical" value. But it still makes interesting historical reading, and still proves a touching tribute, in its dated way, to "that most honorable craft—the building of a house."

Architecture Abroad

ARCHITECTURE IN ITALY. *By Martin S. Briggs. E. P. Dutton & Co., Inc., 300 Fourth Ave., New York 10. 179 pp., illus. $3.75.*

The subtitle, "A Handbook for Travelers and Students," is accurately put, since this is not, despite its convenient shape and size, a proper guidebook. The material, which is made readily comprehensible, is organized chronologically, from the Etruscans through Nervi, and is de-

continued on page 65

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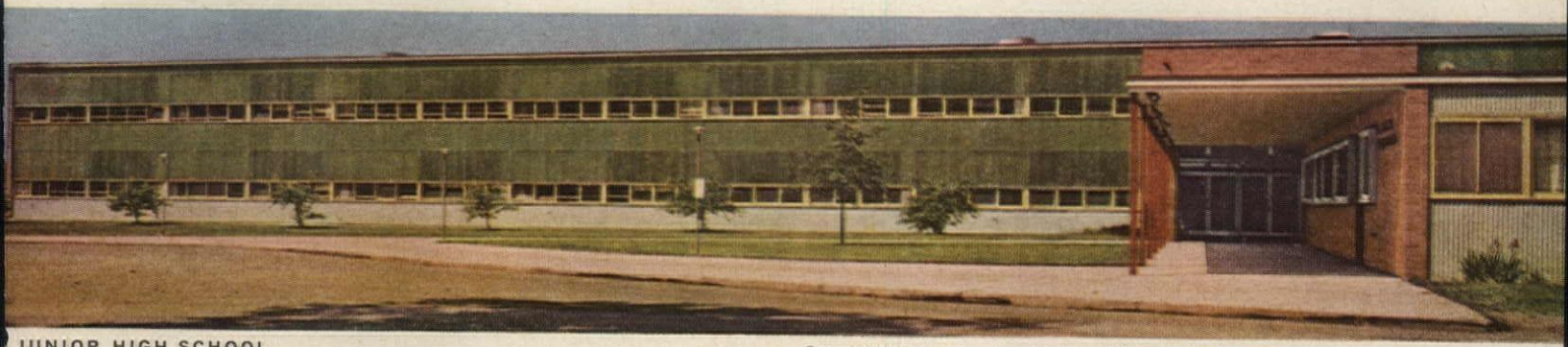
Donald J. Prout & Associates, Architects

AIRPORT BUILDING J-M Corrulux provides a translucent shield for the walkways at either end of this unusual building. This is a unique and imaginative use of Corrulux for sun control

Donald R. Goss Associates, Architects & Engineers

Eaton W. Tarbell & Associates, Architects



Sargent-Webster-Crenshaw & Folley, A.I.A., Architects & Engineers

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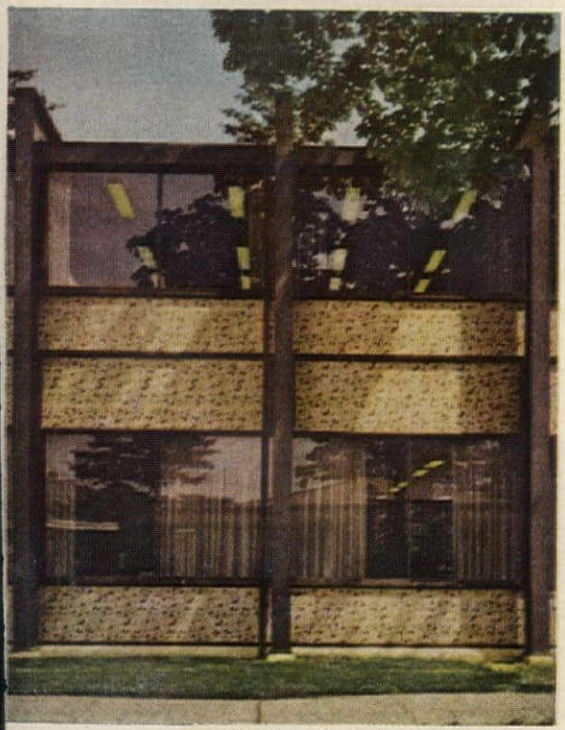
J-M Corrulux attached to the outside of the building columns and beams create a continuous band of translucence above each vision strip of clear glass.

OFFICE BUILDING Window wall panels are of Transitop, veneered with mosaic tile on the outside, painted on the inside. Transitop accepts these and virtually any other finish you specify.



W. Henry Neubeck, A.I.A., Architect

These modern buildings use one of the following **Johns**-Manville materials for exterior walls.

J-M TRANSITOP®—a "3-in-1" panel that serves as outside wall, inside wall and insulation. Between facings of asbestos Flexboard® is a rigid, durable core of insulation. Transitop panels are 4 ft. wide by up to 12 ft. long, thicknesses to 2 in.

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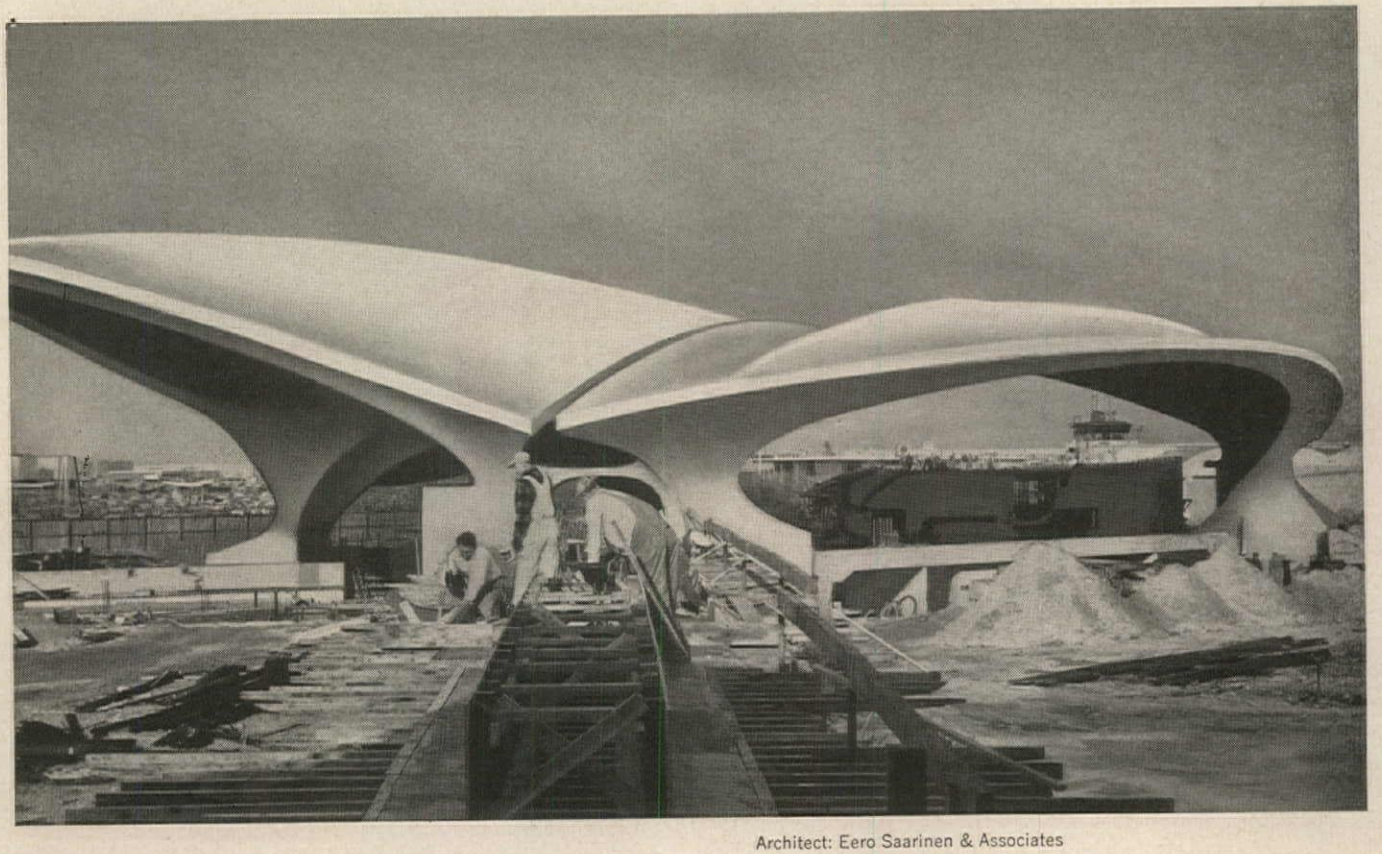

Architect: Eero Saarinen & Associates
Consulting Engineer: Ammann & Whitney
General Contractor: Grove, Shepard, Wilson & Kruge, Inc.

Imagine what You can create with REINFORCED CONCRETE

For structures of every type, creative architects know that monolithic reinforced concrete provides greater opportunity for individuality in building design and construction.

Suggestive of a huge bird poised for take-off, the new TWA Terminal Building at Idlewild Airport is a testimonial to the flexibility of this construction method. Its huge concrete shell roof is an arch cantilever design in four continuous monolithic reinforced concrete sections.

On your next project, design with greater freedom —design for monolithic reinforced concrete.

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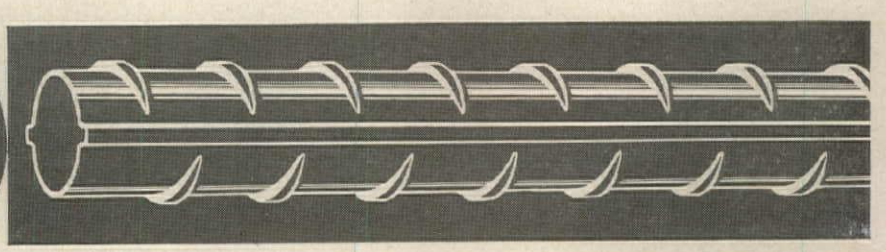

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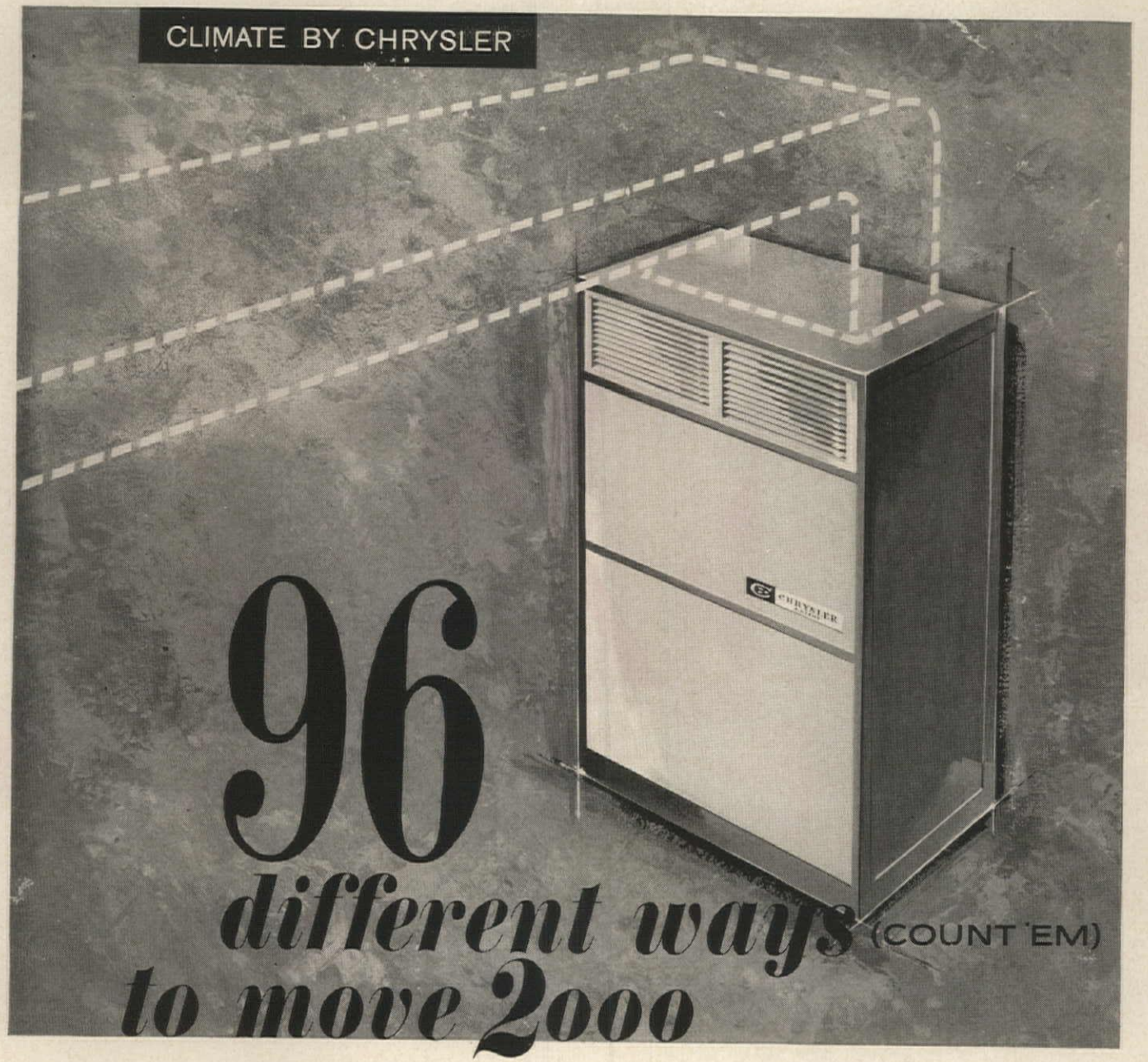

You've never seen anything like this new Chrysler 1456 air handling unit before. It's truly the most versatile commercial or residential unit ever designed. It can be installed in any position, including upside-down and horizontally (and it's so thin you can even slip it into a 36-inch closet, sideways). Discharge and return can be at the front or ends . . . in any combination. You can use it with or without ducts.

It's a free-standing unit. Or, if you want to save floor space, hang it on the wall, or suspend it from the ceiling. And if you want supplementary heating, simply add electric resistance units, or a steam coil . . . or use it as the indoor section of a heat pump. In all combinations, you've got 96 different ways to move 2000 C.F.M.

Perhaps you're thinking that any unit used so many ways will be complicated to install. Nothing could be further from the truth. The new Chrysler 1456 is completely factory-assembled. You don't waste time or money putting it together on the site. And once it's going, you have to strain to hear it. The new 2-speed direct-drive blower is that quiet. If your curiosity is whetted, send for folder LL-513.

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Design project: a commercial office building entrance. The designers: the New York architectural firm of Kahn & Jacobs. Here's another vivid reflection of architectural awareness of ceramic tile's growing role: for beautiful exterior walls, distinctive floors, colorful spandrels.

Ageless ceramic tile will enhance any commercial or institutional project you may have on the boards. And it will pay its way over the years for your clients with savings on maintenance.

THE MODERN STYLE IS .

Required Reading

continued from page 54

signed to serve as a brief historical introduction to the "standard topographical guidebooks."

THE ART OF CHINA: SPIRIT AND SOCIETY. *By Werner Speiser. 257 pp., illus. $5.95.* THE ART OF INDIA: FIVE THOUSAND YEARS OF INDIAN ART. *By Herman Goetz. 275 pp., illus. $5.95.* THE ART OF INDONESIA: THE ART OF AN ISLAND GROUP. *By Frits A. Wagner. 257 pp., illus. $5.95. Art of the World Series, Crown Publishers, Inc., 419 Fourth Ave., New York 16.*

It seems quite a while since publishers have brought out good books at popular prices on the exotic arts of the world. Possibly the texts are a little more scholarly than the casually interested reader would care about, but neither are they likely to leave any casual questions unanswered. All of the authors concentrate mainly on the fine and minor arts, though architecture has its innings in the coverage of India and China.

The reproductions are quite beautiful, quite generous, and virtually all in color.

For the Children

THE FIRST BOOK OF ARCHITECTURE. *By Lamont Moore. Franklin Watts, Inc., 575 Lexington Ave., New York 22. 82 pp., illus. $1.95.*

Guiding a fairly young, but literate, child through Architecture, Mr. Moore starts with the Taj Mahal (pure architecture) and ends with the Piazza San Marco (pure architecture plus). What may strike an adult as misleading oversimplification will certainly strike the child as admirable directness; and the facts, each will recognize, are accurate. Anyone contemplating giving this little book to a child ought, however, to be warned that the presentation is open-ended—stimulating to the child's curiosity, but demanding of the donor's knowledge (if the approach to St. Peter's is "one of the three most noted squares in the world," for instance, what are the other two?).

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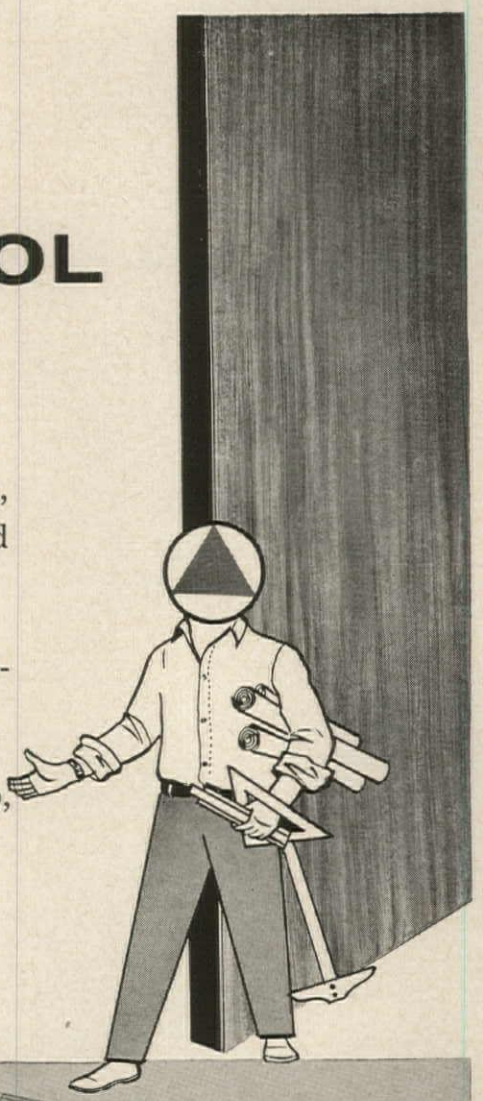

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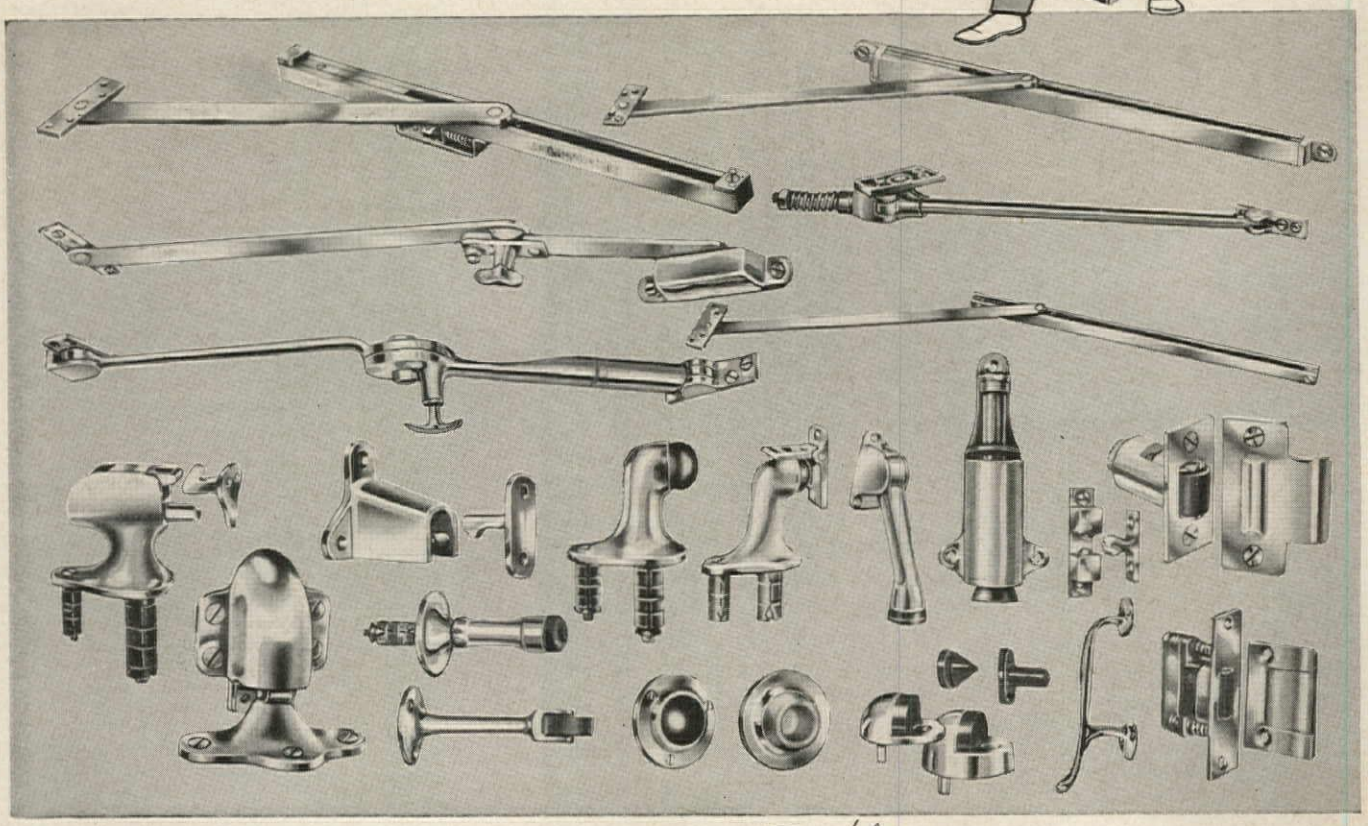

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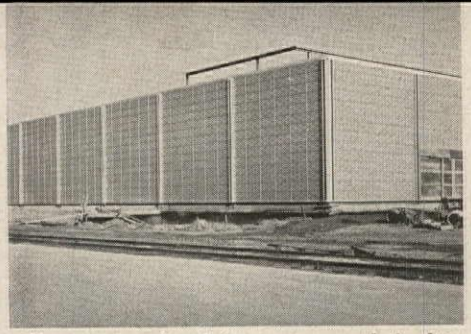
Geon VINYLS

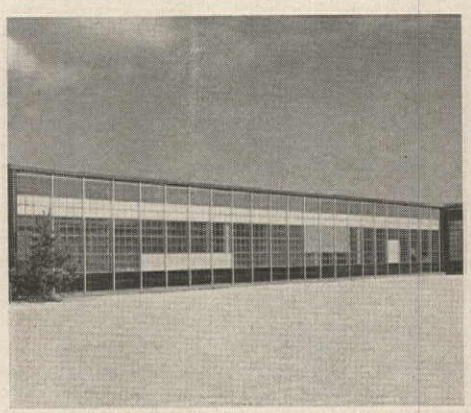
Light-controlling Thinlite panels provide excellent natural light, help reduce heating and cooling costs for the new $20-million Intelex Systems Post Office in Providence, R. I. Charles A. Maguire & Assoc., Providence, supervised design and construction.



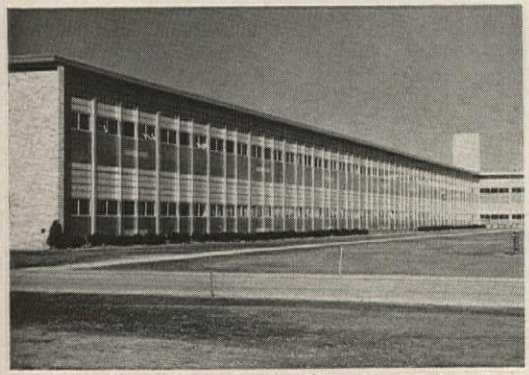
All exterior walls of the new research facility of Miles Laboratory at Elkhart, Indiana, designed by A. M. Kinney & Assoc., Cincinnati, will utilize the light-controlling features of colored Thinlite panels. The ground-to-roof installation will provide a more pleasant controlled environment for modern research.

Thinlite panels of Clear Vista, accented with ceramic colors, adm maximum light with low heat transmission in the new office build of the State Employees Building Corp., Sacramento, Calif. West Amer Engineering Co., Inc., San Francisco, designed the structure.

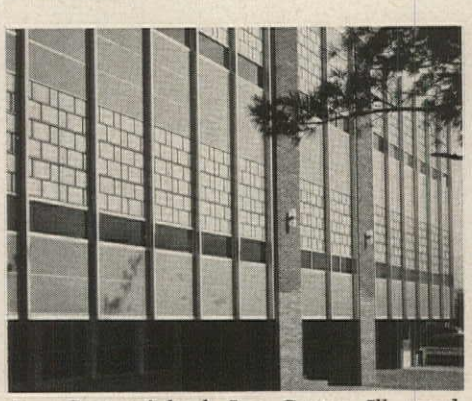
Northwest Suburban Y.M.C.A., Des Plaines, Illinois, is one of a series of new Y.M.C.A. buildings in the Chicago area in which Thinlite is used. Y.M.C.A. architect Eugene White commissioned Eckroth, Martorana & Eckroth, Chicago, to design Des Plaines Y.M.C.A.



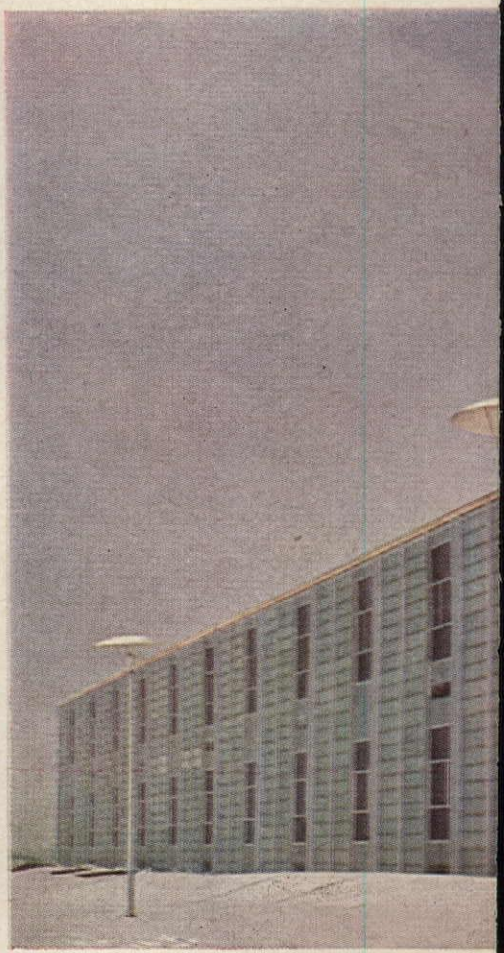
Severe New England winters called for a weather-control exterior at the Split Ball Bearing plant in Lebanon, N. H., so C. M. Koelb Associates, Weston, Mass. specified Thinlite curtain wall with vista panels and ceramic accent panels.

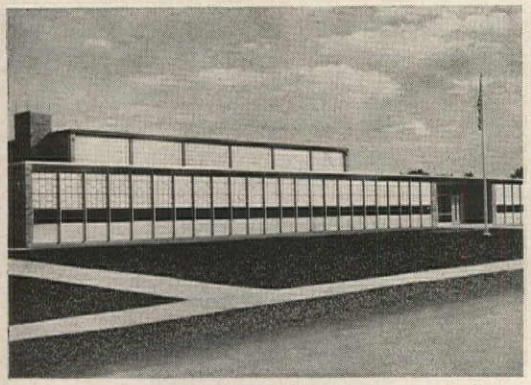


Architect Enos Cooke, New Kensington, Pa., used Thinlite in a major way at Stewart Junior High School, Lower Burrell Township, Pa., blending light-controlling panels with windows and aluminum-faced insulating panels.



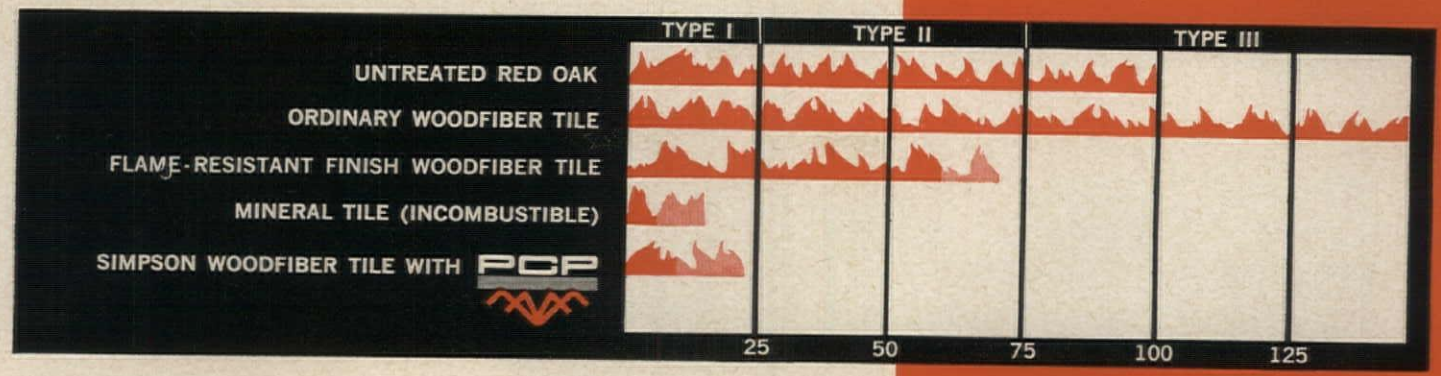
Lee Center School, Lee Center, Ill., used Thinlite Curtain Wall for this new addition that has taken years off the appearance of the school. Samuelson & Sandquist, Chicago, architect.





Extensive use of Thinlite prismatic panels, in combination with gray glass and porcelain enamel panels, controls harsh sunlight and severe weather in John Quincy Adams School, West Allis, Wisconsin. Architect, Schutte, Phillips & Mochon, Inc.

West Carrollton (Ohio) Senior High School (Architects—Outcalt, Guenther & Assoc.) features extensive use of prismatic and window panels to protect occupants from sun and weather in classrooms, corridors and cafeteria.



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PCP TREATMENT*

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6860/S1A14

The Record Reports

continued from page 94

solar devices, partitioning), free experimentation and use of color, Mr. Parkin concluded that in the completion of industrial parks such as Annacis Island or Don Mills, Canadian architecture has realized one of its most important achievements. "The lesson to be learned . . . is . . . that it is in the successful grouping of buildings into a harmonious whole that we can find an ideal worthy of our most conscientious striving . . . I personally believe that our industrial parks are the first important step in a progressive movement to extract order out of the urban environment."

In the role of interrogators were Charles R. Colbert, dean, School of Architecture, Columbia University, and Robert W. McLaughlin, F.A.I.A., director, School of Architecture, Princeton University.

Answering Dean Colbert's question as to why Canada used predominantly steel, Mexico concrete, Mr. Parkin replied that continuous operation all year round, with Canada's cold winter months, inhibited the use of concrete, and that Canada's big steel companies were aggressive. Mr. Candela explained that there were not many steel mills in Mexico partly since the "Spanish countries have always had a tendency to resist the technological age," that concrete was cheap and available, and that he used concrete because "I wanted to build shells."

Architects and/or Engineers?

A discussion followed Dean McLaughlin's question: "How do practices differ, as far as the collaboration of architects and engineers is concerned?" in which Mr. Parkin declared, "The integration of engineering and architecture is the only way good architecture can come about." Dean Colbert intervened, "When you see architects and engineers assembled, you see mediocrity. One of them is a kept man!" This drew the following reply from Mr. Parkin, "I do not believe people working in collaboration, particularly when they have an interest in the firm, are necessarily inferior . . ." He stated that in his firm both engineers and architects were there in the fundamental shap-

continued on page 248

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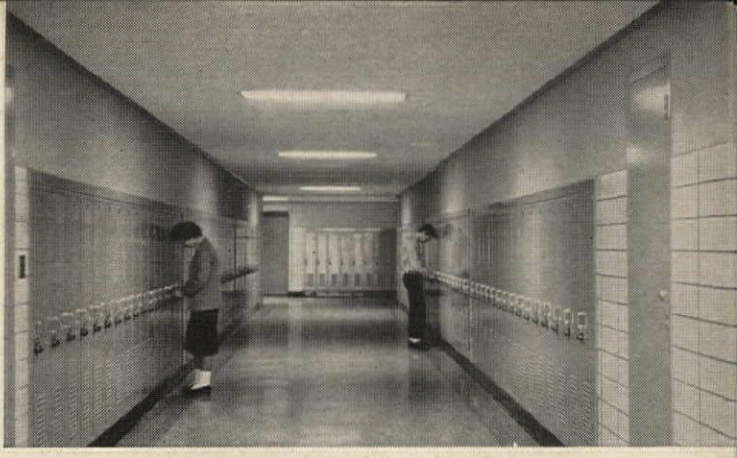

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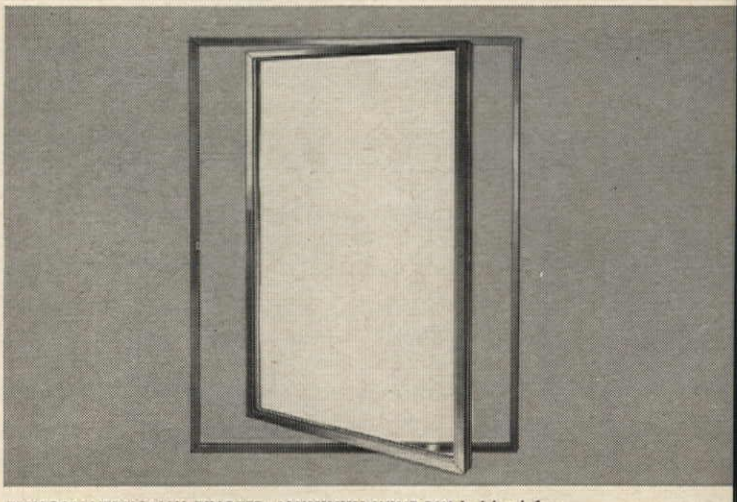

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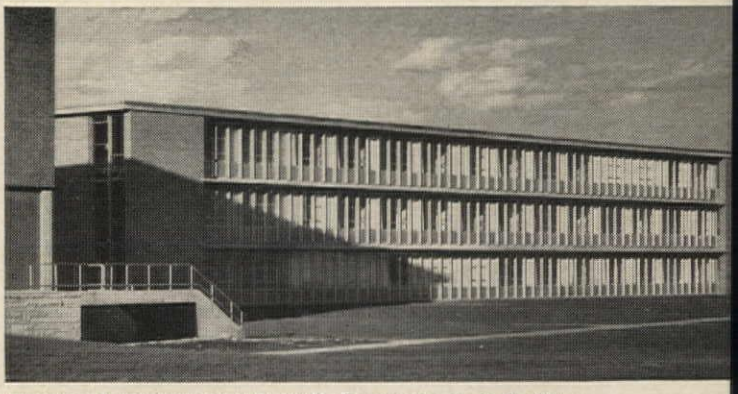

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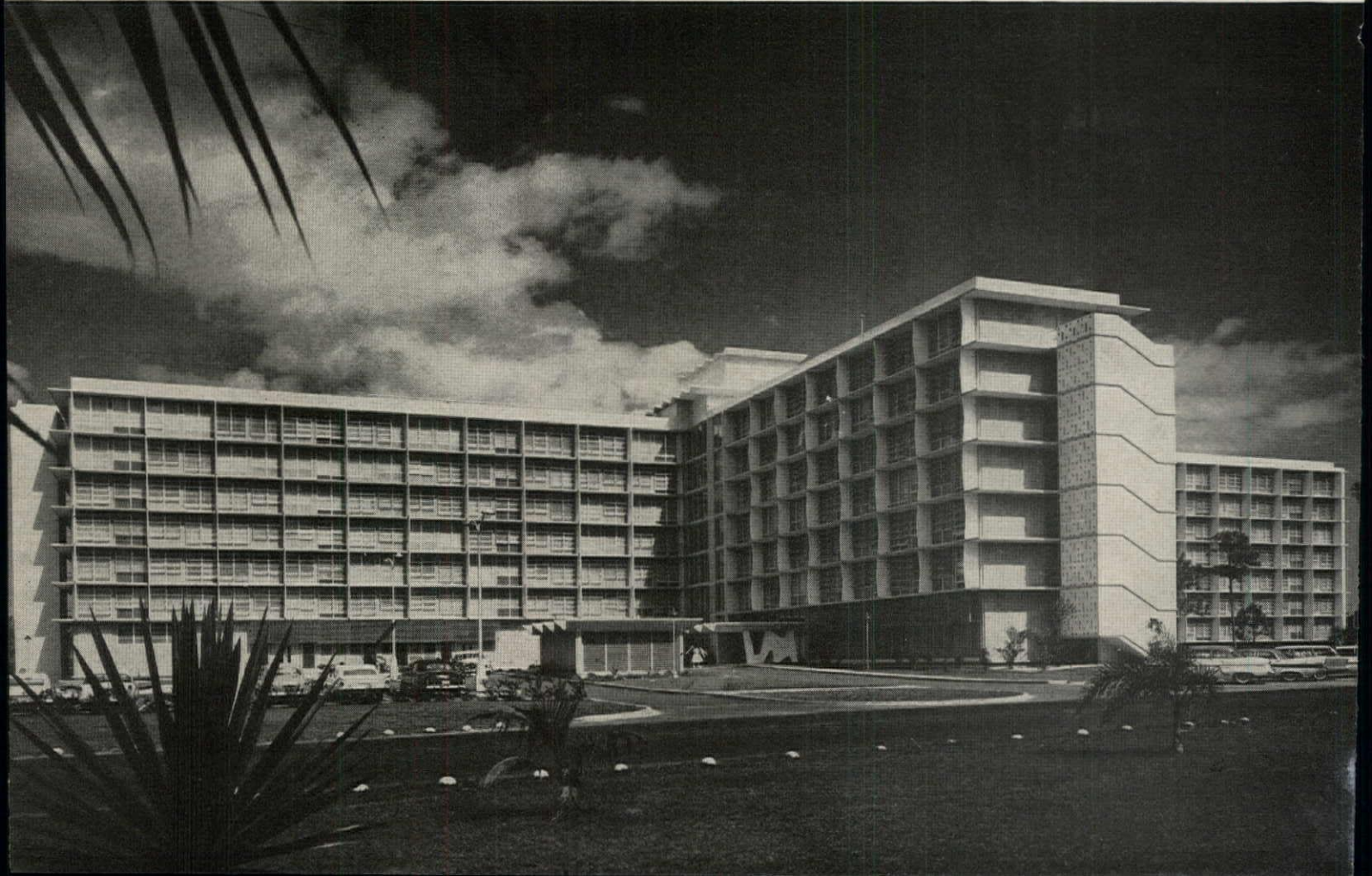
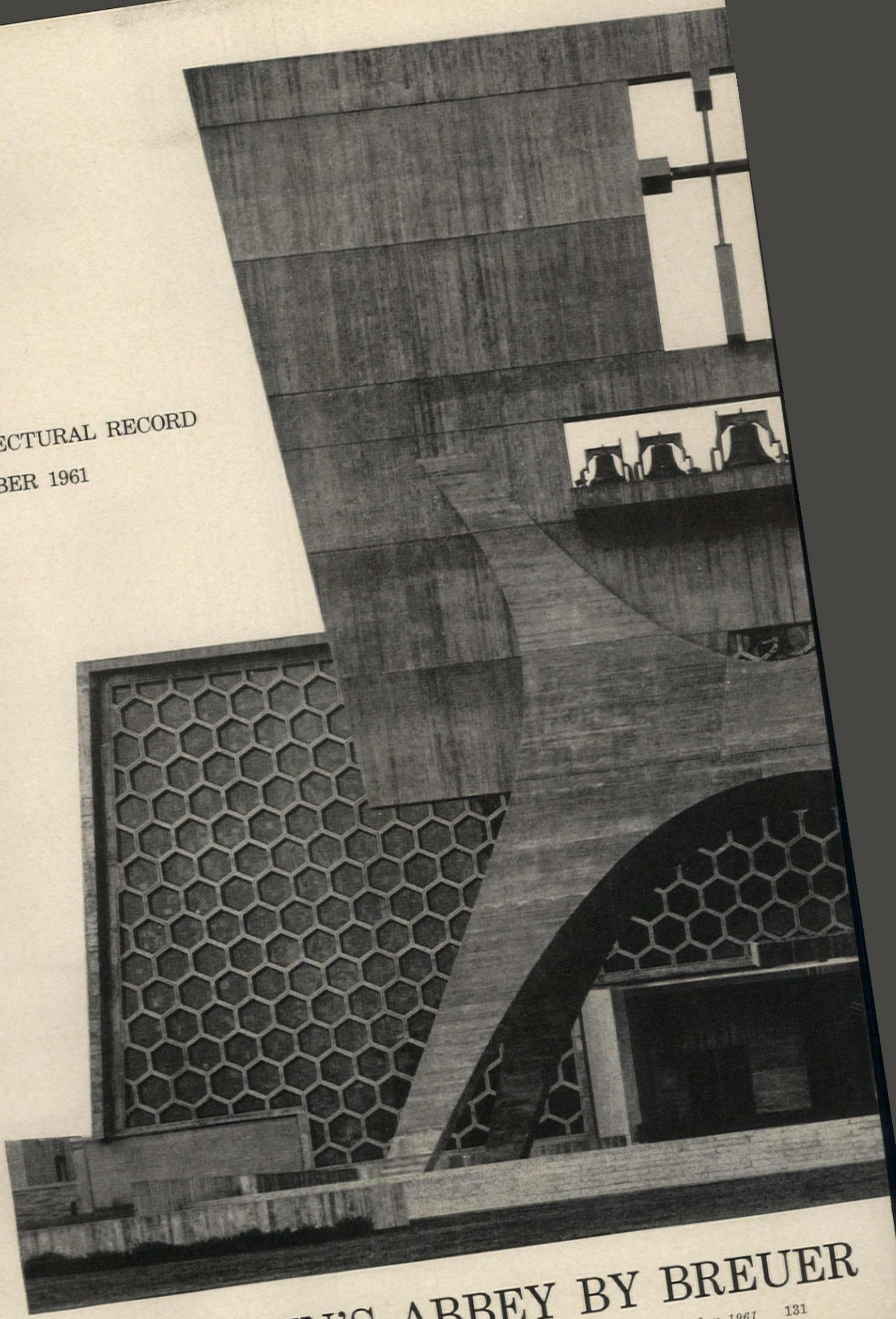
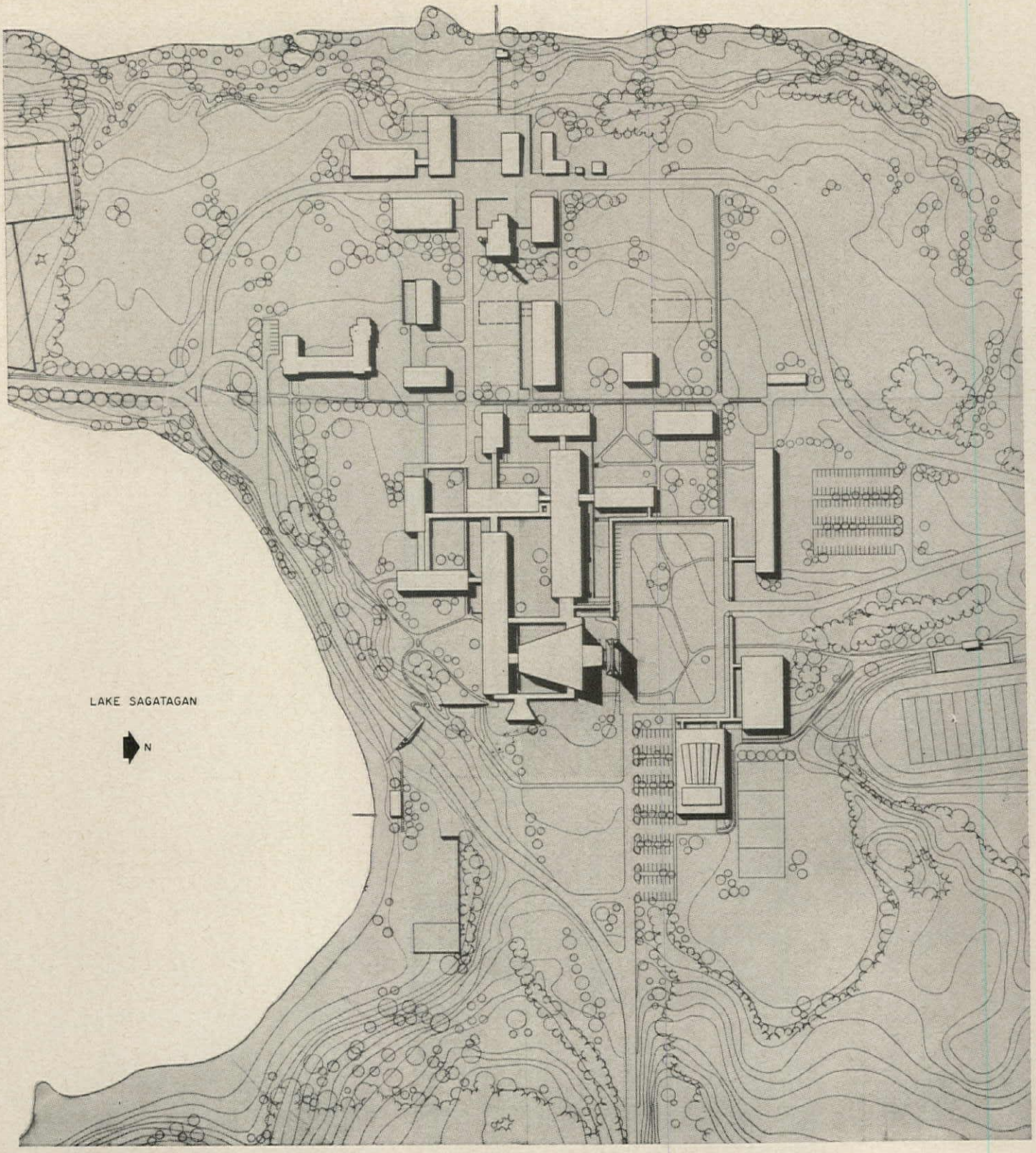
Student Dormitory, University of Miami, Miami, Florida. Architect: Robert M. Little, F.A.I.A., Miami. General Contractor: M. R. Harrison Construction Company, Miami. Painting Contractor: A. Petri, Miami.



ARCHITECTURAL RECORD
NOVEMBER 1961



SAINT JOHN'S ABBEY BY BREUER



Located on 2500 acres in the rolling, wooded lake country 80 miles northwest of Minneapolis, the community of St. John's Abbey was founded in 1856 by five Benedictines. They came to establish, as St. Benedict wrote in his *Rule*, "a school of the Lord's service" to nurture the surrounding parishes and do missionary work among the Chippewa Indians. The growth of St. John's physical plant over a 100-year period was more or less haphazard, without the benefit of master plan. As architect Breuer's comprehensive scheme (above and at right) shows, the old buildings will gradually be replaced during the next 100 years within the discipline of an over-all concept

A Master Plan for the Next 100 Years

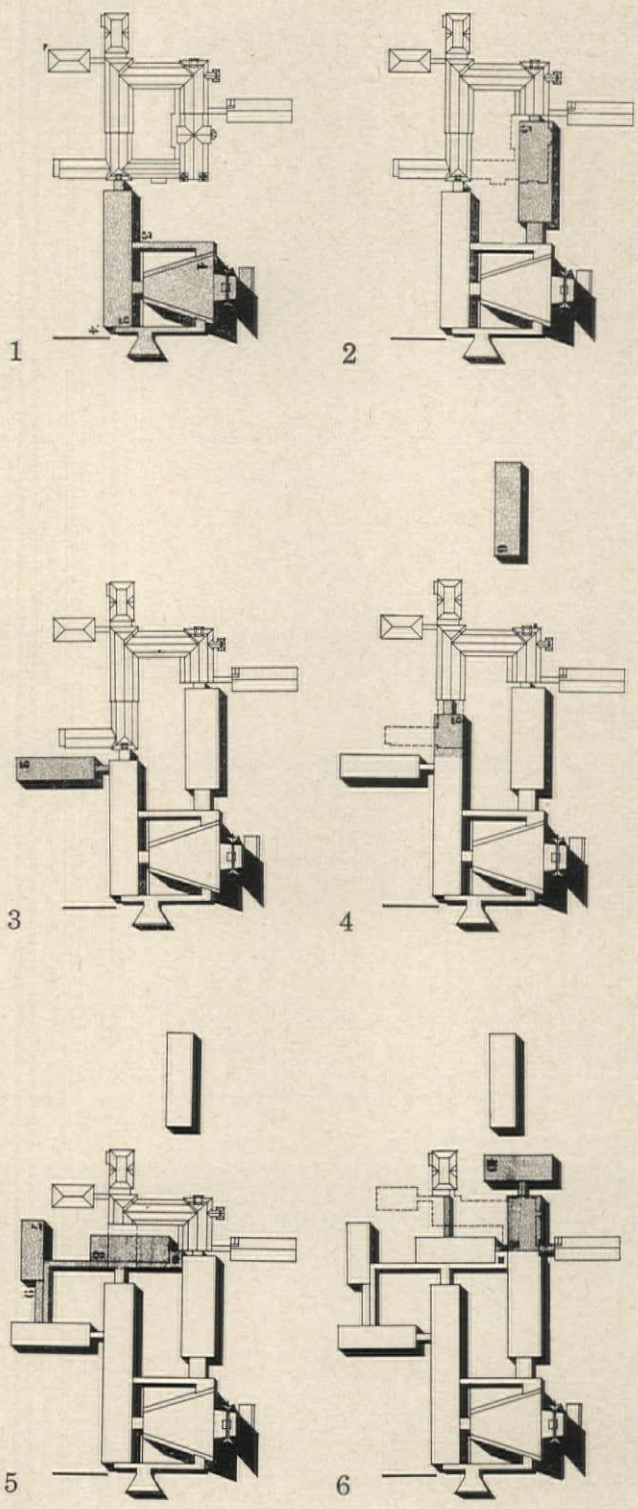
With the church, monastery, and dormitory completed, and drawings for the library ready, the building program at St. John's enters its second phase

The program for the master plan of Saint John's Abbey is based upon the idea of containment rather than expansion; a program aimed to provide the members of the community the facilities they need in order to become more effective in their work. Thus, architect Breuer devised a system of "shadow building" in which a new building is constructed next to—or in the shadow of—the one to be demolished; the second new building then replaces the one demolished, superseding the one to be torn down next, and so on. In this manner, old buildings are replaced painlessly, while the functioning of the monastic community suffers minimum disturbance.

Breuer's plan was developed after exhaustive study of the workings and ideals of the community, and is conceived to be carried out in stages over a one hundred year period. Its 19 buildings will house a Benedictine monastery of 500 (300 in residence)—the largest in the world; as well as a seminary, university, and high school—total student enrollment of 2,700. The entire complex will, of course, center on and revolve about the abbey church, which will seat a congregation of 1,580 in addition to the choir of 260 priests, clerics, and brothers. The bell-shaped church building visually dominates the scene—appropriately enough—by its size and height; its bell banner rising 112 ft to make a landmark visible for miles in the surrounding countryside.

The plan clearly separates and defines claustral and scholastic zones, which come together at the church, which in turn faces upon a large, open green at the center of the plan. Connected to the south—or monastic—end of the church, the monastery faces across a south slope to Lake Sagatagan. The next two claustral units face the lake (moving toward the top of the plan) and are, respectively, the monastic seminary and the diocesan seminary. The scholastic buildings—high school and college—are grouped to the north and west (top and right) of the public green, while shops and agricultural buildings are grouped at the top (west extremity) of the plan. The administration building (next to the church), library, and auditorium complete the grouping about the central green.

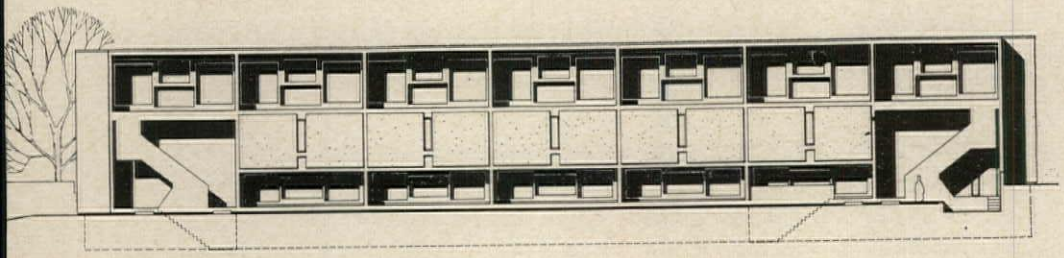
In traditional fashion, the units in the central portion of the plan will be connected by covered walkways, which will variously define or enclose outdoor spaces and gardens. The different kinds of outdoor spaces between buildings—wholly or partly defined, varied in scale and form—are the key to the character of the plan. The pattern of interlocking and separated forms sets up an appealing rhythmic esthetic for the whole.



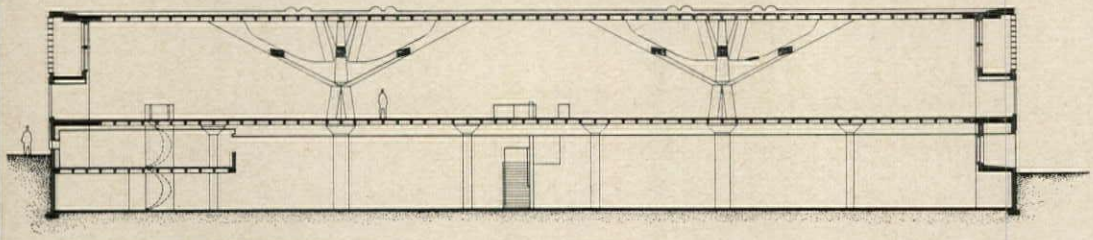
SIX STAGES, CENTRAL GROUP: 1—Church and monastic wing (now completed); 2—Administration Center (after razing old church); 3—New monastic wing; 4—High school dormitory for 220 students; 5—Classrooms and monastic seminary; 6—Science Hall and classrooms

1. MONASTIC WING 2. CHAPTER HOUSE 3. ABBEY CHURCH 4. BAPTISTRY 5. BELL BANNER

The photo above shows, in comprehensive fashion, the completed monastic wing, chapter house, church, baptistry, and bell tower; the plan below explains how they relate to each other and to the public green and parking area. The university library (6) will be built diagonally across the green

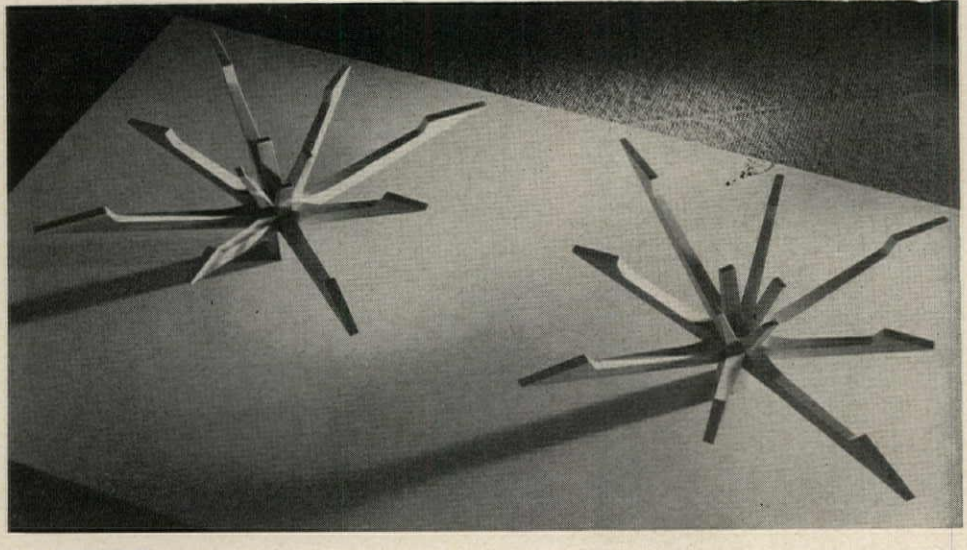


SOUTH ELEVATION OF LIBRARY



CROSS SECTION OF LIBRARY

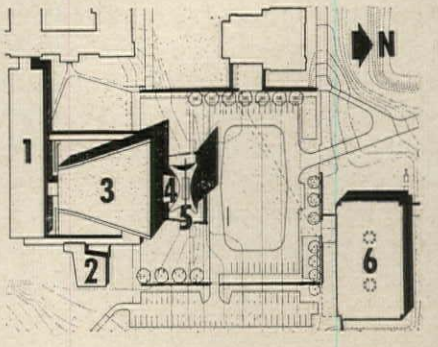
Ben Schnall photo

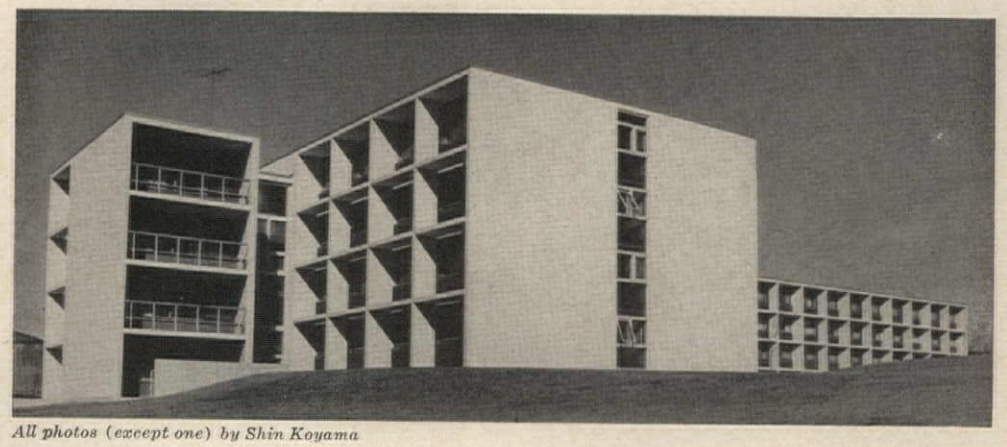


6. LIBRARY

THE UNIVERSITY LIBRARY, next unit in the program to be built, will feature an interesting main reading room and open stack area at second floor level. This room will be sheltered by a deeply coffered concrete waffle-grid slab, 204 by 124 ft, which will be carried on only two interior "trees" of concrete, each of which will branch out in organic fashion to provide eight points of support. Piers around the perimeter longitudinally normal to the façades will provide lateral bracing

THE STUDENT DORMITORY, shown at right, has a design character in keeping with the monastery wing. Its concrete floor and roof slabs are supported by concrete block bearing walls. Both slabs and walls extend beyond the plane of enclosure to provide horizontal and vertical sunshading, and in so doing, build up a strong chiaroscuro pattern



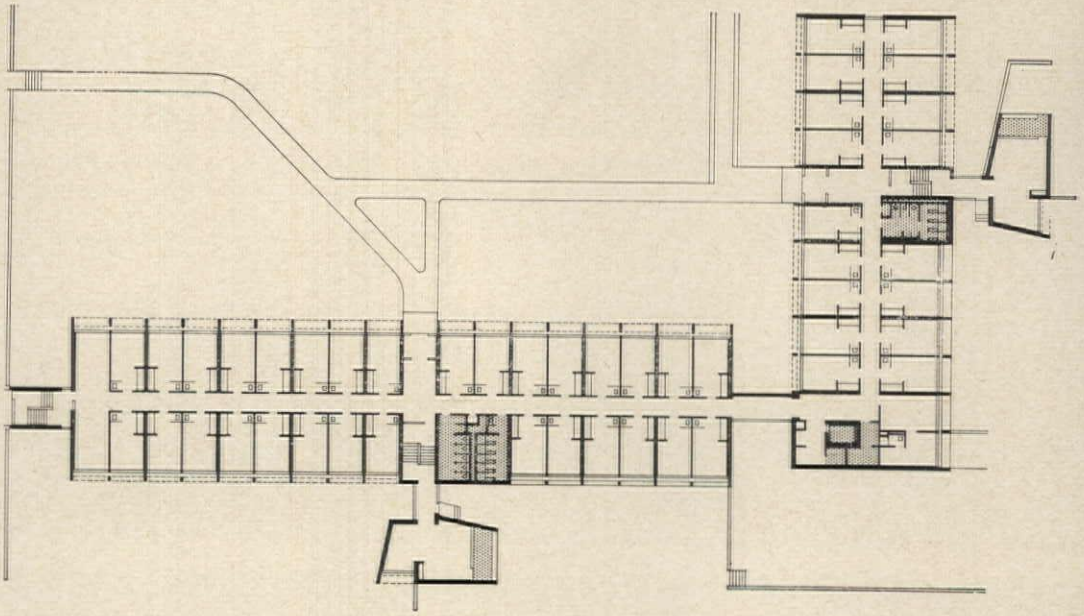


All photos (except one) by Shin Koyama

STUDENT DORMITORY:

Marcel Breuer, Architect;
Hamilton Smith, Associate

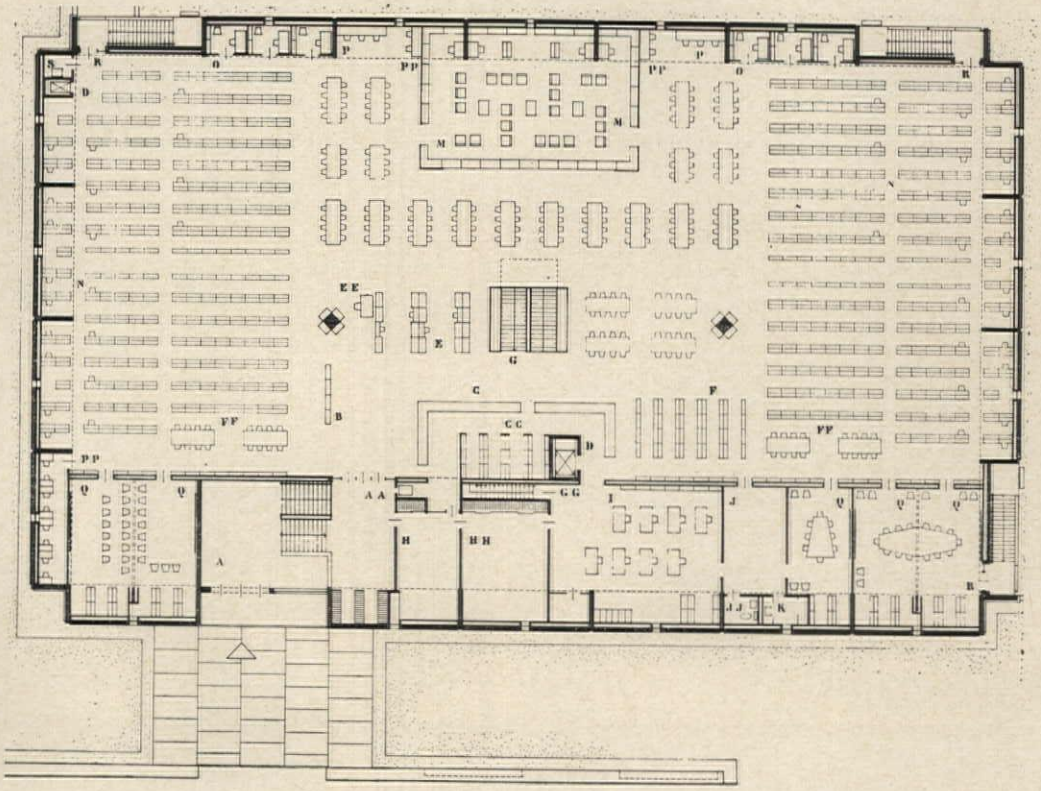
Weisenfeld, Hayward & Leon, Structural Engineers; Gausman & Moore, Mechanical Engineers; Val Michelson, Field Supervision; Maurice Mandel, Contractor

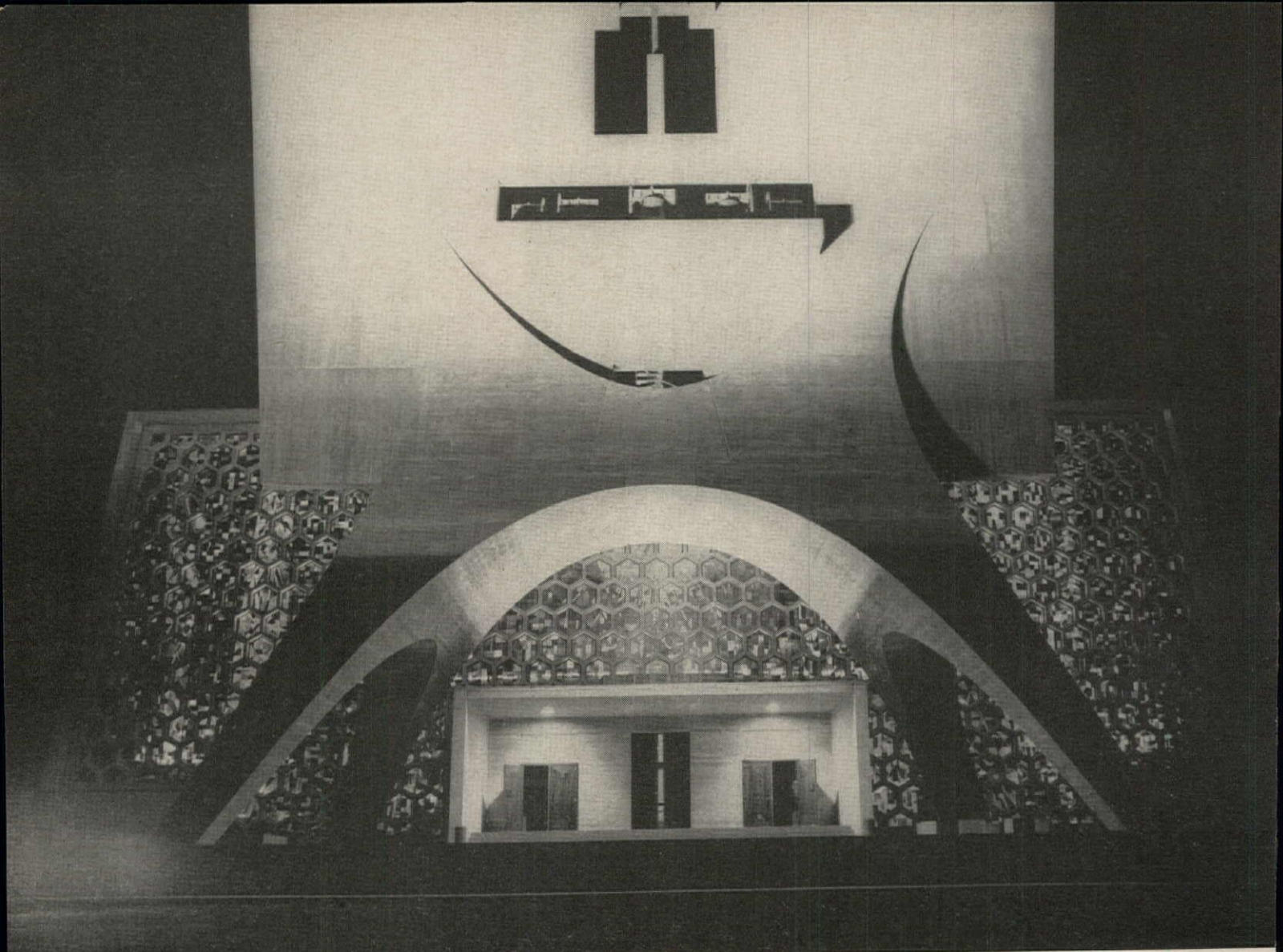


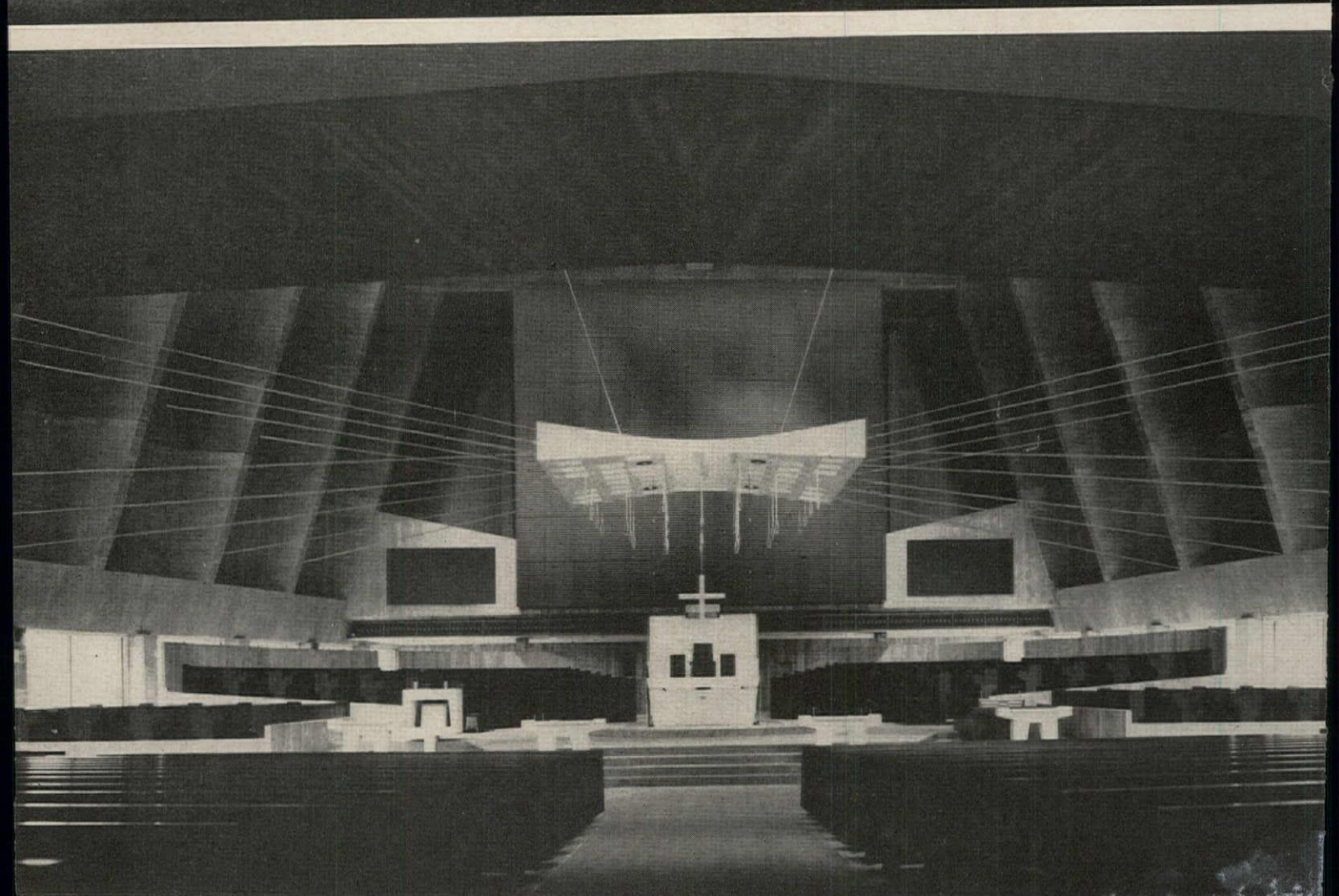
LIBRARY PROJECT:

Marcel Breuer, Architect;
Hamilton Smith, Associate

Johnson-Sahlman, Structural Engineers; Paul Weidlinger, Structural Theory Consultant; Gausman & Moore, Mechanical Engineers; Sidney K. Wolf, Acoustical Consultant





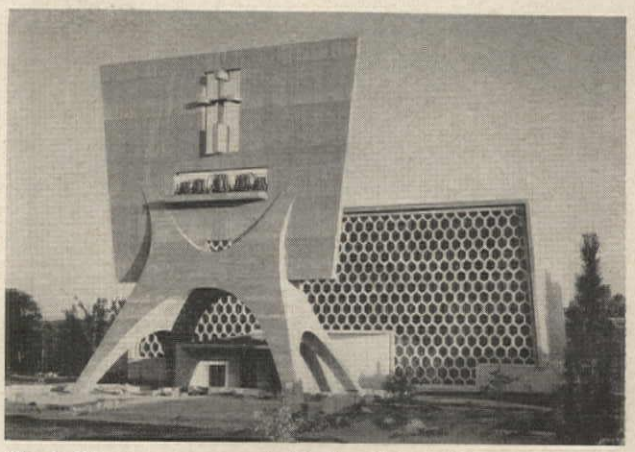


NINE IDEAS SHAPED THIS CHURCH: three—liturgical in nature—proposed by the monks as important in their use of the church, determined the *plan*; three—architectural in nature—stemmed from Breuer and determined the church's *form*; and three—less tangible in nature—held by both, which determined the *character* of the church.

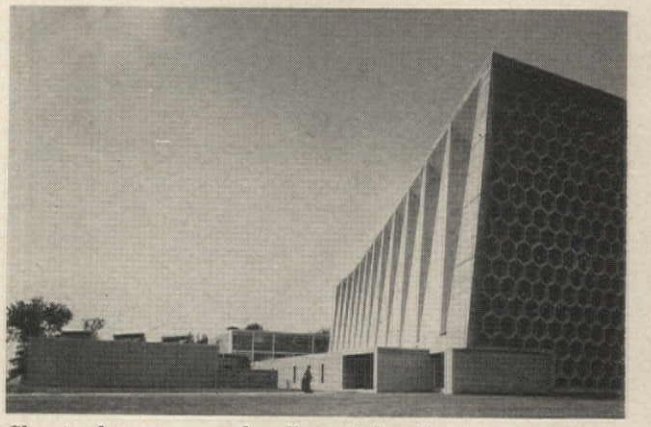
The monks proposed that the altar should be free-standing and centrally located, so the entire congregation of 1580—as well as the choir—would be as close to the sanctuary as possible. This idea also led to the provision of a cantilevered balcony as preferable to a lengthened nave. The monks' second request was that their choir be visible to the congregation and divided into two facing halves; a felicitous arrangement for Benedictine plain song. Third, the monks recommended—for liturgical, symbolic, and visual reasons—that baptistry, church door, confessionals, communion tables, altar, and abbot's throne be placed in sequence along a central axis. This idea set the general arrangement and also resulted in the creation of the low baptistry-atrium structure as entrance. This unit could not be left open to the sky in Early Christian tradition, due to the Minnesota climate, but contains skylights to open it upwards.

Breuer felt that structure should make a dominant visual statement, both exterior and interior; and that this statement should be contemporary in nature. Thus, the concrete folded plate construction for walls and roof, in which the longest of the continuous folds spans 135 ft, is 15 ft deep, and varies from 6 to 8 in. in thickness. The second architectural idea was that the interior church space should extend outward to include confined, controlled outdoor space. The wall construction was therefore brought down on buttress-piers so the church space could flow out between them to the cloister gardens. Third, the bell banner was created as symbol, as monumental gateway, and as a light reflector for the north wall of stained glass. The banner—an up-ended cantilever slab pierced for cross and bells—makes a poignant symbol in today's architectural idiom which is peculiarly appropriate for the Benedictines, a forward looking order.

The basic optimism and positive attitude of the monks underline the first shared idea; that the new church should be of a form valid for the future, and expressive of contemporary technology. Breuer agreed also with monastic tradition in the next idea; that enduring, non-pretentious materials should be used. The untreated concrete, brick, granite, and dark oak woodwork seem expressive of the austerity, humility, and continence of monastic life. The third common idea came from Breuer's feeling that the special devotional quality of a space is enhanced greatly, both in dignity and solemnity, by generous scale. St. John's encloses a volume greater than a million cu ft, and its amplitude is a measure of its success as architecture.



The bell banner surmounts the baptistry



Chapter house, covered walk, and church

The monastic wing joins the church to the south

THE ABBEY CHURCH:

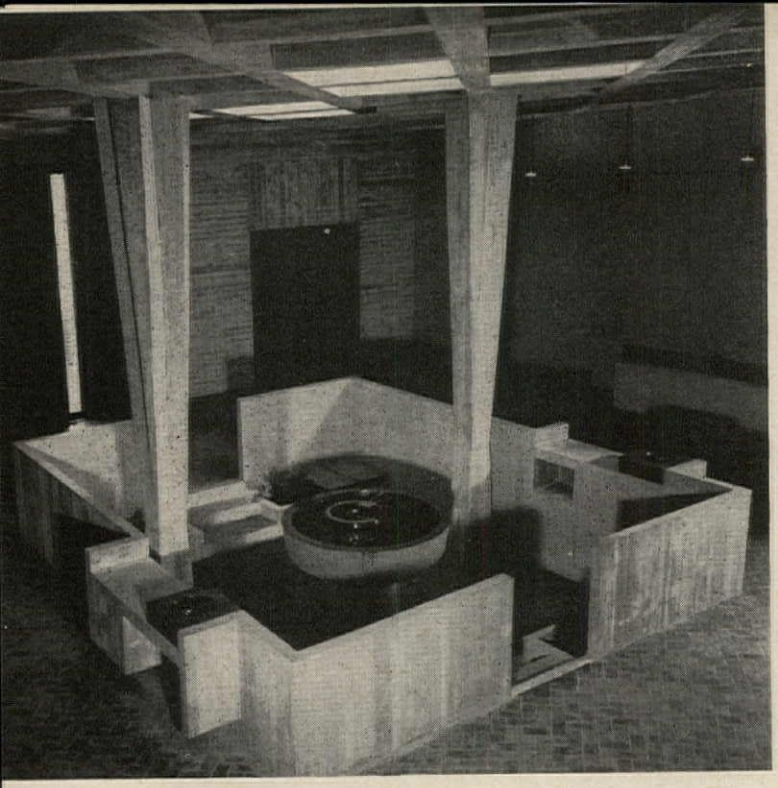
Marcel Breuer, Architect; Hamilton Smith, Associate

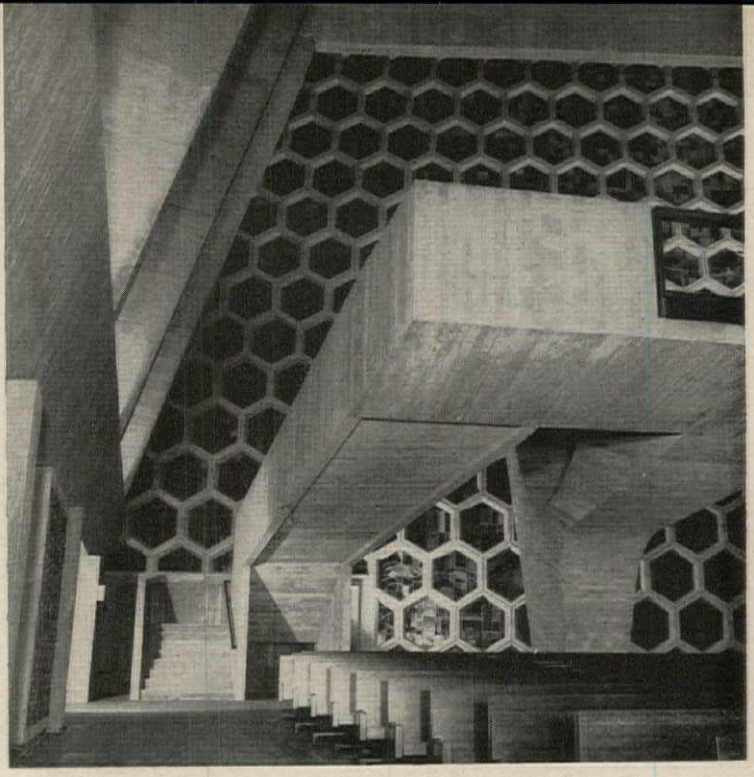
Weisenfeld, Hayward & Leon, Structural Engineers; Pier Luigi Nervi, Structural Consultant; Gausman & Moore, Mechanical Engineers; Stanley McCandless, Lighting Consultant; Sidney K. Wolf, Acoustical Consultant; Holtkamp Organ Co., Organ Consultant; Traynor & Hermanson, Architects — Owner's Coordinator; Val Michelson, Field Supervision; McGough Construction Co., General Contractor

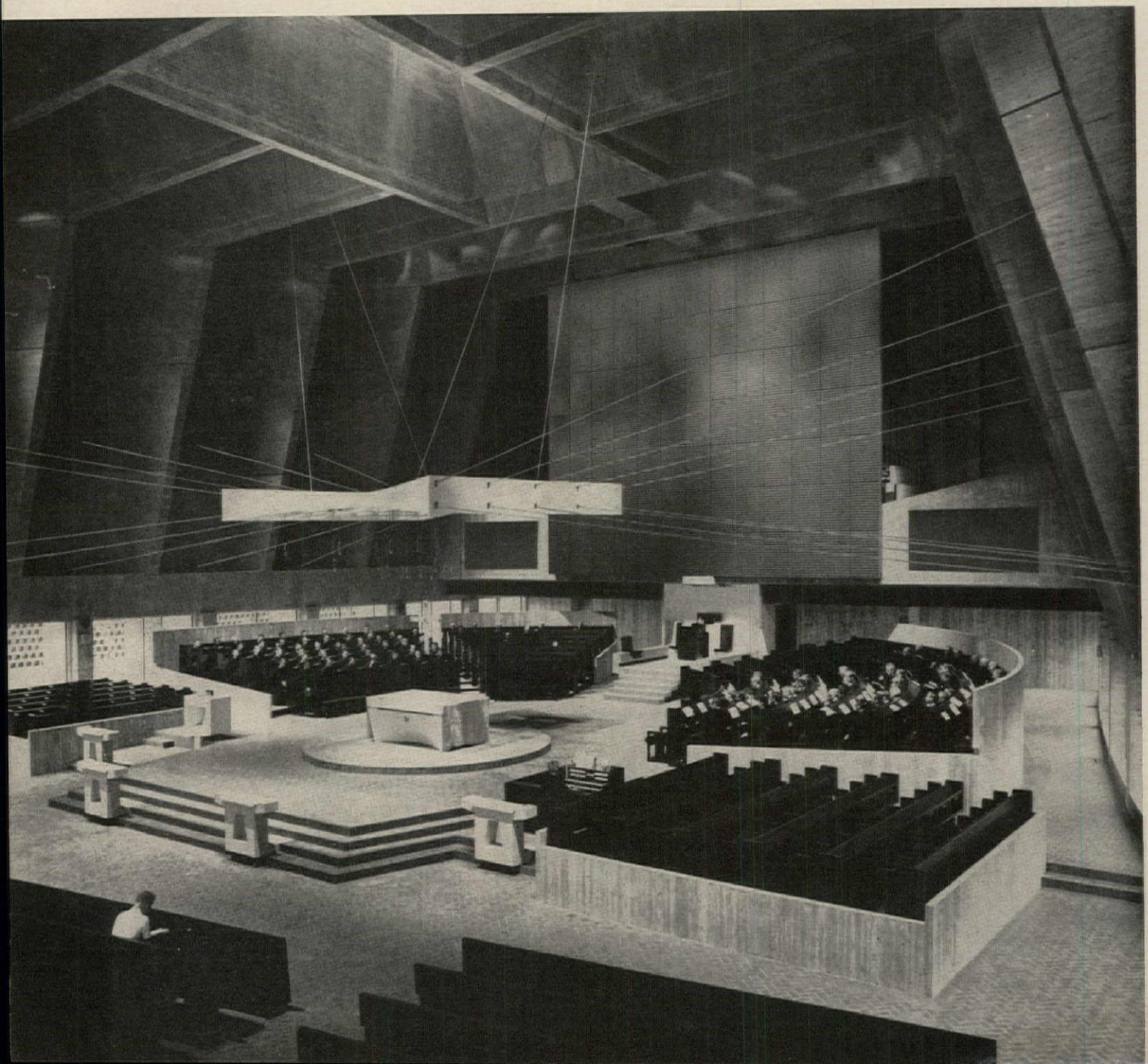
THE MONASTIC WING:

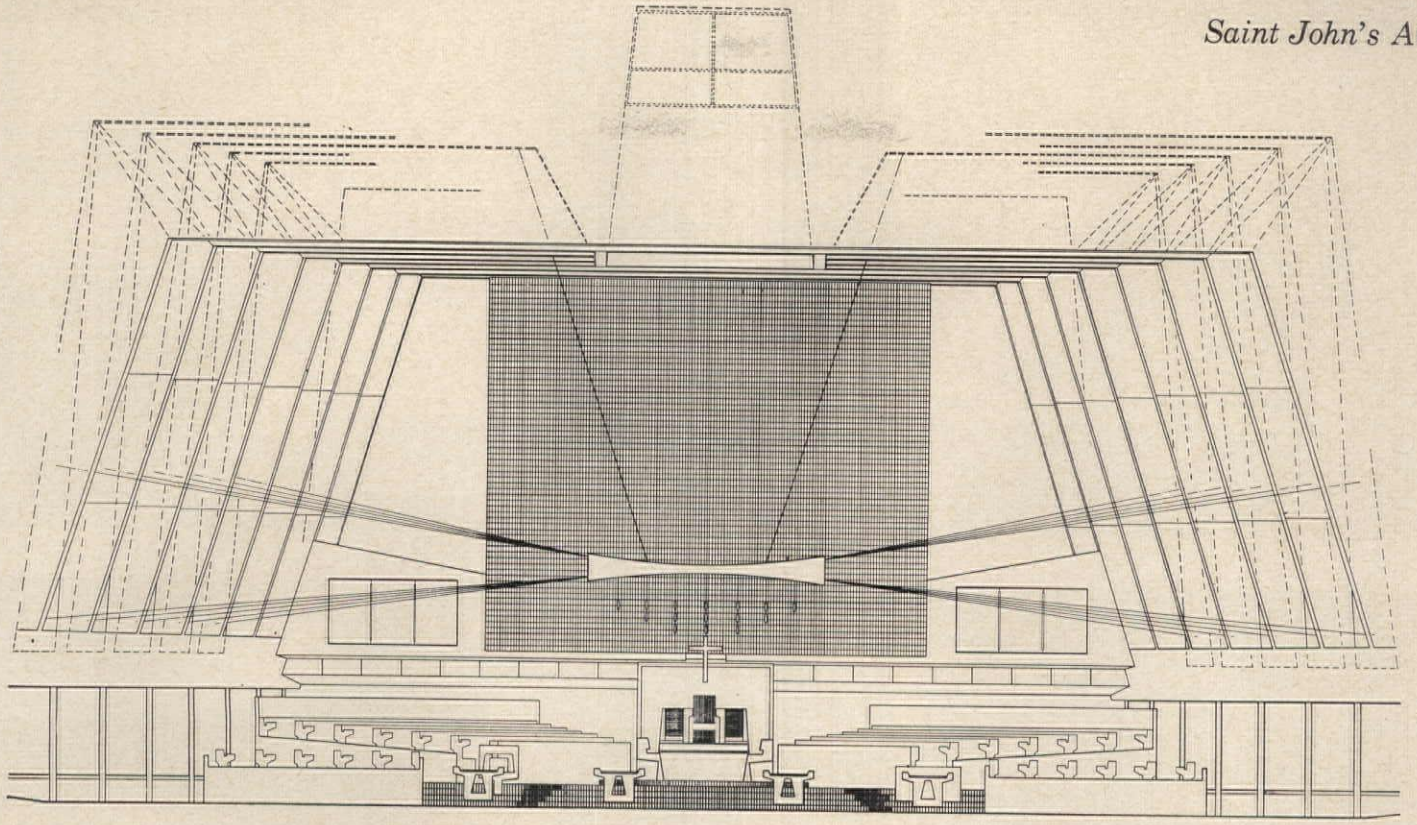
Marcel Breuer, Architect; Hamilton Smith, Associate

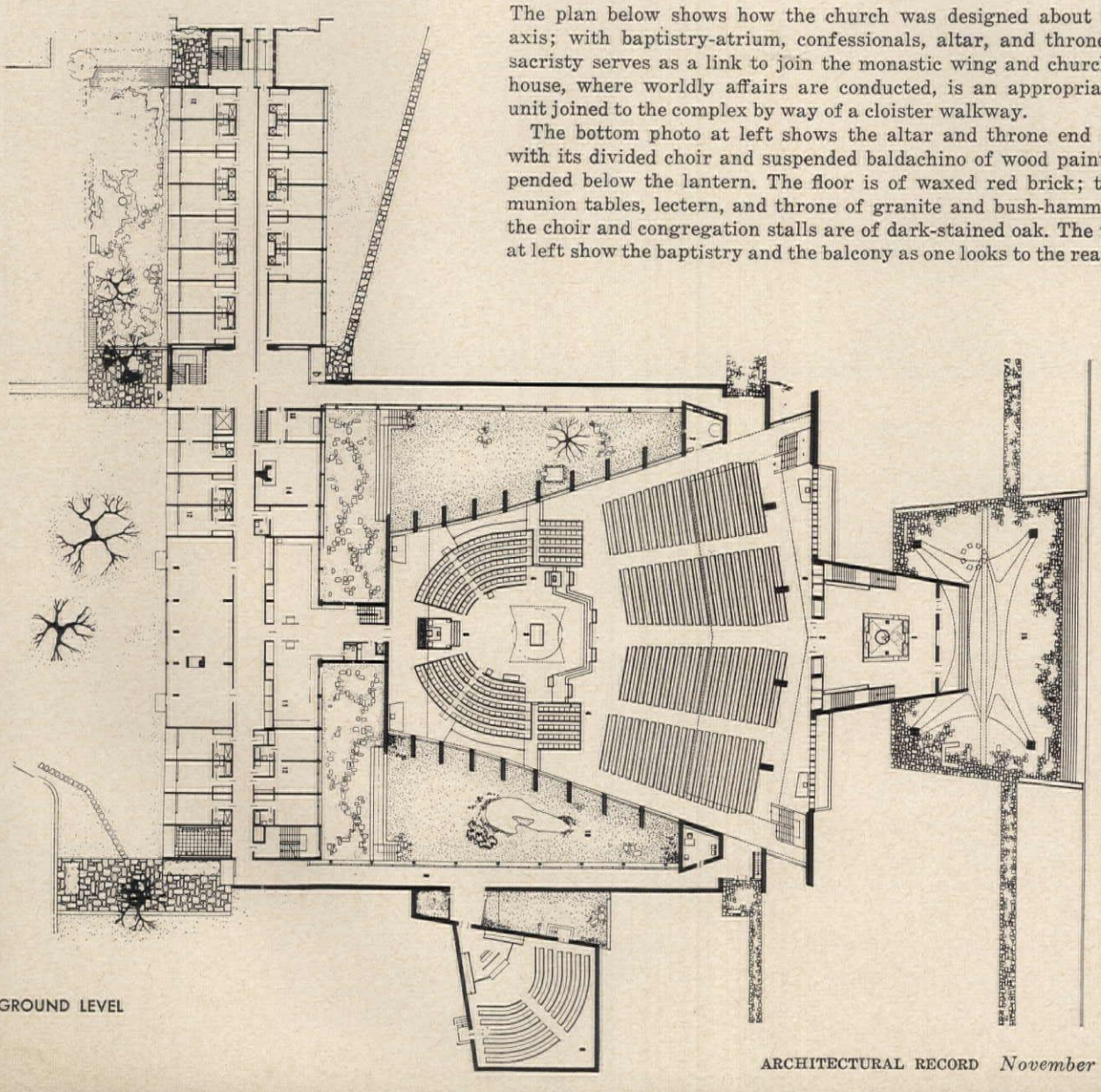
Farkas & Barron, Structural Engineers; Fred S. Dubin Associates, Mechanical Engineers; Sidney K. Wolf, Acoustical Consultant; Traynor & Hermanson, Architects — Local Supervision; Wahl Construction Co., General Contractor







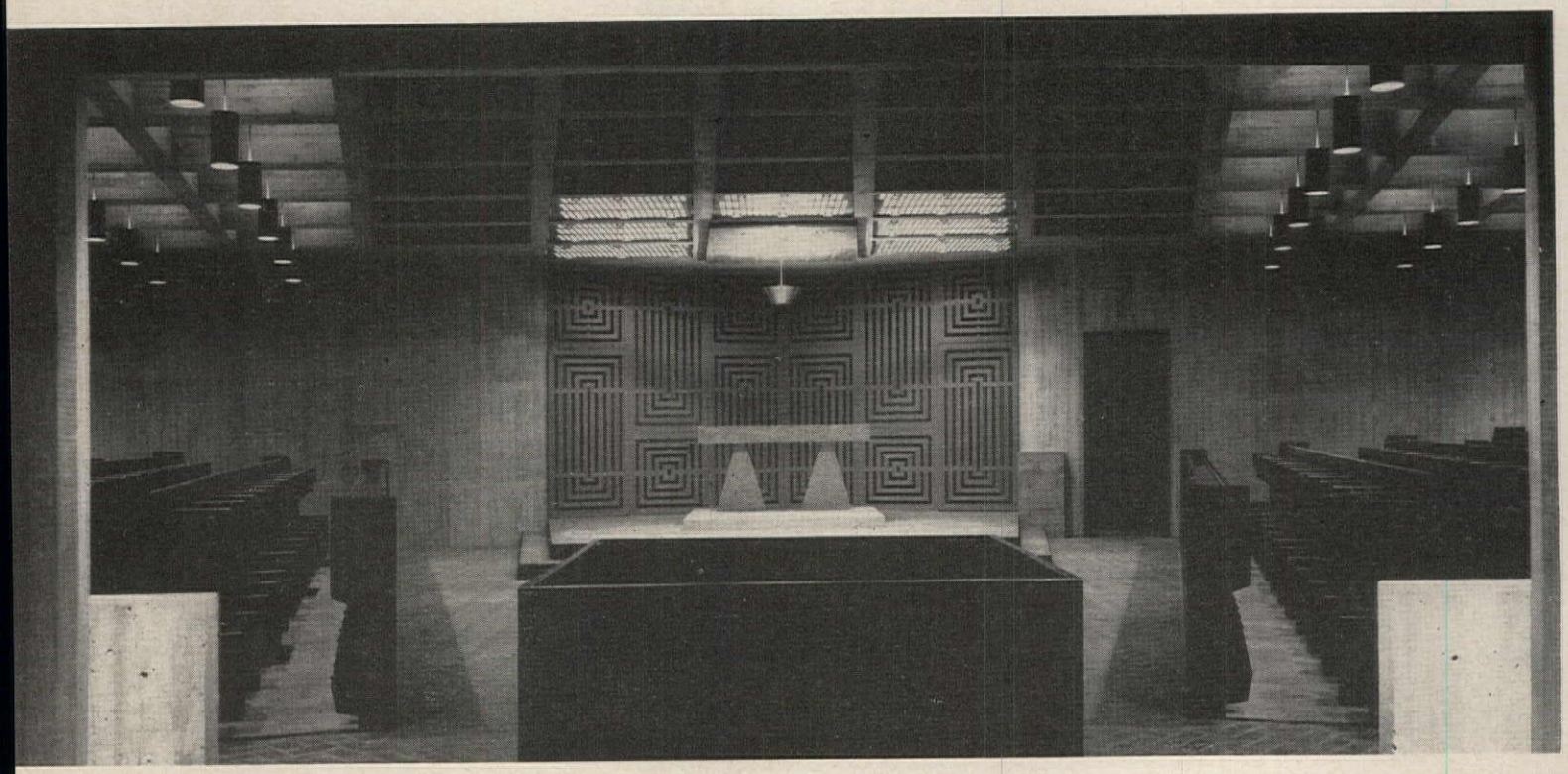


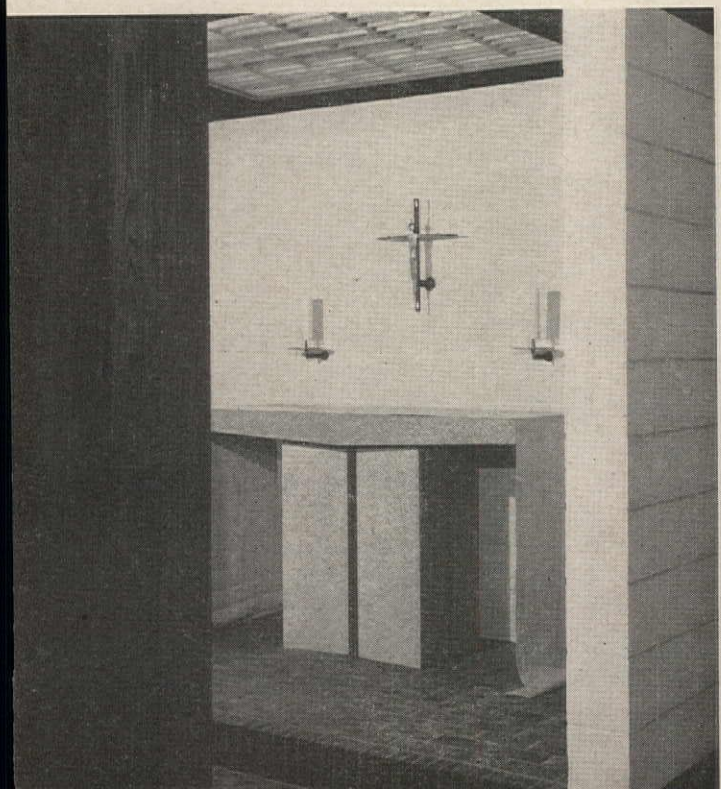


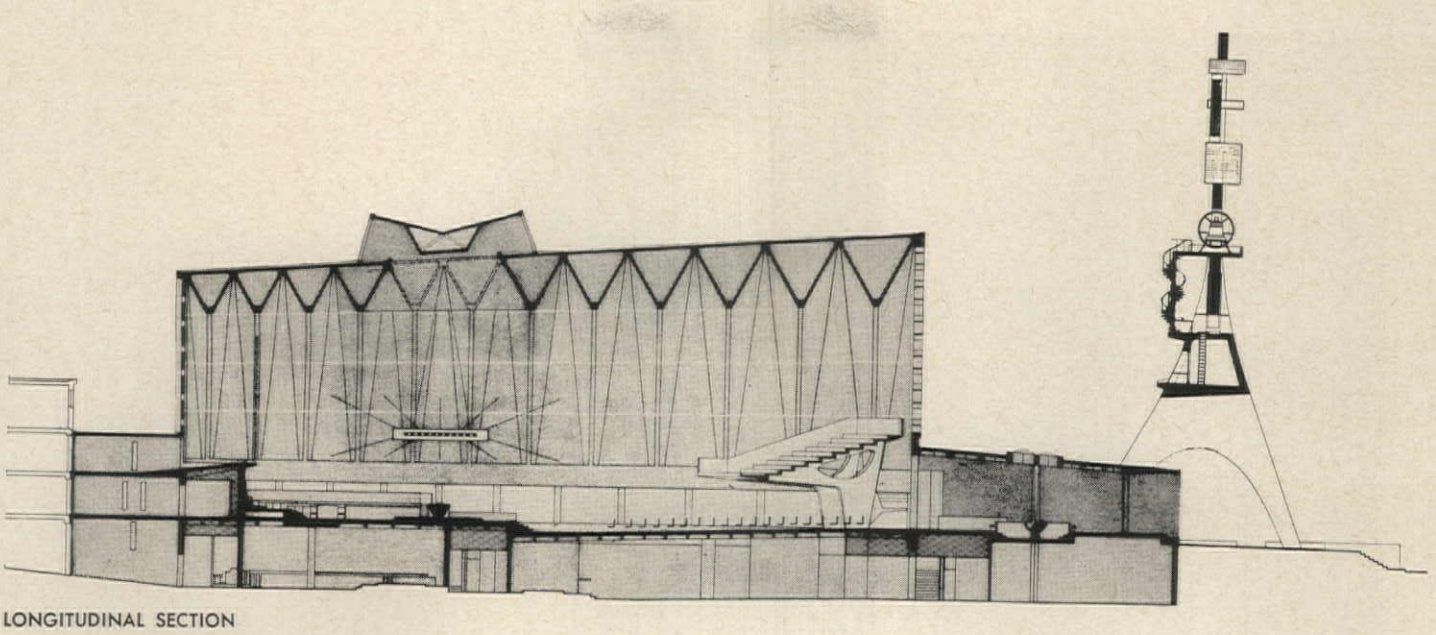
GROUND LEVEL

The plan below shows how the church was designed about a sacramental axis; with baptistry-atrium, confessionals, altar, and throne aligned. The sacristy serves as a link to join the monastic wing and church; the chapter house, where worldly affairs are conducted, is an appropriately separated unit joined to the complex by way of a cloister walkway.

The bottom photo at left shows the altar and throne end of the church, with its divided choir and suspended baldachino of wood painted white, suspended below the lantern. The floor is of waxed red brick; the altar, communion tables, lectern, and throne of granite and bush-hammered concrete; the choir and congregation stalls are of dark-stained oak. The two top photos at left show the baptistry and the balcony as one looks to the rear of the church







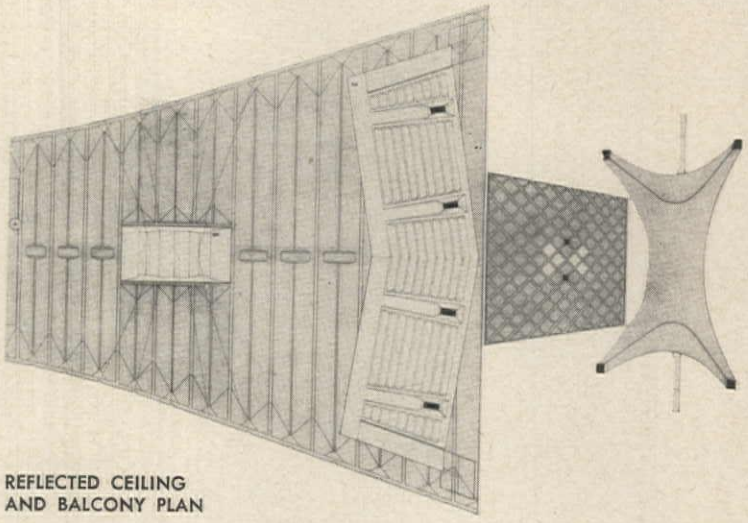
LONGITUDINAL SECTION

At the lower level of the church building there is a parish church seating 450 (top photo); the Brothers' chapel for 104 (center photo); a series of 34 private Mass chapels (bottom left photo); and a relic shrine (bottom right photo), which is located at the rear of the parish chapel.

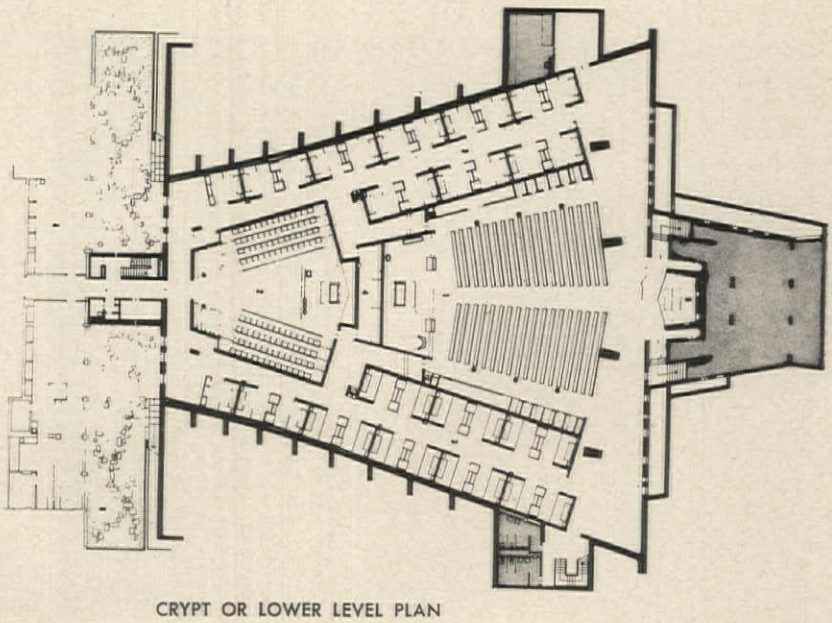
Regarding structure as it affected the design, architect Breuer says, "Plans and details of St. John's were based upon a meticulously re-examined liturgical tradition. To crystallize this tradition was a vital contribution of the devoted monastic community to the building.

"Although the church may be a new sensation to the eye, its architectural concept resembles in some ways those of religious buildings in the Middle Ages and the classic period. Whether stone lintels on stone columns are employed, or Roman or Gothic arches—whether dome, barrel vault, or folded concrete plates—church architecture at its best is always identical with the structural logic of the enclosure. This identity is basic, dominant, and visually so obvious that it almost appears simple, though it holds infinite subtleties. The rhythm of space is that of its structure, despite important differences of technology and form: in the old days stone on stone, held in place by the weight of its parts; now, one flowing line of concrete held in place by the continuity of steel bars.

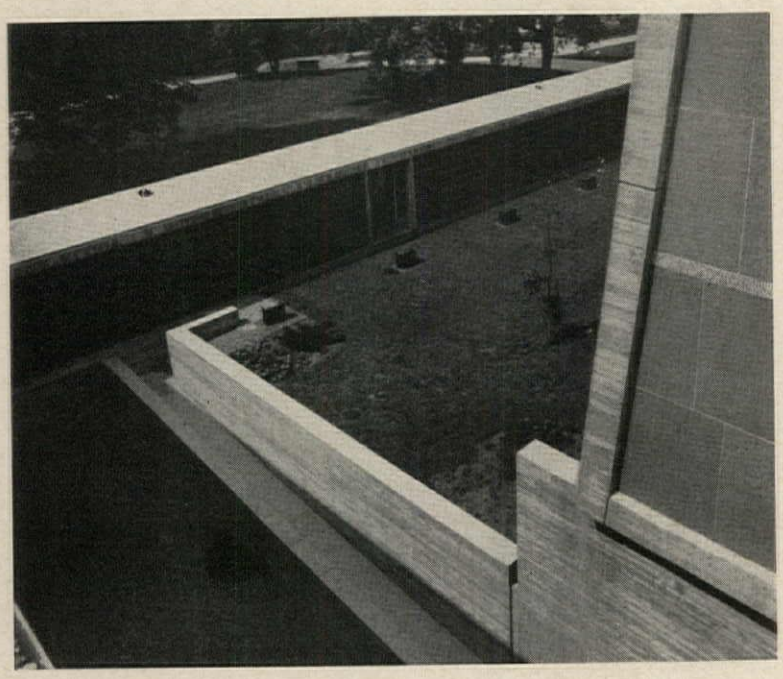
"How much we will be affected by the building—how strongly it will signify its reverent purpose, will depend on the courage it manifests in facing the ancient task of defeating gravity and lifting its material to great heights over great spans, to render the enclosed space a part of infinite space. The structure tells its story by the eternal laws of geometry, gravity, and space. This is true for the bell banner also. It is a slender cantilevered slab on parabolic supports. This form, or symbol, is made possible by our technology; by new building methods, new materials, and modern engineering. But still, it is ruled by the same eternal laws of gravity, geometry, and space."



REFLECTED CEILING AND BALCONY PLAN

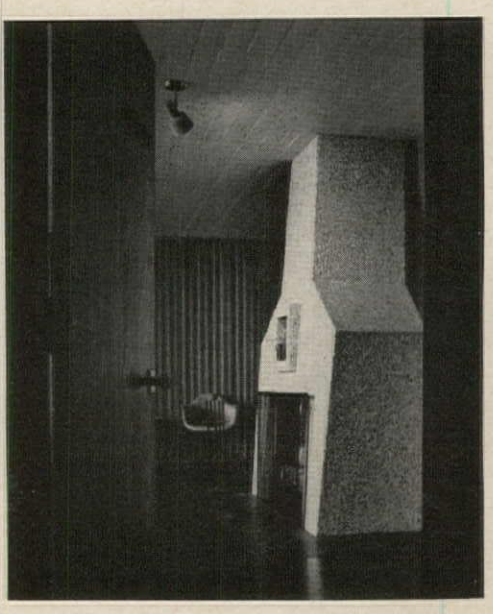


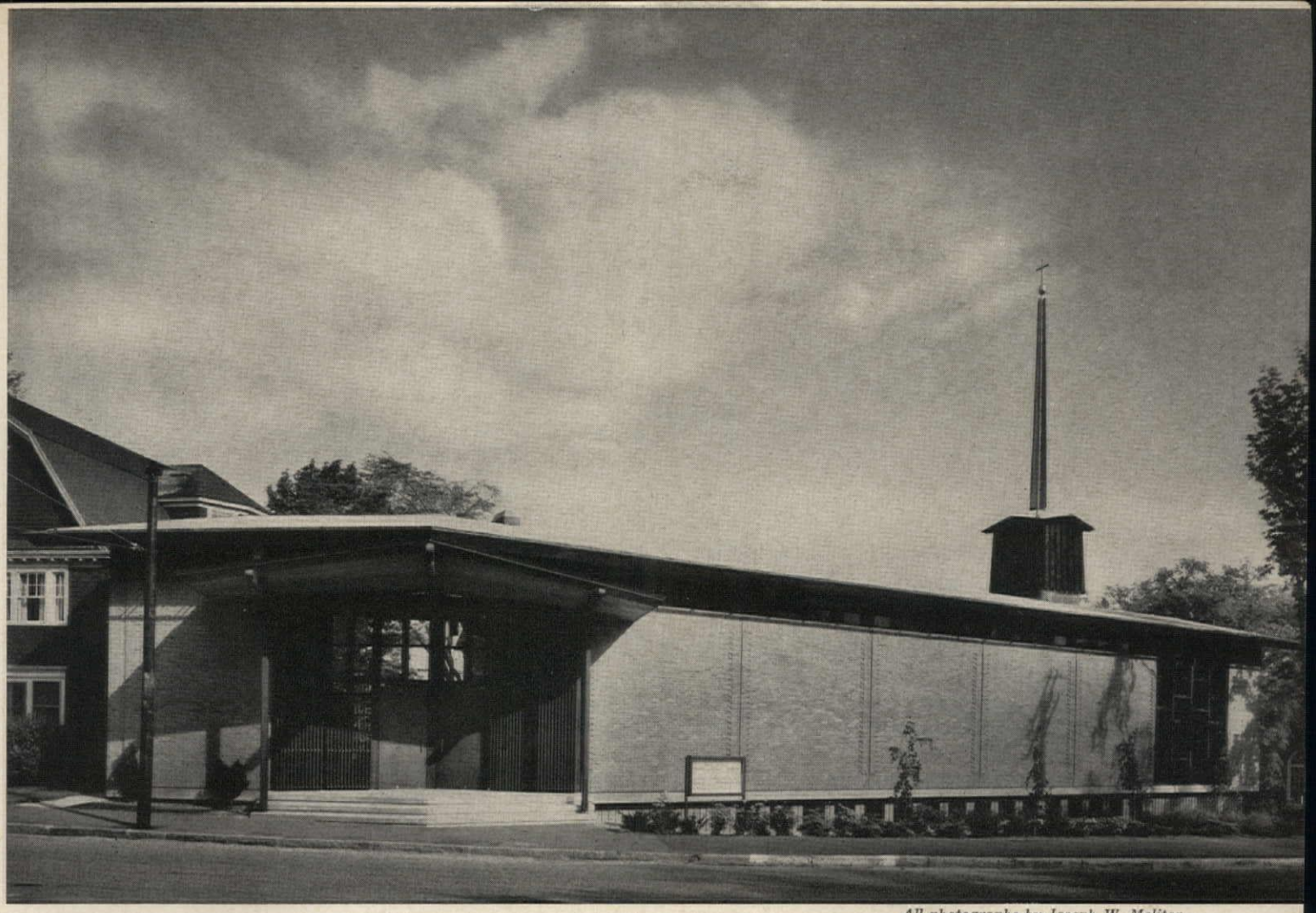
CRYPT OR LOWER LEVEL PLAN



The top photo at left shows the interior of the chapter house, looking toward the dais and chairs for abbot, prior, and chapter secretary. The chapter house is reached by a cloister walkway, pictured in the next photo below, and is lighted by nine vertical windows extending above the roof in monitor form clerestories. The room's unbroken walls of granite ashlar block are symbolic of the secrecy in which matters discussed here are held.

The two lower photos picture a monastery passage (at left) and the reception room for the abbot's office (at right). The fireplace of bush-hammered concrete is one of four special designs made by Breuer for the monastery. Woodwork in both monastic wing and church is of oak stained to a black-brown tone. The random split granite block—native to the region—is in a range of grays running from light to dark





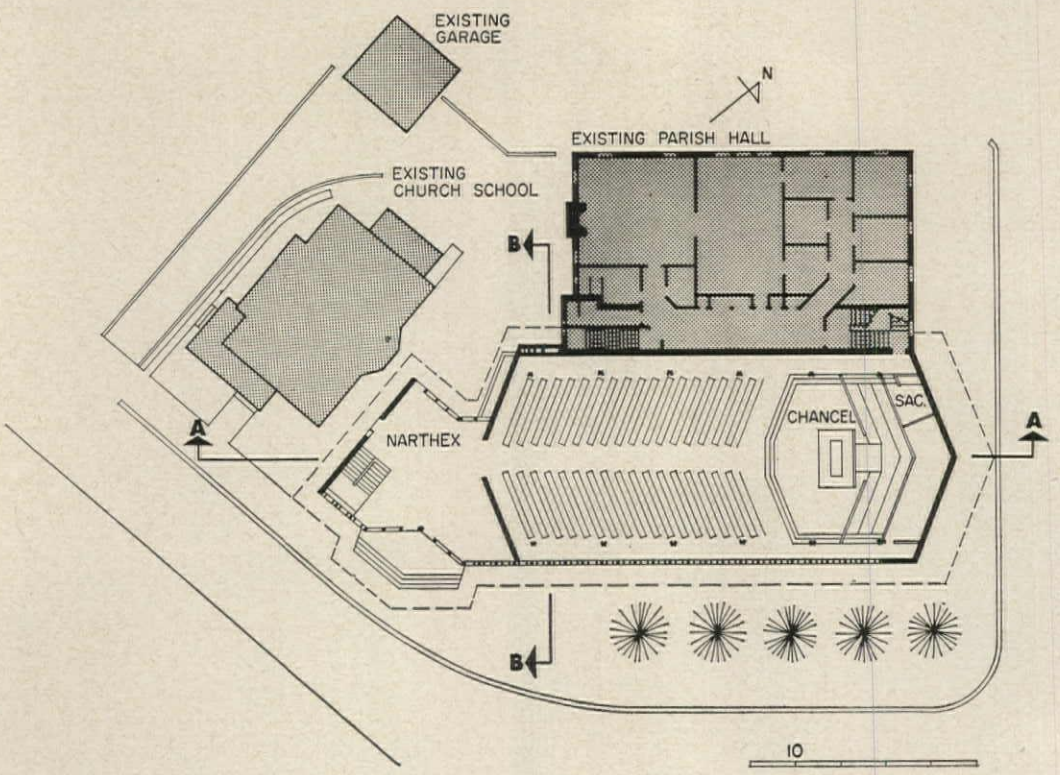
All photographs by Joseph W. Molitor

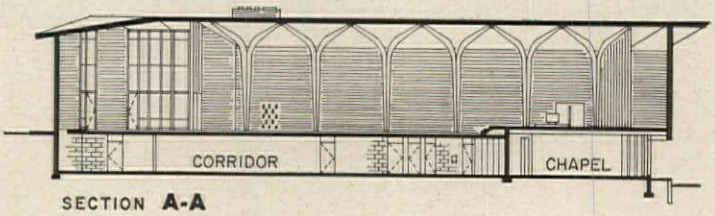
Church Designed for Difficult Site and Low Budget

Fine proportion, handsome details, distinguish small suburban Congregational church by Pietro Belluschi and Carl Koch & Associates

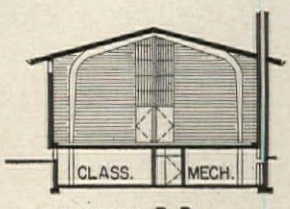
NAME: *Park Avenue Congregational Church*
LOCATION: *Arlington, Mass.*
ARCHITECTS: *Pietro Belluschi and Carl Koch & Associates, Associated Architects; Frederic L. Day, Jr., associate in charge*
STRUCTURAL ENGINEERS: *Souza & True*
MECHANICAL AND ELECTRICAL ENGINEERS: *Fred S. Dubin Associates*
ACOUSTICAL ENGINEERS: *Bolt, Beranek and Newman*
HORTICULTURALIST: *Alexander Heimlich*
GENERAL CONTRACTOR: *Hans Tobiason*

Church by Belluschi and Koch





SECTION **A-A**



SECTION **B-B**

Main entrance. Doors are copper clad

Built on a barely adequate site, sharing a wall with a brick pseudo Georgian parish hall, and hugging a wood frame shingle covered church school, this new church nonetheless presents a remarkably coherent appearance. A study of the plan reveals that the church has been designed so that it may eventually stand alone as a complete entity. Hemmed in as it now is, however, it presents a strong image as seen from the two intersecting streets, by means of a generous welcoming entrance and a beautifully scaled belfry and spire.

The minister, Wilbur D. Canaday Jr. points out that the new church with its "herring-boned" seating plan angled toward the central communion table "permits all in the fellowship to see and hear and participate vitally in the worship . . . a cherished Congregational principle. At the same time this seating arrangement helps preserve the intimacy which was experienced by the worshippers in their former church." The angled pews become the basis of the design organization in plan creating a shape which complements the site and establishes more open space between the school and the parish hall.

Typical of Belluschi's search for means of architectural enrichment which do not proclaim themselves are the exterior vertical brick patterns which articulate the structural system. Note quoins and grooves in photographs at right and on page 148. Such thoughtful yet simple details as this lend elegance to an essentially low cost church built for approximately $193,000.

A vertically slatted screen, not yet installed will project forward to conceal the point at which the new church adjoins the parish hall

Church by Belluschi and Koch

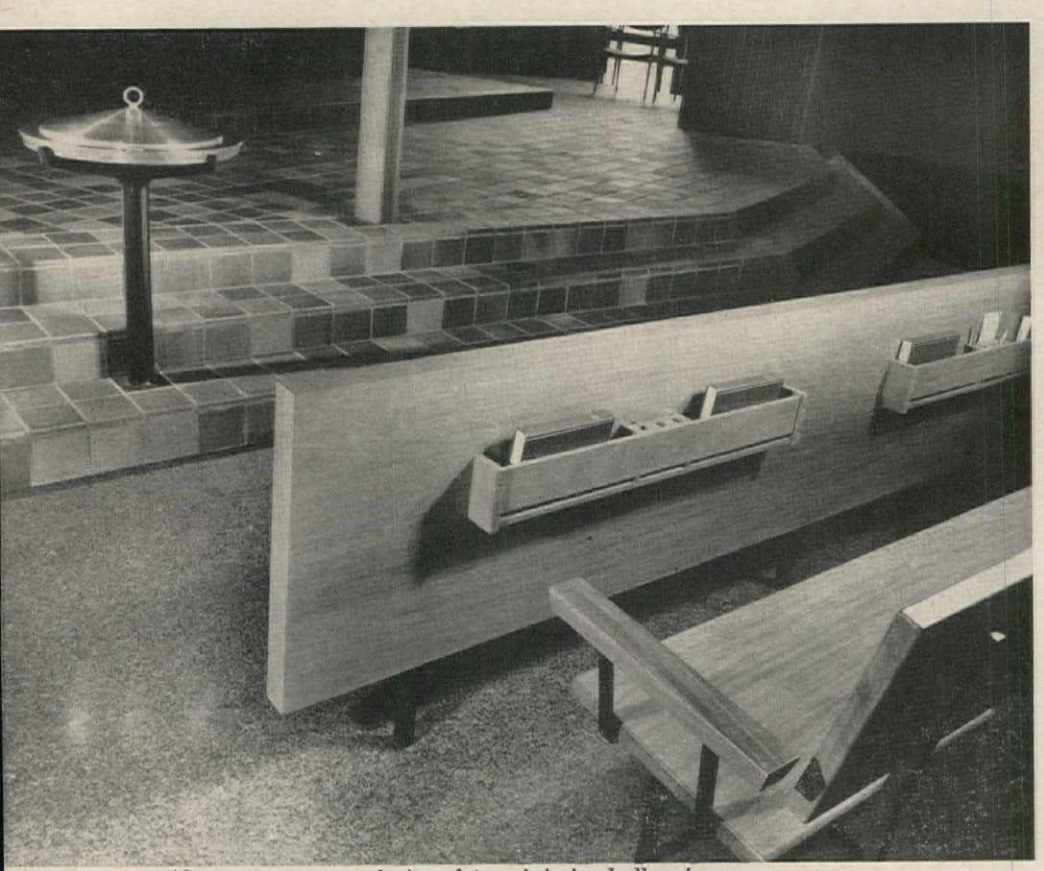
Laminated arches of douglas fir stained a deep red brown contrast with fir ceiling of natural finish. Louvered screen at rear of sanctuary conceals pipes of second hand organ, purchased at a great saving. Organ console is concealed directly behind panel at altar table. Choir sits behind lower screen which aligns with panel. When seated their heads may be seen through the more widely spaced louvers

Narthex. Stair leads to chapel and classrooms below. Entrance to nave is at right

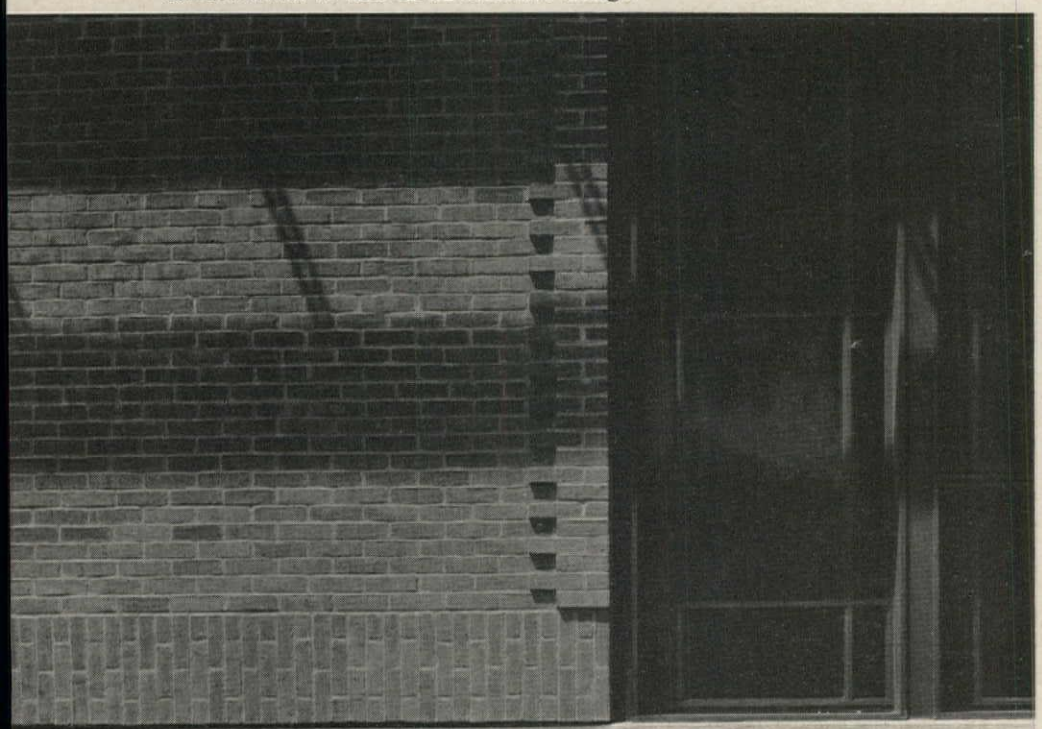
Chancel

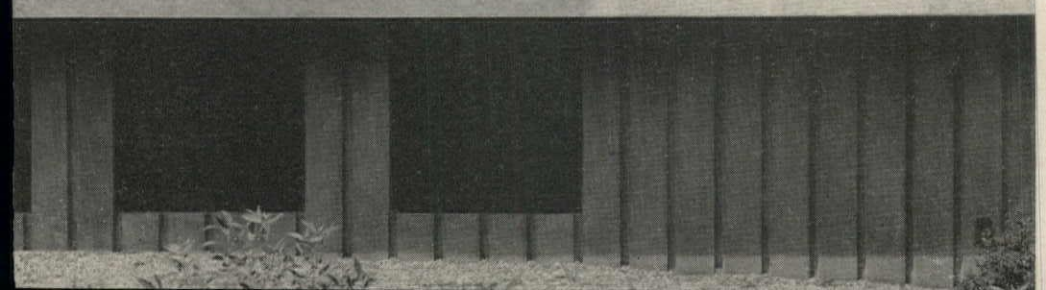
Nave

Church by Belluschi and Koch: details



Above: pews were designed to minimize bulk, give a feeling of lightness. Chancel floor is English heather brown quarry tile, nave floor is asphalt tile in a pattern similar to cork. *Below*: reinforced concrete foundation has pattern of deep vertical grooves, rose colored brick is laid in an effective design





FIVE HOUSES FOR ENJOYABLE SITES

A group of houses emphasizing spaciousness and suitability to site, well executed in simple materials

ARCHITECT: *Marcel Breuer*
ASSOCIATE ARCHITECT: *Herbert Beckhard*
OWNER: *John McMullen*
LOCATION: *Mantoloking, New Jersey*

ARCHITECT: *Campbell and Wong & Associates*
OWNER: *John Carden Campbell*
LOCATION: *Mokelumne Hill, California*

ARCHITECTS: *George Fred Keck, William Kec*
OWNER: *Dr. Robert E. Bloom*
LOCATION: *North Muskegon, Michigan*

ARCHITECT AND OWNER: *Fletcher Ashley*
LOCATION: *Ogunquit, Maine*

ARCHITECT: *Francis Joseph McCarthy*
OWNER: *Mr. and Mrs. W. Coy Filmer*
LOCATION: *Downieville, California*

BREUER BUILDS FOR THE NEW JERSEY SHORE

The sculptural quality of architecture—a three-dimensional aspect too often ignored in simpler structures—has been given a dominant role in this handsome house for the seashore of New Jersey. Breuer's well known concern for sun and shadow, plus an adept interplay of interesting textures, has added an enormous interest to this otherwise simple "box" structure.

The plan employs a "raised basement" scheme, with the two upper, principal living floors well expressed on the exterior. The inset ground floor is devoted to garage, entry, shower room, heater room, and a maid's or guest room. The next, or main, floor consists of living room, dining room, kitchen, utility room and study. The arrangement provides both privacy and spaciousness for entertaining. The living area itself is a full two stories in height, and dominated by a striking sculptured fireplace. The upstairs bedrooms for parents, child and guest, open off a balcony fitted with a series of sliding screens for privacy when desired.

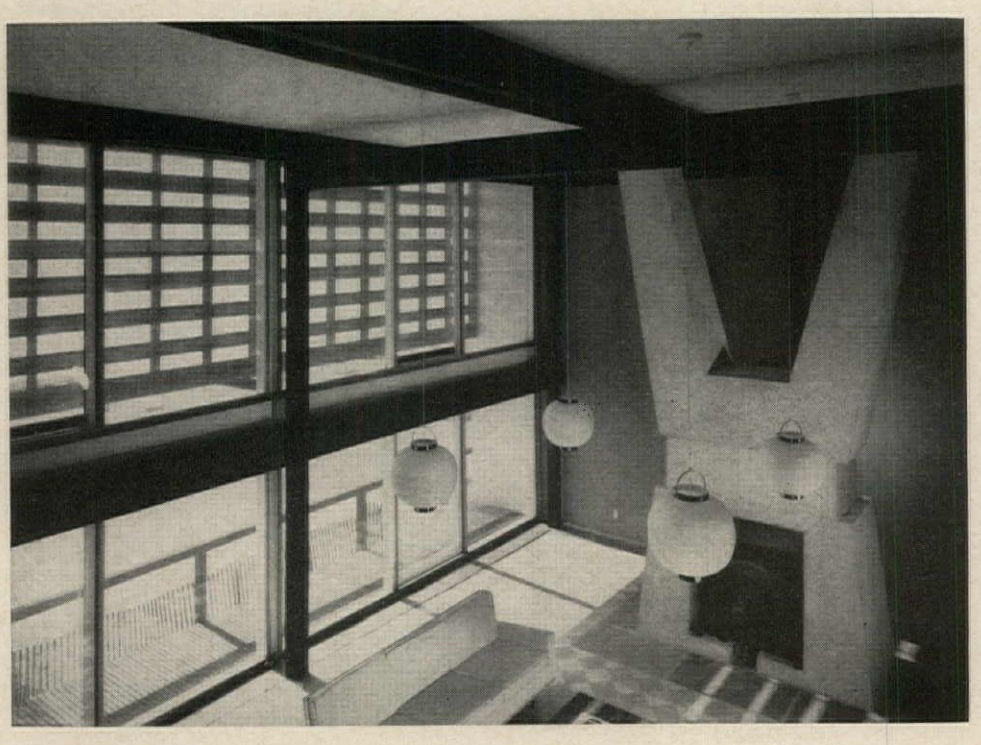
The structure rests on concrete block foundations; the frame is wood with exterior walls of painted concrete block and painted board and batten. The roof is tongue and groove planking with a built-up topping. Floors are fir plywood, bluestone and concrete; plywood areas are surfaced with vinyl tile or sisal matting. Interior partitions are wood studs surfaced with gypsum board. Ceilings are cedar boarding.

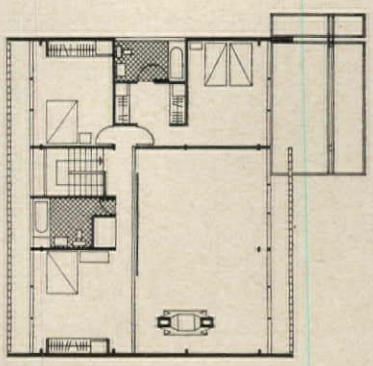
ARCHITECT:
Marcel Breuer

ASSOCIATE ARCHITECT:
Herbert Beckhard

OWNER:
John McMullen

LOCATION:
Mantoloking, New Jersey





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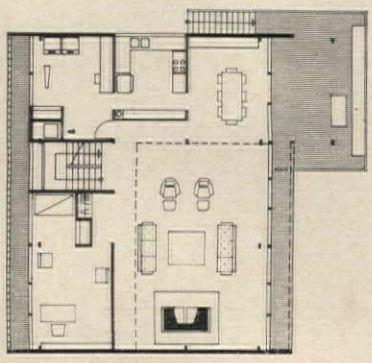
Ben Schnall



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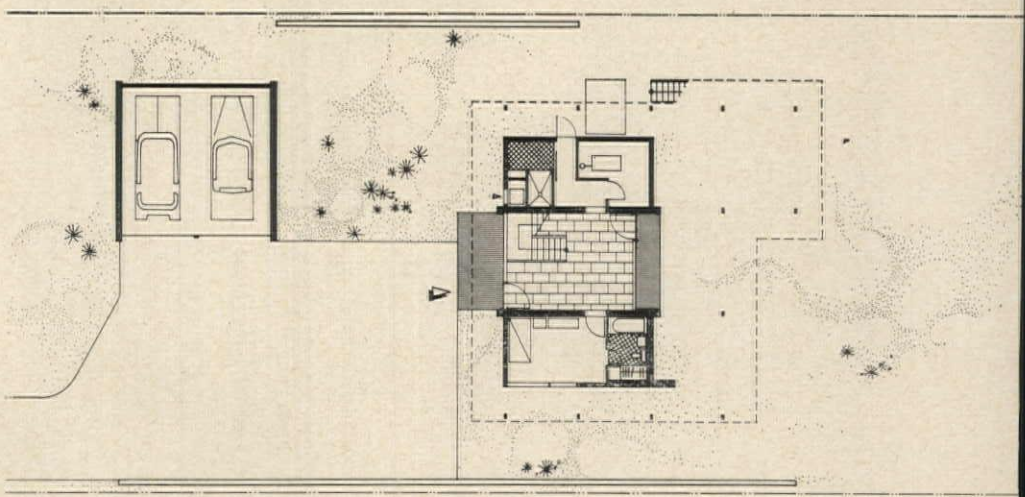

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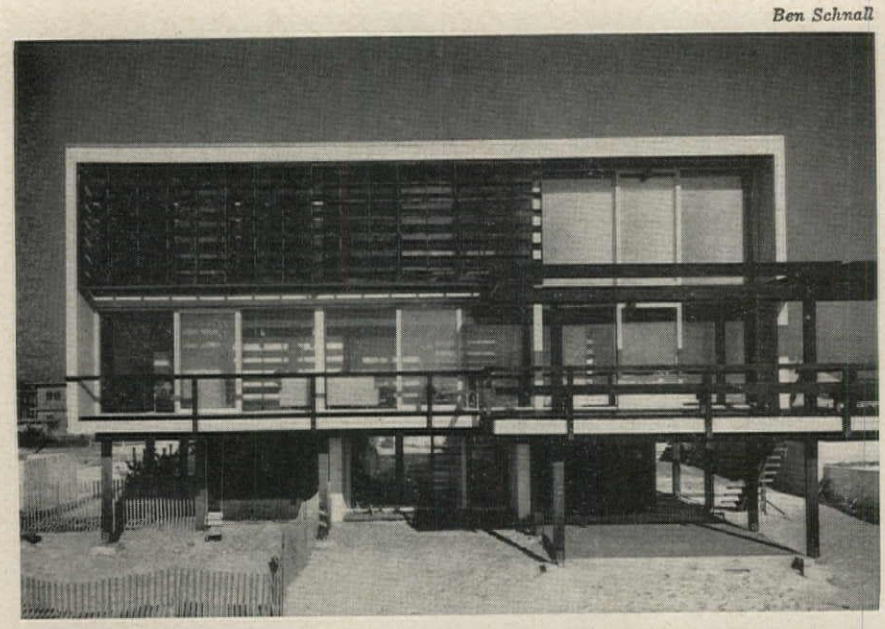
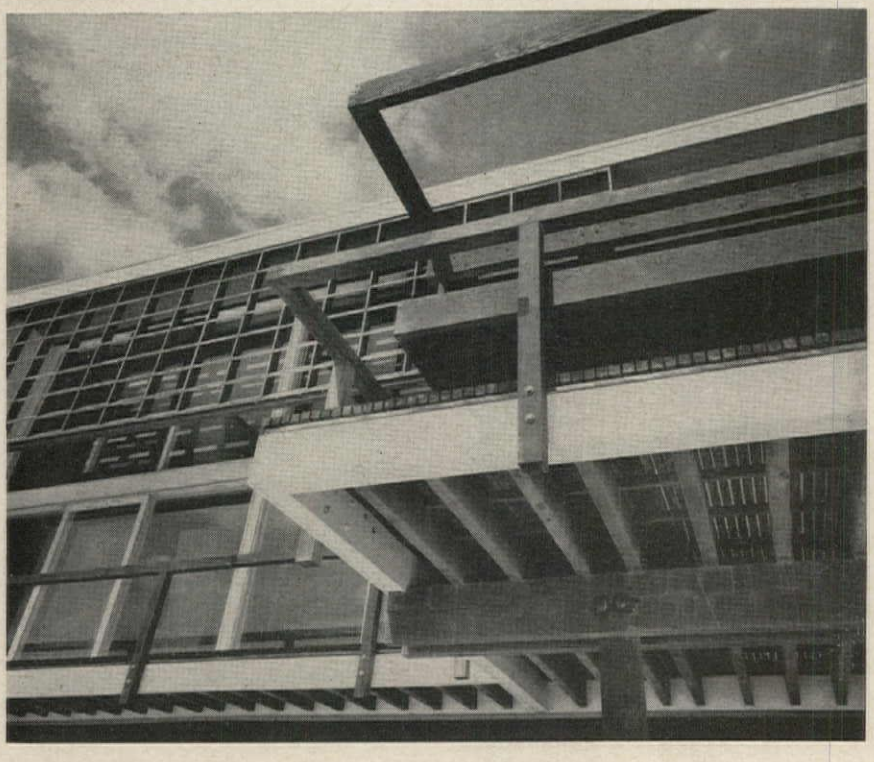
Ben Schnall





The McMullen House

Sun control is provided on the two major glass walls of the house by a series of wood louvers, which also help reduce sand and sky glare; in addition there are roll-up blinds on the interior.

Indoor-outdoor connection is achieved by stairs from the main floor balcony and terrace. The area beneath the terrace plus the inset areas surrounding the lower floor give shady spaces for lounging.

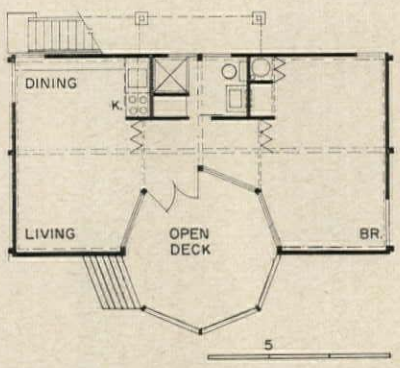
The abstract, sculptural quality of the house is emphasized by the trellis over the terrace, and by the carefully studied fenestration

A FLEXIBLE OPEN PLAN FOR A COUNTRY COTTAGE

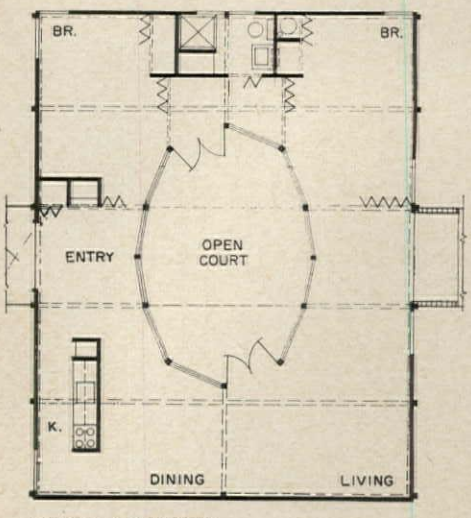
ARCHITECTS: *Campbell & Wong & Associates*
OWNER: *John Carden Campbell*
LOCATION: *Mokelumne Hill, California*
SPONSOR: *Western Pine Association*

Morley Baer

Morley Baer



PLAN ABOVE: possible first stage for building the house in two phases
PLAN RIGHT: completed house as shown
SECTION (far right): simple tongue and groove surfaces used for walls, floors and ceilings



FUTURE EXPANSION

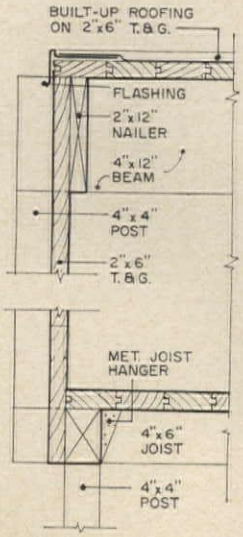
The John Carden Campbell House

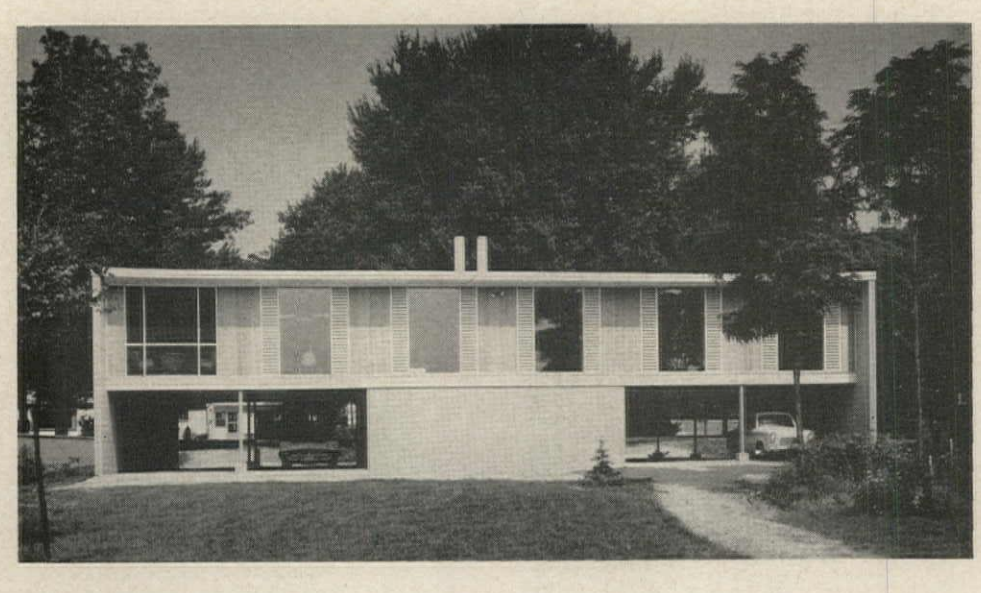
An amazing sense of spaciousness has been developed in this little house of 1,200 sq ft. Built around an open, central court (and planned to be constructed in two stages, if desired—see plans), the house uses folding partitions to create the appropriate living and sleeping spaces. With partitions closed, each room has an exterior window, and one window into the court; this vista is cut off by a window shade. When the partitions are pushed back, the entire house becomes a single space.

The house as built is used primarily as a weekend house, but would very well adapt itself to full time occupancy. The architects state that the house cost under $7,800 (with heating, plumbing and electricity kept to a minimum), but might be constructed for regular use in an incorporated community for around $10,000.

The house is of extremely simple construction (note section), with all walls, ceiling and floor made of 2-in.-thick tongue and groove kiln-dried white fir decking. The same wall forms both exterior and interior surfaces. It is located in the Mokelumne Hill area in the foothills of the Sierra Nevada Mountains in eastern California.

The interiors are finished with white-painted walls, dark-stained floors and ceilings stained yellow ocher.





A RAISED COTTAGE FOR A LAKESIDE SITE

The traditional Southern raised cottage scheme has a logical counterpart in this Michigan lakeside house. Fundamentally, it is a one floor house, but has been raised a story above the ground level to gain better views (see photo right) and to afford sheltered sitting and parking space below (note lower level plan).

The design incorporates a typical, and well handled, Keck device of flanking fixed glass view areas by wood louvers, which are in turn backed by doors to control ventilation and drafts. These form a major design feature, with the rest of the house subordinated with a simple, restrained elegance.

In such a scheme, the entrance stairs become a more dominant factor; as can be seen in the photo below, the stairs and entrance hall have been carried out in a handsome and welcoming fashion.

The house has foundations of concrete block and poured concrete. The frame of the house is of wood, masonry and steel, and is surfaced with wood and concrete block. Interior walls are painted concrete block, wood, and hardboard. Floors are concrete, surfaced with asphalt tile. All vent louvers are fitted with plastic screens for insect protection.

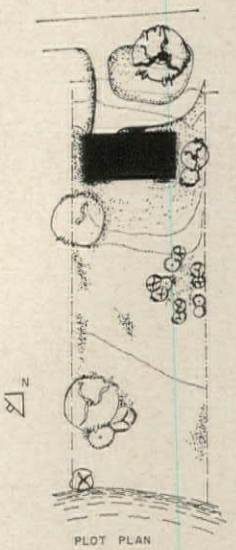
The heating system is a hot water, radiant one, located in the floors. Baths have auxiliary electric space heaters. The kitchen includes a garbage disposer and dishwasher.

ARCHITECTS:
George Fred Keck-William Keck

OWNER:
Dr. Robert E. Bloom

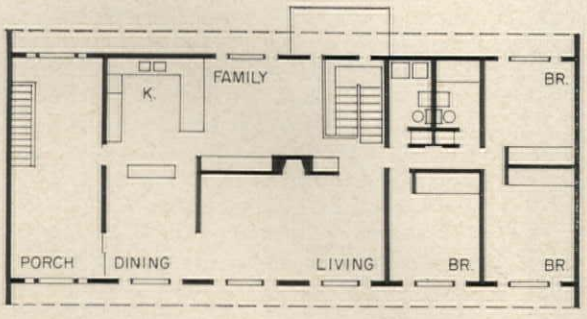
LOCATION:
North Muskegon, Michigan

CONTRACTOR:
F. Jack Rose

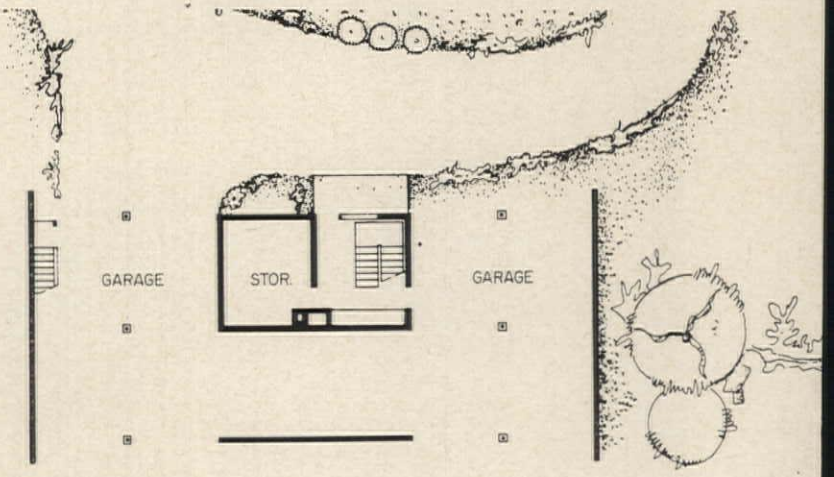


PLOT PLAN

Hedrich-Blessing

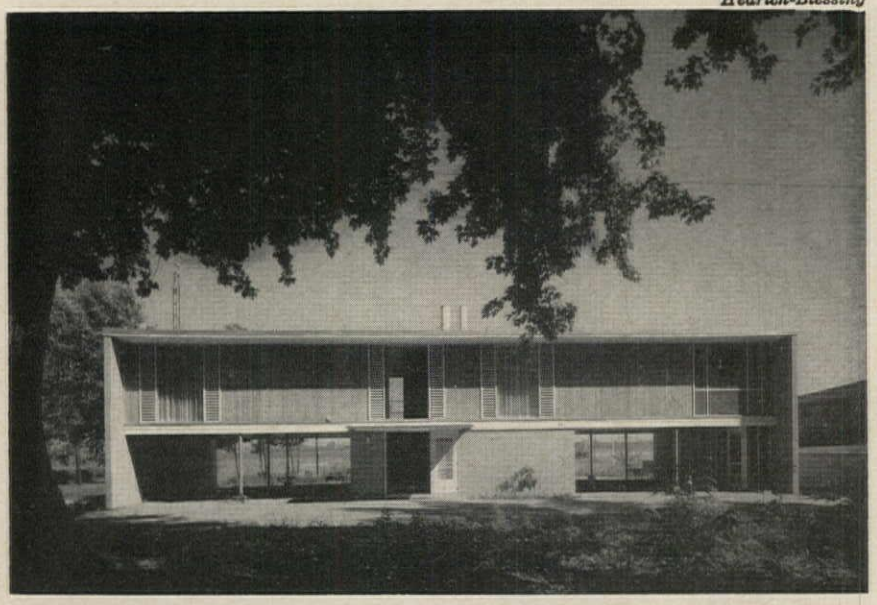


UPPER LEVEL



LOWER LEVEL

Hedrich-Blessing

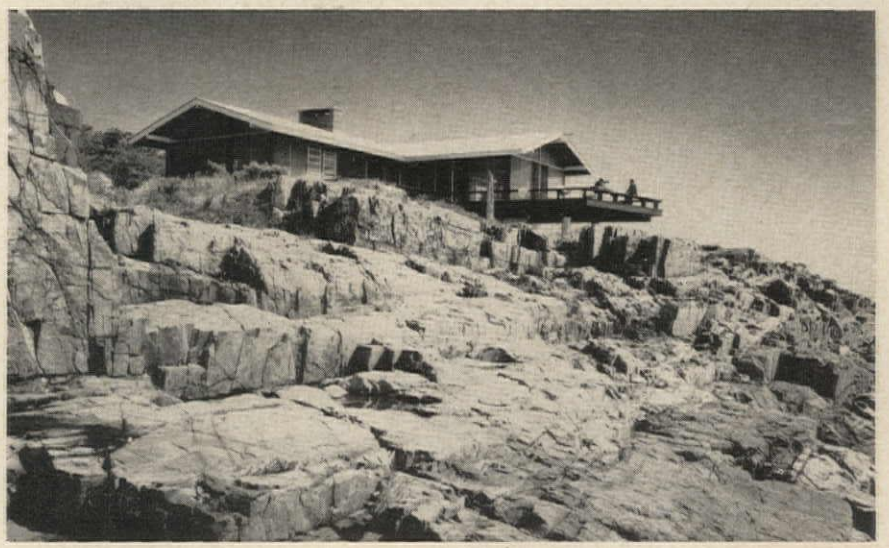


The Bloom House

The front approach to the house (top photo) permits clear views, under the house, of the lake beyond. The end and lower level walls are painted concrete block; walls of the upper, main level are stained wood.

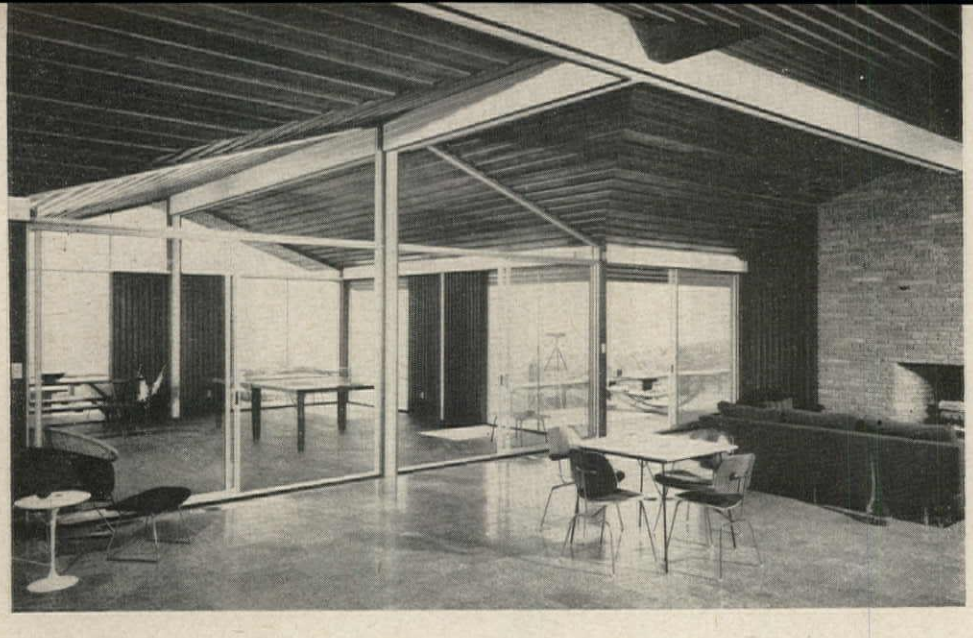
The living room (center photo) carries out the same materials as the exterior for wall surfaces, and achieves a look of luxury with economy.

The kitchen (bottom photo) carries out the wood and masonry theme. Big windows are on the dining end of the room; the kitchen area proper is lighted by a skylight



ARCHITECT AND OWNER: *Fletcher Ashley*
LOCATION: *Ogunquit, Maine*

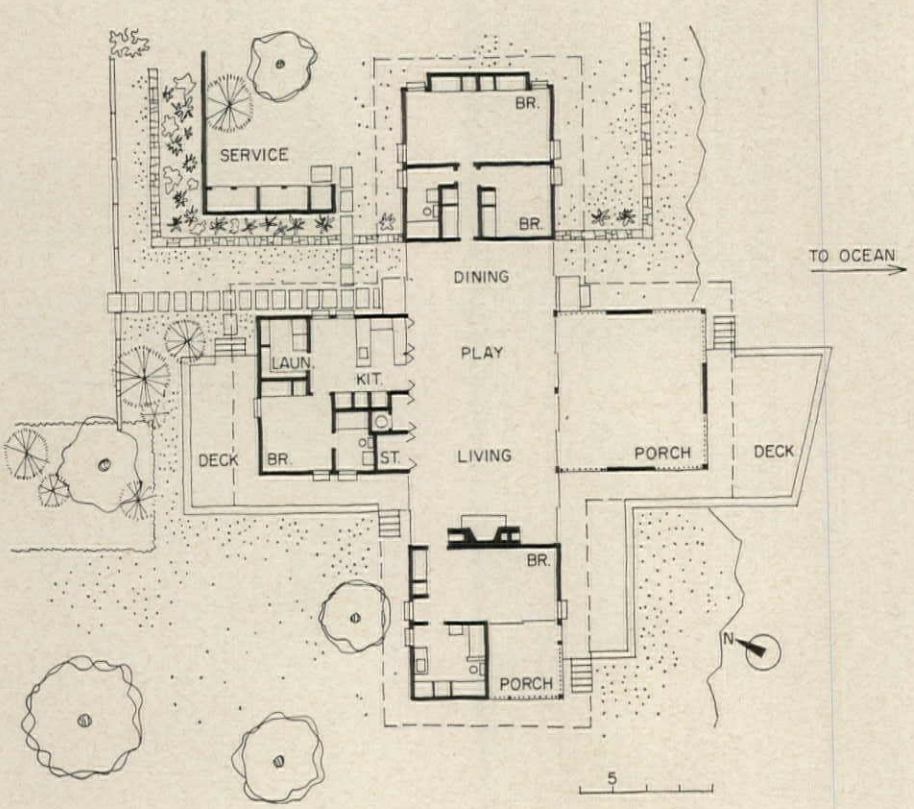
A COMMODIOUS HOUSE FOR THE COAST OF MAINE



The Fletcher Ashley House

This informal and convenient house sensibly makes the most of its very spectacular Maine coast site. As can be noted in the plan and in the photo above, the house provides a great degree of openness and flexibility in the living areas; these areas are generously supplemented with screened and open outdoor terraces and gardens. The service areas, master bedroom suite, and children's or guest bedrooms flank the living areas on three sides, and are well separated for privacy. The big multipurpose living space provides for all such activities as cocktail parties, dances, ping pong and cards, as well as the usual living and dining functions. The parents' suite has its own dressing and bath facilities, a sitting area around a small fireplace, and a choice of either inside or screened porch sleeping areas. The children (four girls) have their own wing, with double decker bunks which allow extra sleeping spaces for their friends. A guest or maid's room and bath is off the kitchen. Kitchen and storage may be completely opened to the central room by a series of folding doors (note photo, lower right).

Heating is by a forced hot air system, with the furnace in the crawl space. This is supplemented by electric heaters in the baths, and the fireplaces. The frame is douglas fir post and beam on concrete foundations, with board and batten exteriors. Interiors are wood and hardboard; floors are vinyl.



A BRIDGE HOUSE OVER A MOUNTAIN WATERFALL

The site of this mountain home is on an old mining claim, which runs along a creek in California's Sierra Nevada. The property is extremely steep, with the only level spot being a small area by the creek bed. To create a big enough building site in this terrain, the architect designed the house to span the creek.

The plan places the master bedroom suite on one side of the creek, with living, dining, and guest rooms on the other side. The bridge portion consists of an enclosed porch with sliding glass doors opening onto an outdoor balcony.

A low dam located downstream from the house creates a quiet pool of deep water, which lowers the noise level of the waterfall and has become a spawning ground for trout.

Materials were chosen for minimum upkeep. Foundations are concrete, and the frame is Douglas Fir; steel beams span the creek. The exterior is clear board and batten redwood. Interiors are redwood, plywood and hardboard. The roof is surfaced with aluminum. Floors are vinyl tile. Aluminum sliding windows are used throughout the house, and fitted with aluminum screens.

The house is heated by electric baseboard units. Thermal insulation is mineral wool. The kitchen is fitted with a garbage disposer, dishwasher.

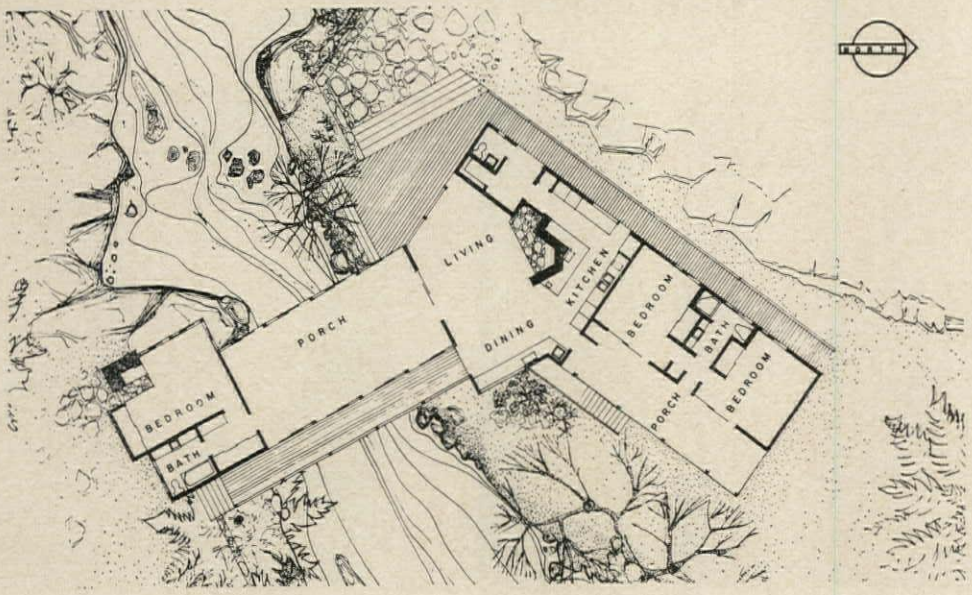
ARCHITECT:
Francis Joseph McCarthy

OWNERS:
Mr. and Mrs. W. Coy Filmer

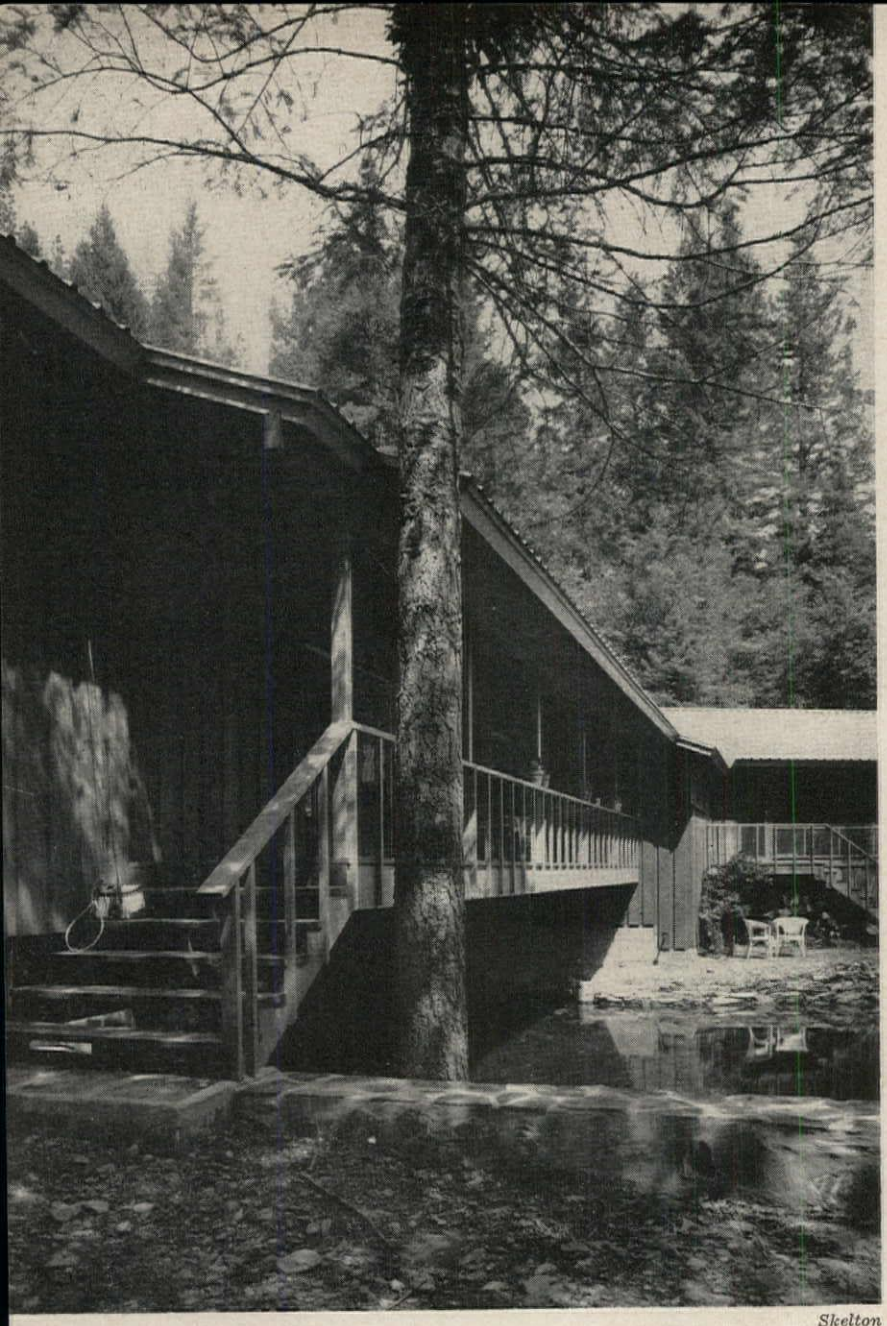
LOCATION:
Downieville, Sierra County, California

STRUCTURAL ENGINEER:
A. V. Saph Jr.

CONTRACTOR:
Clarence Dawe



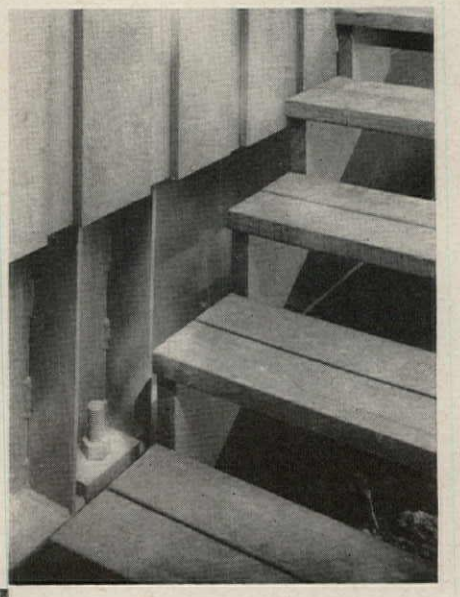
Skelton



Skelton

The Filmer House

Two steel beams, 49 ft long form a bridge across which the central portion of the house rests. The beams are 24-in. wide flange sections, secured with 1¼-in. anchor bolts to concrete abutments poured on bedrock at the creek banks. Two lengths of steel were spliced together at the site to form each of the beams. Three-by-ten wooden nailers bolted to the top flanges of the beams provided a means of nailing floor joists to the steel. Steel beams are painted a dull blue-black. A walkway supported by a steel frame (photo bottom) provides footroom for washing windows



Joseph W. Molitor

PITTSBURGH'S RETRACTABLE DOME NOW IN OPERATION

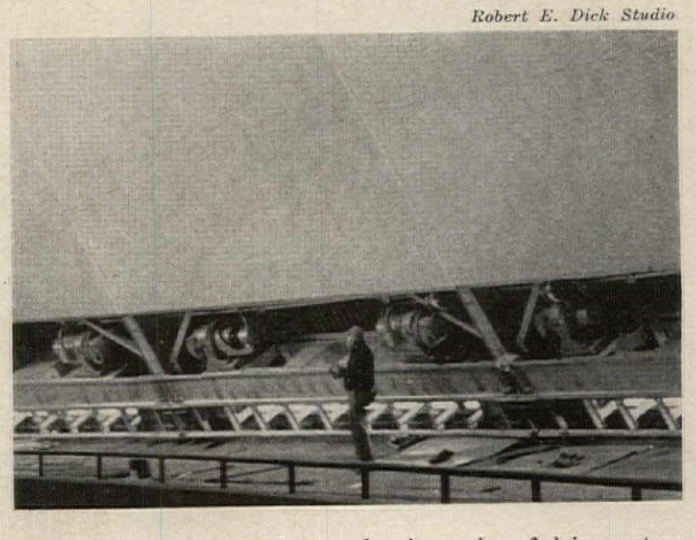
Over 15 years ago architects Mitchell and Ritchey proposed that Pittsburgh build a civic auditorium with a retractable roof. Their idea which seemed far-fetched to many has at last been realized and Pittsburghers began to enjoy their indoor-outdoor arena this fall.

Joseph W. Molitor

Pittsburgh's Retractable Dome Now in Operation

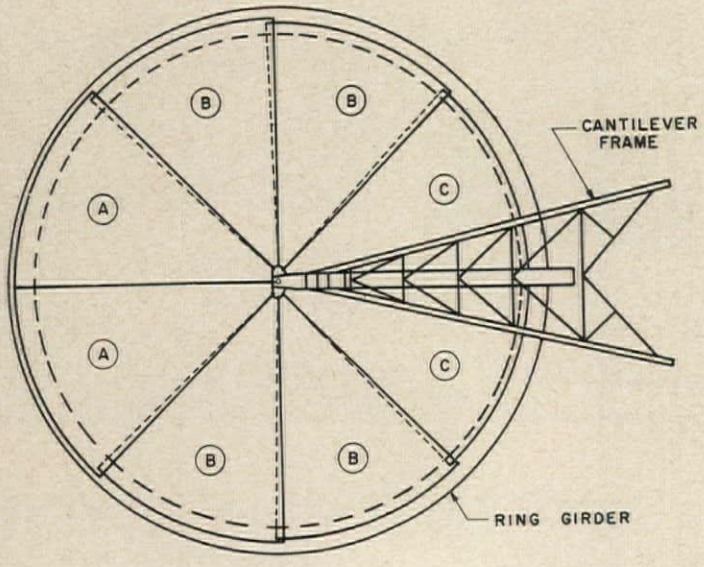
NAME: *The Auditorium*
OWNER: *Public Auditorium Authority of Pittsburgh and Allegheny County*
ARCHITECTS: *Mitchell & Ritchey*
CONSULTING ENGINEERS: *Ammann & Whitney*
STRUCTURAL ENGINEER: *Robert A. Zern*
ELECTRICAL ENGINEER: *Carl J. Long*
MECHANICAL ENGINEERS: *Dzubay & Bedsole, John W. Mullin*
LANDSCAPE ARCHITECTS: *Simonds & Simonds*
GENERAL CONTRACTOR: *Dick Corporation*

Robert E. Dick Studio

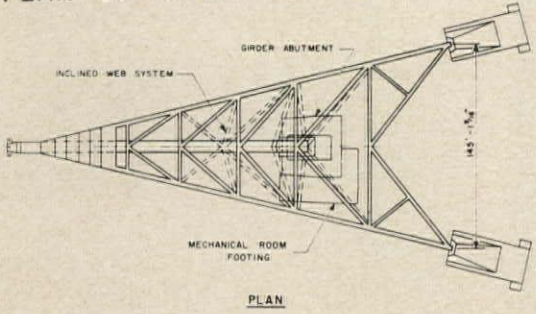


Base of one of the roof leaves showing pairs of drive motors and brakes controlling sets of wheels directly below them which carry roof segments along three sets of rails mounted on the surface of a reinforced concrete ring girder which is banked 13 degrees and supported by a series of concrete A frames, 48 in all

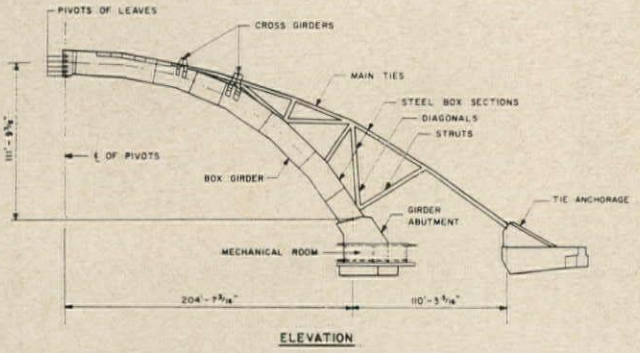
A - TOP LEADING MOVABLE LEAF
B - INTERMEDIATE MOVABLE LEAF
C - BOTTOM FIXED LEAF



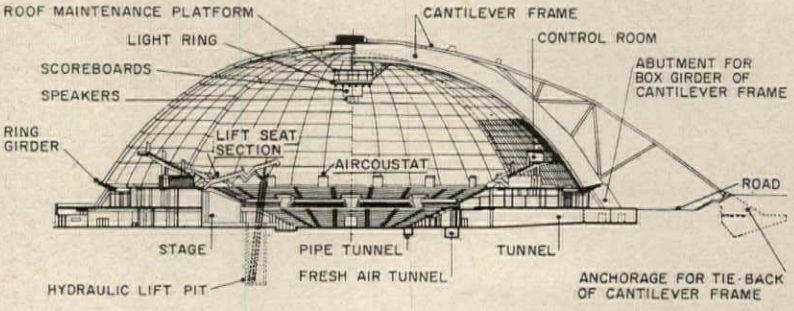
PLAN OF ROOF LEAVES

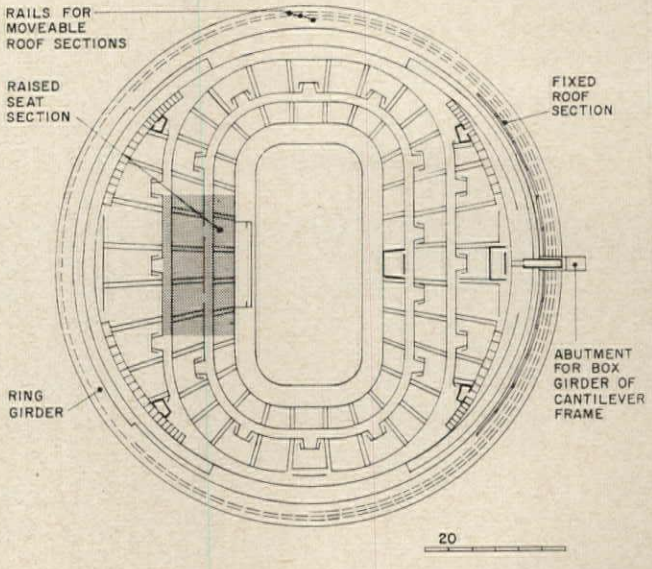


PLAN



ELEVATION





The auditorium, nearly circular in plan is approximately 417 ft in diameter. The lift seat section (2,200 seats) raises to form a canopy over a well equipped stage. There are 9,200 permanent seats with 4,400 available on arena floor for special events. For example 10,500 seats are available for hockey and 13,600 for boxing. The interior of the box-girder shown in the section above as part of the cantilever frame contains a stairway for access from the auditorium to the winch platform suspended directly beneath the leaf pivot points. It is also a path for lighting cables

Constructed for approximately $20,000,000 on a 20 acre site as part of the redevelopment of 95 acres at the upper end of the Golden Triangle in the formerly blighted Lower Hill district, Pittsburgh's auditorium, convention hall, open air ampitheater and exhibition center is an architectural and engineering phenomenon. It boasts one of the largest clear span roofs in the world, which at the press of a button folds back upon itself, opening or closing in 2½ minutes. No such roof has ever been built before.

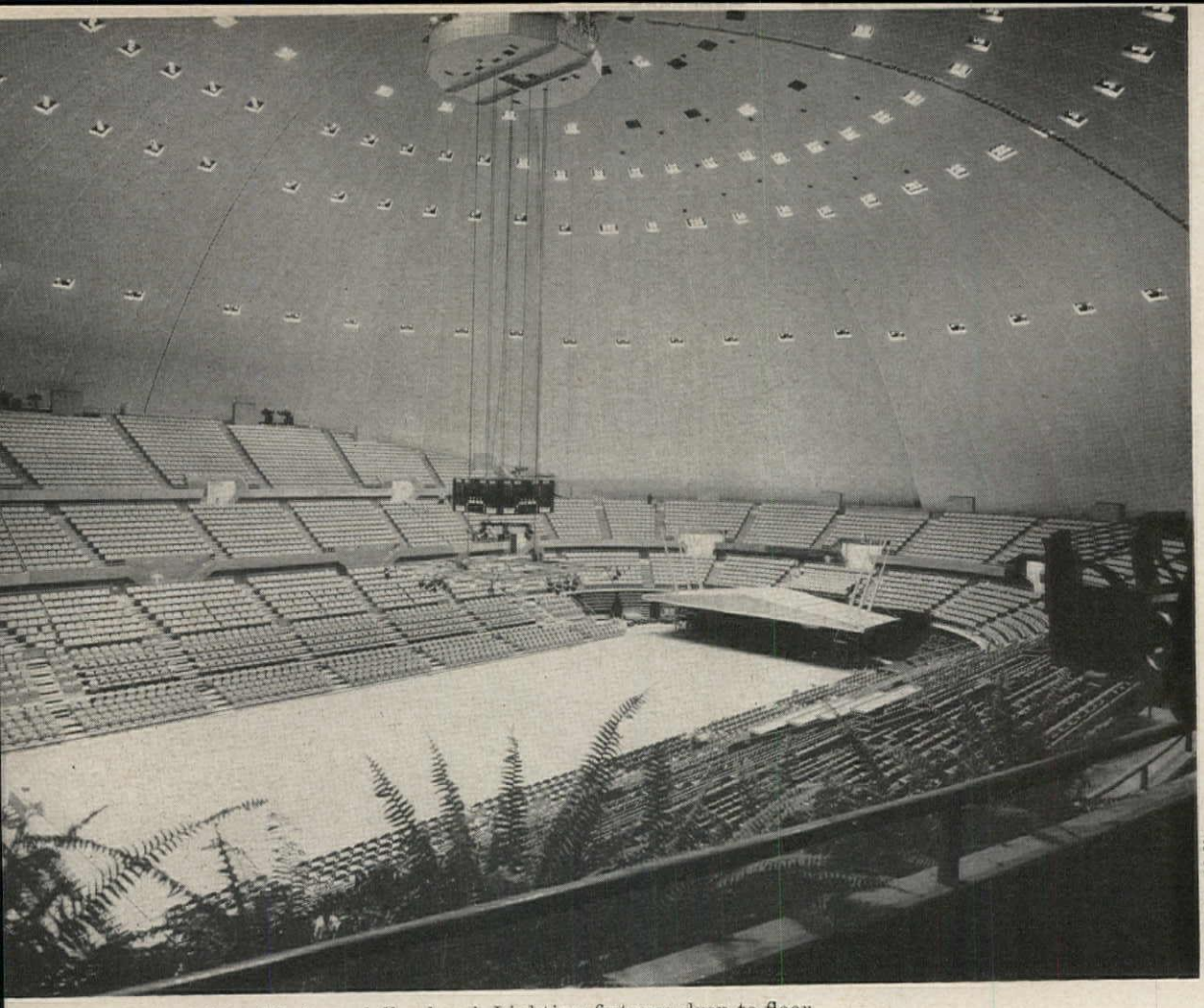
The brief technical description which follows has been condensed from information furnished to the RECORD by Edward Cohen, an engineer for Ammann & Whitney who played a major role in the structural design of the auditorium.

The roof is divided radially into eight approximately equal sections, six movable and two stationary. When the roof is retracted, the six movable sections (three on each side) will glide one over the other to rest on top of the two fixed sections. Each roof leaf is a 45 degree sector of a circle with a radius of approximately 207 ft and weighing 300 tons. The distance from the ring girder rail to the roof pivot measured along the roof curve is approximately 250 ft. The leaf is constructed of 30 in. deep WF beams which radiate toward the center pivot and are connected by 24 in. deep WF cross frames, 8 and 10 in. WF purlins and a complex system of bracing at the top and bottom flanges of the purlins to stiffen the leaves against traction, wind and bumper forces. The 30 in. WF ribs are spaced 27 ft apart at the base and as the leaf decreases in width toward the apex, alternate ribs are discontinued, their loads being transferred by cross framing to adjacent ribs.

At the apex of each leaf is a pivot weldment with a spherical stainless steel knuckle which is pinned into a multiple clevis weldment which delivers the leaf thrust, a maximum of 350 tons, through the pivot to the cantilever frame. This frame which projects 205 ft over the auditorium from the center of the ring girder is basically an inclined, curved tripod. The lower leg of the tripod, an 8 ft by 7½ ft box-girder follows the curve of the roof. The two upper legs of the tripod, also chords of a curve, are each 3 ft by 3½ ft box-members acting as the tension tiebacks. They terminate in concrete anchorages, and are held away from the box girder by triangular frames consisting of struts and cross ties. When the leafs nest, the tip of the cantilever frame moves outward 3 in. and downward 6 in. An unbalanced snow load on the closed roof causes a sideward movement of about a foot.

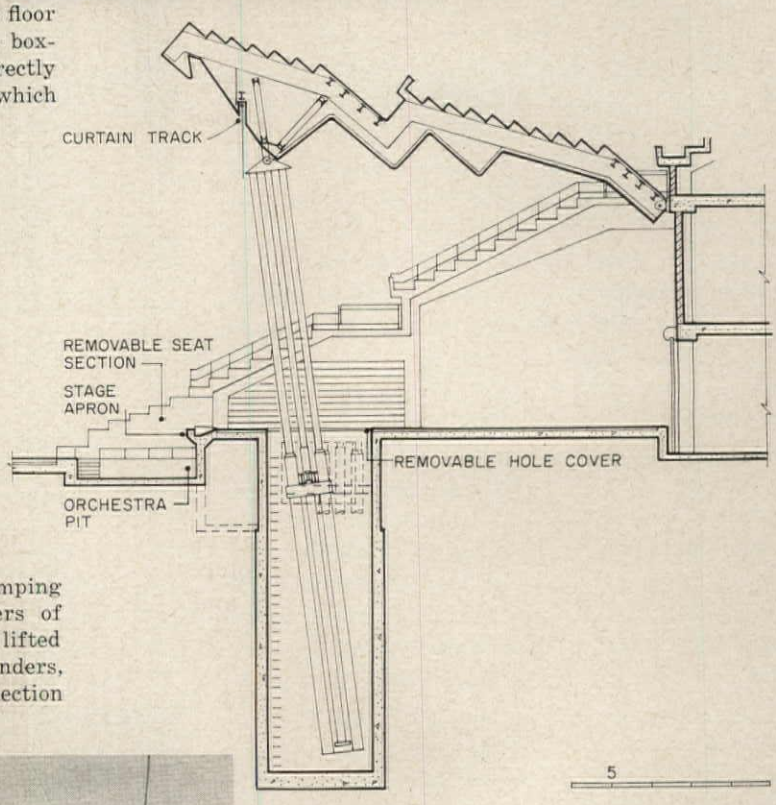
Joseph W. Molitor

Roof opens or shuts at the press of a button in 2½ minutes. Roof is not yet fully open in photograph above. Six movable segments nest above remaining two fixed segments when roof is completely open. The structural frame of each leaf is covered with metal decking, 2 in. rigid insulation and stainless steel roofing. The interior surface is of acoustic metal made of perforated zinc coated sheet steel with a baked enamel finish enclosing 2 in. of acoustic insulation. Total thickness of each leaf including roof and ceiling is about 3 ft. Photograph below shows tripod shaped cantilever frame which supports pivot about which roof moves

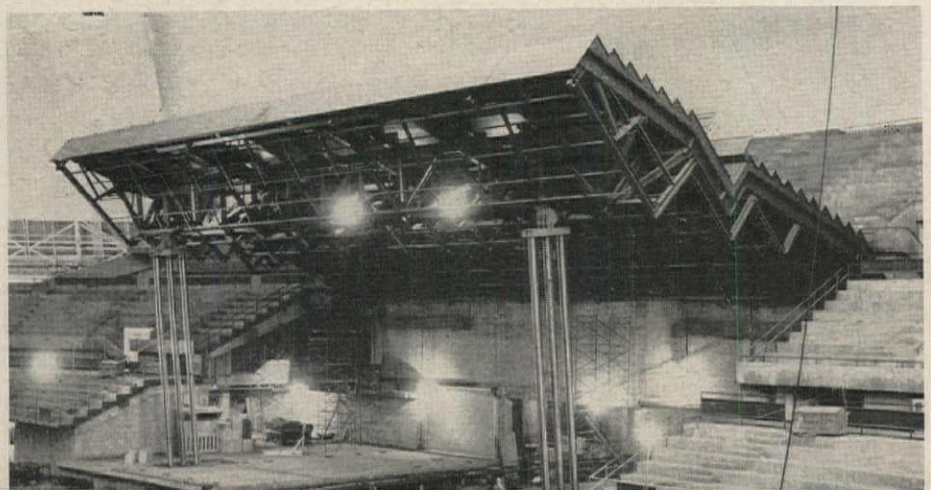


Joseph W. Molitor

Interior with dome fully closed. Lighting fixtures drop to floor for servicing. The main electric cable runs through the box-girder of the cantilever frame to the power center directly below the dome pivot. Here it connects to flexible cables which connect to distribution panels in each leaf



The lift seat section is operated by high pressure pumping units which cause four 42 ft long hydraulic plungers of 12⅝ in. diameter to raise and lower it. The total weight lifted by these jacks is 445,000 pounds. Two additional cylinders, one on each side, serve as locking posts to secure the section in the "up" position



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BUILDING TYPES STUDY 300
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INDUSTRIAL BUILDINGS

Buildings for research and buildings for manufacture designed for future expansion strike two optimistic notes in the portfolio of current activity which follows. Research scouts the horizon of new products and new venture. The expansible plant, conserving the strength of its owner against overextension, is testimony to his confidence in future growth. Confirmation of this happy rationale is sounded in the final example of one company's threefold expansion on a site and plan developed only three years ago.

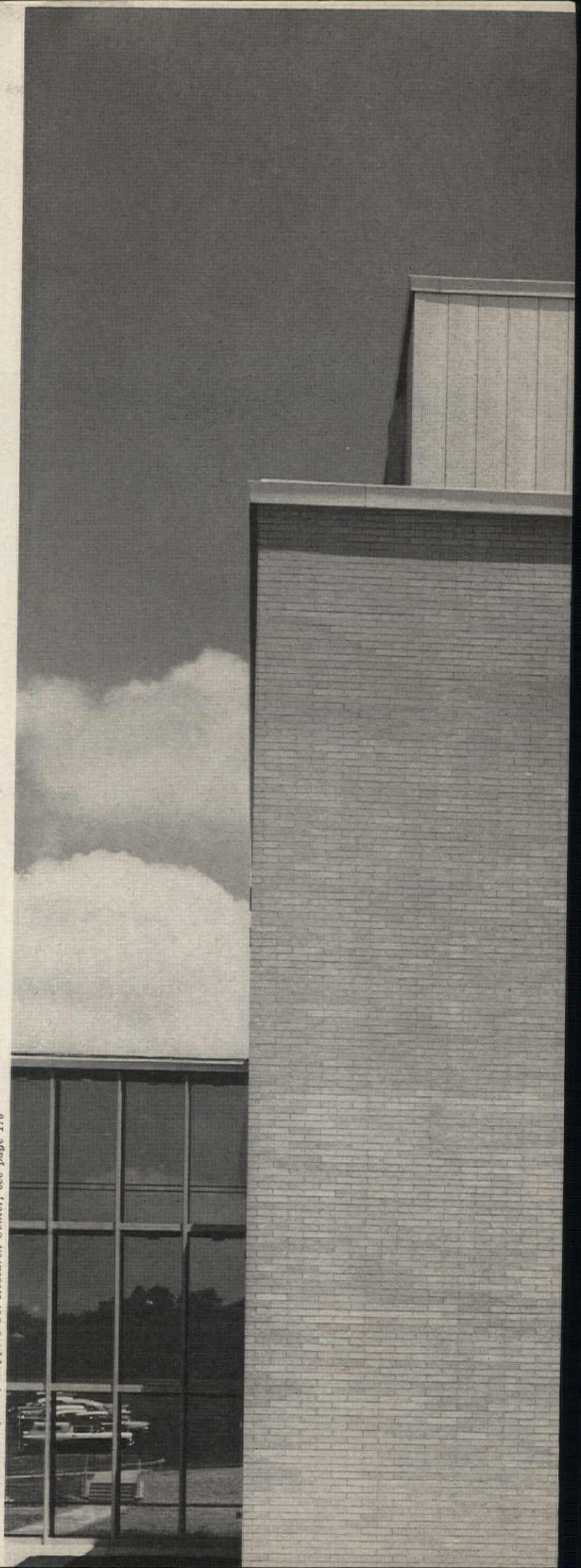
Whatever the doleful compilations of recession, taxation, or inflation; whatever the per cent relationships of this to next or prior years; the annual outlay for manufacturing plant construction is on the order of two billion dollars; for industrial research facilities, 650 million. Add to these the almost equal figures for non-manufacturing industries and subtract the pipes and kettles of the petro-chemicals. The result is a sizable melon at worst—and it is growing.

What's in it for the architect?

First, he has to get the business. How? By making known his present and growing skills in solving the manifold problems of industrial location and construction. By calling on the skills of others in finance, real estate, transportation, community and labor relations, and all the impinging areas of expertise which he alone is best qualified to orient within a single plan. By knowing costs and what they mean to clients.

The examples in this study amply demonstrate these skills and the increasing climate of acceptance of their role in industry. Architects are no longer summoned merely to contrive the façades of corporate images. The rewards of increasing sophistication and broadening services of architects in their industrial solutions are everywhere apparent. The industrial landscape they are steadily re-creating is their finest testimonial.

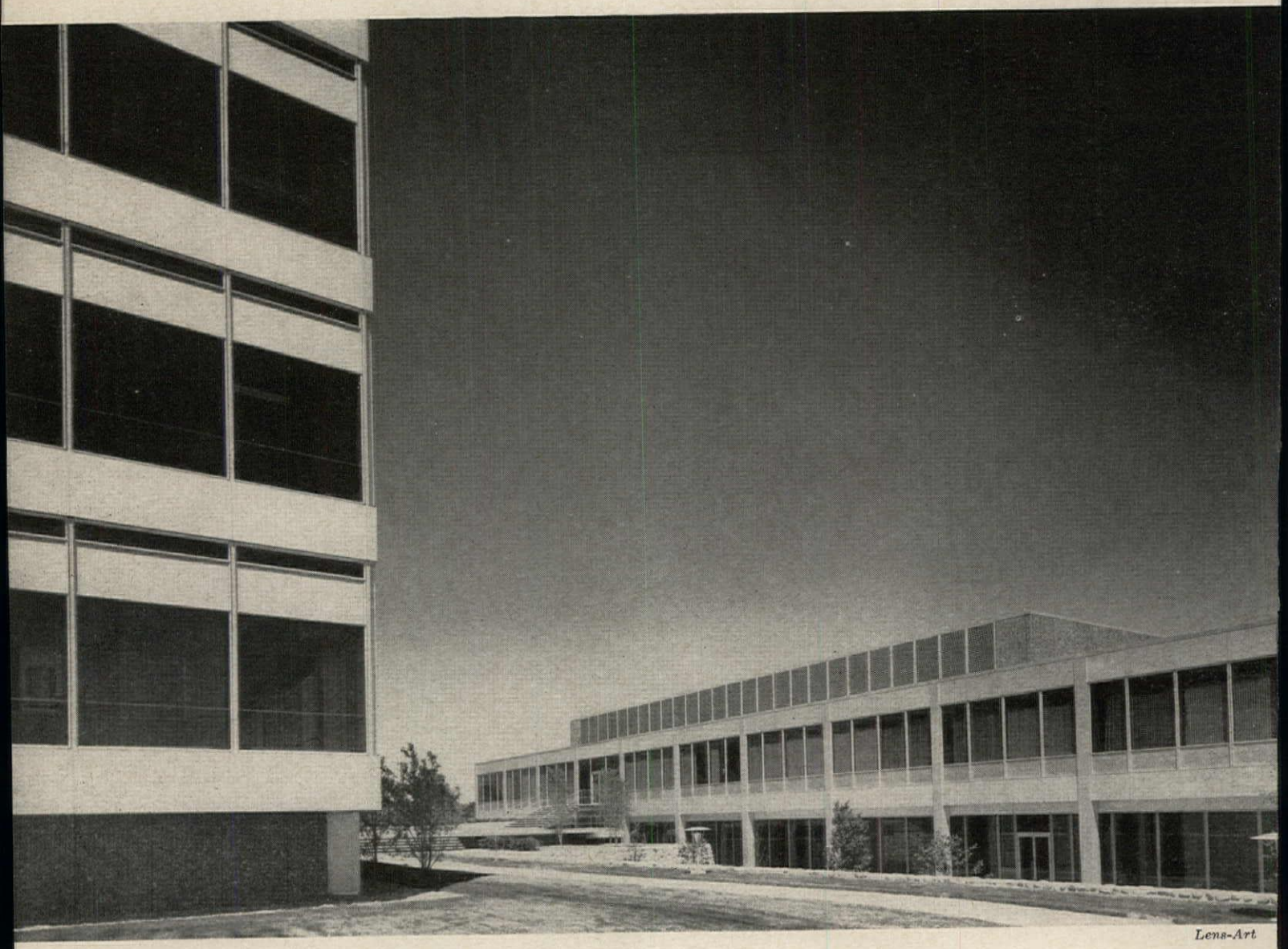
Wm. B. Foxhall



Clyde Hare photo; Koppers Co. Research Center; *see page 176*

CAMPUS PLAN FOR A FIVE-BUILDING RESEARCH CENTER

A large and complex pharmaceutical research program and owner's insistence on an academic atmosphere led architects from site selection through detailed programming to a fitting solution, neighbor to a university

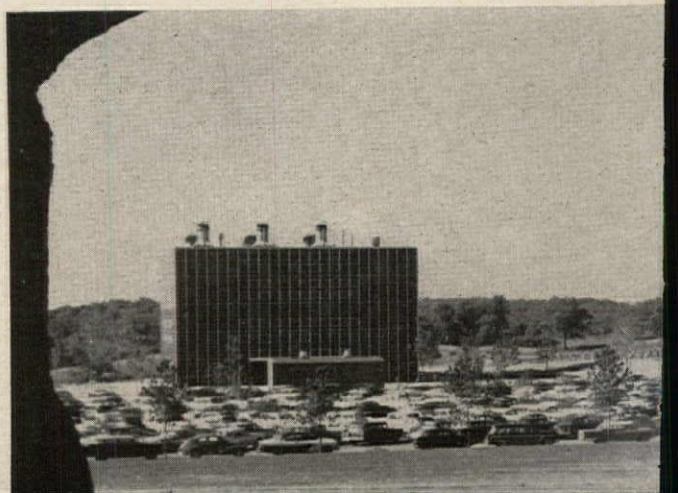


Lens-Art

Parke, Davis & Company
Research Laboratories
Ann Arbor, Michigan

Skidmore Owings & Merrill
Architects and Engineers

Barton-Malow Company
General Contractors

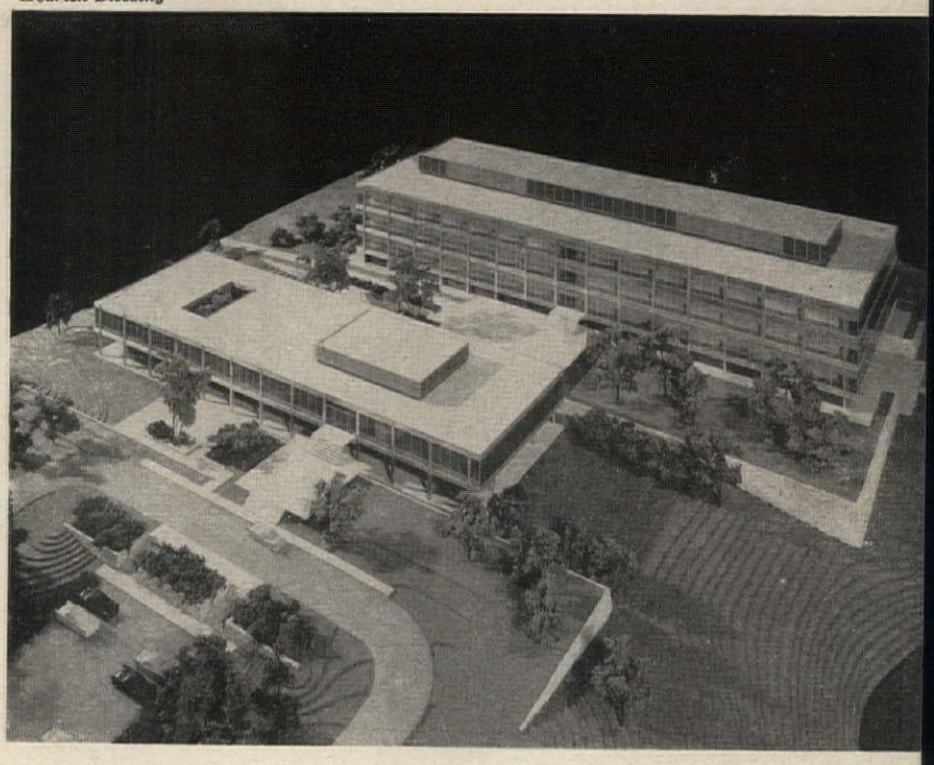


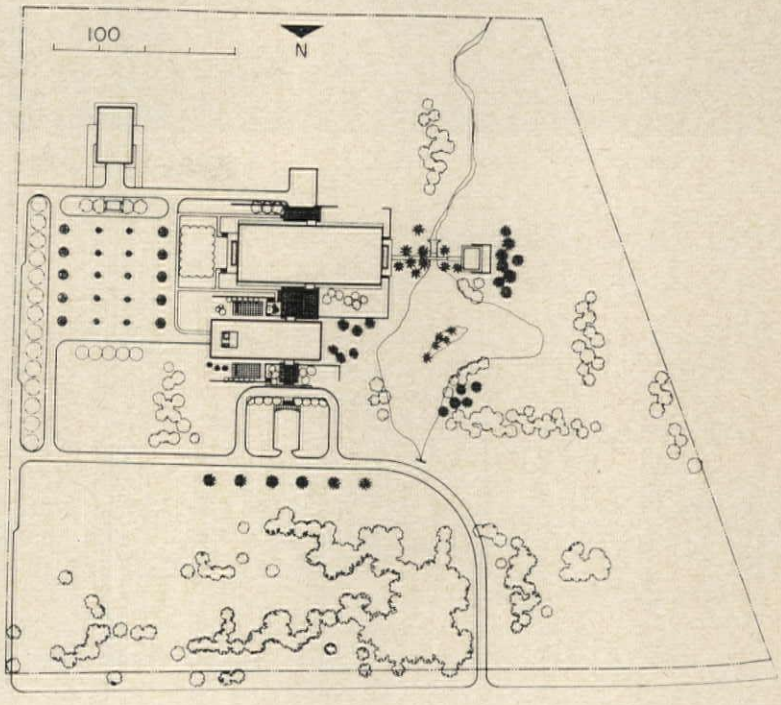
From selection of a site in Ann Arbor, adjacent to the campus of the University of Michigan, to interior decoration and furnishing of administration offices, development of the Parke, Davis Research Laboratory was an architect-owner team operation of unusual penetration and scope. Important considerations were the owner's wish to be near a research university and to establish an academic atmosphere. The result is a campus-oriented complex of three major buildings: a two-story administration building set in front of a three-story laboratory, and a power plant. There are two ancillary structures: a solvent storage shed visible in front of the power plant at left below, and a high pressure lab across a small stream from the end of the main lab. (See plot plan at right.)

Once the site had been selected, the research program of the company was reviewed in minute detail with respect to space, personnel, traffic, equipment, services, environment control, and relationships among laboratories and other departments. A functional analysis of the whole operation was drawn up to show flow and control points for people, animals, and materials. Plans, models, and full mock-ups were studied, and materials were tested in actual situations.

Buildings are framed in structural steel on reinforced concrete spread footings. Exterior walls are precast exposed aggregate panels with aluminum and glass curtain wall. Glass is solar gray plate and double plate. Interior walls are painted plaster and glazed structural units with occasional exposed aggregate panels. Interior partitions are prefabricated aluminum and glass or wood and glass. Floors are reinforced concrete with plastic or ceramic tile.

Hedrich-Blessing

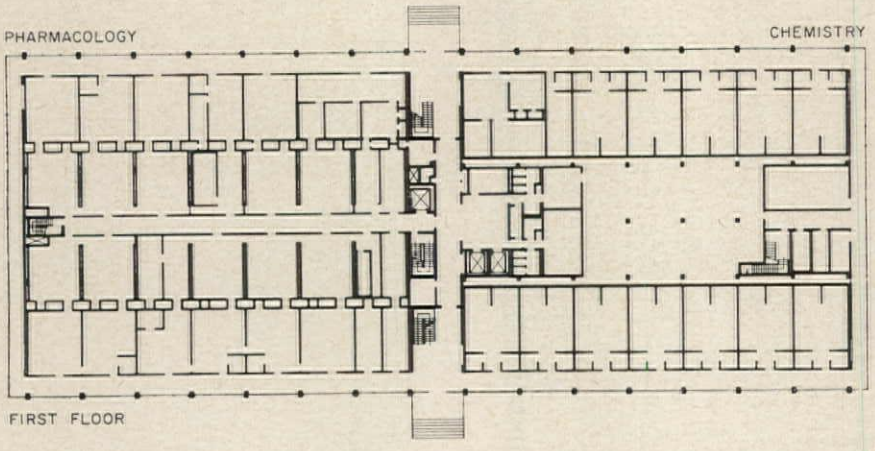


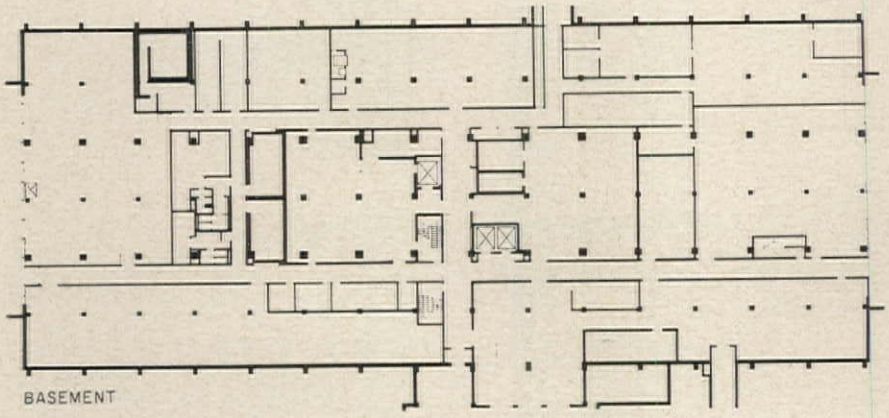


Lens-Art

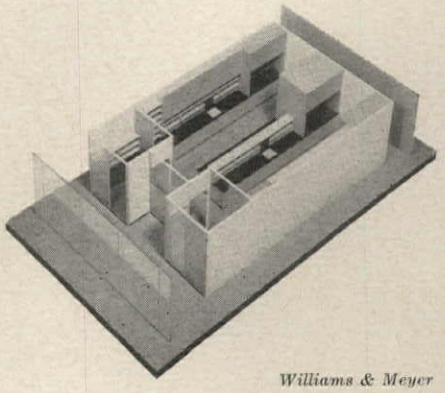
© Baltazar Korab

Parke, Davis & Company

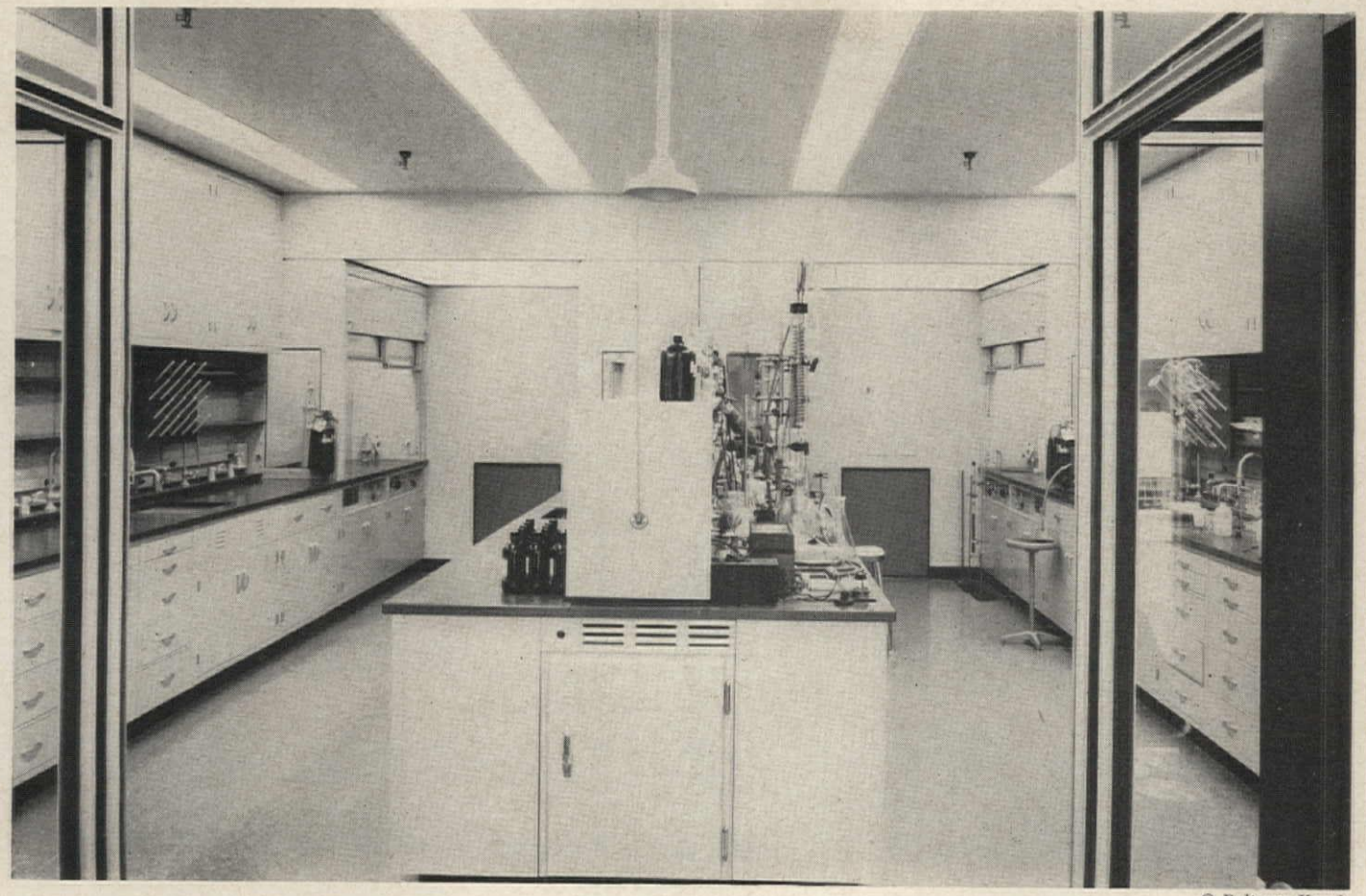




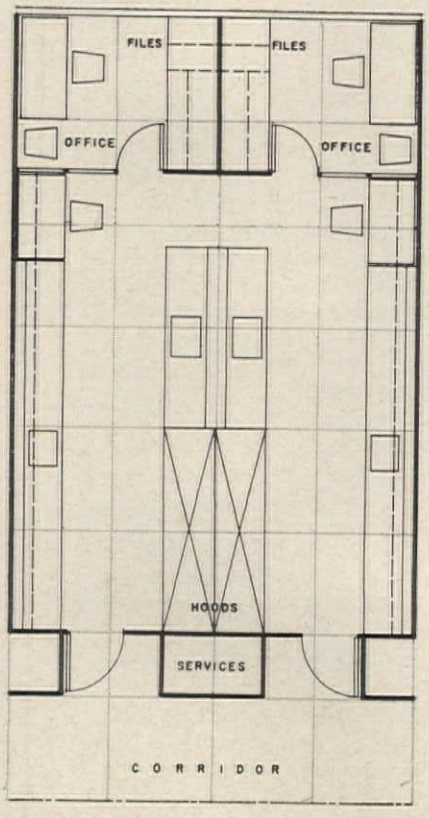
The main laboratory building has three floors above a basement. Upper floors are similar to first floor plan shown at left. The basement contains a receiving dock, mechanical rooms, animal receiving, bottle and cage washing, and supply distribution. Upper floors are about equally divided into two functional areas, chemistry and pharmacology. The chemistry end is built around a central mechanical equipment area with laboratory modules opening to an exterior corridor. The pharmacology end contains interior laboratory or animal rooms along a central interior corridor, back to back with laboratories on the exterior corridor



Williams & Meyer

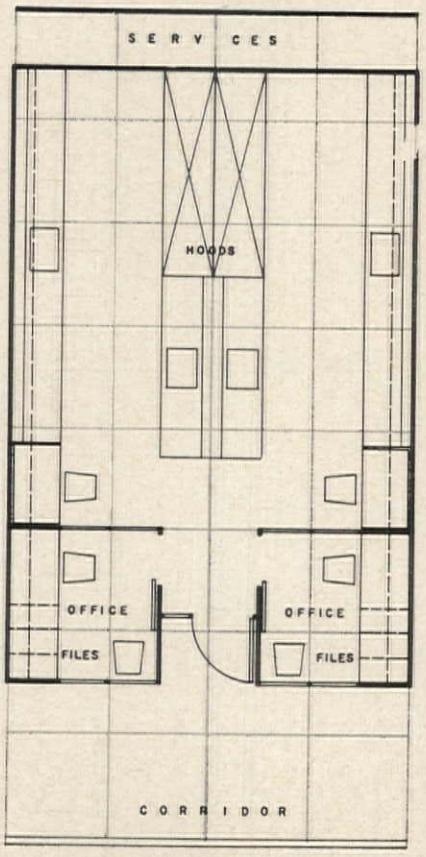


© *Baltazar Korab*



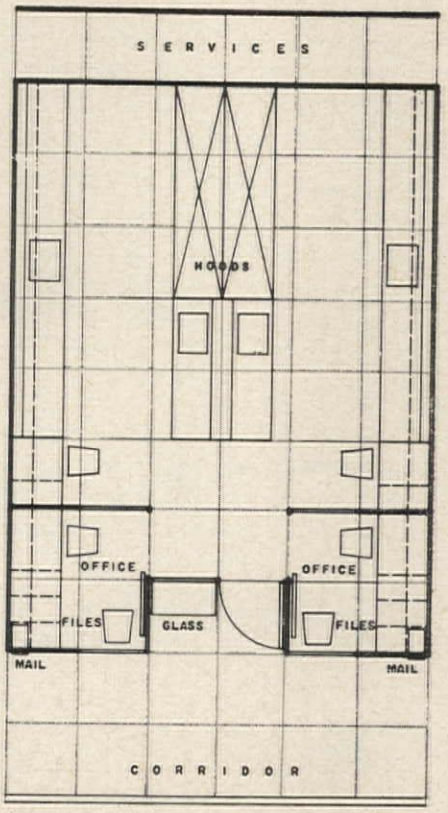
5'-0" MODULE, INTERIOR CORRIDOR

LAB AREA	600 S.F.
BENCH	55 L.F.
SHELF	45 L.F.



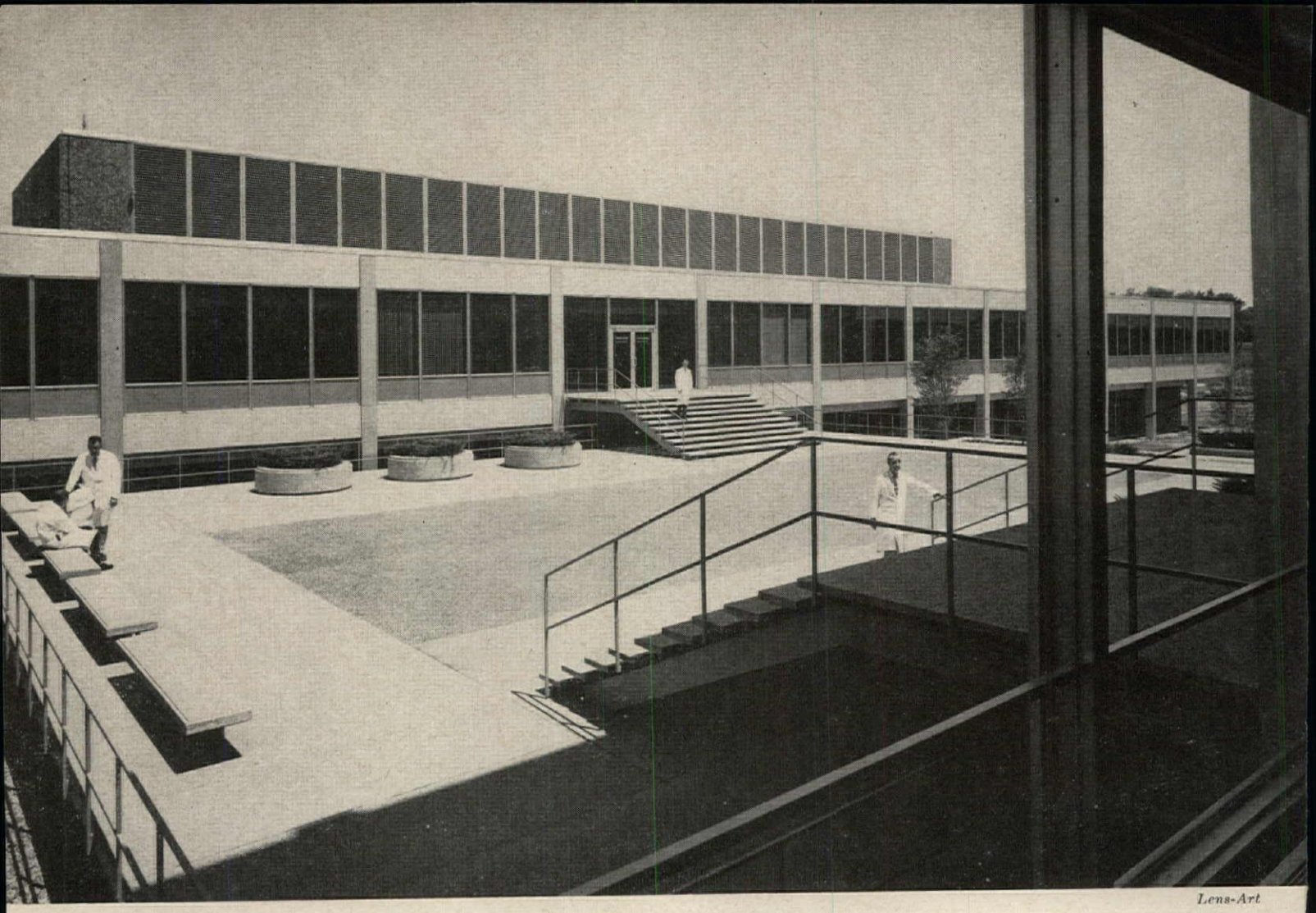
5'-0" MODULE, EXTERIOR CORRIDOR

LAB AREA	600 S.F.
BENCH	55 L.F.
SHELF	45 L.F.



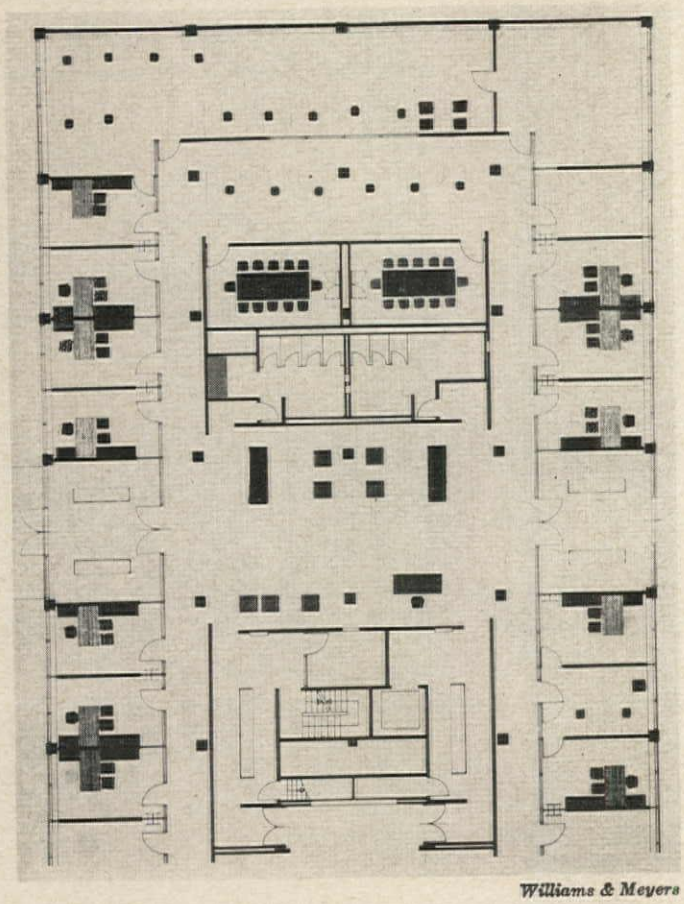
3'-6" MODULE EXTERIOR CORRIDOR

LAB AREA	588 S.F.
BENCH	49 L.F.
SHELF	35 L.F.



Lens-Art

Parke, Davis & Company

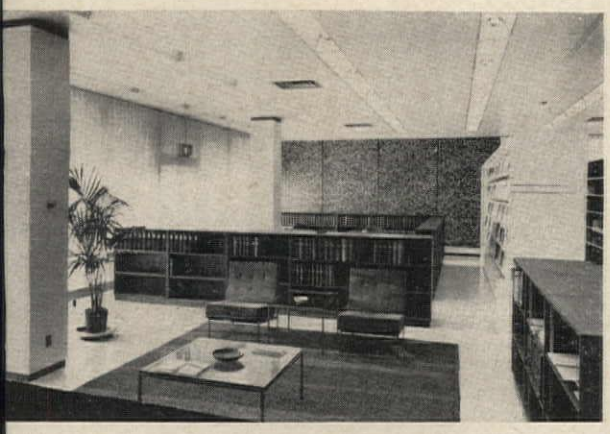


Williams & Meyers

Access to the administration building, front and rear, is at both floor levels. Upper floor access in front is by bridging from an embankment; in the rear, similarly, by stair flight to a mid-level terrace between administration and laboratory buildings as shown above. The administration building contains offices, library, auditorium, and cafeteria. Module for offices is similar to that for laboratories but with interior corridors and conference rooms in the executive area. In this structure, the architects executed the complete services including interiors and selection of furnishings, as shown at left and above right.

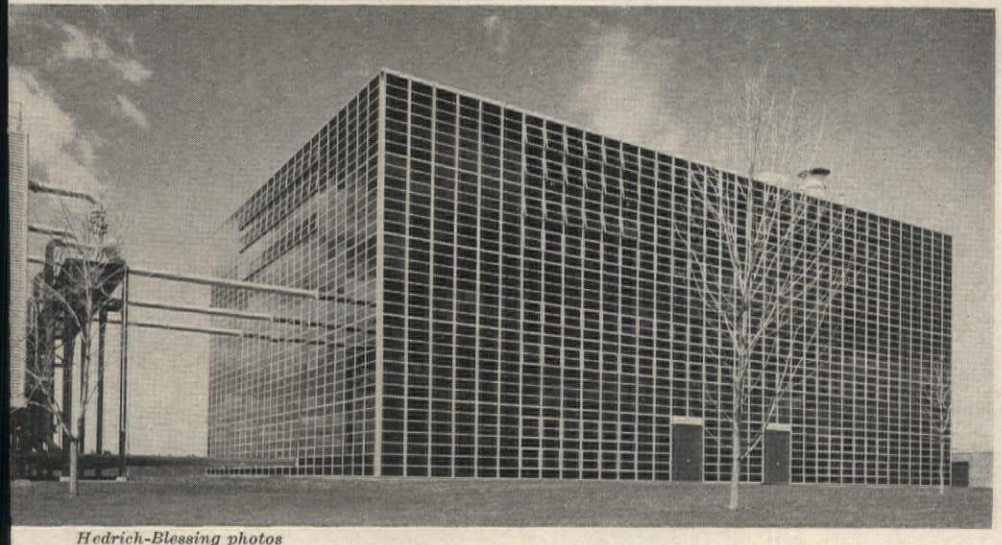
First floor perimeter offices are air conditioned with reheat low pressure induction units; other areas through conventional ceiling diffusers. Perimeter corridor in the lab building is heated and air conditioned by vertical discharge air grilles at the base of windows. This air is exhausted through fume hood areas as make-up. Medium pressure air is supplied to labs through troffer light-diffuser combinations.

Power plant provides heating and process steam, chilled water, and standby electric current

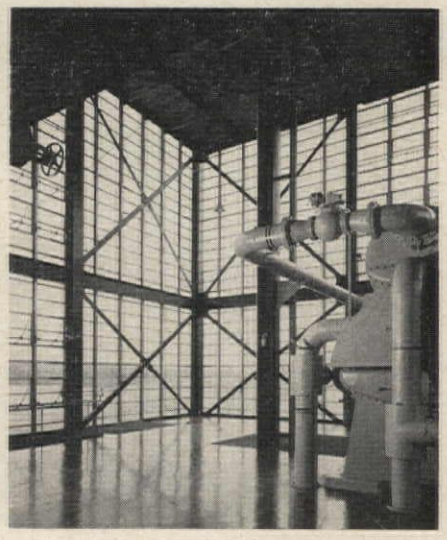


© *Baltazar Korab photos*

Lens-Art



Hedrich-Blessing photos



EXPANSIBILITY AND FLEXIBILITY ON A MODULAR PLAN

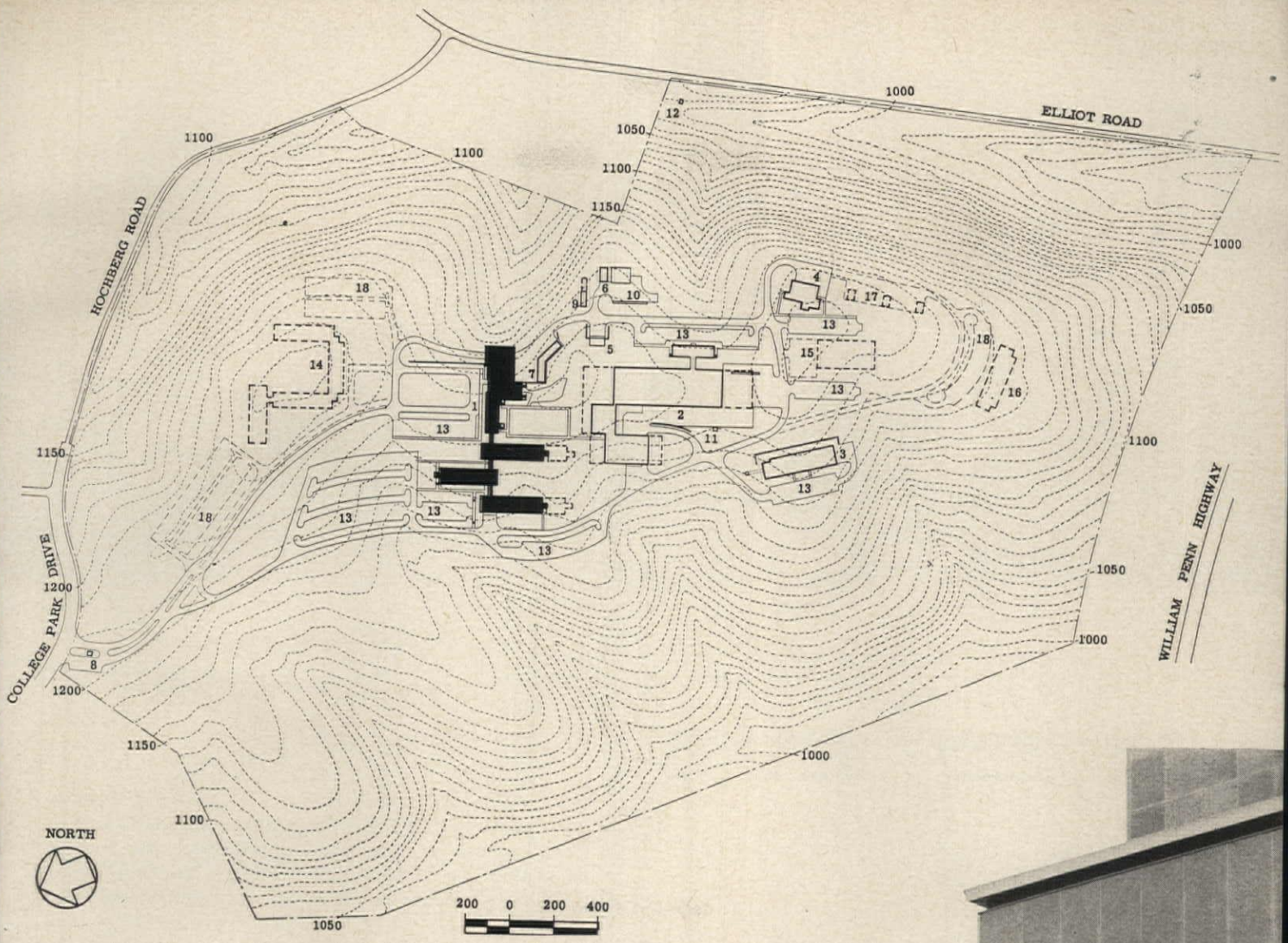
Atop a wooded hill 18 miles from Pittsburgh is the completed first phase of a research center designed to accommodate the rapid growth and changing needs of seven diverse divisions of an 80-plant highly technical business enterprise

Koppers Company, Inc.
Research Center
Monroeville, Pennsylvania

Voorhees Walker Smith Smith & Haines
Architects and Engineers

The Navarro Corporation
General Contractor

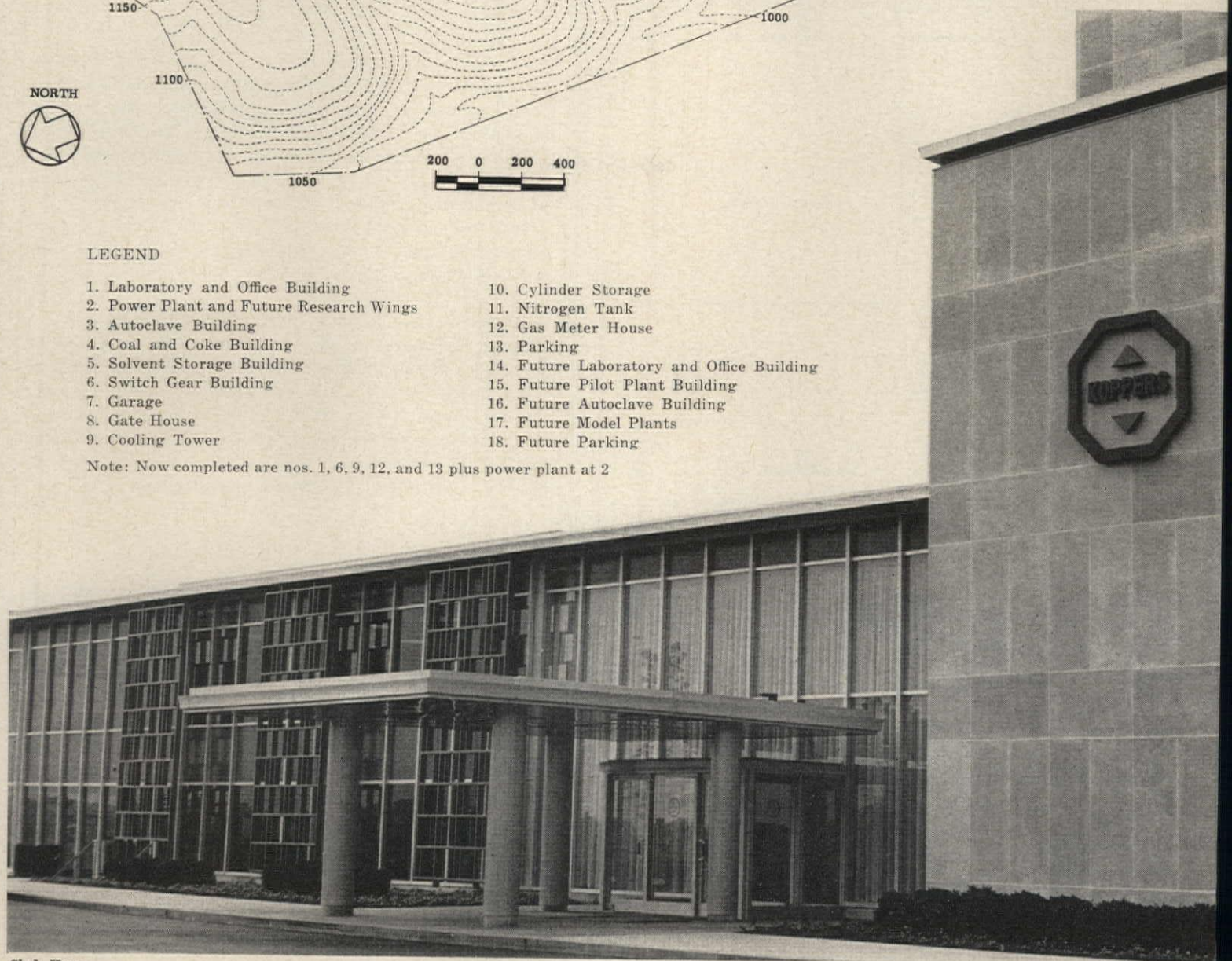
Koppers' Research Center now consists of a basic structure containing reception, auditorium, library, and dining areas with an attached office wing and three corridor-connected laboratory wings, and a separate boiler house, switch gear house, and gas meter house located on a 176-acre tract "25 minutes by car" from downtown Pittsburgh. Called Somervell Park in honor of Koppers' late president, General Brehon B. Somervell, the site provides space for enlargement of present facilities to handle about three times the present chemical and metallurgical research activity. Present facilities are designed for a population of about 600. The anticipated ten-year research program will about double present space.



LEGEND

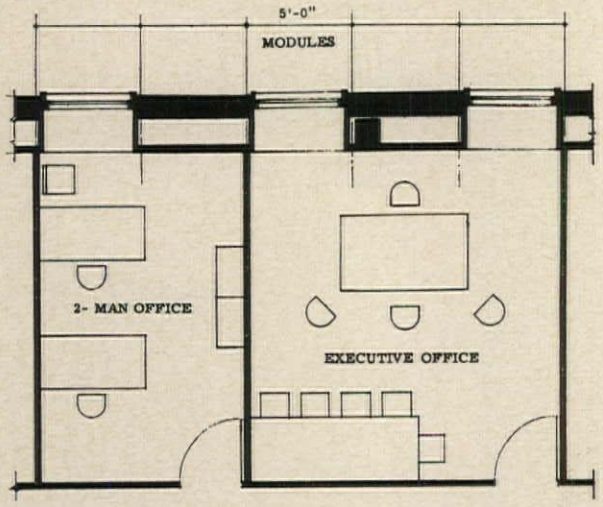
1. Laboratory and Office Building
2. Power Plant and Future Research Wings
3. Autoclave Building
4. Coal and Coke Building
5. Solvent Storage Building
6. Switch Gear Building
7. Garage
8. Gate House
9. Cooling Tower
10. Cylinder Storage
11. Nitrogen Tank
12. Gas Meter House
13. Parking
14. Future Laboratory and Office Building
15. Future Pilot Plant Building
16. Future Autoclave Building
17. Future Model Plants
18. Future Parking

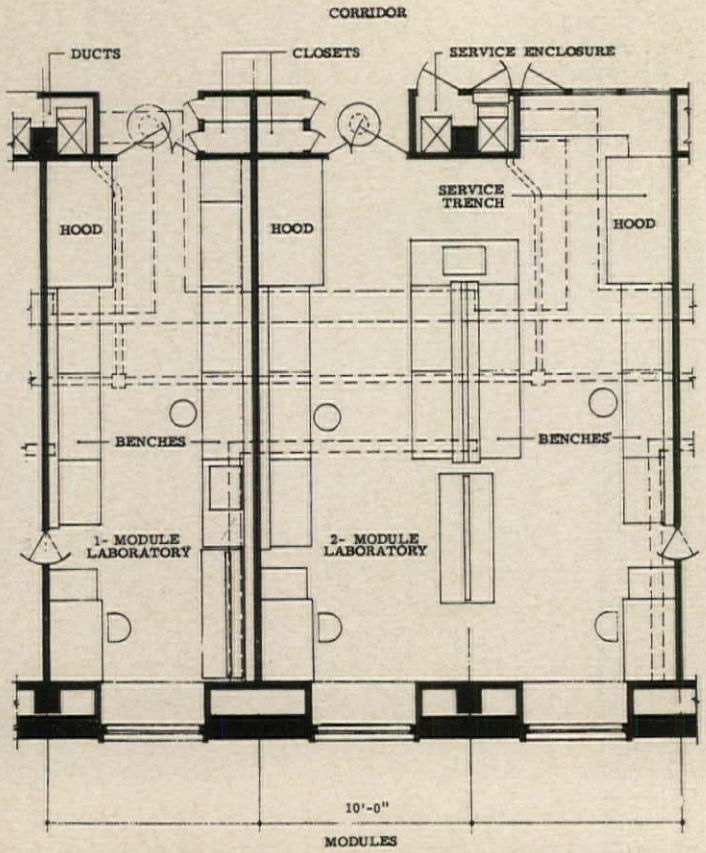
Note: Now completed are nos. 1, 6, 9, 12, and 13 plus power plant at 2



Clyde Hare

Leonard Schugar



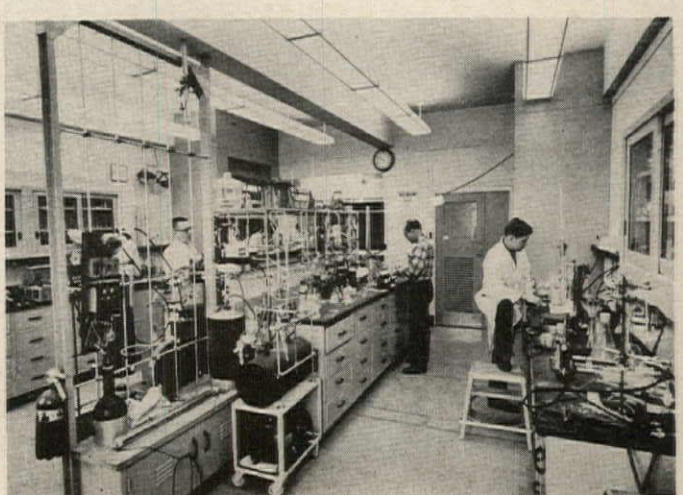


Koppers Company, Inc.

Both offices and laboratories are designed for flexibility on a modular plan. Each module is completely equipped with services, lighting, power, air conditioning, and, for labs, piped gases, liquids and drainage. The office module is 5 by 15 ft, with a minimum office of two modules. Laboratory module is 10 by 24 ft, and each module line may be centerline of either a partition or an island bench. For safety, each lab has two exits, a safety shower, fire extinguisher, and blanket at the corridor door, and an eyewash fountain near the sink.

Structure

Framing of the office wing is concrete; other wings and power house, steel. Exterior walls of office wing are limestone veneer; other wings and power house, face brick; cafeteria and library, metal and glass. Interior partitions are foam-cored metal and wood. Floors are concrete with terrazzo or vinyl asbestos tile. Ceilings are painted concrete or suspended acoustic tile.

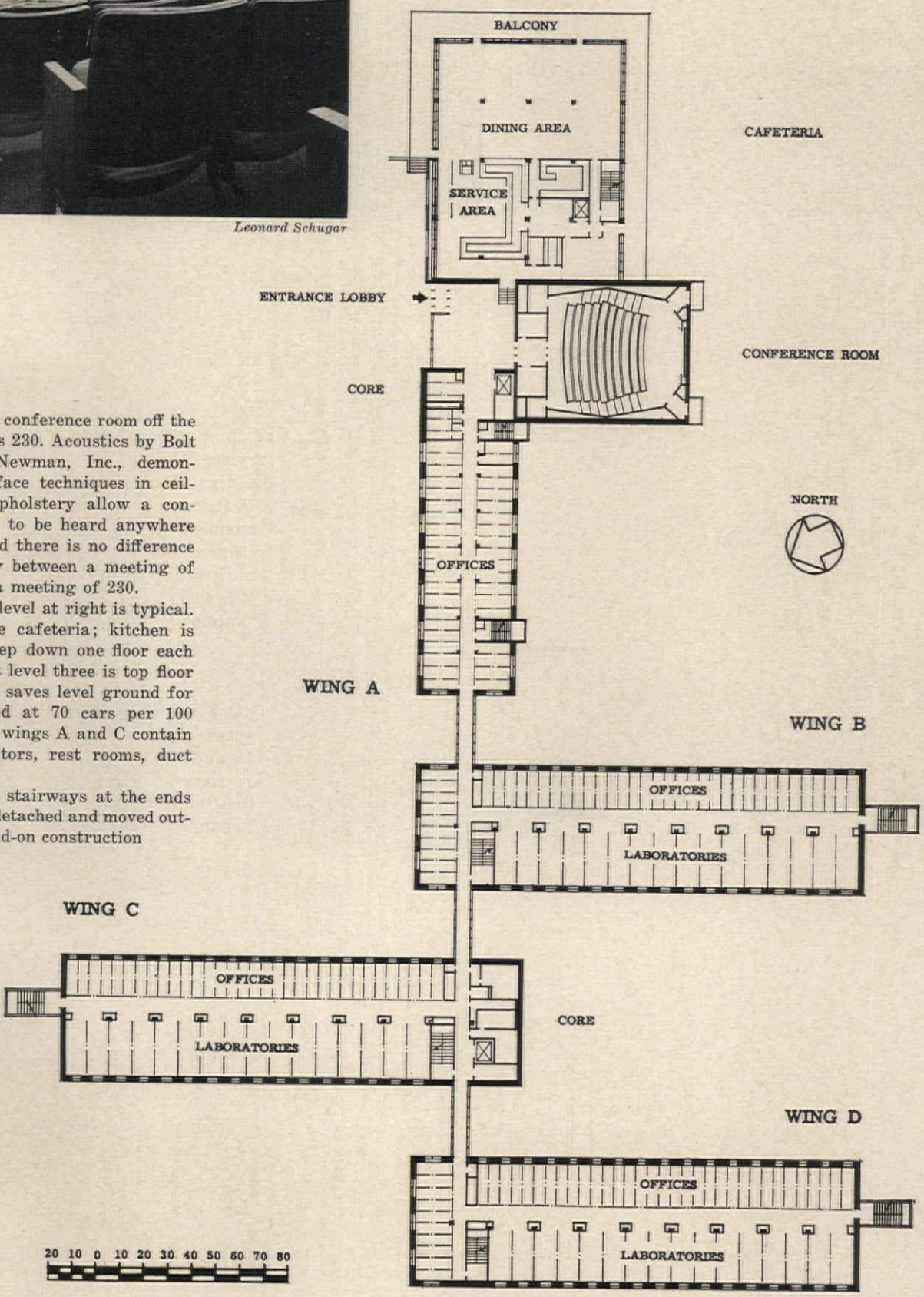


Leonard Schugar

Auditorium and conference room off the main lobby seats 230. Acoustics by Bolt Beranek and Newman, Inc., demonstrate how surface techniques in ceiling and seat upholstery allow a conversational tone to be heard anywhere in the room; and there is no difference in sound quality between a meeting of ten people and a meeting of 230.

Plan of third level at right is typical. Library is above cafeteria; kitchen is below. Wings step down one floor each with site so that level three is top floor of wing D. This saves level ground for parking designed at 70 cars per 100 people. Cores at wings A and C contain stairways, elevators, rest rooms, duct risers, etc.

Glass-enclosed stairways at the ends of wings can be detached and moved outward to allow add-on construction



ARCHITECTURE AND NATURE COMBAT INDUSTRIAL BLIGHT

Architects, engineers, and industrialists are joining forces with the gifts of nature in the "dream of a true industrial neighborhood in Farmington Industrial Park, where dignity of man shall never be subservient to machines"

Connecticut Spring Corporation
Farmington Industrial Park
Farmington, Connecticut

Walter F. Greene Jr., Architect

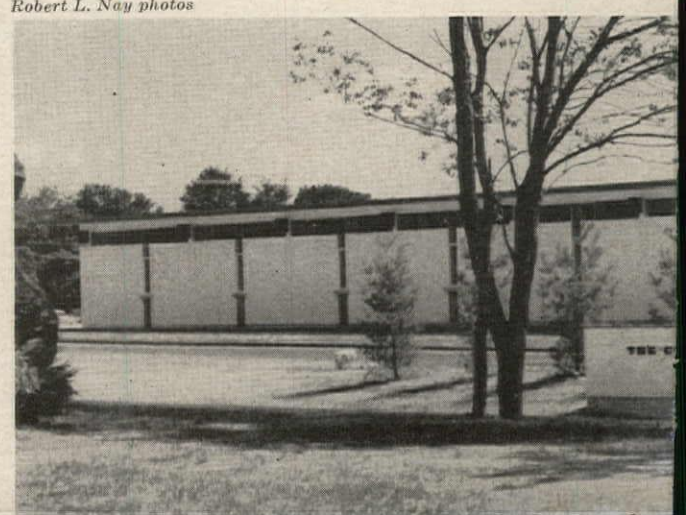
Loomis and Loomis
Structural Engineers

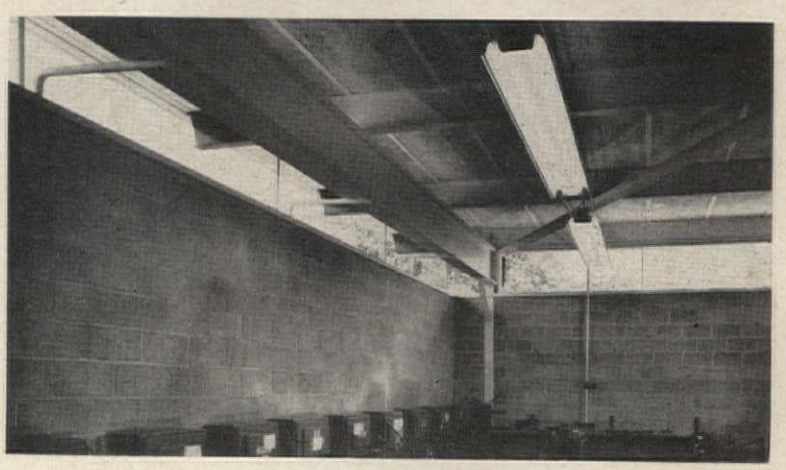
Burton and Van Houten
Mechanical Engineers

Maine and Tillapaugh
Land Planning Consultants

Abel Construction Company, Inc.
General Contractors

Robert L. Nay photos

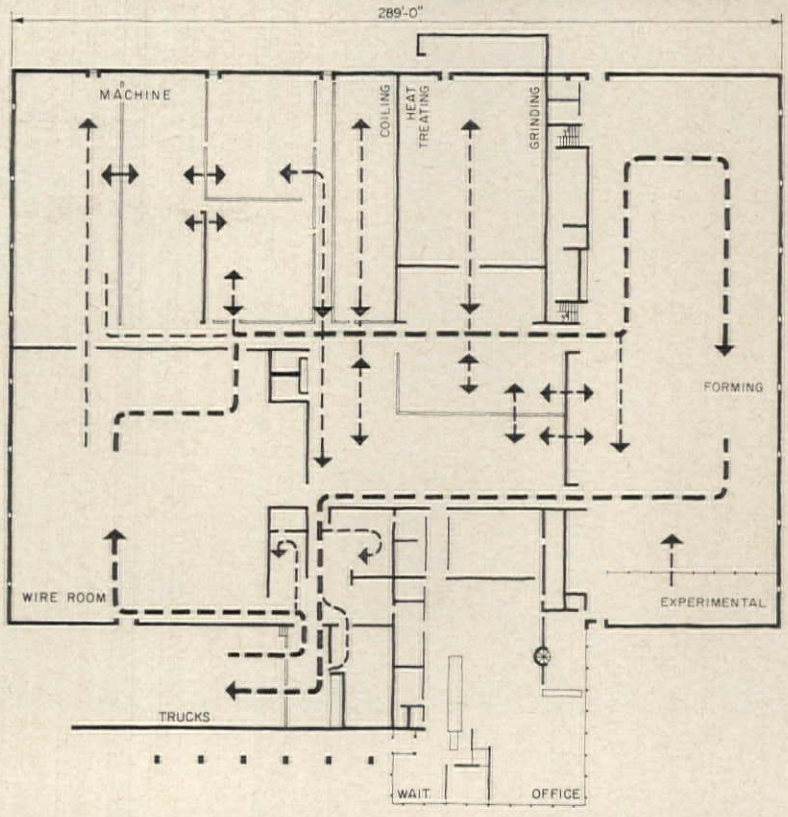


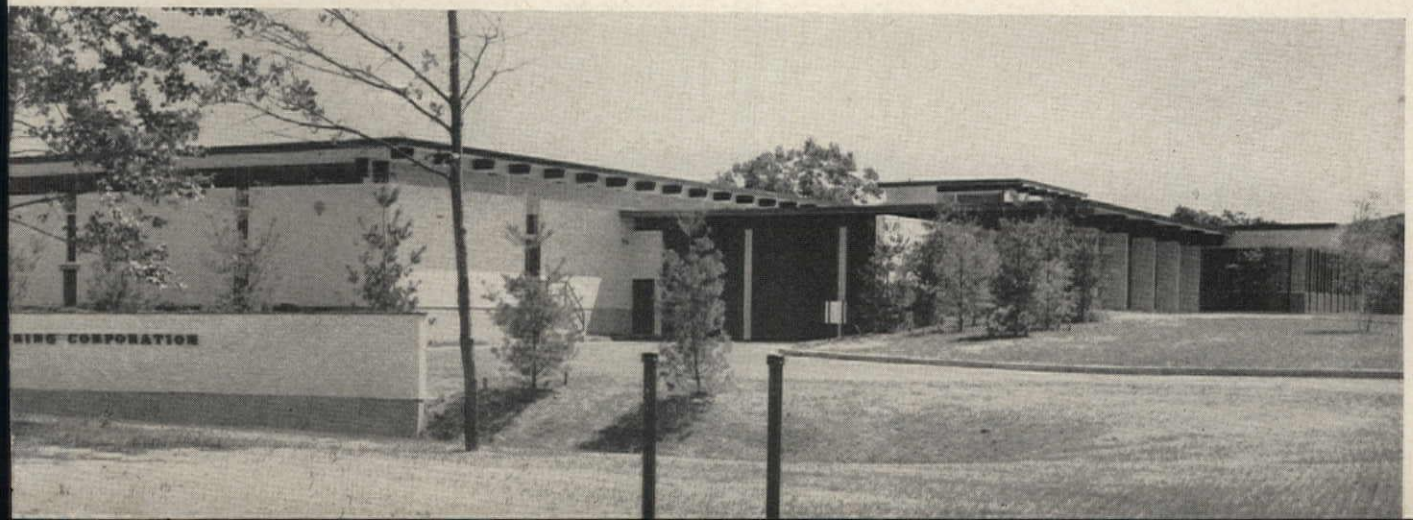


First of some fifteen or twenty plants to be constructed on a 150-acre site of rolling hills and woodland, this spring factory, home of the park's owners, sets a standard of design and quality. Other buildings will be variously designed around their purposes, but all will be coordinated by a planning team to relate to each other and to the park. All will be fully air conditioned. And all will be landscaped into their sites as naturally as possible.

The program for Connecticut Spring Corporation required a factory to make many kinds and sizes of specialized springs. Some products move through many departments; others only one. Large repeating orders are mixed with small specialized ones. Flow must be free in several directions with special attention to production and quality control. The solution is a very simple building block, expandable in two directions, completely flexible, with mechanical services located overhead.

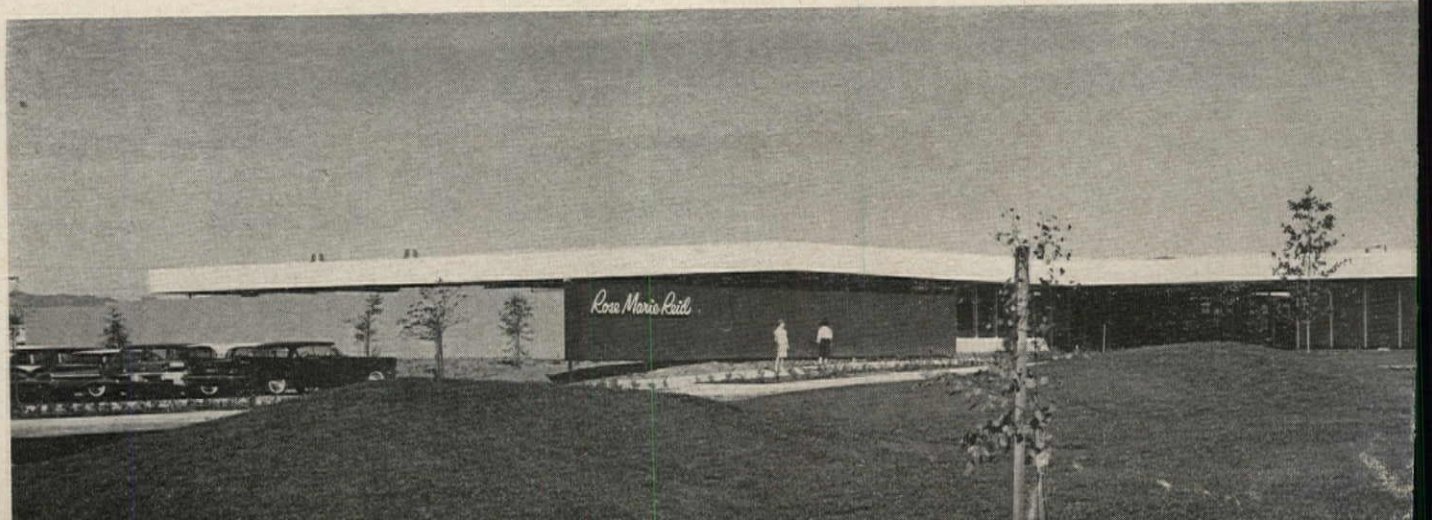
Structure is a double cantilever system with 25 by 40 ft bays and all steel held free from masonry walls.

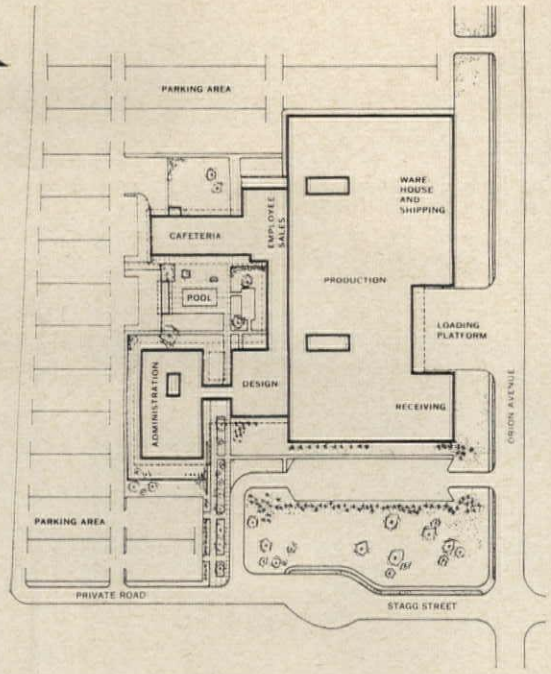




COLORS, COURTS, AND POOL ADD FLAIR TO SWIMSUIT PLANT

Extensive roof overhang, generous use of wood and gay colors, and careful scaling of wings surrounding a demonstration swimming pool impart a country club air to a swimsuit plant with landscaped courts on view inside and out



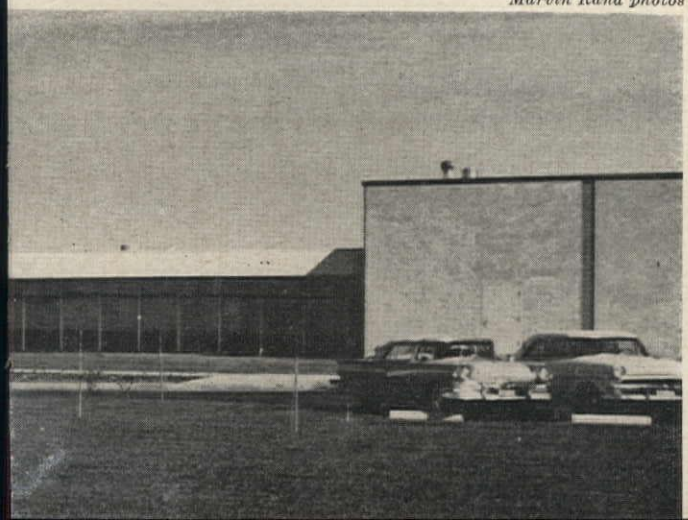


One of the architect's primary assignments in design of the Rose Marie Reid plant was to keep it low and carry into his design the client's advertised reputation for "flair".

Based on an analysis of function, departments are grouped in a series of wings so that an almost residential character is achieved. Wings are arranged around a landscaped patio featuring a swimming pool used for product testing and weekend recreation for employes. In the factory area, two glass enclosed, 20 by 60 ft, landscaped courts are visible from all points.

Building is fully air conditioned. Framing is steel, brightly painted, with tapered girders spanning 60 ft at 20-ft intervals. Walls are tilt up concrete with pebble finish. Cafeteria and reception areas are glass enclosed. Floors are concrete with asphalt or vinyl tile.

Marvin Rand photos



Rose Marie Reid, Inc.
Van Nuys, California

Victor Gruen Associates
Architects and Engineers

Conant and Lieberman
General Contractor

PLANT IS DESIGNED AROUND PRODUCTION FLOW LAYOUT

Designed for direct flow of materials and flexibility of production layout with provision for future expansion of the building, this one-floor plant has more capacity than about the same area in former nine-floor quarters

Edwin J. Schoettle Company, Inc.
Folding Carton Plant and Offices
Upper Gwynedd Twp., Pennsylvania

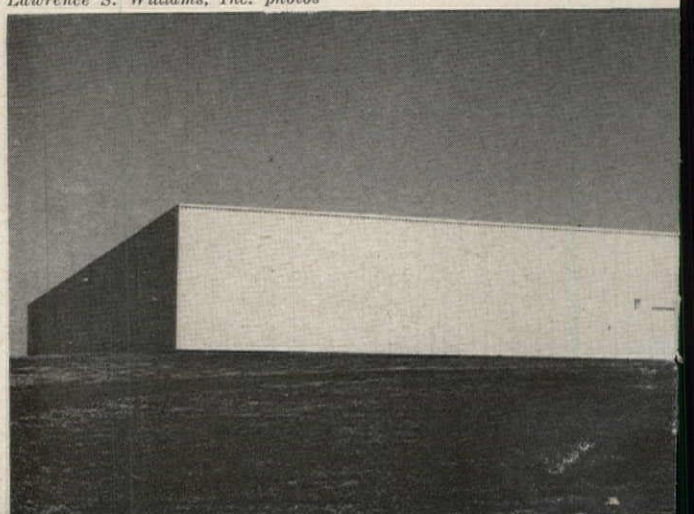
Vincent G. Kling
Architect

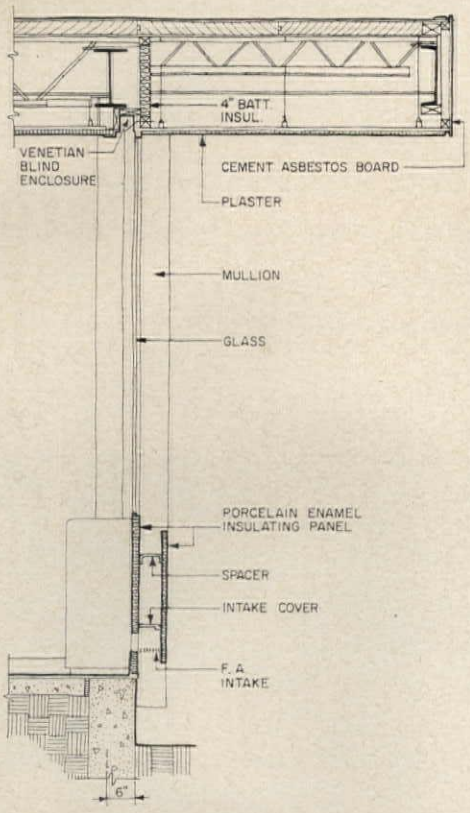
McCormick-Taylor Associates
Structural Engineers

Stewart A. Jellett Company
Mechanical Engineers

Wark and Company
General Contractor

Lawrence S. Williams, Inc. photos

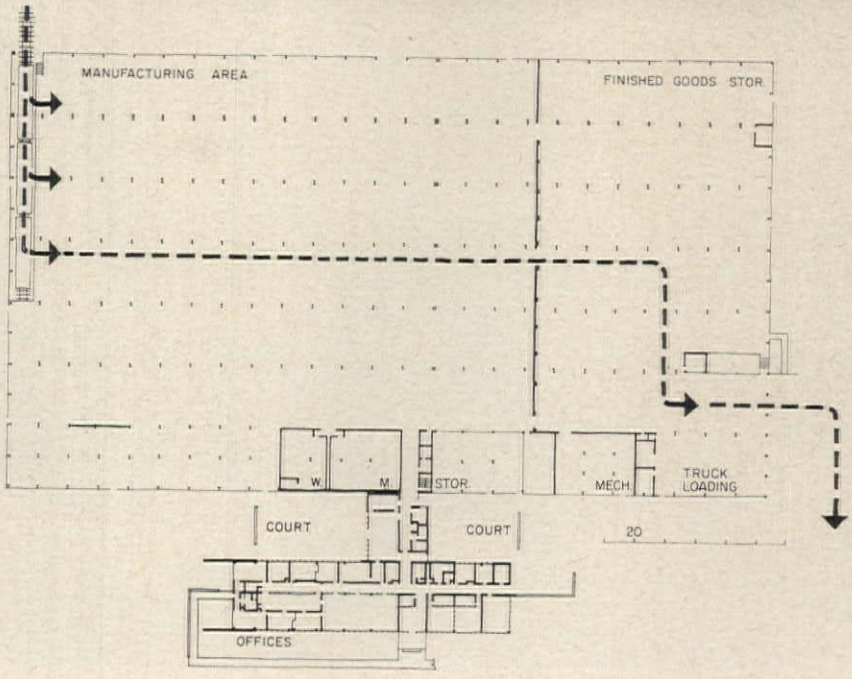


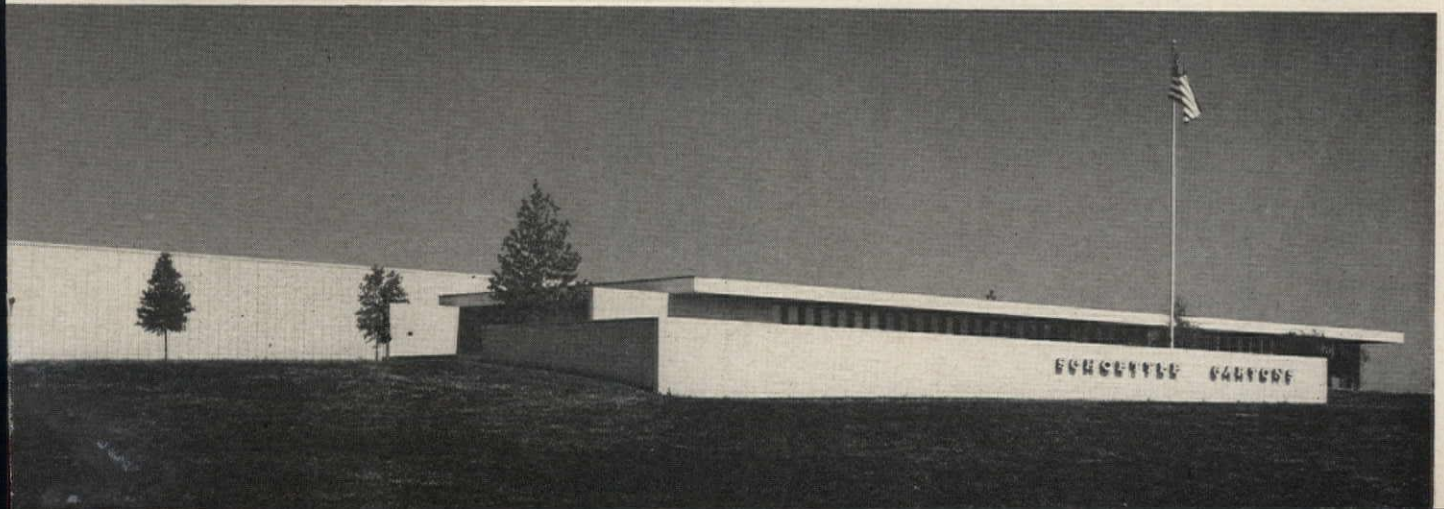


Site requirement for this paper box plant called for rail delivery of raw materials and trucking access for highway distribution of finished products.

The plant building is a 145,000-sq ft rectangular open space designed to house a pre-established production pattern. Three box cars can enter the building on the west side. Flow is through cutting, printing, waxing, creasing, etc., with parallel pneumatic scrap removal, to finished storage, scrap baling, and shipping on the east. Wall divides humidified production area from storage.

Structure of office wing and plant is steel frame with precast roof planks on bar joists. Plant walls are vertical insulated metal panel. Office walls are fixed glass with porcelain panels below. At air intakes for unit heater-coolers, porcelain cover panels (see above) are set flush with mullions creating self-color highlights.





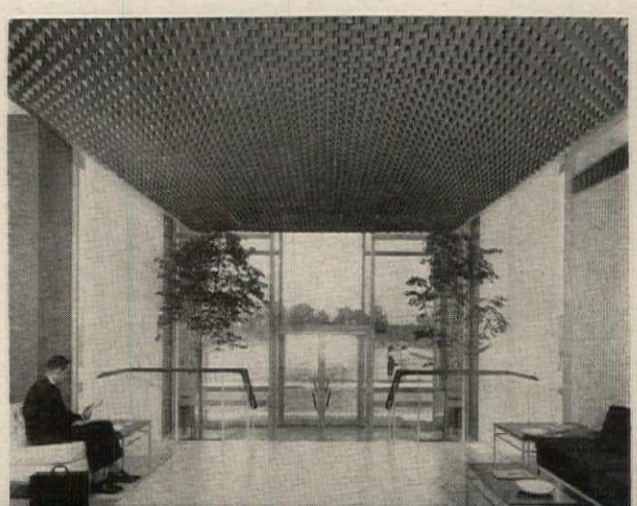
ADDITIONS PRESENT NEW FAÇADE ON AN ESTABLISHED SITE

Expansion of facilities at a Simmons mattress plant completed architectural development of a suburban site, reoriented frontage with new glass curtain walled offices, trebled the working area, streamlined metal furniture production

Simmons Company
Munster, Indiana

A. Epstein and Sons, Inc.
Engineers and Architects

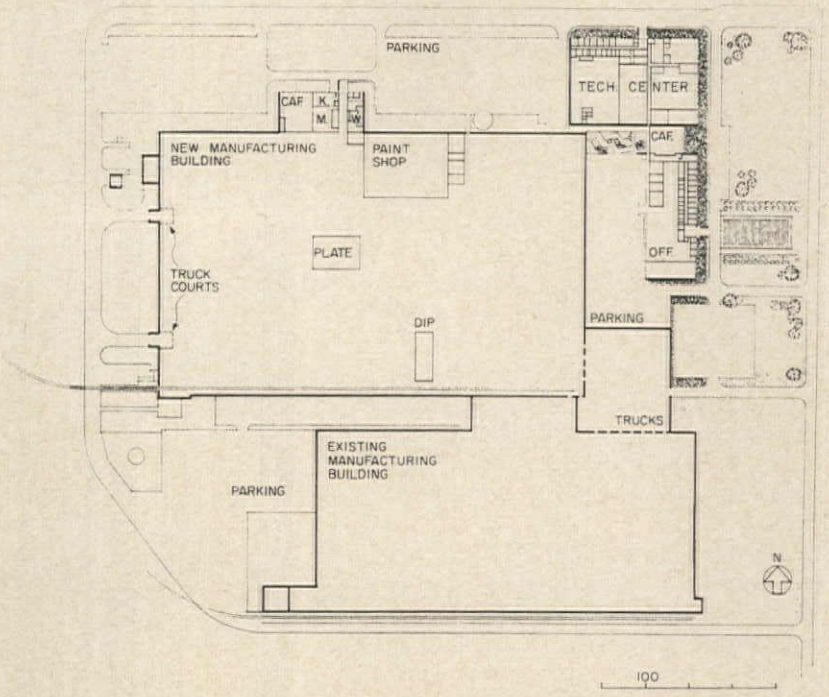
Pathman Construction Company
General Contractors

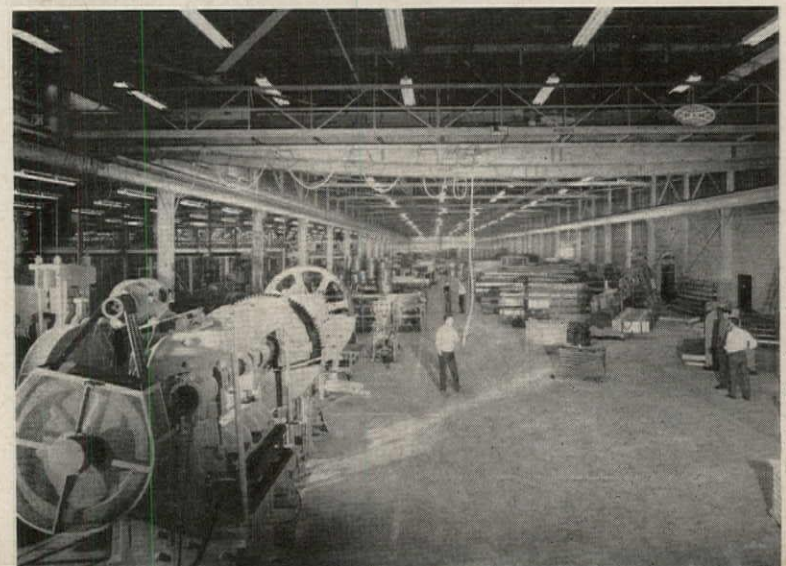


Hedrich-Blessing photos

Three new buildings, consolidating Simmons' midwestern operations, have added offices, an engineering center, and a metal working plant for hospital beds and furniture to an existing plant. Offices and technological center face the main thoroughfare and are set back about 150 ft from the street line. Landscaped frontage includes a 60 by 120 ft reflecting pool directly in front of the main entrance. The pool doubles as a cooling tower for the air conditioning system which serves both buildings. Between buildings is a glass enclosed cafeteria facing, on the west, a large landscaped patio. This in turn is edged by a glazed walkway (above) leading to the manufacturing plant. Fenestration of offices and technological center is clear continuous glass 7.5 ft high with colored glass span-

continued on next page





Hedrich-Blessing photos

Simmons Company

drels top and bottom. End walls are face brick.

Manufacturing area (687,322 sq ft) has a minimum of 19 ft clear height with bays 30 by 40 ft. Structure is steel frame, poured gypsum roof deck, columns on caissons, aluminum insulated panels enclosing walls. Cranes and conveyors transport metal furniture from raw steel to spray painting and finally to ovens located on the roof.

Heating is by high temperature high pressure water from four boilers in a southeast annex of the old plant. Lighting is high intensity fluorescent. A fully automatic sprinkler system, smoke detection devices and hose stations give fire protection. There is a fire wall around paint areas.

A second kitchen and cafeteria are located in the manufacturing area, and toilet facilities are located on mezzanines throughout the plant as are offices for supervisory personnel.

Architectural Engineering

Integrating Lighting, Heating and Cooling

In many buildings today, particularly office buildings and schools, the problem much of the time is not how to heat them, but how to get rid of heat from people, business machines and lights. In an office building with 100 footcandles of general illumination, the lighting load can account for approximately 42 per cent of the total air conditioning requirements. Obviously with lighting levels of this magnitude and higher, more efficient means have to be found for removing the heat from the equipment. A special issue of *Illuminating Engineering* (August 1961) on "Integration of Lighting, Heating and Cooling" examines the nature of the problem and suggests approaches to help lessen the air conditioning load.

School Lighting Guide

The Illuminating Engineering Society reports that the IES Council has approved a new *Guide to School Lighting* which is to be submitted for approval as an American Standard (American Standards Association). Described as a non-technical document, the *Guide* is expected by IES to be published within a few months.

Residential Heating, Cooling Loads

Load Calculation for Residential Winter and Summer Air Conditioning is the title of Manual J just issued by the National Warm Air Heating and Air Conditioning Association providing a single load calculation designed to be simple to handle, yet accurate. The manual is an outgrowth of two years' work by the Load Calculation Committee of NWAHACA and the combined efforts of the Industry Heat Gain Joint Study Group which included, in addition to NWAHACA, the Air Conditioning and Refrigeration Institute and The Institute of Boiler and Radiator Manufacturers. A main feature of the new manual is the "family-type" grouping of construction assemblies to reduce the factors from 4400 for heating only in former manuals, to 1000 for both heating and cooling. The manual is available from NWAHACA at 640 Engineers Building, Cleveland 14, Ohio, for $2.50.

Progress in Steel Structures

More evidence of advances in structural steel framing for buildings comes with the announcement of prize winners in the $25,000 Awards Program sponsored by the James F. Lincoln Arc Welding Foundation—a professional competition for the design of machines or structures using arc-welded steel. Third Award went to Peter P. Petkoff, Chief Structural Engineer and Lin Y. Huang, Senior Structural Engineer for Minoru Yamasaki—Smith Hinchman & Grylls, Associated Architects and Engineers, on the use of direct butt-welded, beam-to-column connections in the 28-story Consolidated Gas office building; savings in steel of 10 per cent over riveted connections were reported. Among other structures included in the awards were: a laminated steel hyperbolic paraboloid roof for a restaurant; a folded steel plate roof for a branch bank; all-welded grid trusses for a new library at Yale; composite welded steel and concrete shell roof for a drive-in bank; cantilever truss for the retractable roof of the Pittsburgh Public Auditorium; structural steel folded plate roof for a bowling alley; and a hyperbolic paraboloid of welded steel decking.

New Building Research

"Needed Research on the Effect of Building on Human Behavior" is one of seven papers just published by the Building Research Institute covering a conference on New Building Research, Fall 1960, held as part of the 1960 Fall Conferences. This paper describes a project centered in the Department of Architecture at the University of Michigan and sponsored by the Educational Facilities Laboratories of the Ford Foundation which has as its first goal the searching of literature and making an inventory of what is known about the effect of the environment on learning. Included under environment are the atmosphere, light, sound, spatial arrangement and social groupings; human behavior covers physiology, perception, mental reactions, performance and learning. This publication is available from Building Research Institute, 2101 Constitution Ave., Washington 25, D. C. for $6.00.

This Month's AE Section

SPACE STRUCTURES IN STEEL

by Robert E. Rapp,
Regional Engineer,
American Institute
of Steel Construction, Inc.

Space frames are not new in concept, but interest in them is greater now with growing sophistication in structure. The basic idea, of course, is to obtain greater structural efficiency and potential cost savings. This article shows the many variations possible, discusses problems in analyzing these structures and gives several current examples. The Time-Saver Standards on pp 195 and 196 discuss the geometry and analysis of space frames in some detail

While grid and space frameworks are not new in concept, or even in practice, they have not been extensively used in this country.

But since the list of applications is beginning to grow, it is important that the architect and engineer be aware of the availability of information on the design of these frames, be able to distinguish types of systems, and be conscious of the considerations involved in their structural designs.

There are many types of space structures. These take the general form of the simple monolithic grid, double layer grid and coplanar systems (folded or curved structures).

GRID SYSTEMS

A grid framework can be described as a continuous monolithic plane system usually symmetrically tied together by a series of longitudinal and transverse members to resist all applied forces acting normal to the system's plane.

The most common of these grids are the rectangular and diagonal types. The diagonal arrangement is commonly referred to as a "diagrid." The diagrid is the most popular because of its greater rigidity as compared to the rectangular grid system. Figure 1 shows layouts of various grid patterns most frequently occuring in practice. It is apparent from the geometry of the different systems shown that the analysis and fabrication costs would be less for the rectangular or diagrid arrangements than for the other types illustrated.

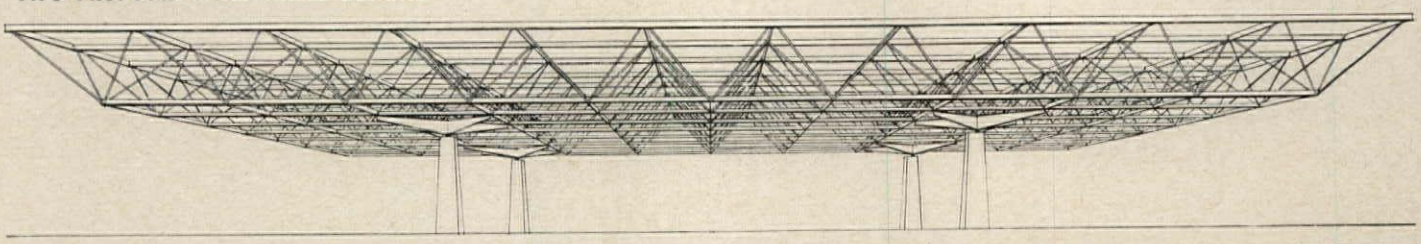
John Hotchkiss, Senior Regional Engineer for the AISC, in a paper on lamellas, diagrids and arches has cited the following advantages of grid construction:

1) Considerable reduction in required structural depth,
2) Avoidance of main beams and girders,
3) Notable saving in steel,
4) Simplification of fabrication due to repetition of members.

He pointed out further that a hypothetical grid system measuring 45 by 75 ft with no internal column support weighed 20.3 tons as compared with a weight of 26.6 tons for a floor system of girder and beam design—a saving of 6.3 tons of steel. In addition the grid system had a required depth of 18 in. as compared to a 36 in. depth for the conventional design. With a depth difference of 18 in. the architect and engineer could imagine what the saving in height might be for multi-story buildings in which large column-free areas are required.

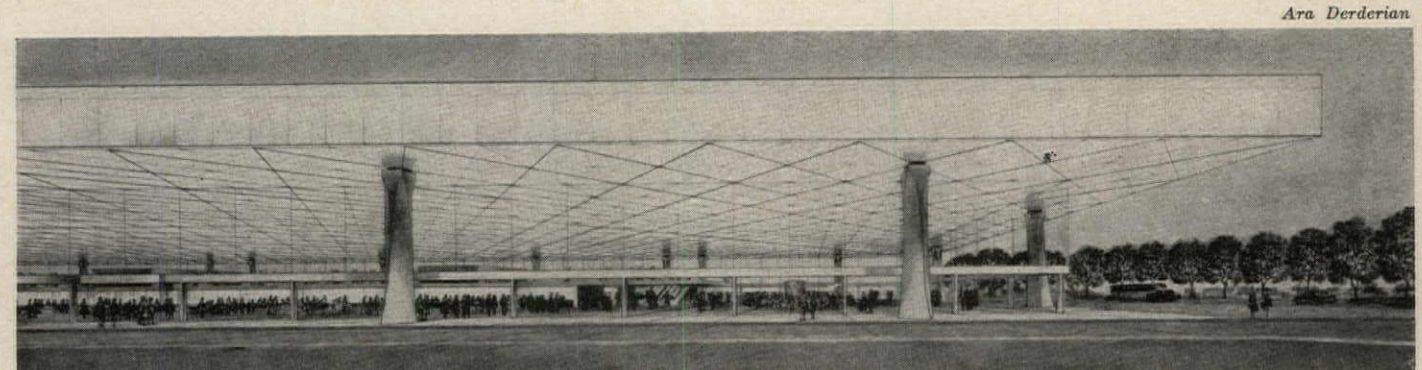
Grid systems are noted for their

TWO PROPOSED SPACE FRAME DESIGNS



Structural steel space frame for a high school in Peoria, Illinois covers an area of 280 by 168 ft, has a 28-ft cantilever, and is 14-ft deep. Foley, Hackler, Thompson and Lee, Architects. The Engineers Collaborative, Structural Engineers

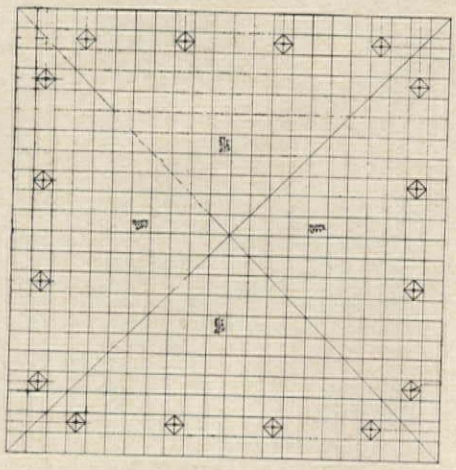
Ara Derderian

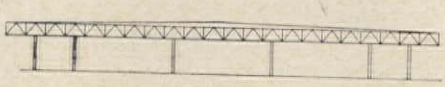


Competition winner for multi-airlines terminal at New York International Airport. Frame is 625 by 225 ft, spanning 200 ft between columns. Designed for pre-assembled steel tetrahedrons, the frame is tied together at the top by a reinforced concrete slab and at the bottom by tension cables in the central area, changing to steel compression members around columns. I.M. Pei & Associates, Architects; Ammann & Whitney, Structural Engineers

A RECTANGULAR DOUBLE-LAYER GRID

Roof structure of Cadet Dining Hall for Air Force Academy consists of 23 Warren trusses intersecting at right angles to cover an area 308 ft square. Skidmore, Owings & Merrill, Architects and Engineers





FOLDED-TRUSS ROOF

Folded roof for a high school gym in Littleton, Mass. is framed with structural steel shapes. The Architects Collaborative, Architects; Goldberg & LeMessurier, Structural Engineers

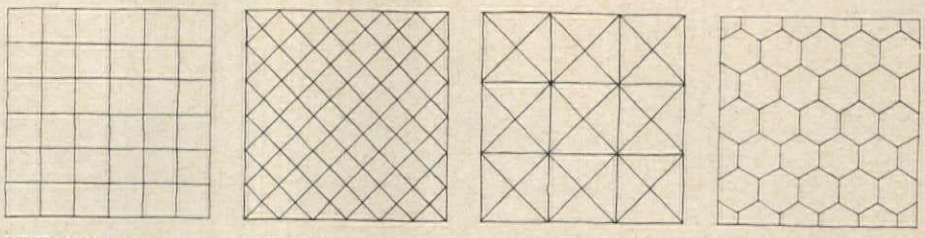


Figure 1. Grid Patterns Used in Structures

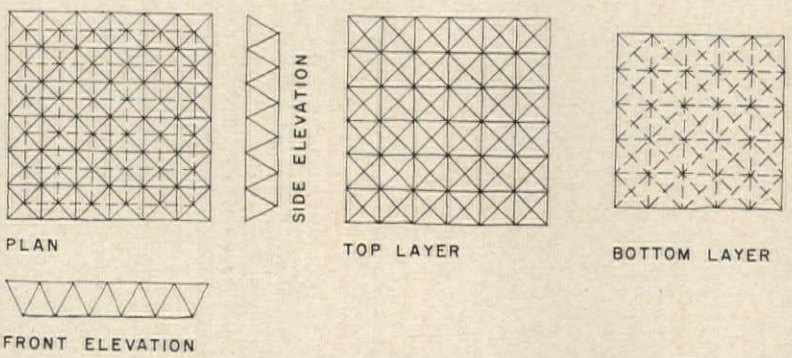


Figure 2. Typical Double Layer Grid System

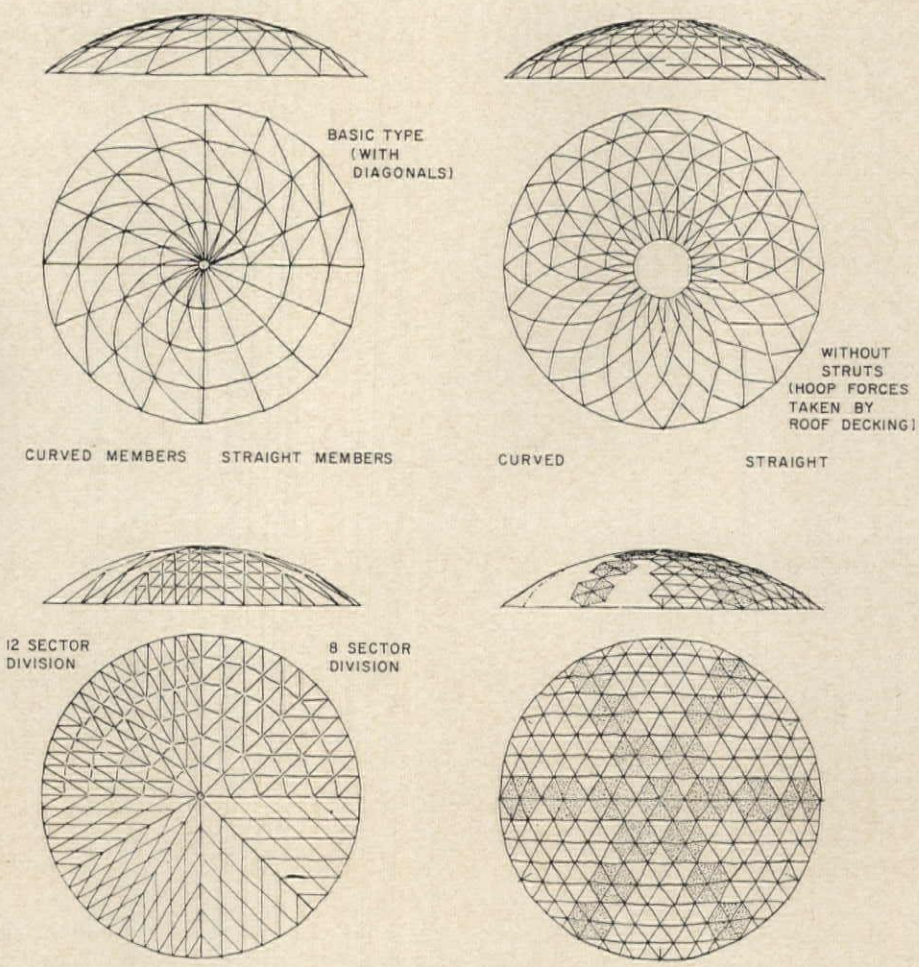


Figure 3. Dome Designs Incorporating Grid Patterns

ability to distribute loads throughout their interconnecting members. It is distribution of stress which allows large areas to be covered without internal columns.

The monolithic plane grid framework is normally erected as a roof or floor system. Interconnecting members are commonly fabricated of uniform cross-section. Monolithic two-way grids form an ideal roof or floor frame for earthquake-resistant structures in which the floor and roof elements have to transmit horizontal forces. Such grids provide many paths for these forces.

As greater unsupported areas are required, it may be found that the monolithic grid system becomes too cumbersome. The designer may then resort to the double-layer grid. A typical double-layer grid is shown in Figure 2. These three-dimensional planar systems are designed in many geometric patterns and have many names describing them; however, this writer prefers to call these frames "double-layer grid structures" as they are referred to by Dr. Z. S. Makowski in his paper published by the *Architectural Association Journal*, March 1961 (London). Dr. Makowski has done considerable research on many types of grid spatial structures.

These double layer systems are suited for structures under the action of heavy concentrated loads, and, like the monolithic grid systems, allow the engineer to take full advantage of repetition of members and prefabrication.

DOMES, ARCHES, FOLDED PLATES

The discussion thus far has been mainly about monolithic planar systems. Space structures often take the form of co-planar grid systems in the form of domes, arches, valley-ridge arrangements and other more complex spatial form.

From Figure 3, dome designs incorporating grid patterns can be classified as the following types:*

1) Schwedler Dome.
2) Lattice or Lamella types.
3) Parallel Lamella systems.
4) Hexagonal systems.

This space frame is defined here as a multi-planar continuous framework which acts simultaneously in three dimensions to resist all applied forces. Space frames not only take the form of arches, and domes, but also can be constructed as spatial grids and rigid frame bents in many different patterns.

Figure 4 shows some typical designs incorporating spatial grid arrangements.

Greater spans may be achieved with this folded plate, spatial grid method by utilizing what German engineers call a rhombic truss. The author prefers the term lattice girder. These girders are truss arrangements with interlaced, interconnecting members as shown in Figure 5 (a). Although these lattice sections are indeterminate, the idea is simply to provide a method for cutting down the l/r stiffness ratio of the truss chords and interconnecting members. This enables the engineer to design long span spatial truss arrangements constructed of relatively lightweight steel. Economical column-free spans up to 300 ft can be designed with lattice sections. For example, if lattice sections are laid in a simulated valley-ridge arrangement such as folded plates, one-story buildings can be made column free internally for widths up to 300 ft, and for lengths along the gable section to infinity. Figure 5 (b) shows typical double-layer spatial grid gable sections for long-span construc-

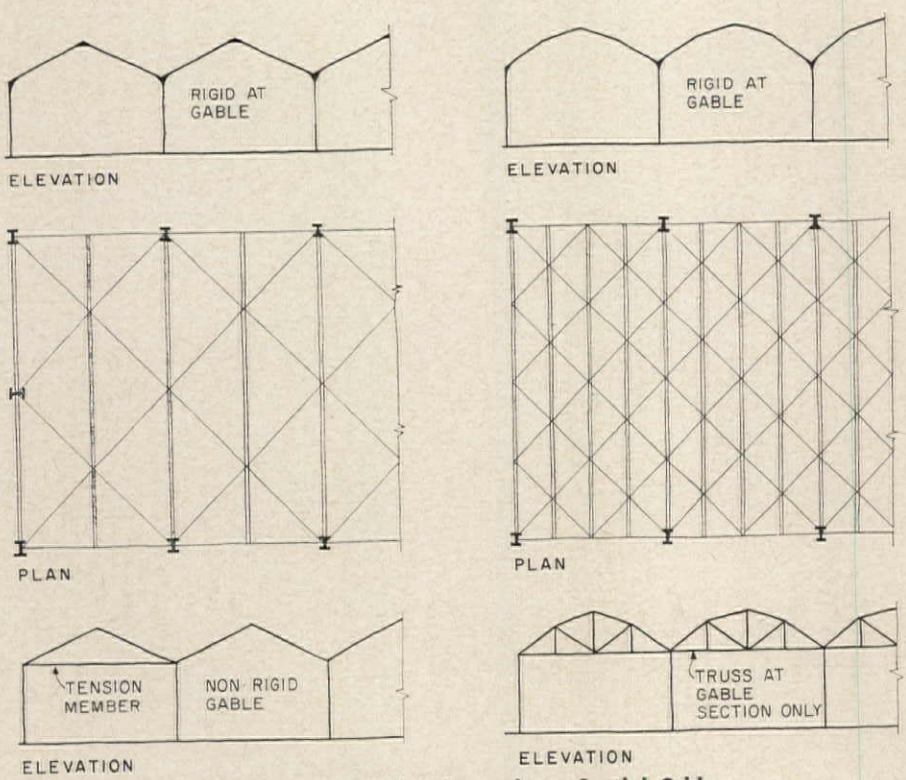


Figure 4. Two Typical Determinate Spatial Grids.

Definitions

GRID FRAMEWORK
A continuous monolithic plane system generally symmetrically tied together by a series of longitudinal and transverse members to resist all applied forces acting normal to the system's plane.

SPACE FRAME
A multi-planar continuous framework which acts simultaneously in three dimensions to resist all applied forces.

LATTICE GIRDER
An indeterminate truss system consisting of internal tension and compression members arranged in a grid pattern tying together the upper and lower chords so as to resist applied forces acting in line with the system's plane.

tion: valley ridge; barrel arches.

Spatial grids may be used for circular dome sections with the folded plate method. Figure 6 shows these members forming a valley-ridge, pie-shaped sectional arrangement terminating at a compression ring in the center of the structure. The individual truss sections may be designed as determinate members, or as lattice members where greater spans are required.

Axial forces are the prime concern in spatial grid arrangements. But in addition, the vertical loading conditions for bending must be investigated. Methods for determining axial and bending forces in determinate sections are covered in a very timely paper on a "Steel Frame Folded Plate Roof" by Oliver A. Baer shows the simplicity of designing these frames by statically determinate analysis. (American Society of Civil Engineers, *Journal of Structural Division Proceedings.*)

PLASTIC DESIGN

The author was asked recently if a ridged frame dome could be designed plastically. The structure in question was a circular shaped building divided into a 12-sided polygon with a diameter of 100 ft. The columns were 20 ft high. A typical section was analyzed. It was found that 14 WF 30 beams and columns were required to carry a uniform dead and live load of 70 lb per sq ft. Figure 7 shows the simple plastic analysis in algebraic-geometric form. Similar analysis may be performed for different dimensions and loading conditions.

A very good publication on the use of plastic analysis pertaining to grid frameworks is *Plastic Analysis of Structures*, Philip G. Hodge Jr., McGraw-Hill Book Co., Inc., 1959.

The most simple of the monolithic or co-planar grid-space systems are highly complex to analyze. If exact analysis is necessary, this complexity may be greatly reduced by assuming the joints as hinge-connected instead of rigid. Also, by ignoring the torsional forces the number of design calculations may be cut. Analysis of monolithic grids is discussed in "An

*These were discussed by Seymour Howard in Time-Saver Standards on "Metal Domes", AR, Nov., Dec., 1960

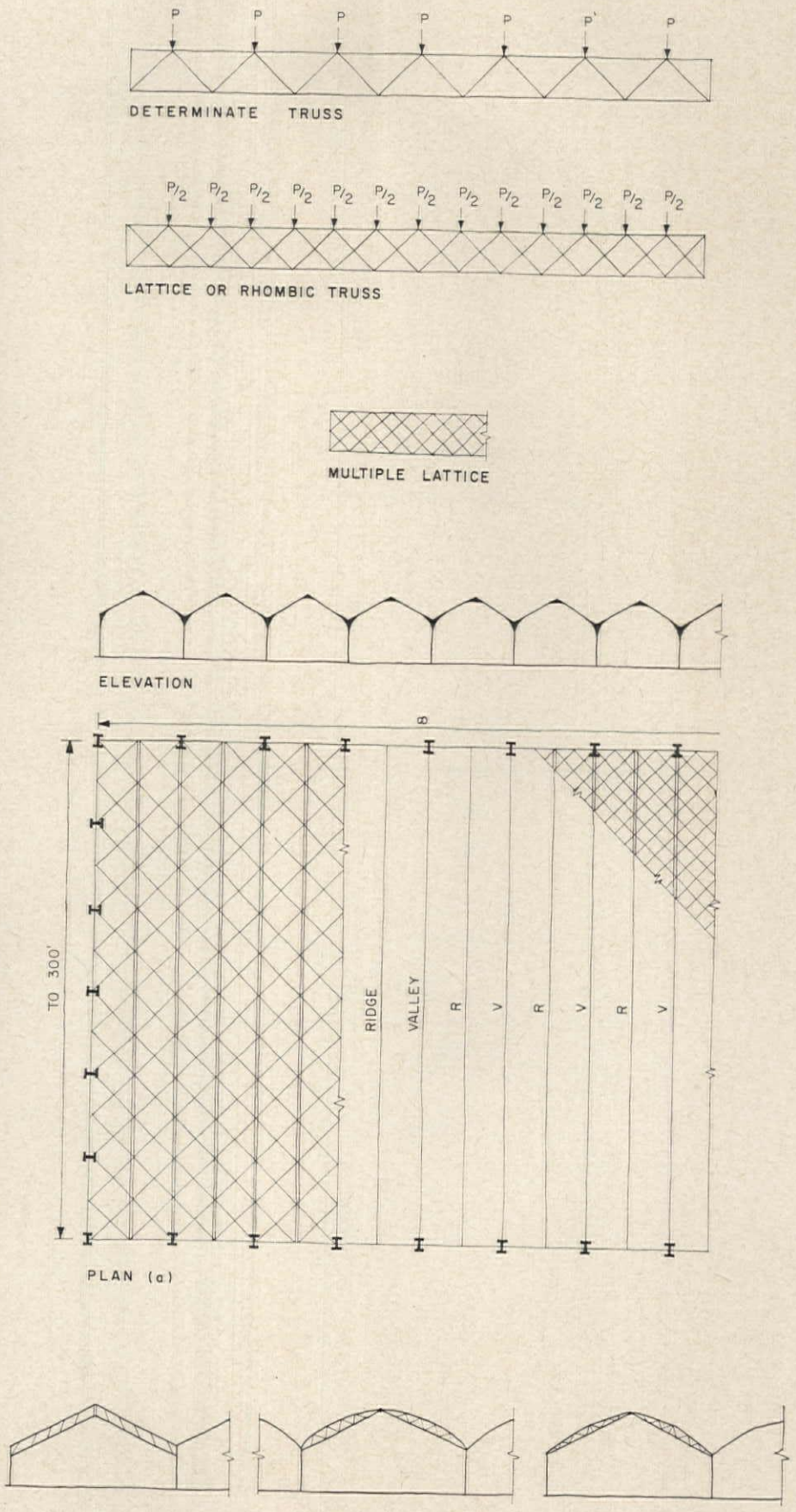


Figure 5. Typical Lattice Spatial Grid Arrangements

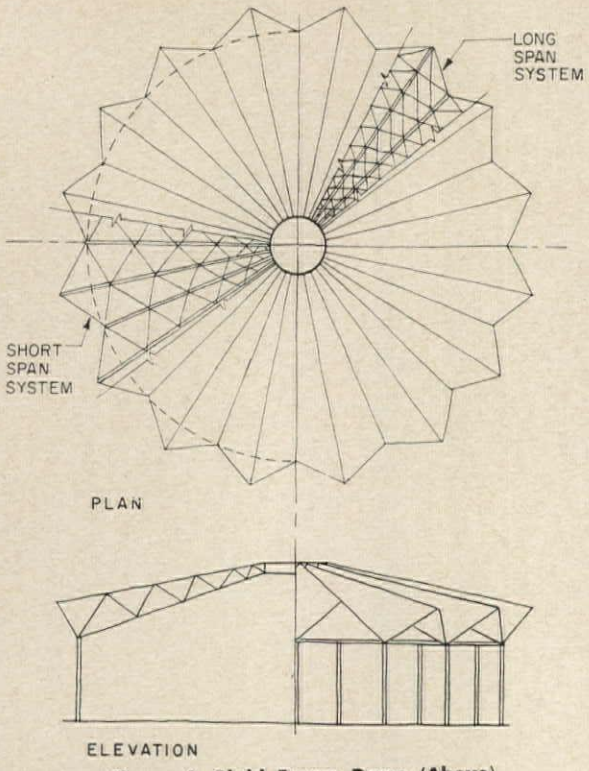
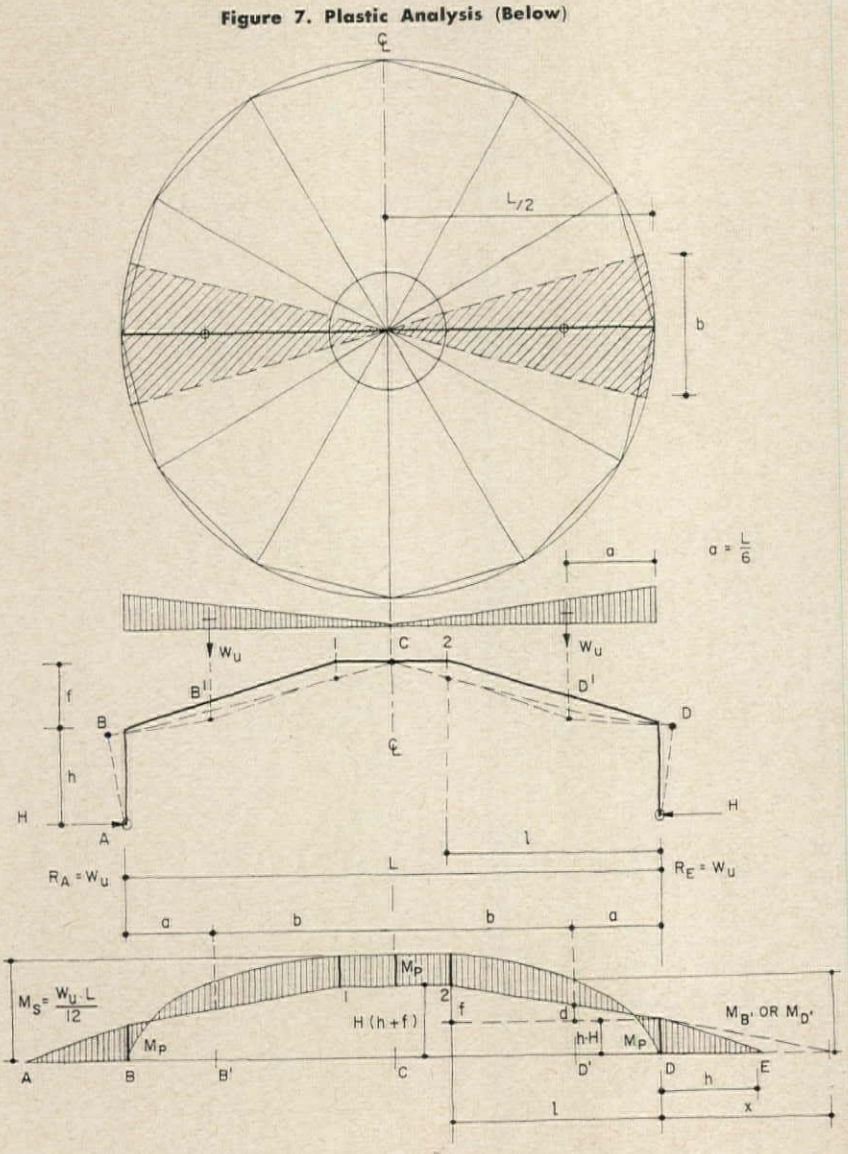


Figure 6. Rigid Frame Dome (Above)

Figure 7. Plastic Analysis (Below)



$w = lb/ft^2$

$W = \left(\frac{L \times b}{2}\right) \cdot w$

$W_u = 1.85 \cdot \left[\left(\frac{L \times b}{2}\right) \cdot w\right]$

$x = h \cdot l/f$

$d = h \cdot a/x$

Solve: $M_P = h \cdot H = \frac{W_u L}{12} - H(h+f)$

$M_{B'} = M_{P'} = \frac{1}{2} W_u \left(a - 2\frac{a^2}{L} + \frac{4}{3}\frac{a^3}{L^2}\right)$

CHECK $M_{B'} - H \cdot (h+d) \leq M_P$

Analysis of Open Grid Frameworks" by Dr. Makowski. His method permits the designer to solve a rectangular or diagrid frame in a matter of minutes. Dr. Makowski gives constants in chart form for determining moments, shears and deflections.

If the analysis is simplified by assuming the nodes hinge-connected, calculations will be on the conservative side. If lightness of the structure is the prime factor in design, however, the engineer must resort to more exact analysis. In this case the nodes would be assumed to be rigidly connected and all forces, moments and deflections would be considered. This analysis is highly redundant, especially with the co-planar or double layer systems. Where many contemplated complex designs are anticipated, it would probably be better for the designer to develop an electronic computer program. [Model analysis has been used where edge loading conditions were complicated and varying—Ed.]

The steel industry has made available new high-strength, low-alloy steels such as A440 and A441 which have yield strengths of 50,000 psi in rolled shapes and plate thicknesses to ¾ in. Another high-strength, heat-treated steel is now available in structural shapes with yields in excess of 100,000 psi.

Steel is available now with controlled properties and yield strengths ranging from 33,000 psi to over 100,000 psi.

Engineers can appreciate the structural advantages in conventional uses of these steels, let alone the advantages they may achieve with their use in space and grid frame design. And the architect can visualize the lightness in design possible.

Design tools are available to the engineer through a storehouse of reference material. It remains only for the architect and engineer to use these materials and apply these tools to open up space with structure.

The American Institute of Steel Construction has prepared a bibliography of some 30 references on grid and space frames. It is available without charge from: American Institute of Steel Construction, Inc., 101 Park Ave., New York 17, N. Y.

SPACE FRAMES: 1

by SEYMOUR HOWARD, *Architect, Associate Professor, Pratt Institute*

Space frames as defined here are essentially three-dimensional trusses. Known also as lattice structures, space frames may be thought of as three-dimensional equivalents of commonly used plane trusses.

Nature of Members

Just as with a plane truss, roof or floor decking and other elements should be arranged so that all loads are transferred to the joints of the truss. In that way all members of the truss can act as two-force members. Theoretically the members should have spherical (ball-and-socket) hinges at their ends—a most difficult condition to realize in practice. The construction of the joints, even with a certain amount of restraint, is a difficult and costly problem, and is, as a result, the principal basis for patents.

Materials

Space frames are typically built of steel or aluminum, but also may be of reinforced concrete, or even of wood if the joint problem is solved.

In order to simplify construction, the designer tends to use members of uniform size. If all the members are made of tubes of the same outside diameter, the wall thickness can be varied (although at considerable expense) to maintain uniform stresses in the material. Otherwise the majority of the members must be oversized in order that the most heavily loaded are not over-stressed.

Depth

The principal purpose of the depth of any structural assembly is to provide adequate moment arm between the upper and lower edges. The depths of space frames therefore correspond fairly closely to those of plane trusses under similar loadings. A single prismatic frame with heavy loads would require a depth of from $\frac{1}{6}$ to $\frac{1}{12}$ of the span. A complete floor system, however, with the top and bottom chords forming a two- or three-way grid similar to a system of closely spaced joists, would permit a minimum depth of $\frac{1}{20}$ to $\frac{1}{24}$ of the span.

Determining Forces

Most plane trusses used in building construction are statically determinate, and the forces (bar stresses) found through equations of statics or Maxwell-Cremona diagrams are reasonably accurate. For three-dimensional trusses, however, even though statically determinate, the forces found through statics equations alone are often not sufficiently accurate for an economical design. Their configurations are such that one or more members at a particular joint would often be statically redundant for a given loading. The end condition of the joints must also be taken into account. Solutions based on energy equations are more satisfactory, but are tedious. Model testing is probably the best method, but it is also costly.

The basic geometrical unit in space frames, as defined here, is the tetrahedron, corresponding to the triangle in plane trusses.

The minimum number of members (m) necessary for a rigid truss, is related to the number of joints (j) by the following formula:

$$m = 3j - 6$$

Although the corresponding formula for plane trusses ($m = 2j - 3$) is seldom used, since the triangulation can usually be checked by eye, the formula for three-dimensional trusses should always be used as a check on the number of members. The hexagonal, parallel-plane space truss shown in Figure 1, for example, would require at least three hexagons to

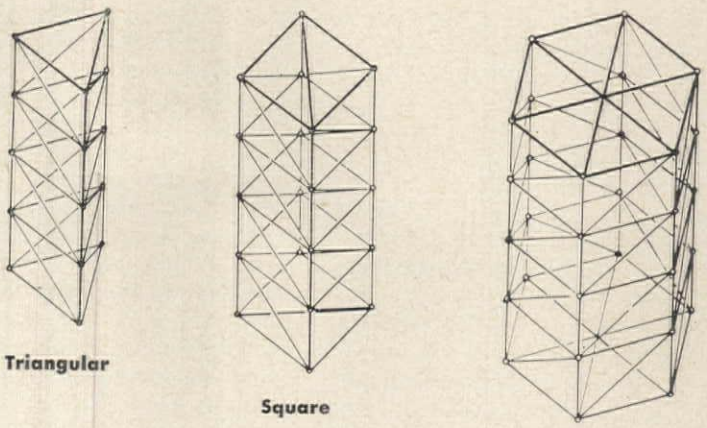
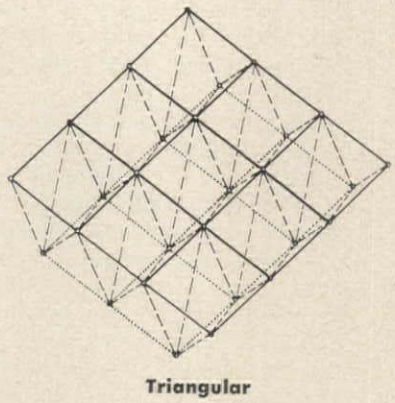
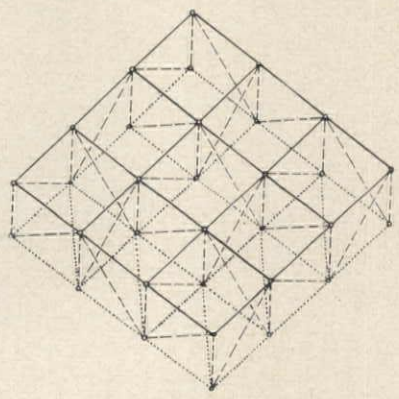


Figure 1: TOWERS





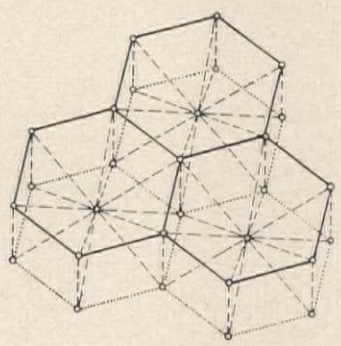


Figure 2: PRISMS

SPACE FRAMES: 2

by SEYMOUR HOWARD, *Architect, Associate Professor, Pratt Institute*

satisfy the formula; the type S isometric space truss would require at least six squares in the upper plane.

This formula expresses a necessary condition for rigidity, but not a sufficient one. Some configurations meet this condition, but still permit deformation. For such configurations, additional checks such as the "zero-load test" should be made. (For an example see *Theory of Structures* by S. Timoshenko and D. H. Young, McGraw-Hill, 1945.)

Types

The various types of space frames can be classified by the polyhedra from which they are built up.

For simple structures such as towers or isolated trusses, the space frame can be thought of as a single polyhedron. Any closed polyhedron whose faces are rigid (completely triangulated) must be itself rigid. Thus the triangular, square, and hexagonal towers shown in Fig. 1 can be completely hollow, provided the top and bottom planes are triangulated. The towers also can be hollow if they are laid on their sides as single trussed girders.

These three towers are drawn in axonometric projection. All vertical and horizontal members can be the same length; only the diagonals on the sides and across the top and bottom of the square must be longer.

In searching for a space-frame pattern suitable for a complete floor or roof, we need to investigate some of the lattices formed by the various space-filling polyhedra. We are interested in those lattices that give a level upper plane (floor) and a parallel lower plane (ceiling or floor). In Fig. 2 all the members in the upper planes are drawn with full lines. All those in the bottom plane with dotted lines, and those in between with broken lines.

The *triangular prism*, used as the basic geometrical unit, gives two sets of plane trusses, which meet at an angle (here 90 deg.)

The *cube* (or *rectangular prism*) also gives two sets of plane trusses. Note that diagonals are not generally provided in plan; thus, for rigidity, at least two complete edges of the floor system must be triangulated as shown. Floor or roof decking might be used to achieve this rigidity.

The hexagonal prism gives an upper and a lower plane of hexagons, connected vertically at each corner and diagonally from each upper corner to the diametrally opposite lower corner. Note the joint where the diagonals intersect. Three hexagonal prisms are needed for rigidity.

Octahedra plus tetrahedra give what may well be called isometric space frames. These lattices, which can be generated by the regular rhombehedron (itself made up of one octahedron and two tetrahedra) permit all members to be the same length. They correspond to the crystallographer's "face-centered cubic." (See Fig. 3).

If an isometric space lattice is cut by any plane containing the faces of the octahedra (and the tetrahedra), the result is a type T isometric space frame (so-called because of its triangular pattern on the plan.)

If, on the other hand, the lattice is cut by any plane containing the central squares of the octahedra, the result is a type S isometric space frame (because of the squares that appear on the plan.) This truss has the advantage of conforming easily to the plan of rectangular buildings. (It has been used, for example, in two experimental structures erected for Unistrut Corp.

Note that the formula for the number of members is not satisfied unless there are at least six squares in the upper plane and two in the lower.

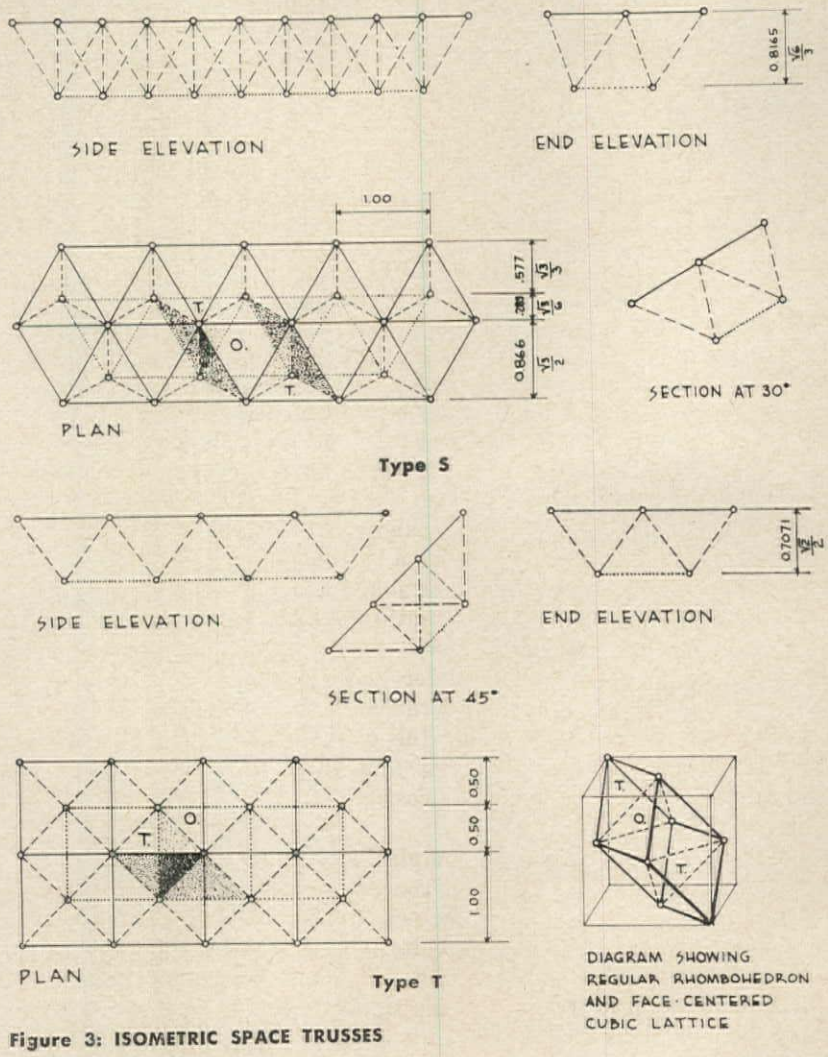
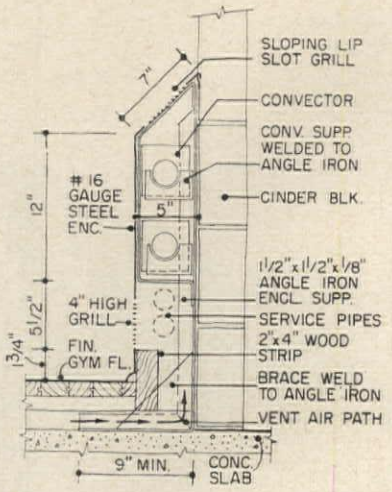


Figure 3: ISOMETRIC SPACE TRUSSES



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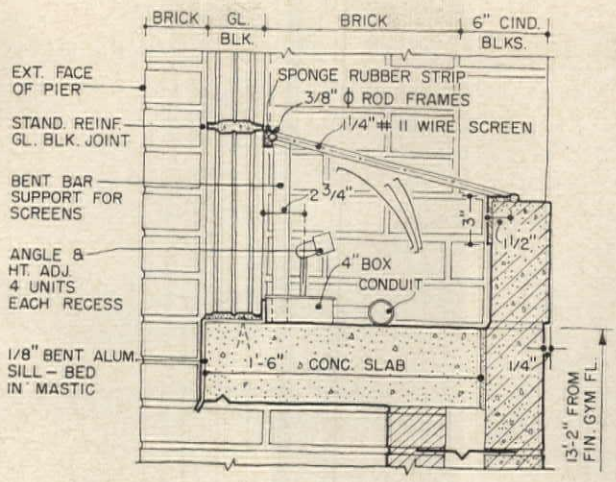


2

Two Details Cut Mechanical and Electrical Costs in Gyms

1. Arrangement for concealing heating piping eliminates trenching
2. Lighting system conveniently hides conduit

Searching for economies that might be applied to mechanical systems of a school addition recently, the office of George B. Post & Sons, New York, hit upon a means of eliminating long runs of expensive pipe trench. Lessing Williams of this firm, tells how the wall space beneath convectors in a slab-on-ground gymnasium was used as a chase to conceal utility piping which otherwise would have required many hundreds of dollars worth of trenching.

The detail which sparked the idea showed a standard convector in cross section against an outside wall (Fig. 1). It was known that, to withstand the impact of gym activity, a heavier than standard sheet metal cover would be needed for convectors. It became a simple matter, then, to increase the height of the cover to provide space for pipes mounted on the wall. The cover was extended to the floor, with slotted grille near the bottom and on the sloping top.

There were advantages to this treatment in addition to the saving of trenching costs. Air circulation through convectors was increased by stack effect of the deeper front. Access to pipes and valves was simplified. Appearance of the convector wall was improved. And the enclosed pipe chase allowed the venting of sub-floor sleeper spaces into this same channel to take advantage of stack effect and assure better ventilation between concrete slab and gym floor.

A variant of the same idea has been incorporated into Post plans for another building which was to have a run of piping through second floor joists near an outside wall. By mounting pipes, instead, in a furred chase enclosing also the convectors under second floor windows, appearance of the wall and accessibility of the piping were improved while joist strength was left unimpaired by costly boring for pipes.

Simplified Conduit Installation

At the East Woods School in Oyster Bay, N. Y., the Post firm, by a simple architectural device, solved a gymnasium lighting problem and at the same time saved a great deal of fixture and conduit installation expense.

The gymnasium was designed with brick facing on concrete block walls recessed between engaged columns on 10-ft centers. At clerestory height, precast reinforced concrete cross-members provided a soffit between columns and a sill supporting glass block panels to roof height flush with outside facia of sills (see photo). Indirect lighting, recessed at sill height, was to be reflected from the ceiling as a means for avoiding glare.

The problems of selecting lighting fixtures and attaching conduit to interior block walls, at the same time coping with the vulnerability of electrical components to gymnasium activities, were solved by simply continuing the block wall in 4-in. thickness one course higher than the sill (Fig. 2) as both light shield and protection. Conduit was then easily laid into the open channel thus formed between glass and concrete blocks. Sleeves were cast in for passage through columns. Swivel spot fixtures were installed at intervals in the channel and directed at the ceiling. Fixture and installation costs were much below normal, and a complete, protected, easily accessible system was provided.

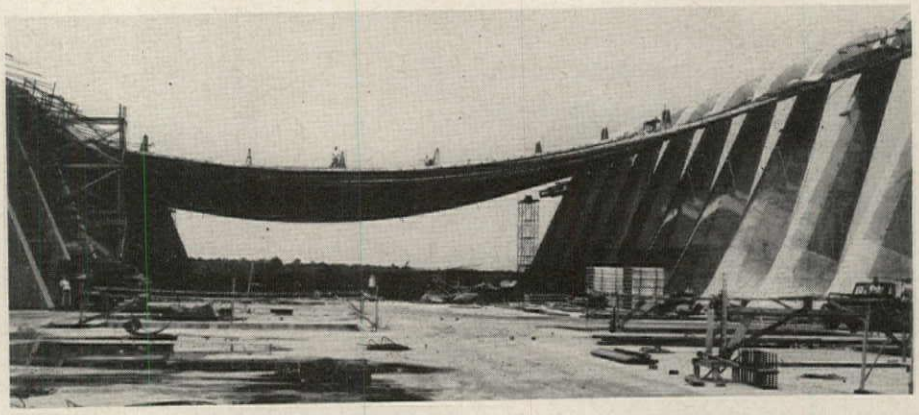
HAMMOCK-TYPE ROOF FOR DULLES AIRPORT

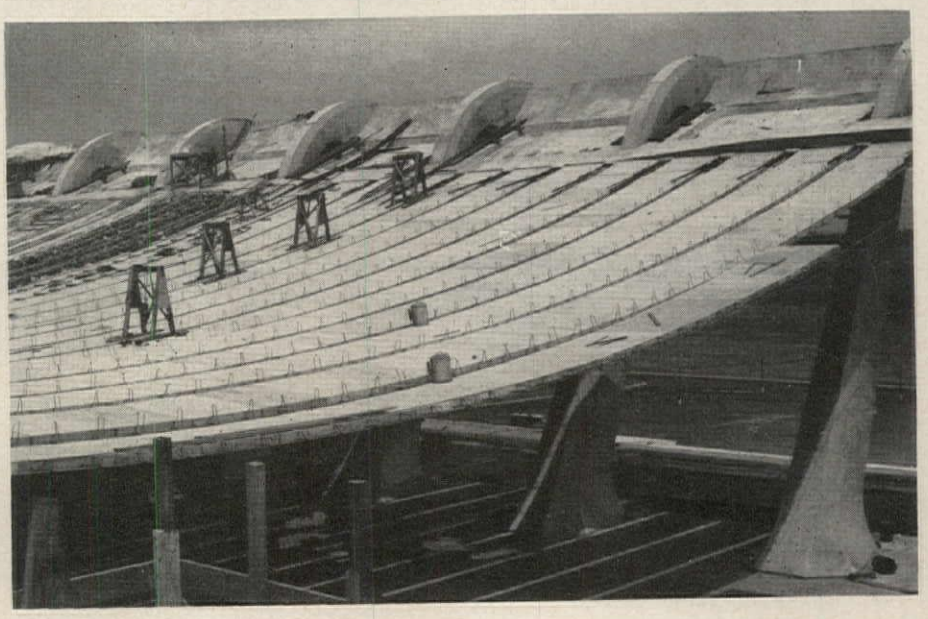
Construction is well advanced on the structure for the new Dulles International Airport west of Washington, D.C. by the office of Eero Saarinen.

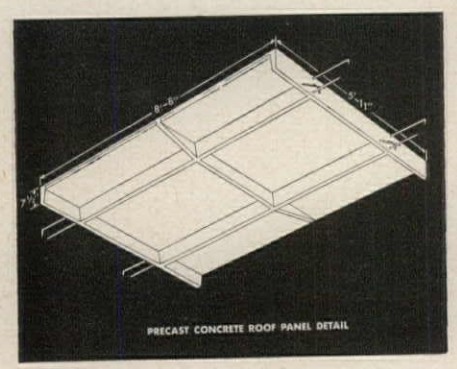
All interior columns have been eliminated by a hanging roof which is carried on 1-in. diameter catenary cables spanning 150 ft. The cables are fastened to an edge beam, which is poured in place between adjoining columns.

The roof decking, 89,800 sq ft in total area, will be made up of 1792 precast concrete panels. Poured concrete beams will go around the cables and between the panels.

The 1-in. slab between beams has 1½ in. of foamed polystyrene insulation cast to the underside.







PRECAST CONCRETE ROOF PANEL DETAIL

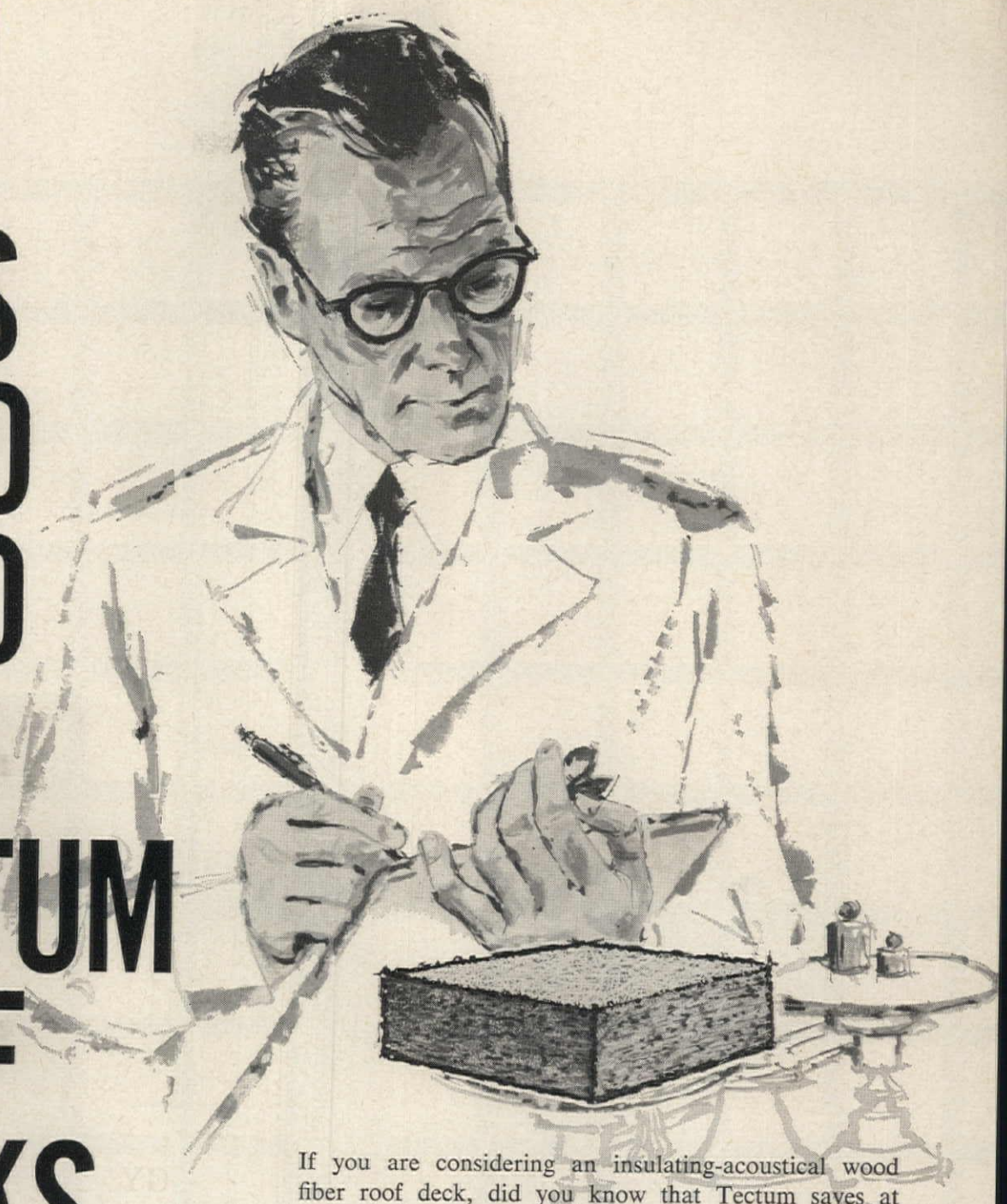
QUARTZ LAMPS HEAT AND LIGHT A GYMNASIUM

Fifty electric infrared fixtures in a new gymnasium for Greenville College, Greenville, Illinois, supply heat as well as 150 footcandles of light on the playing floor. Tubular quartz infrared lamps are used which convert about 87 per cent of their input wattage into radiant heat.

Each row of fixtures contains one type which has a reflector specifically designed to direct or spread infrared heat over a particular area or zone of the floor below. This allows the concentration of more heat on spectator seating, for instance, than on the playing area of the floor where less heat is needed. The fixtures are also specially designed to reduce glare in the range of vision to a comfortable level.

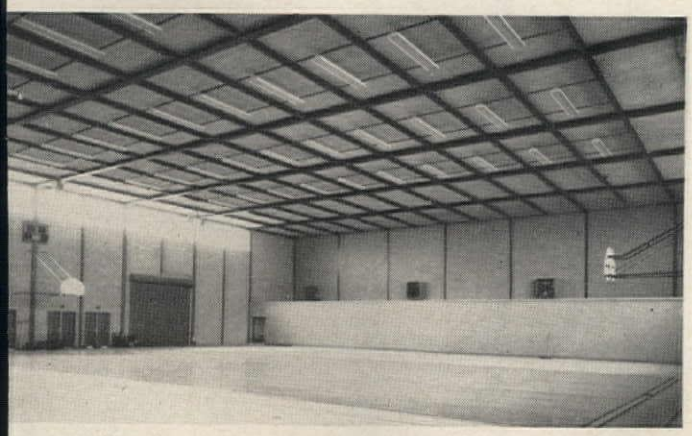
Operating costs for the entire 1960-61 winter heating season were reported to be less than $2000. The photo shows the switch gear for lamps.

40% LESS DEAD LOAD with TECTUM ROOF DECKS



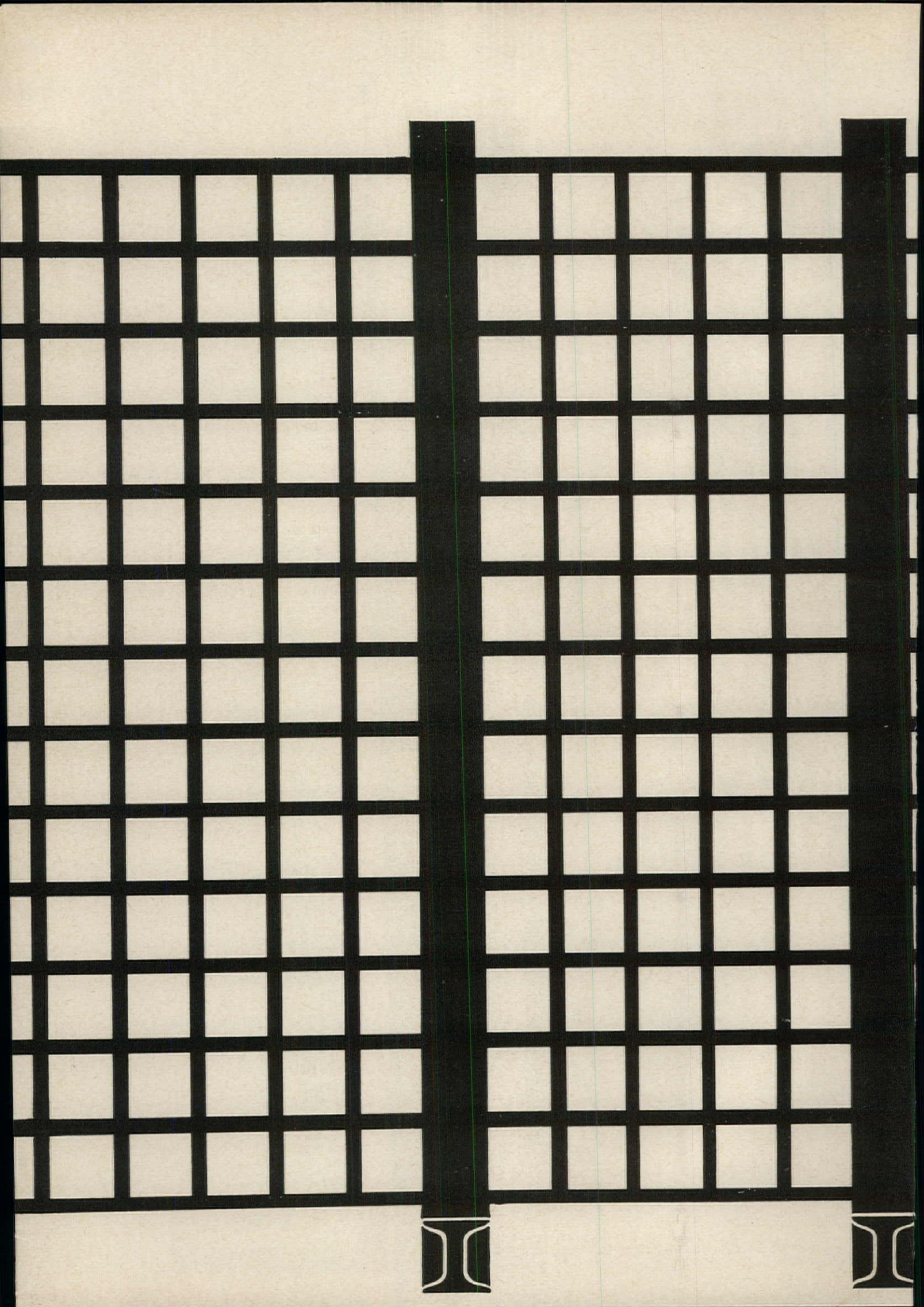
If you are considering an insulating-acoustical wood fiber roof deck, did you know that Tectum saves at least 40% of the total roof deck weight? On a building of 100,000 square feet this is the equivalent of nearly 200 tons reduction in dead load on framing, load bearing walls and foundation. Translate this into possible steel savings, shipping and erection costs or improved safety factors and you'll appreciate how much Tectum contributes toward building economies.

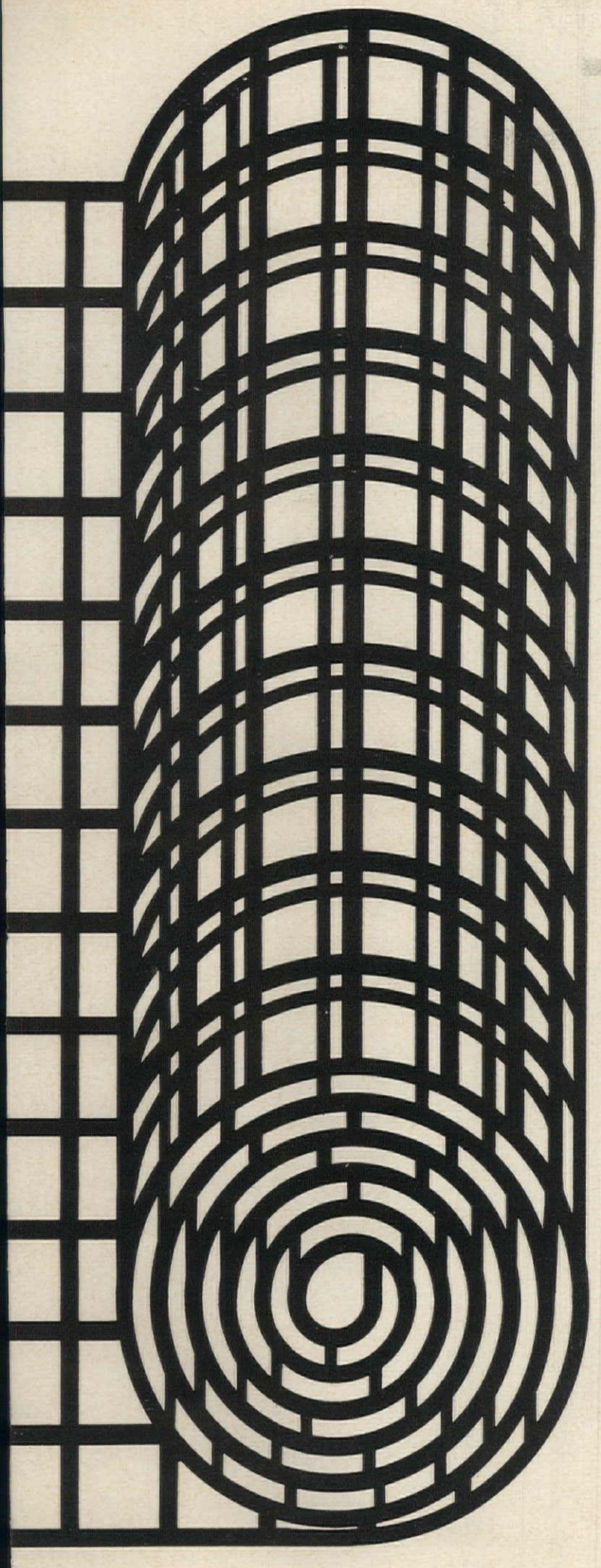
An independent research laboratory recently tested Tectum and two other similar wood fiber roof deck materials for an architect client. Tectum's sample weighed 5.4 psf; Type A, 9.2 psf; Type B, 9.8 psf. Tectum is the only structural wood fiber board that does not use Portland cement as a binder. Thus the weight advantage — as well as several other features you'll want to consider. For complete information see your Tectum representative or write Tectum Corporation, 535 East Broad Street, Columbus 15, Ohio.



The new Savannah, Georgia Armory, illustrated, is an excellent example of utilizing Tectum's lighter weight to improve safety factors. The armory, built on an unfavorable soil condition, makes use of a rigid steel frame, concrete block walls and Tectum roof deck. The frame carries the weight. Walls act only as screens. **Architects:** Thomas, Driscoll, Hutton, Savannah, Ga. **General Contractor:** Hugh Jackson, Savannah, Ga.

Tectum®





PLACE REINFORCING STEEL 1/3 FASTER

Consider the advantages of eliminating the thousands of time-consuming placing and tying operations required by bar reinforcement. It's a lot easier to reinforce concrete with USS American Welded Wire Fabric. We can furnish it in easy-to-handle rolls which are quickly unrolled into position, or in flat sheets sized to your exact specifications. Either way, we believe you can save at least 1/3 placement time. In many cases the building can be finished and ready for occupancy sooner when fabric is used —this is another profitable advantage of American Welded Wire Fabric. ■ USS American Welded Wire Fabric has many other advantages, too. It is made from cold-drawn, 60,000 psi minimum yield strength wire, meeting ASTM Specifications A-185. Higher working stresses can be used since high bond value is guaranteed by the positive anchorage provided at each welded intersection. Spacing of each reinforcing member is guaranteed to a close tolerance of ± ¼" and each reinforcing member is cold drawn to a tolerance of .003 of an inch. That means less steel, less freight, lower handling and installing costs. Since it is pre-fabricated, welded wire fabric requires less man hours per ton to place than loose reinforcing members. ■ All concrete fills or slabs on grade should be reinforced with Welded Wire Fabric because it increases the strength of a plain concrete slab 30%. The cost of the fabric reinforcement slab is therefore much less than an unreinforced slab of equal strength. ■ For a complete look at the cost and design advantages of USS American Welded Wire Fabric, call or write American Steel and Wire, Dept. 1406, Rockefeller Building, Cleveland 13, Ohio. We will gladly assist you on any concrete reinforcing problem.

Innovators in wire

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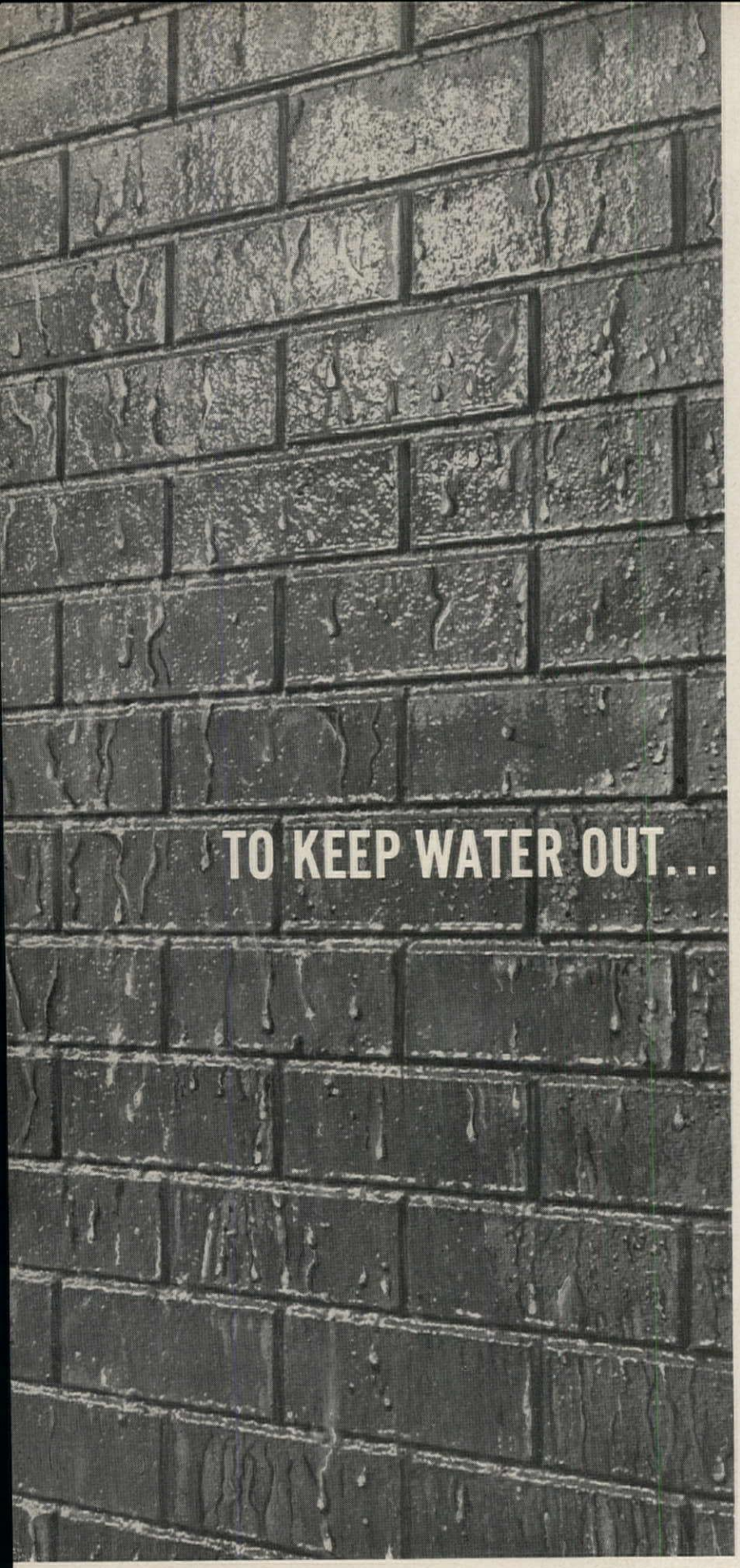
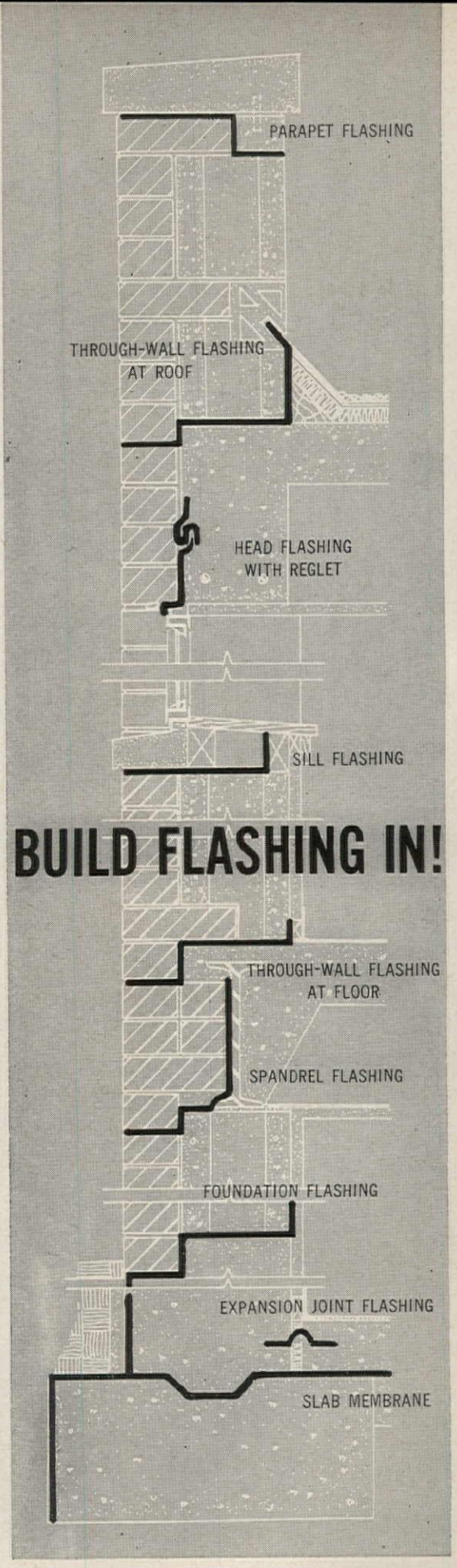
American Steel and Wire Division of United States Steel

Columbia-Geneva Steel Division, San Francisco
Tennessee Coal and Iron Division, Fairfield, Alabama
United States Steel Export Company



TO KEEP WATER OUT...



BUILD FLASHING IN!

Moisture constantly seeks the fatal point of access into every type of construction. Wasco Flashings bar the way. Today, buildings can be permanently protected against water damage . . . at a cost rarely exceeding five hundredths of one per cent of total construction investment . . . with Wasco Flashing.

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A Lexicon for PLASTICS IN BUILDING

Part II (Conclusion)

When the properties of plastics are compared with conventional materials, it is apparent that along with the similarities are numerous differences. It is important, therefore, that the physical and chemical properties of plastics be kept in mind by the designer. Such characteristics as thermal coefficients, weather resistance, corrosion resistance, fire behavior and deformation under load must be appraised in selecting plastics for building components

by William Demarest
Director, Plastics in Building
Manufacturing Chemists' Association, Inc.

Water & Vapor Barriers

MEMBRANES, FLASHING, TAPES

Plastics typically employed—Polyethylene; PVC; Saran.

Preferred because—Flexible; sealable, thus offering waterproof sheeting of any size. Sufficient elasticity can be formulated to accommodate building's movements, also to seal around penetrating nails, pipes, etc.

Remarks—Plastic foams employed as thermal insulation often double as vapor barriers; so can plastic films applied to sheets such as plywood. With flashing and tapes, it must be kept in mind that some plastics are formulated only for placement within the construction, not for exposure to ultra-violet and weather.

WEATHERSTRIPPING, WATERSTOPS

Plastics typically employed—PVC; polyurethane.

Preferred because—Can be formulated for elasticity approaching that of synthetic rubbers, which are also common in these applications. No corrosion; no staining. Thermoplastics, such as PVC, readily joined at mitered corners by "welding," or thermal-pressure-joinery.

Remarks—Such flexible materials, in extruded form, offer ideal water-stop-expansion-joint between adjacent pours of concrete slab or wall. Another class of synthetics somewhat related to plastics are also important in building as water-barriers: "elastomers" (i.e. rubbery materials) such as neoprene gaskets and sheeting, polysulfide and butadiene sealants, silicone polymers, synthetic-rubber roof coatings, and the like.

Thermal Insulation

Plastics typically employed—Polystyrene, polyurethane (foams).

Preferred because—Insulating properties not reduced by wetting; density readily controlled; special properties possible: adhesiveness, vapor barrier, some structural strength, decorative translucence.

Remarks—Where desirable to fill voids, may be foamed-in-place. Although these foams burn when held in a flame, they usually are self-extinguishing.

Structural Elements

Plastics typically employed—Polyester or epoxy, reinforced with glass fibers; rigid PVC.

Preferred because—Make possible high strength-to-weight ratios.

Remarks—Plastics have been used in sandwich panels for faces, adhesives and cores. Phenolic impregnated kraft honeycomb is probably the most used core material. More recently polystyrene and polyurethane foams have come into use. So far plastics have been little used structurally for load-bearing panels sandwich.

Finish Hardware

Plastics typically employed—Almost all the thermoplastics listed here and most of the thermosets.

Preferred because—Good decorative characteristics; minimal maintenance; inexpensive even when intricately shaped. Certain properties often determine specific applications; for instance, nylon's superb wear-resistance has introduced it into door hardware.

Remarks—Plastic or plastic-coated insect screening popular because non-corroding. Plastic drawers now as commonplace as plastic chairs. Plastics safer than glass or ceramic for knobs and handles, towel bars, etc.

Electrical Components

Plastics typically employed—All.

Preferred because—Superior electrical properties, especially under adverse conditions such as prolonged dampness, vibration, etc. Translucency the basis for widespread use as electric-light diffusers, including "luminous ceilings."

Remarks—First major commercial area for plastics (in the 1920's) was electrical applications; this continues to broaden with the increase of electrical and electronic complexity in buildings.

Plumbing

Plastics typically employed—For fixtures and fittings, reinforced polyester, rigid PVC, ABS; for piping, polyethylene, PVC, and various butadiene blends akin to ABS.

Preferred because—No corrosion. Easy to handle, to assemble. Fewer joints; easy maintenance.

Remarks—At present only higher-priced plastic pipes will handle hot liquids under pressure; therefore plastic pipe is generally limited to industrial uses. But lower-priced plastics to do this are just around the corner and may revolutionize residential plumbing.

Miscellaneous Construction Aids

Translucent polyethylene film provides an ideal temporary enclosure for wintertime construction. The same material is widely used as an inexpensive tarpaulin to protect equipment or materials stored on site. A top-quality, very durable tarpaulin is PVC-coated nylon fabric. Plastic chairs to support reinforcing rods in concrete make good use of the non-corrosive properties of plastics. Various plastic coatings for concrete forms produce smoother concrete, prolong the life of the forms, and make their removal easier. Strippable plastic coatings are used to protect plumbing fixtures and finished metal surfaces during construction.

The synthetic resins upon which most paints are based today are closely identified with the plastics discussed here; so, too, are a number of adhesives and binders that are important in building: phenolic adhesives for exterior-grade plywood, phenolic binders for glass-fiber insulating batts and boards, urea particle-board binders, resorcinol or epoxy adhesives, and similar materials.

DESIGNING FOR PLASTICS

Thermal Coefficient

Thermal expansion and contraction of plastics is typically high; the coefficient is five or more times that of metals. This calls for special care in detailing, keeping in mind movement in the major axis or plane of the component. Thus means should be devised for avoiding or disguising distortion of large sheets. In the same general connection, an important advantage of plastics for use in building is their capability of being formed fairly readily to resist stress concentrations, whether arising from thermal movement or other causes.

Durability

Weathering of plastics outdoors and the general durability of plastics when not exposed to the weather, are questions uppermost in the minds of designers and specifiers. Unfortunately, the plastics industry has not yet succeeded in developing accelerated laboratory tests that reliably predict the weathering performance of materials over periods of 20 years and more.

The record of actual exposures, of course, grows longer and more complete all the while. There are acrylics that have stood up well under outdoor exposures exceeding 20 years. A few other plastics can point to exterior installations 15 years or more old, with negligible deterioration. With new formulations constantly appearing, the designer can only cautiously weigh the variables. The more easily replaceable components —glazing, for example—might not have to prove themselves by decades of actual exposure-history if replacement costs were counterbalanced by other factors: low initial installed cost, good appearance, resistance to damage, ease of maintenance.

Aside from weather-erosion and deterioration under ultra-violet light, the general durability of plastics in typical building applications has been very good. PVC for example provides perhaps the best resilient flooring from the viewpoint of standing up under neglect. According to accelerated tests, nylon outwears bronze mechanically. Many plastics offer impact resistance that makes them more durable than alternative materials for the same application. (The success of plastic and plastic-coated luggage illustrates this.) Sometimes the properties which provide durability in plastics also enhance their attributes for safety. For example, the use of plastics in shower doors and room dividers is appropriate since it is almost impossible to fall through them. Even if broken they are a negligible hazard.

Corrosion, Stain Resistance

Another aspect of plastics' durability which can be all-important to the designer is that they are not subject to chemical corrosion or to electrolytic action. This generalization must be modified, however, by pointing out that some plastic materials are selectively attacked by certain classes of solvents—mostly chemicals that are not likely to be found outside laboratory or industrial buildings. (Where a plastic is to be put to a new use, the designer would be wise to check the possibilities against a listing of the degree to which a number of chemicals will attack it. Such tabulations are available from the producer of the basic material.) This absence of ordinary corrosion means absence of staining as well as increased durability.

Fire Behavior

Being organic materials, all plastics can be destroyed by fire. Although some plastics burn of themselves, many are self-extinguishing when the flame igniting them has been removed. Among these flammable plastics, there is a great range of the degree of ease of ignition. Another organic material, wood, perhaps exemplifies the average burning characteristics of plastics and is easily kept in mind by the designer. Where actual fire hazards may be present, specific properties of the material must be considered. Thermoplasties, for instance, will soften —perhaps melt—before a fire even reaches them. Partly depending on the softening temperature, this may be bad or good: Underwriters' Laboratories approves those plastics for ceiling light-diffusion that can be relied upon in case of fire to fall out of position soon enough so as not to interfere with effectiveness of sprinklers placed above the suspended ceiling.

Most building codes do not take ease of ignition into account, but the designer should do so wherever he believes that this could bear on fire safety. Codes do emphasize two characteristics of materials, both of which presuppose an out-of-control blaze already going: One is fire retardation, and this is something only for heavy constructions of brick, concrete, etc.—not for organic materials. The other is the rate at which flame may spread across the surface of a flammable material. Especially in spaces used by the public, this can become a fire- and panic-hazard and should be kept in mind, building code or no. According to the various standard tests used for measuring this characteristic, the flammable plastics present a wide range of surface-flame-travel. Some will hardly spread flame at all; others will do so faster than woods.

Deformation Under Load

"Creep" is a property of most materials, but, with traditional materials of construction, it is reasonable to assume elastic behavior within certain limits of stress. However, many plastics, especially the thermoplastics, exhibit time-dependent plastic behavior: flow, or creep, of the material under load, so deformation depends not only on the load, but also on the rate at which it is applied and on its duration. Further, this phenomenon is greater at elevated temperatures. In the case of many plastics, these relationships are of major significance and must be taken into account; otherwise, failures may occur. Appropriate stress levels and factors of safety must be employed. For materials exhibiting no sharply defined yield points or elastic limits, the working stresses are likely to depend upon the degree of creep that can be tolerated.

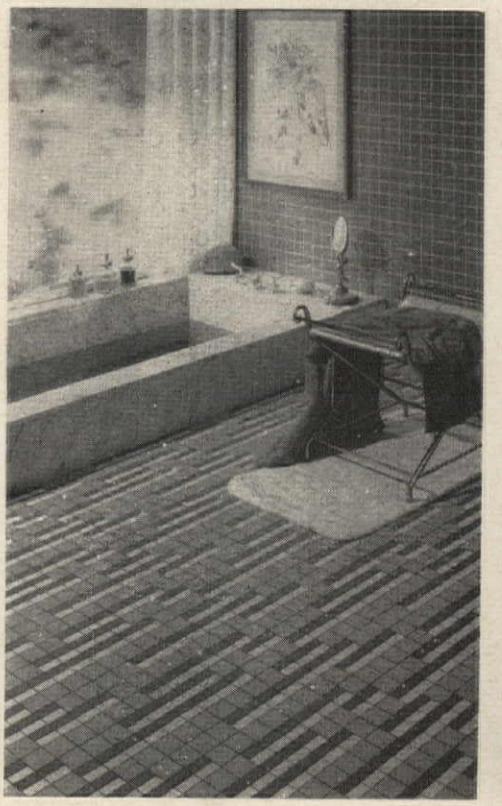
MOSAIC TILE LINE OFFERS DESIGN, COLOR, VARIETY

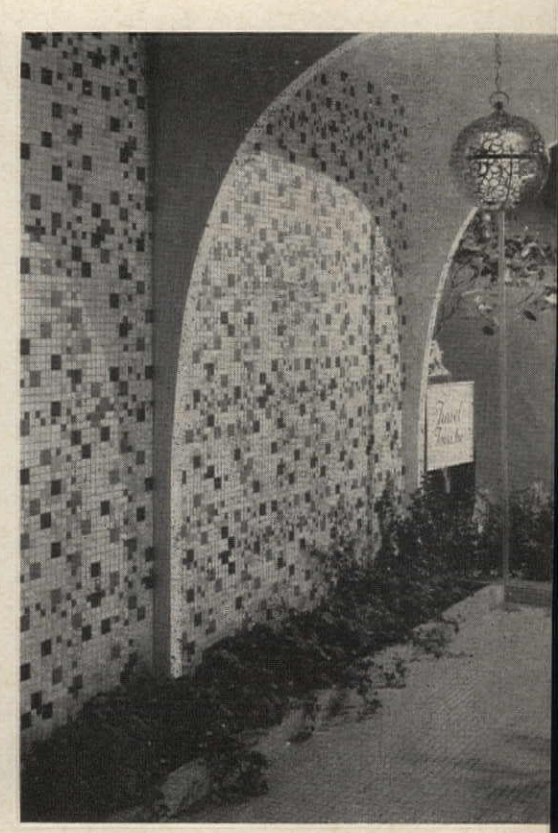
The *Precedent Collection* of ceramic mosaic tiles incorporates a new tile body, new sizes, colors and patterns.

The tile body is denser and finer grained than previous ones, resulting in a tile body more resistant to stains and easier to clean. The tiles are made in three modular sizes: 1 by 1 in., 2 by 1 in., and 2 by 2 in.—making possible a wide variety of patterns, including custom designs.

There are 54 colors to choose from, 28 *Clearline* colors—bright and pastel hues, 14 *Texline*—colors softened by the addition of white flecks and 12 glazed accent colors. The colors were developed to harmonize with each other and to co-ordinate with standard glazed tile colors.

Fifty-three patterns are being featured, divided into seven groups—designer patterns, *Texline* blends, 1 by 1 in. blends, stripes, 2 by 2 in. blends, 2 by 1 in. blends and block random patterns. *American Olean Tile Co., Lansdale, Penn.*





AREA LIGHTING FIXTURES INTRODUCED

New area lighting fixtures to serve a variety of needs have been introduced by the General Electric Co.

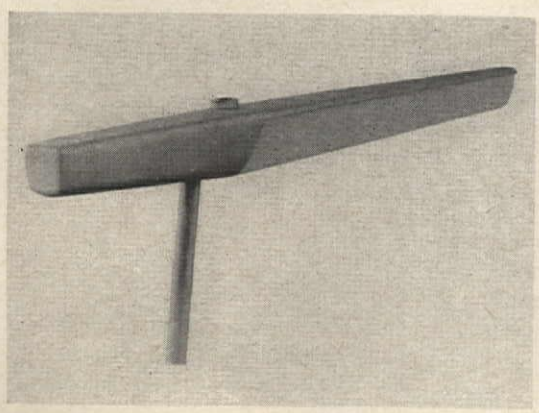
A compact floodlight (center, below) for high-intensity area lighting utilizes the *Quartzline* lamp, which produces 20 per cent more light and has twice the lamp life of conventional filament sources. The units, about the size of small television sets, are available in 500 and 1500 watts. They are designed for large areas where their wide horizontal beam and narrow vertical beam with sharp cutoff make fewer poles necessary.

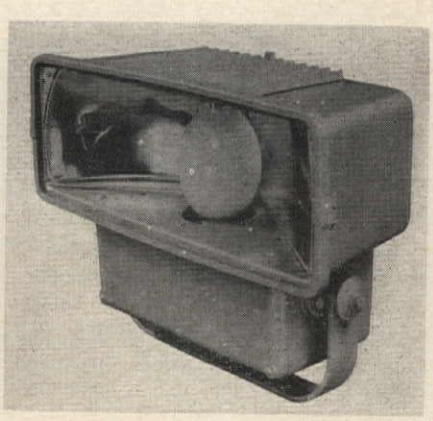
An internal-ballast mercury floodlight (right, below) is designed for high efficiency and long life. A wrap-around reflector provides a wide angle beam for uniform coverage of wide rectangular areas.

Where appearance is a primary consideration, a fluorescent post-mounted lamp (left, below) offers a broad distribution pattern of soft, glare-free light. The fixture uses a single four-foot *Power-Groove* lamp, which produces 6,900 lumens of light from 150 watts. It is mounted from 10 to 20 ft above the ground.

Two other post-mounted fixtures are designed for areas such as walkways where low mounting heights (10 to 20 ft) and decorative appearance are important. One unit is designed for both mercury-vapor or incandescent lamps. It is available in a variety of light distribution patterns. The other unit is similar, but uses only incandescent lamps. *General Electric, Hendersonville, N.C.*

more products on page 208





Structural Steel

Significant developments in constructional steels and new design concepts are summarized in a 28-page booklet which gives technical data and ideas to guide people who design, fabricate and build with structural steels. Among the subjects treated are carbon and low-alloy steels, wide-flange beam sections and ideas for composite construction with dissimilar materials. *Market Development Division, Room 2809, U. S. Steel Corp., 525 William Penn Place, Pittsburgh 30, Penn.**

Industrial Gas Heaters

Industrial applications of direct fired gas heaters are discussed in an eight-page heating handbook, second in a series of handbooks discussing direct-fired gas heating equipment. *Reznor Mfg. Co., Mercer, Penn.**

Calcium Chloride in Concreting

Three new booklets are now available to concrete users. *Year Round Concreting,* (A.I.A. 3-B-2) summarizes the American Concrete Institute's recommendations for cold weather concreting. *Calcium Chloride for Concrete Construction* is designed for engineers who wish to accelerate the set of concrete, especially at temperatures below 70° F. *Calcium Chloride in Concrete* is a 40-page technical manual with data on major effects of calcium chloride, strength, cold weather protection and air entrained concrete. *Calcium Chloride Institute, 909 Ring Bldg., Washington 6, D.C.*

Fluorescent Lamps

A line of commercial recessed fluorescent luminaires—the *Mark II Mainliner*—is described in a 10-page booklet, No. B-8235, *Westinghouse Lighting Division, Edgewater Park, Cleveland, Ohio**

Door Selection Sheet

A single reference sheet simplifies selection of the proper frames and doors for particular uses. *The Steelcraft Manufacturing Co., 9017 Blue Ash Rd., Cincinnati 42, Ohio**

Steel Pipe

The varied uses of steel pipe in buildings, design, etc., and specifications for the different kinds of pipe needed are told in a 30-page booklet. *Wheeling Steel Corp., Wheeling, W. Va.*

Fiber Pipe and Conduits

Applications of bituminized fiber pipe, conduits and fittings are given in two booklets, a 12-page "Fibre Pipe Catalog" and an eight-page "Electrical Conduit Catalog." *Bermico Div., Brown Co., Berlin, N.H.**

Air Handling Troffer

Illustrated manual describes *Triple-Shell Lumi-Flo* air handling troffer, showing how it provides lighting, heating, ventilating and air conditioning from the same concealed ceiling unit. Installation and engineering data included. Bulletin B. *Benjamin Division, Thomas Industries Inc., 207 E. Broadway, Louisville, Ky.**

Masonry Wall Construction

Five reports summarize studies of masonry wall construction. Three deal with masonry wall reinforcing in stacked bond, glass block and cavity forms. The others consider shear strength of two types of masonry wall control joint materials. *Duro-O-waL, Cedar Rapids, Iowa.**

Lighting Style Book

A 96-page lighting fixture catalog features more than 450 styles, many appropriate for stores, offices, etc. as well as houses. *Lightolier, Jersey City, N.J.**

Multizone Air Conditioning

Detailed technical information about multizone air conditioning units is included in a 64-page handbook which describes 24 different units. Bulletin 34, *Marlo Coil Co., 7100 S. Grand Ave., St. Louis 11, Mo.**

Plumbing Layout Sheets

Over 20 different institutional plumbing layout sheets, showing details of piping and connections in different plumbing installations have been compiled from drawings of actual institutional installations. *Aluminum Plumbing Fixture Corp., 778 Burlway Rd., Burlingame, Calif.*

Outdoor Lighting

A series of four bulletins describes transformers for outdoor incandescent and outdoor mercury-vapor lighting, giving details on lights from 100 to 1000 watts. *Jefferson Electric Co., Bellwood, Ill.*

Dual-Duct Air Distributors

Catalog No. 1361 has 12 pages on low-velocity dual-duct acoustic terminal control (ATC) units, for use in multizone or reheat systems. *Carnes Corp., Verona, Wisc.*

Prestressed Concrete

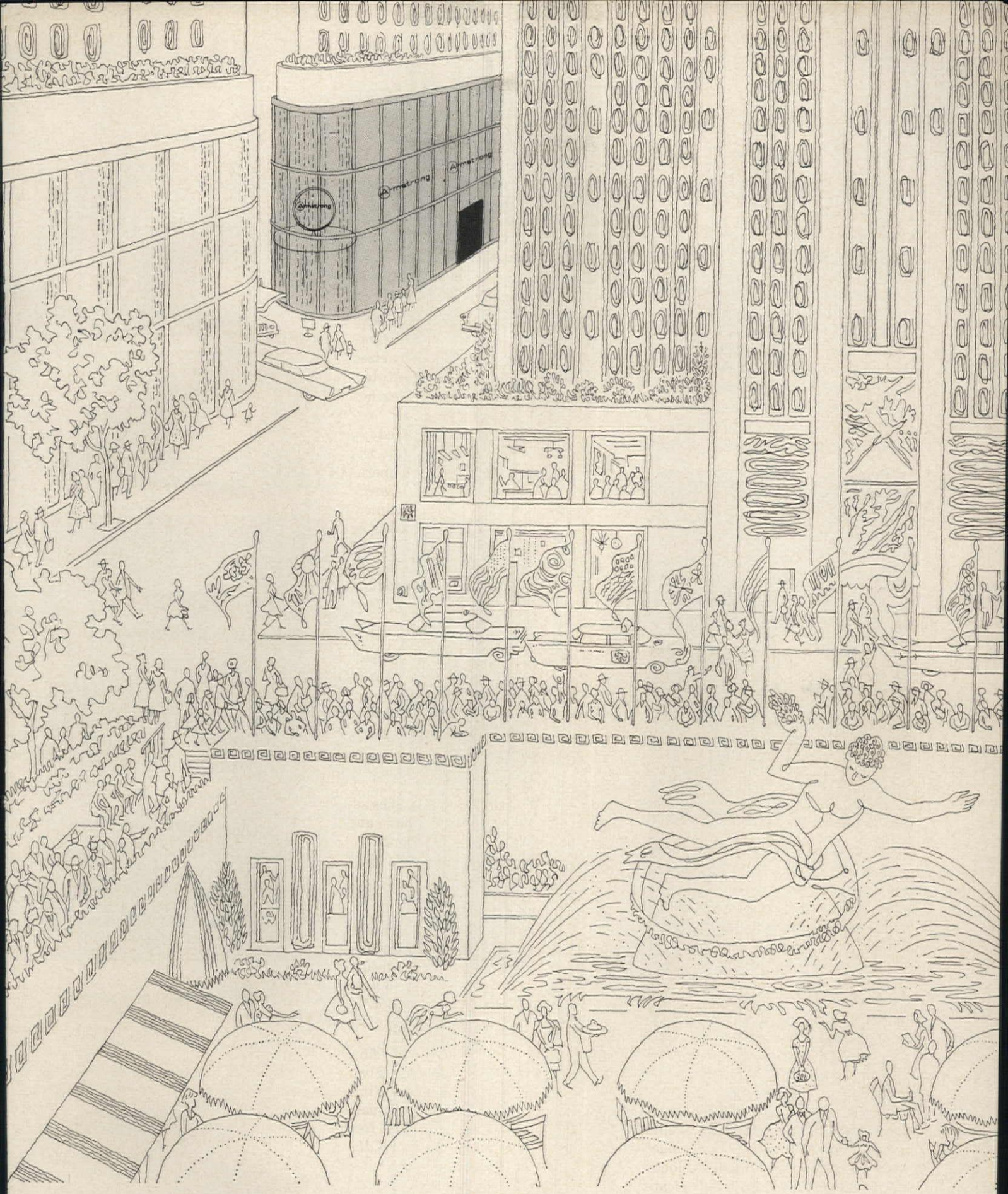
Data on prestressed concrete, with emphasis on the steel strand tensioning elements are given in a 20-page booklet. *John A. Roebling's Sons Division, The Colorado Fuel and Iron Corp., Trenton 2, N.J.**

Drapery Equipment

Illustrated booklet gives details on specifying and installing drapery traverse systems. *Young Manufacturing Co., Box 952, Cheyenne, Wyo.*

**Additional product information in Sweet's Architectural File*

more literature on page 244



THE NEW ARMSTRONG PRODUCT CENTER IS IN THE HEART OF NEW YORK (60 West 49th Street, Rockefeller Center) Armstrong Architect-Builder Consultants and acoustical experts are on hand to give you technical information and suggest new design and functional possibilities for the newest developments in acoustical ceilings, resilient floors, and vinyl wall coverings. Our color consultants and decorators are also available to give you detailed information on interior planning. Open 9-5, Mon.-Fri. For an appointment, call JU 2-3700.

Armstrong FLOORS and CEILINGS

Product Reports

continued from page 205

Vapor Barrier

Pyro-Kure is a pipe insulation with permanent self-extinguishing properties when exposed to fire. The special adhesive binding the aluminum foil, glass fiber and 35 lb kraft emits a gas which smothers the flame when surrounding temperatures reach combustion level. The manufacturer reports the following performance ratings: vapor transmission—less than 0.01, U/L flame spread—5 on the foil side and 25 on the kraft side.

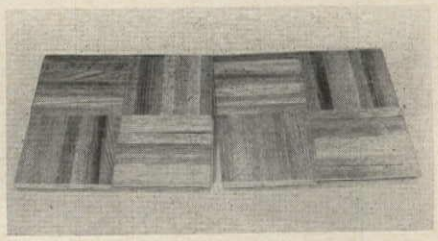
Thickness of fiber glass insulation ranges from ¾ in. to 1½ in. depending on pipe size. Two layers of foil are used in the barrier to protect insulation. *American Sisalkraft Div., St. Regis Paper Co., 2403 S. Burdick St., Kalamazoo 34, Mich.*

Specialty Glass

Three specialized types of glass are now available from Amerada Glass. *Comfor-Lite* contains a louvered sun screen, available in several finishes, hermetically sealed between two panes of glass. *Acousta-Pane* is a laminated safety glass which offers good visibility while absorbing sound, especially in the 1000 to 4000 cycles per second frequency range. It is available in clear, opaque, and gray or blue tint. Both heat and light transmission are reduced by laminated *Twi-Lite* glass, thus lowering air conditioning requirements. It is guaranteed against fading and is sound and shatter resistant. *Amerada Glass Corp., 3301 S. Prairie Ave., Chicago 16, Ill.*

Parquet Floor Panels

Six-inch-square hardwood tiles, in parquet design, are laminated to *Homasote* backing made in 2 by 1 ft and 1 by 1 ft panels. Along with ease of installation because of the larger units, the *Homasote* base provides a resilient walking surface and insulation. Individual *Flexstrip* tiles are made up of seven strips of Appalachian hardwoods locked together by a soft wire for built-in expansion. The



surfaces are pre-finished. *Homasote Co., Trenton 3, N. J.*

more products on page 218

Modern Door Control by *LCN* Closer Concealed in Door

OFFICE OF INTERNATIONAL SHIPPING CO., INC.
NORTON BUILDING, SEATTLE, WASHINGTON

•

LCN CLOSERS, PRINCETON, ILLINOIS
A DIVISION OF SCHLAGE LOCK COMPANY

Installation Details on Opposite Page

Bindon & Wright, *Architects*
Skidmore, Owings & Merrill,
Consulting Architects

Toronto's new airport in the round

This is the way Toronto International Airport will look with all four aeroquays in operation. The second floor is the main level of the aeroquay. It contains the ticket lobby, shops, lounge, coffee shop, and departure areas, as well as observation decks. John B. Parkin Associates, Consulting Architects and Engineers to the Department of Transport, H. J. Connolly, Director of Construction Branch, W. A. Ramsay, Chief Architect. *General Contractor:* Foundation Company of Canada, Ltd.

As adaptable as the steel that frames it, Toronto International Airport is designed to grow as jet traffic grows

Steel *for Strength . . . Economy . . . Versatility*

Toronto's new terminal calls for a central administration building surrounded by four aeroquays. These aeroquays will house all the passenger facilities and operations of the domestic and foreign airlines flying in and out of Toronto.

Shaped like a doughnut, each steel-framed aeroquay will be two buildings in one, 660 feet in diameter. A roadway system will lead vehicles, by underpasses under the aircraft apron, directly to these airline buildings.

The first aeroquay is scheduled for completion in 1962. Sites for three others are available, and these aeroquays will be built as needed.

All-welded steel framework

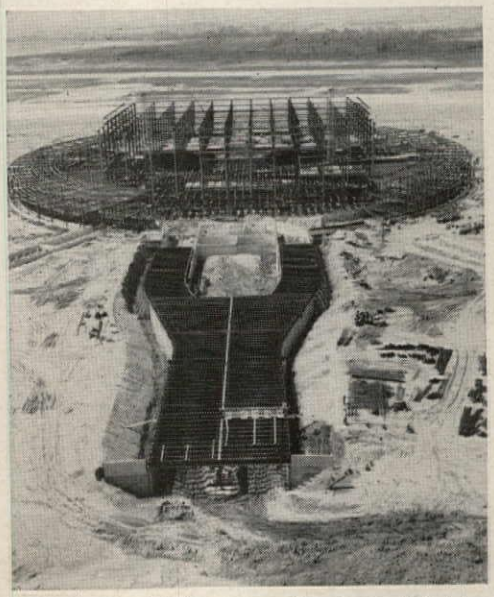
All connections in the shop were welded. For just the 6,000 tons of column sections with welded cover plates, York Steel Construction welded some 40,000 lineal feet of steel. All rigid connection plates were field welded to the column sections at the site.

Steelwork erected in dead of winter

To maintain weld quality in frigid weather, York Steel Construction pre-heated and post-heated the steel, using mobile banks of oxygen and propane. All welds were ultrasonically tested at the site; no failures were reported. Although the winter was severe, only 3½ weeks of erection time were lost to the bad weather.

15,000 tons in under 180 days

York Steel fabricated and erected some 15,000 tons of shapes and plates for aeroquay No. 1. All steel went up in under 180 days. Bethlehem supplied 9,803 tons of wide flange, and 196 tons of plates. The balance of the tonnage was obtained from Canadian sources.



Steel framework of aeroquay No. 1. *Steel Fabricator and Erector:* York Steel Construction, Ltd.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA. *Export Sales:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

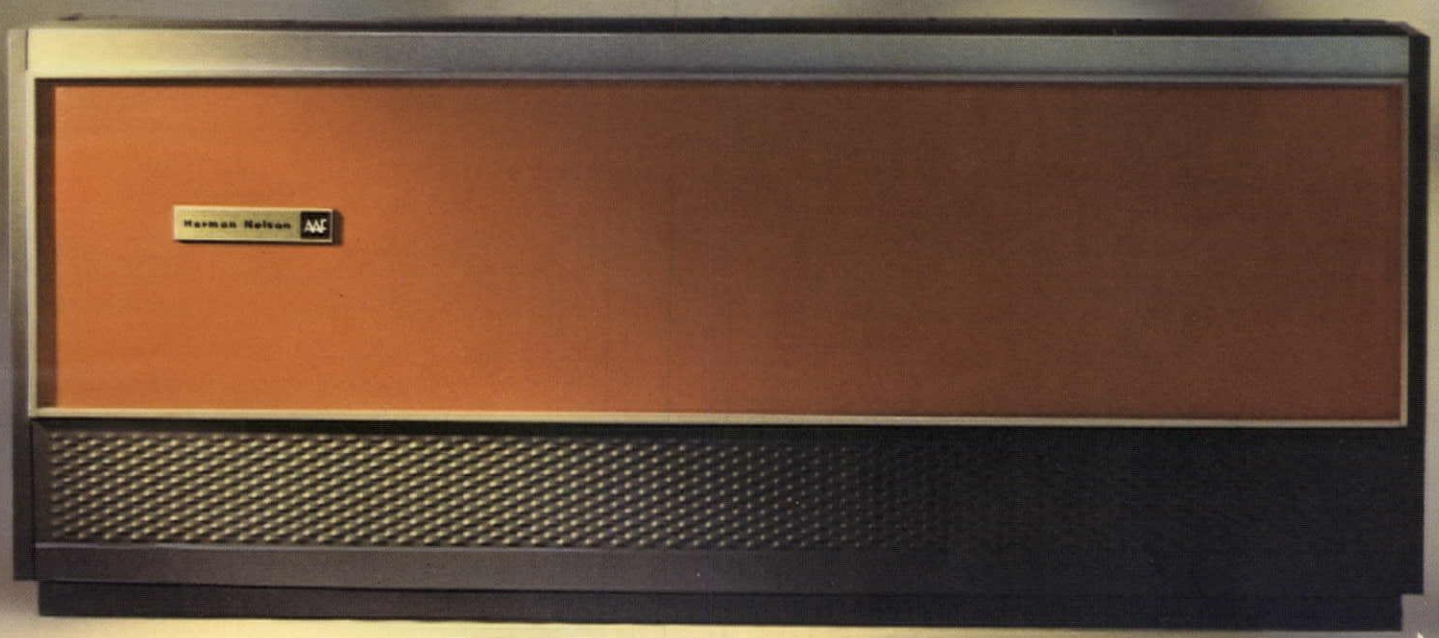
This unit ventilator brings air conditioning within reach of almost any school budget!

Schools in every section of the U.S.—more than 700 of them—are now equipped with Herman Nelson HerNel-Cool "now or later" year-round air conditioning systems.

Construction costs for these schools have ranged all the way from $8.00 per sq. ft. to $21.00 per sq. ft.

For the most part, construction costs in these same areas were as high *or higher* for schools *not* equipped with Herman Nelson "now or later" systems! And now turn the page to see one of the many schools equipped with year-round Nelson air conditioning.

HerNel-Cool III Unit Ventilator. Classic architectural styling. Efficient engineering design.



Herman Nelson photo-reporter visits another air conditioned school

SECOND IN A SERIES:

"We hope to air condition

Hanford Joint Union High School, Hanford, California. Superintendent of Schools: Stratton L. Tarvin. Architect: William Hastrup, Fresno, California. Mechanical Contractor: Gillott Plumbing & Heating, Fresno, California.

Stratton L. Tarvin (left), Superintendent of Schools, and Dr. R. deCampos, Chairman of the Hanford Board of Trustees, reflect community enthusiasm for air conditioned schools. They feel that air conditioning should be included in the plans for all future new schools in Hanford.

Mr. Tarvin says, "Air conditioning was considered in the early stages of planning. In our climate, non-air conditioned rooms are unbearable about four months during every school year. Our year-round unit ventilator system eliminates these conditions.

"Our first experience with school air conditioning has been very successful . . . students are more alert and attentive, and teachers are less exhausted at the end of a day."

all future schools"

Stratton L. Tarvin
Superintendent of Schools
Hanford, California

Architects utilize HerNel-Cool systems to reduce school construction costs

What is a community's reaction to its first air conditioned school? In Hanford, California, as in hundreds of other communities, school air conditioning has proved to be both practical and economical. In fact, school officials want air conditioning for *all* future schools.

Year-round HerNel-Cool Unit Ventilator systems allow the architect to design a more compact school. Low cost back-to-back classroom design makes it possible to eliminate design restrictions imposed by conventional schools. (Example: orientation for natural ventilation.) Expensive fenestration can also be eliminated.

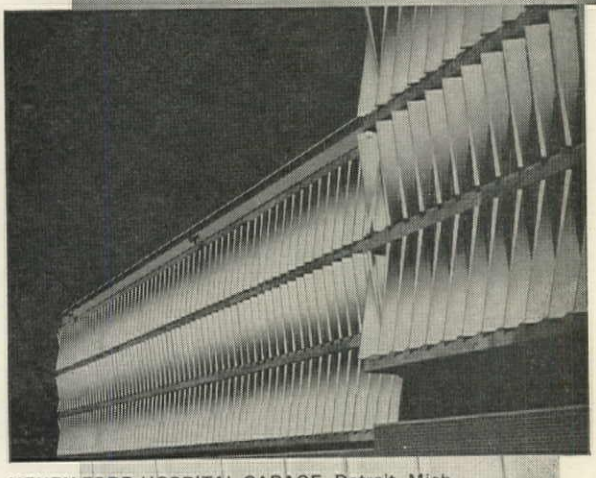
Herman Nelson HerNel-Cool Unit Ventilators are flexible. They provide heating, ventilation and outdoor-air cooling during winter months, and keep room temperatures cool and refreshing in the summer. Air is filtered in each classroom unit . . . there are no dust-collecting ducts *between* the unit and the classroom. Write for more information: School Air Systems Division, American Air Filter Company, Inc., 215 Central Avenue, Louisville 8, Kentucky.

Effects of the Herman Nelson system are extremely important in the school's modern chemistry laboratory. Here a high degree of student activity, chemical odors, and other factors require the flexibility of a unit ventilator system to maintain comfortable, odor-free conditions.

Herman Nelson AAF
SCHOOL AIR SYSTEMS DIVISION

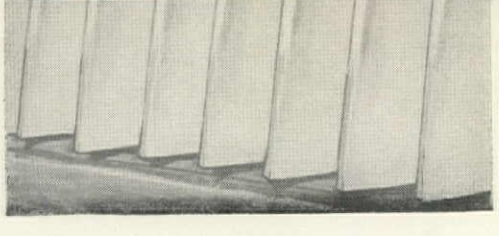
"Reaction of parents and community to our first air conditioned school has been highly favorable. It is a good example of the community's progressive education program. We're all very pleased with it," states the Hanford Joint Union High School P.T.A. President.

MERCY HOSPITAL, Des Moines, Iowa
Architect: Brooks—Borg, Des Moines, Iowa
Gen. Contractor: Wm. Knudson & Sons, Des Moines, Iowa
Panels by Midwest Concrete Industries, Des Moines, Iowa



HENRY FORD HOSPITAL GARAGE, Detroit, Mich.
Architect: Albert Kahn Associates, Inc., Detroit, Mich.
Gen. Contractor: Darin & Armstrong Inc., Detroit, Mich.
Sub Contractor: The Truscon Division of Devoe & Raynolds, (pre-cast units), Detroit, Mich.

GREENEVILLE LIGHT & POWER BLDG., Greeneville, Tenn.
Architect: Honeycutt & Boyd, Greeneville, Tenn.
Gen. Contractor: Hogan Bros., Greeneville, Tenn.
Panels by Southern Cast Stone Co., Knoxville, Tenn.



concrete panels

superb for expressing the unusual in design and color

best cast with **MEDUSA white portland cement**

Precast Concrete Paneling, load bearing or curtain type, is rapidly gaining favor as a means of expressing the unusual in wall design and color. Their design flexibility is unlimited since they are used with plain surfaces or with colorful exposed aggregate, white or tinted, sculptured or solar screened. Architects are specifying that these concrete panels be cast with Medusa, (the original) White Portland Cement with the diamond blue-white color, in order to gain dramatic appeal for exciting interiors and exteriors. For over a half century Medusa White Portland Cement has been winning the complete specification confidence of architects and builders. Write today for information including specifications.

MEDUSA PORTLAND CEMENT COMPANY
P. O. Box 5668 — Cleveland 1, Ohio
Over 65 years of Concrete Progress

lasting low-cost moisture barriers

"ELECTRO-SHEET"

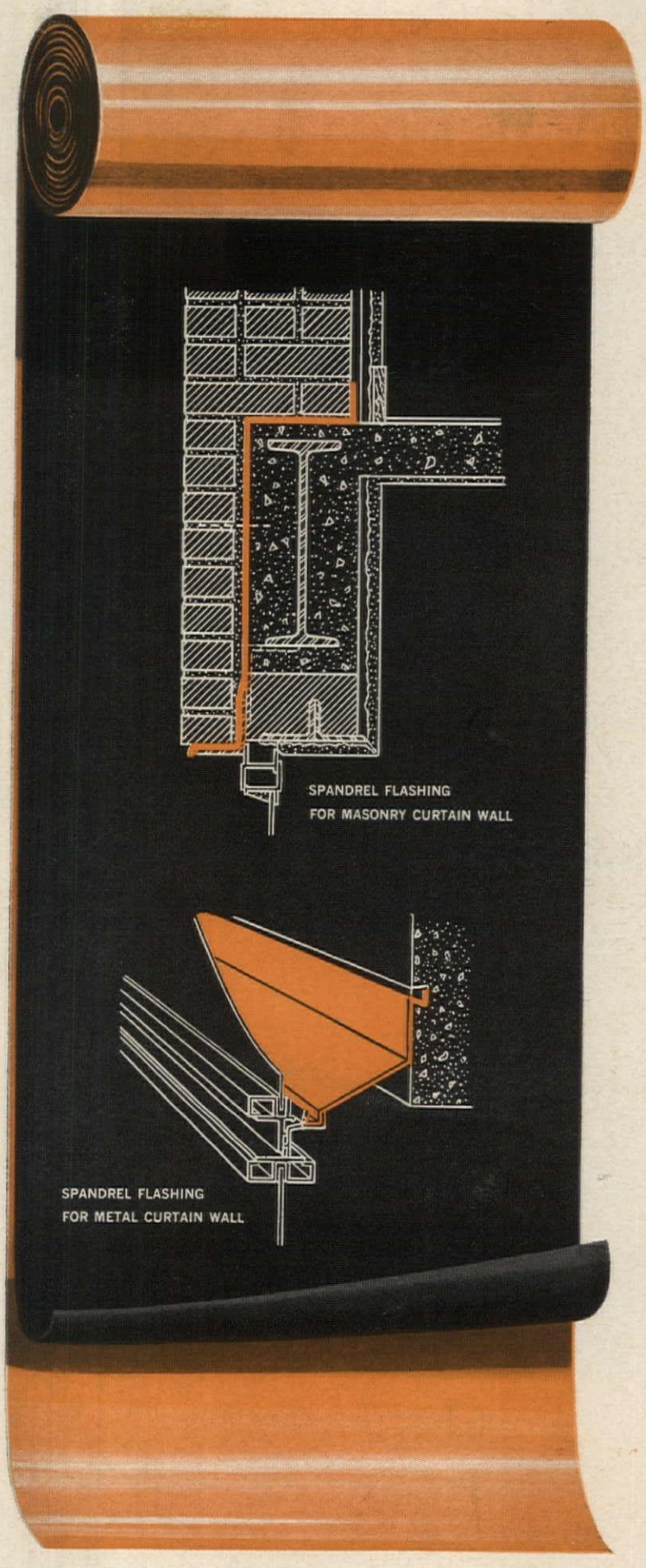
Copper-bonded products

"Electro-Sheet" is pure, thin copper produced in long, wide rolls by electrodeposition. It won't rust and resists most forms of deterioration. Bonded to high-grade building papers or fabrics . . . or to asphaltic compounds . . . it makes concealed flashings you can trust.

"Electro-Sheet" Copper-bonded products are widely used in the hidden trouble spots of buildings: spandrel beams, door and window heads and sills, shower rooms and stalls, parapet walls, etc. They are flexible, easy to handle, and available in rolls up to 60″ wide from building supply dealers throughout the United States and Canada.

For more information about Anaconda "Electro-Sheet" and a list of manufacturers of the flashing products, write: Anaconda American Brass Company, Ansonia Division, Ansonia, Connecticut.

61-1024A

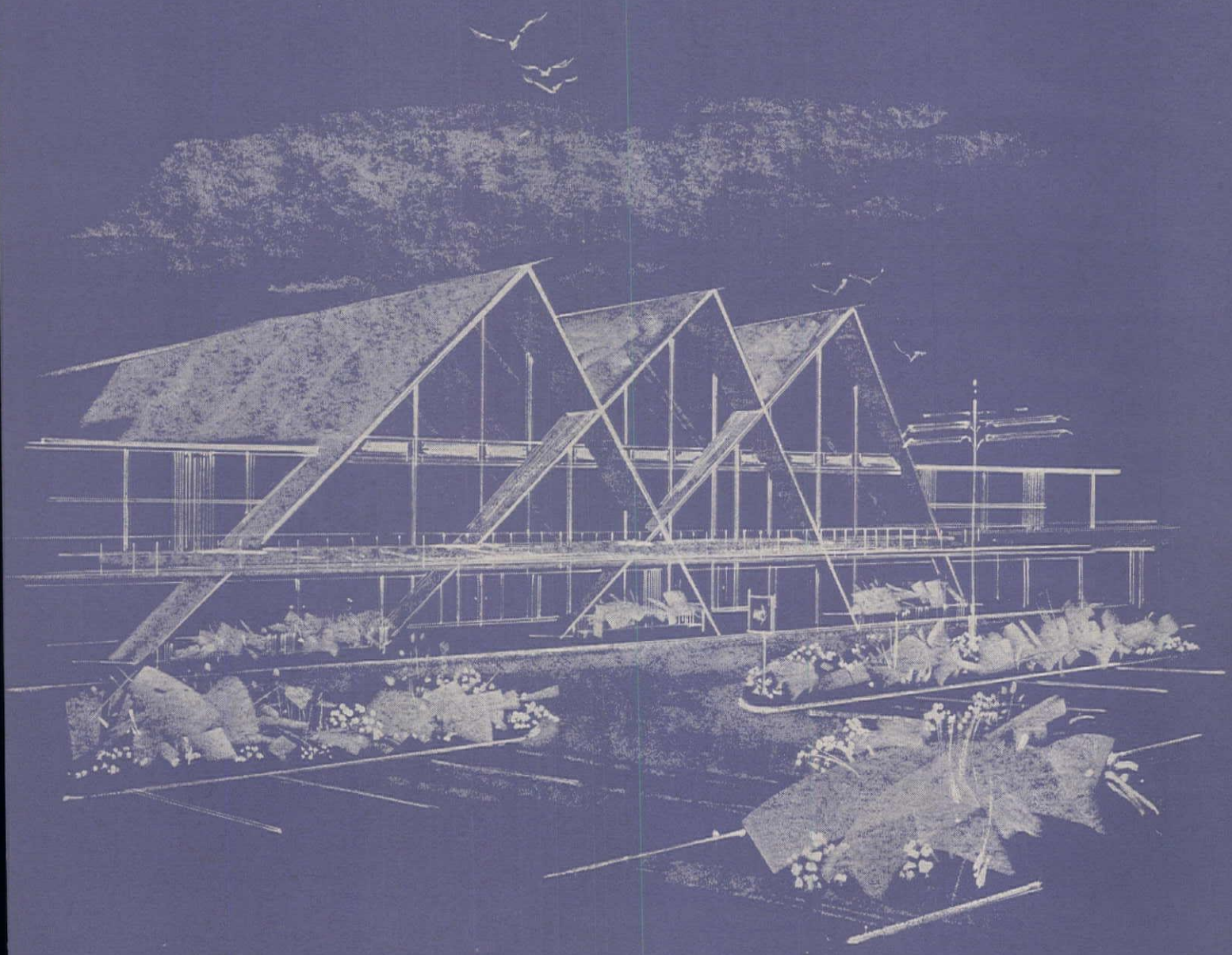


"Electro-Sheet" Copper is available bonded on one or both sides.

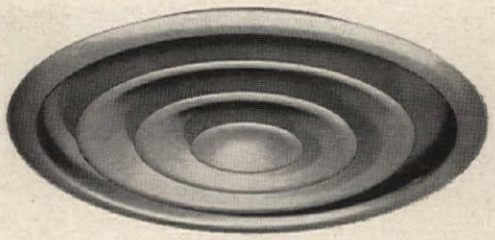
ANACONDA®
AMERICAN BRASS COMPANY

REFRESHING CHANGE IN RETAILING:

SHOPPING CENTERS...

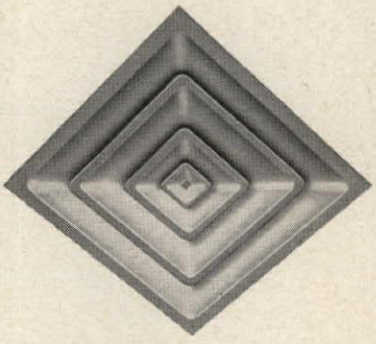


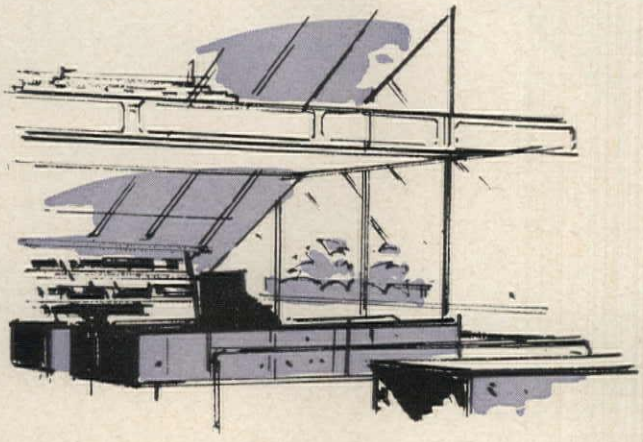
using TUTTLE & BAILEY AIR DISTRIBUTION EQUIPMENT

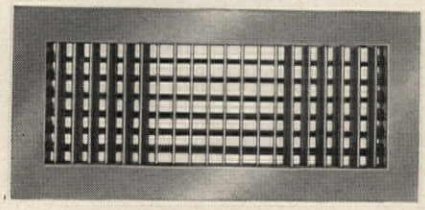


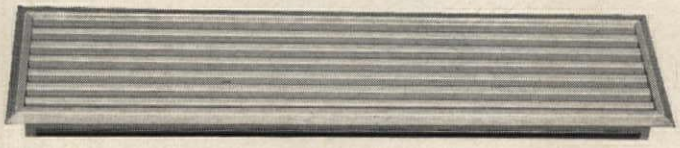
The broad range of T&B air distribution devices and accessory equipment for heating, cooling and ventilating answers every requirement of the architect, engineer and client. As the largest full-line manufacturer, T&B offers the precise piece of equipment for each job . . . setting the highest standards of appearance and performance.

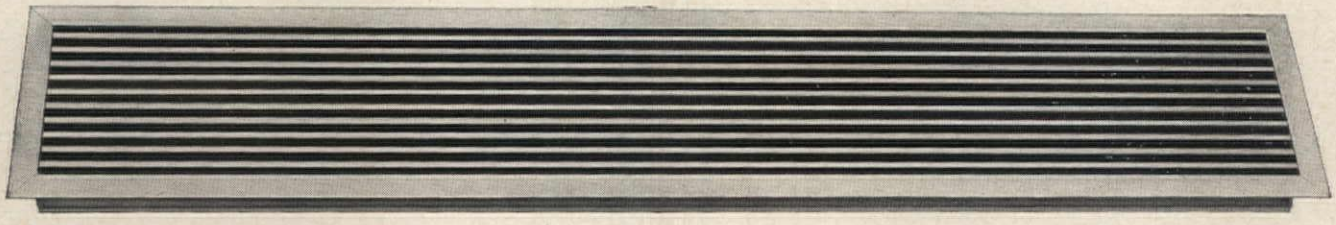
Write for the name and address of the Factory Office or Sales Representative nearest you.

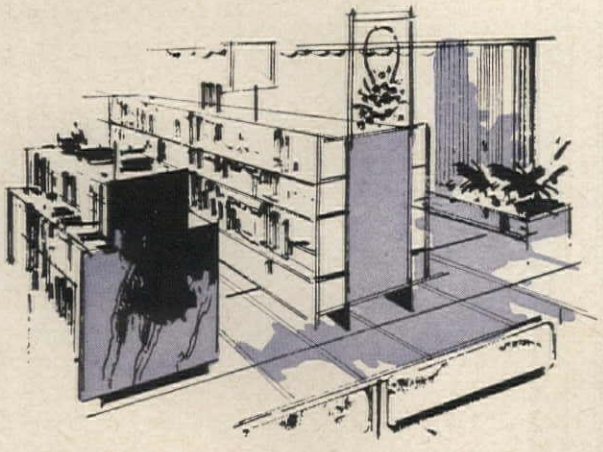


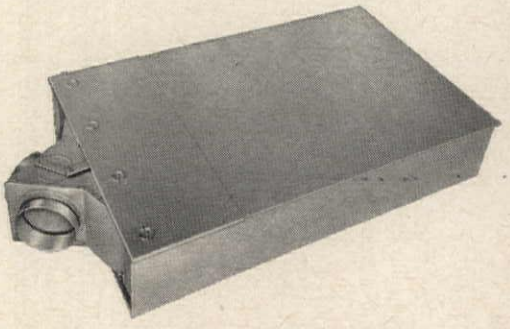












TUTTLE & BAILEY

Division of Allied Thermal Corporation
New Britain, Connecticut

Tuttle & Bailey Pacific, Inc., City of Industry, Calif.

Product Reports

continued from page 208

Automatic Sliding Door Opener

Sliding doors can now be operated automatically with a unit either concealed in a 4 by 4 in. transom section or surface-mounted on the door

header. The cost of installation is less than most swing-out operators, and one door can be used as both entrance and exit. The unit has only one moving part. In case of power failure the door can be operated manually. *Horton Automatics, Inc., 121 Gibson Lane, Corpus Christi, Texas*

Roof Insulation

Rigid urethane foam is used in a roof insulation for flat built-up roofs. Panels of the insulation have tough roofing membranes laminated on both

sides of the urethane. One inch of these panels is reported to have the same insulating capabilities as two in. of glass fiber or 2½ in. of fiberboard roof insulation. Urethane does not absorb water; and the panels can be applied directly in the hot roofing bitumen and provide an immediate "walk-on" surface. *Barrett Division, Allied Chemical Corp., 40 Rector St., New York 6, N.Y.*

more products on page 222

BENEKE

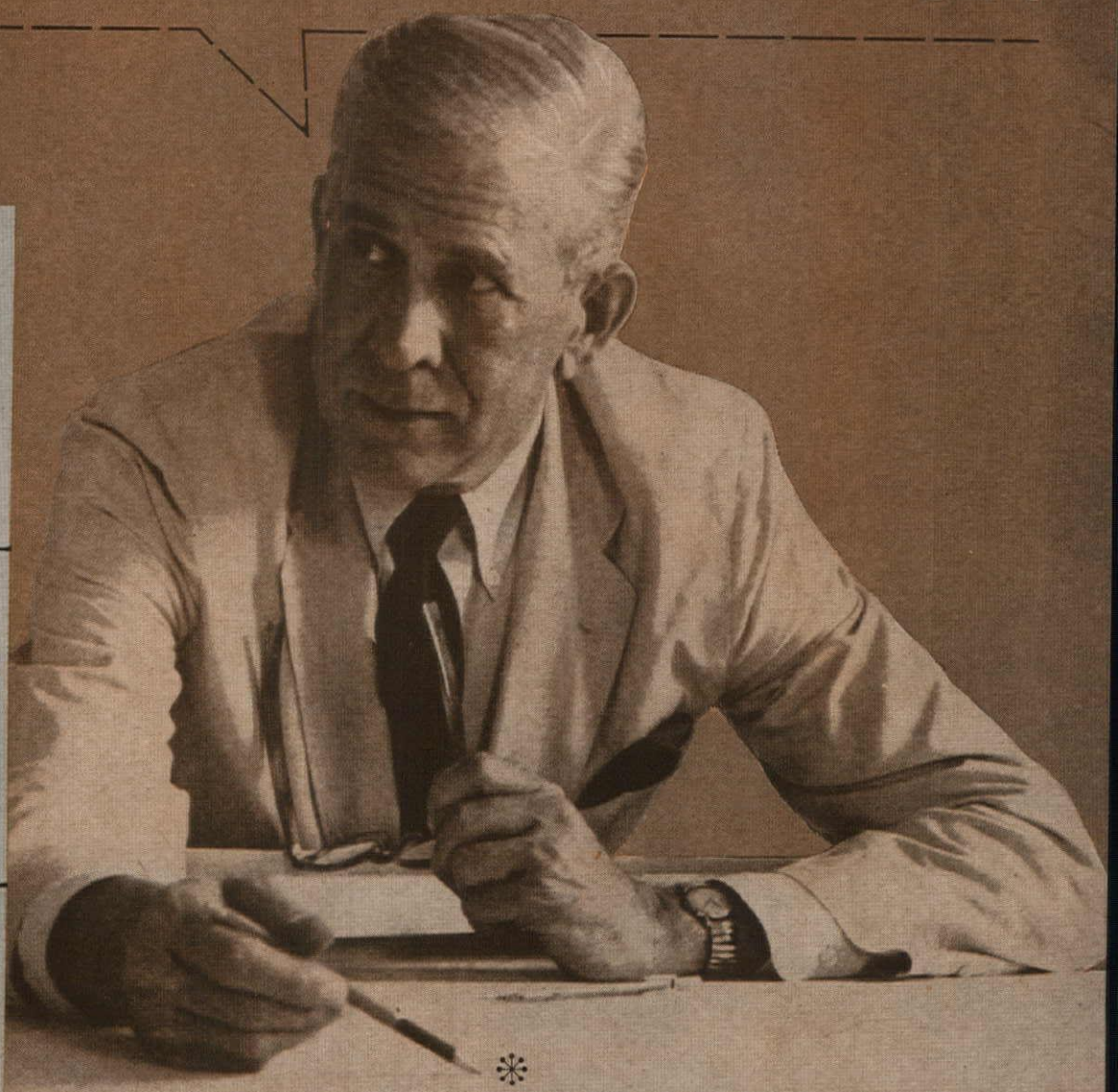
SERIES OF *Solid* SEATS

MEET EVERY SPECIFICATION

OPEN FRONT—WITH COVER
No. 421 designed for regular bowls.
No. 521 designed for elongated bowls.

CLOSED FRONT—LESS COVER
No. 422 designed for regular bowls.
No. 522 designed for elongated bowls.

CLOSED FRONT—WITH COVER
No. 420 designed for regular bowls.
No. 520 designed for elongated bowls.



Beneke . . . the first name
in toilet seats – now the last word
in specification quality seats.

BENEKE CORPORATION
COLUMBUS, MISSISSIPPI

DISTRIBUTED BY PLUMBING WHOLESALERS

What's in a name?

L. S. Donaldson Dept. Store, Edina, Minn.
Architects: John Graham & Co.

the unseen

but all important factor...

DEPENDABILITY...

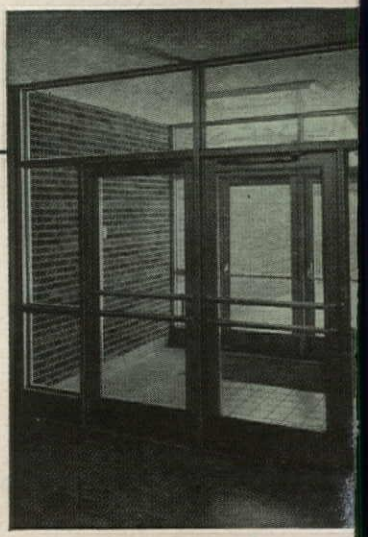
the reason

leading architects

specify

Cupples

Hope College, Holland, Mich.
Architect: Ralph R. Calder



ALUMINUM DOORS
AND ENTRANCES

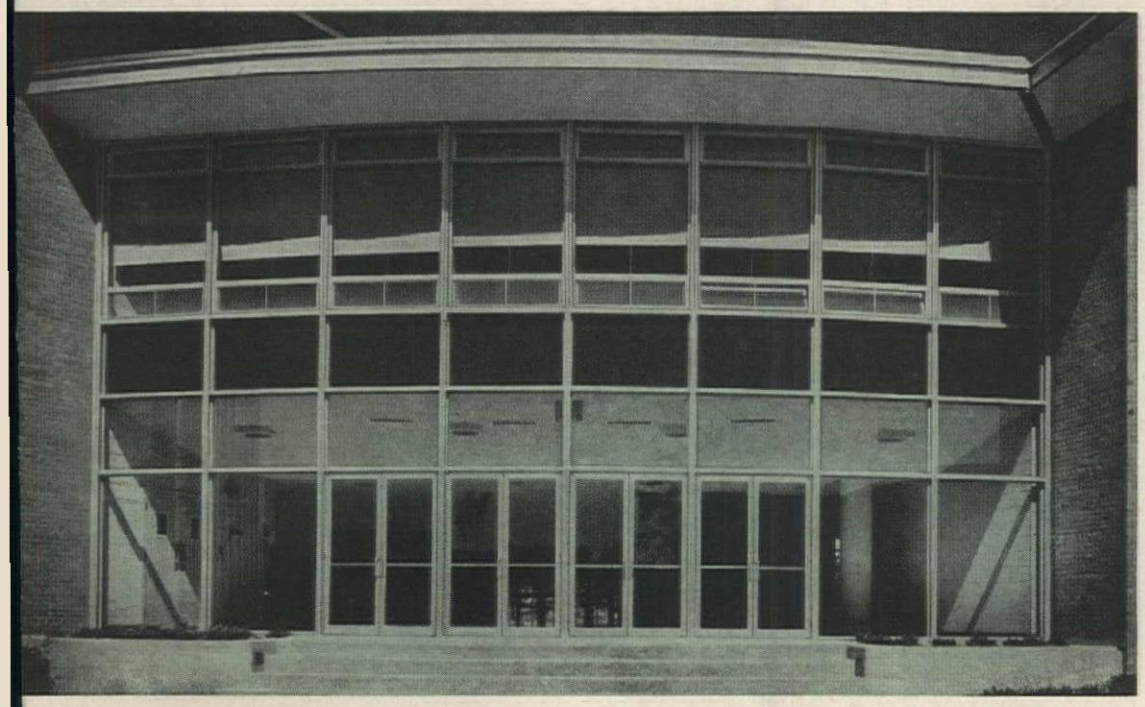
▲ Holiday Inn, Jackson, Mich.
Architect: William W. Bond

When you need entrance doors and frames and want dependability of product and service as well as a dependable company behind the product, the name to remember is *"Cupples"*. . . a division of ALCOA.

Cupples aluminum entrance doors and frames—both custom and our new "40 line" of stock units—have captured the plaudits of both architects and owners. Precision made from heavy gauge extruded aluminum sections, with hairline joints and a beautiful anodized finish that is guaranteed under bond by Cupples, they are the type of products you'll be proud to specify for any job. And, what's more, they're priced competitively to fit any building budget.

Available as single or double doors with many variations in frame, you have complete design flexibility. Choose from new style offset pivots, butts or concealed overhead closers. Double acting doors on floor closers, as well as stock panic device doors are also available.

▼ Elizabeth Seton H. S., Bladensburg, Md.
Architects: Thomas H. Locraft & Associates



ALCOA
CUPPLES PRODUCTS DIVISION
ST. LOUIS, MO.

Other outstanding features include: Complete flush glazing . . . No exposed screws . . . Simplified installation and anchoring . . . 100% vinyl glazing, front and back . . . Vinyl sealed expansion mullion . . . Stock push-pull hardware, interchangeable with custom styled hardware.

Investigate Cupples today and see for yourself why your clients get more for their money when you specify "Entrance Doors and Frames by Cupples." Write for our catalog or see Sweet's, Section 16a/Cu.

CUPPLES PRODUCTS CORPORATION

A DIVISION OF ALUMINUM COMPANY OF AMERICA
DOWAGIAC, MICHIGAN

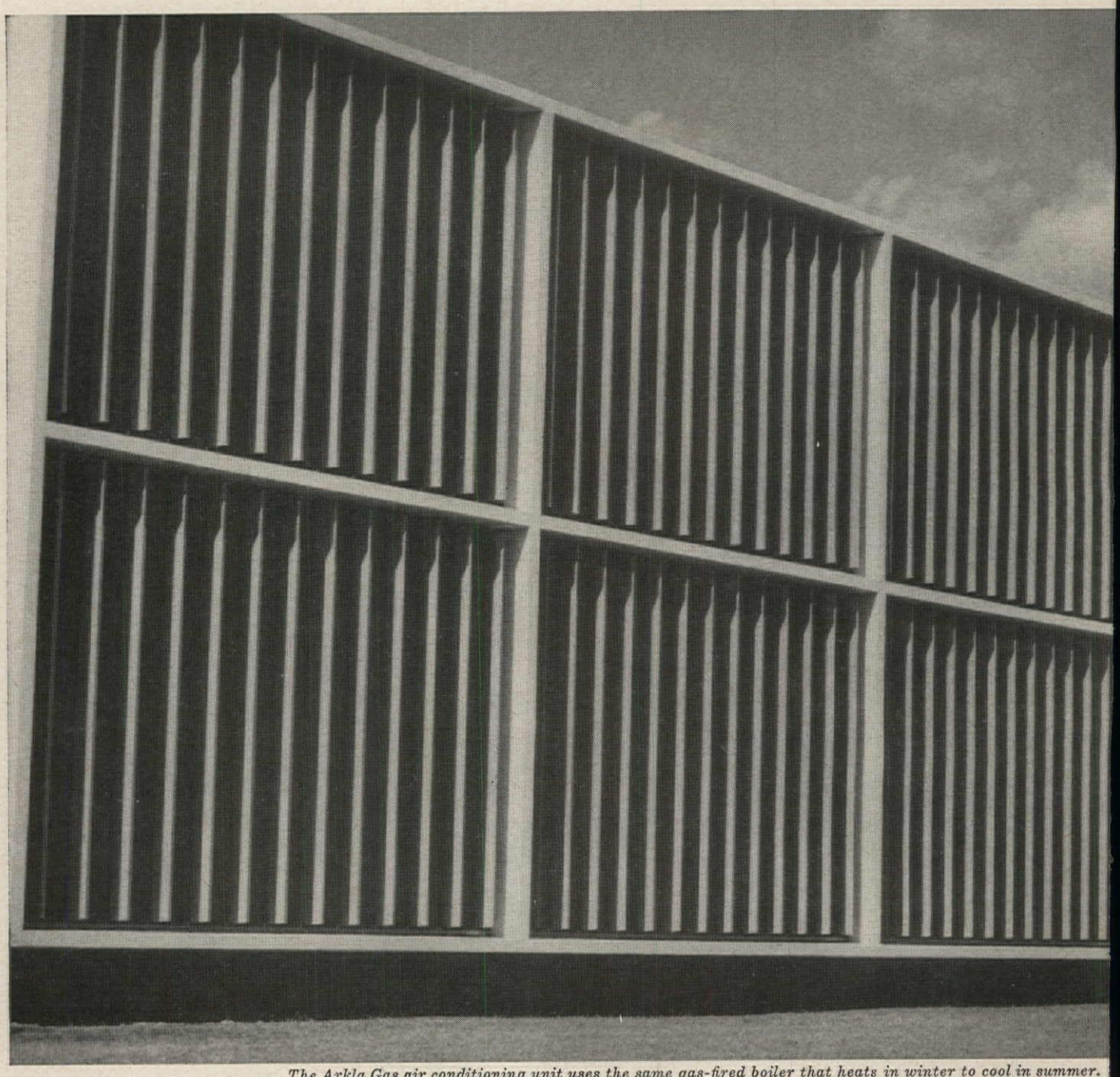
Product Reports

continued from page 218

Three-Dimensional Acoustic Panels
Two-foot-square fiber glass panels with vaulted centers absorb up to 80 per cent of room noise while providing height and interest to ceilings. The *Acousti-Shell* panels are about one-third as thick as flat sound-control panels and have a flame-spread rating of 0. Standard colors are white, blue and green, but a wide range of patterns and colors may be ordered. The panels are easy to install on metal grid systems which are suspended by wires or straps. *Johns-Manville, 22 East 40th St., New York 16, N.Y.*

Vinyl Tile with Slate Appearance
Texture of natural slate is duplicated in *Vinyl Slate* floor tile, combining the advantages of vinyl asbestos floor tile with the appearance of natural stone. Made in 1/8-in. thickness and in 12-in. squares by a continuous process rather than by molding, the tile may be cut into almost any shape when the material is warmed. The tile may be used both indoors and outdoors, in a wide variety of patterns. *B. F. Goodrich Co., Flooring Products, Watertown, Mass.*

more products on page 226



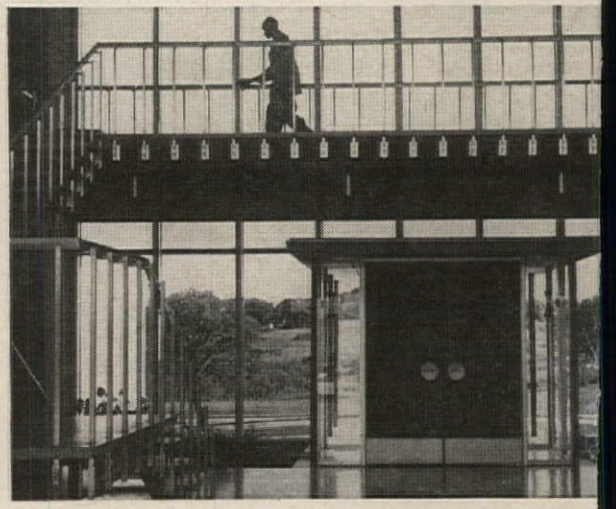
The Arkla Gas air conditioning unit uses the same gas-fired boiler that heats in winter to cool in summer.

As the Building grows, the ARKLA

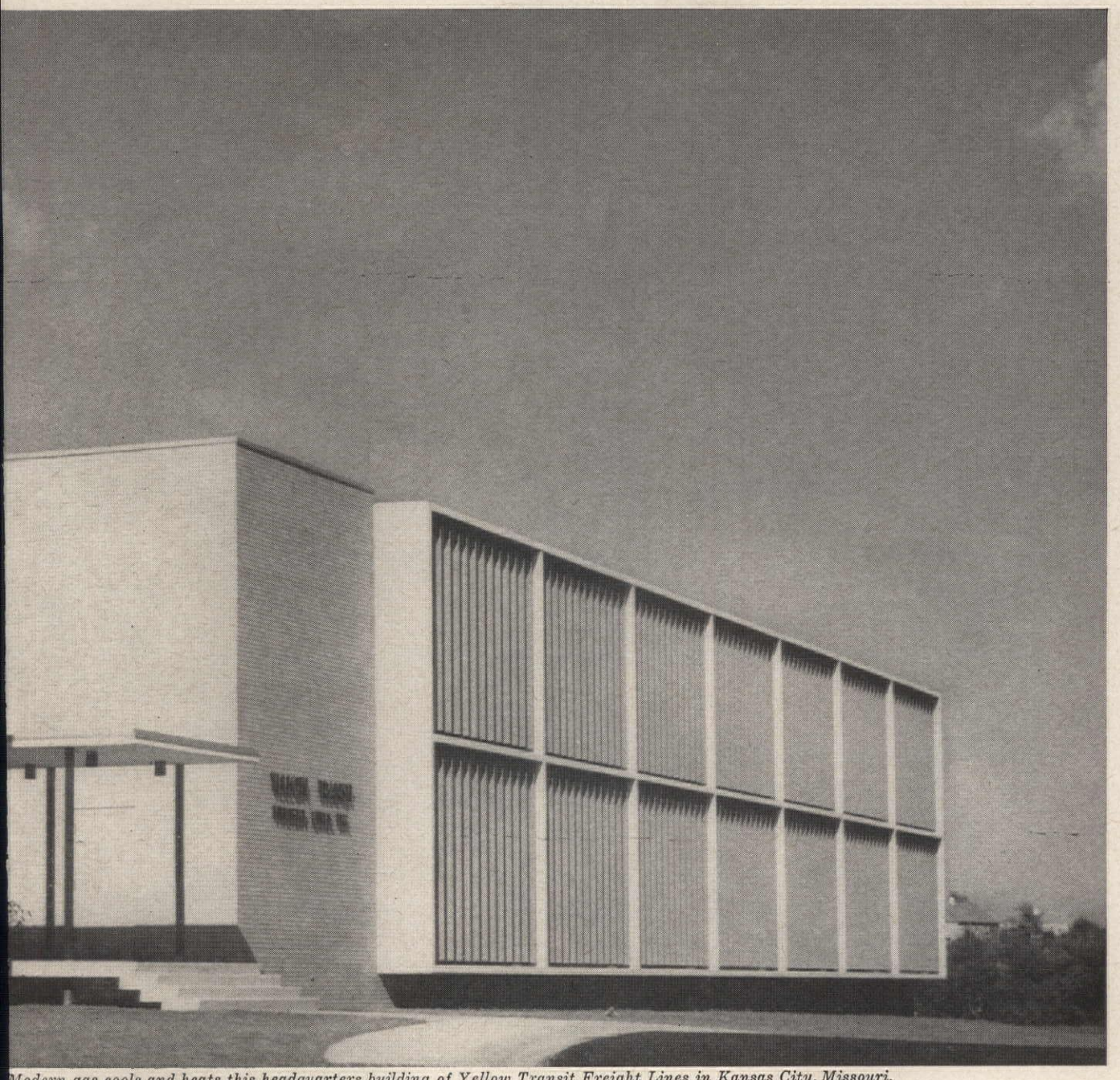
The headquarters building of Yellow Transit Freight Lines, Kansas City, Missouri, was designed to take a third story without major alterations. That's why they chose Arkla gas cooling units . . . a system that can "grow" quickly and at low cost.

When the building expands, they'll just add an Arkla unit. They go on the line right next to the rest, using the same basic piping – and steam from the same gas-fired boiler that energizes all the Arkla units.

The present cooling system includes five 25-ton Arkla Gas

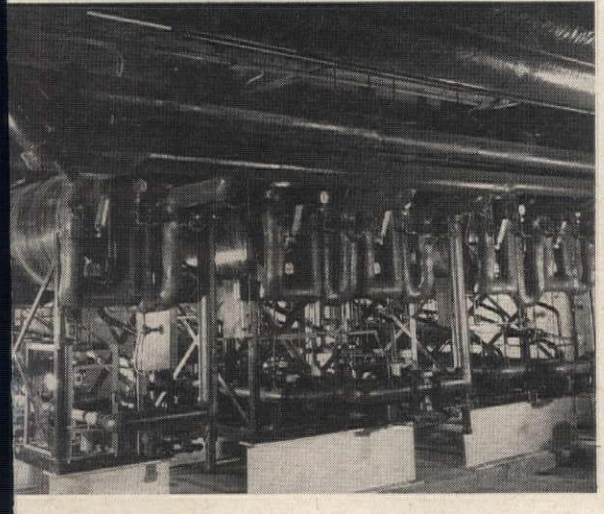


Architect: Folger & Pearson;
Mechanical Contractors: Troug & Nichols.



Modern gas cools and heats this headquarters building of Yellow Transit Freight Lines in Kansas City, Missouri.

GAS COOLING system grows with it



Absorption Water Chillers. These versatile units use steam from the gas-fired boiler to provide chilled water for comfort cooling. The same boiler heats in winter. And thrifty gas keeps fuel costs low.

For specific information on Arkla gas air conditioning, call your local Gas Company. Or write Arkla Air Conditioning Corporation, General Sales Office, 812 Main Street, Little Rock, Arkansas. *American Gas Association.*

FOR HEATING & COOLING...GAS IS GOOD BUSINESS!

For increased cooling capacity, at low cost, additional Arkla units can be installed.

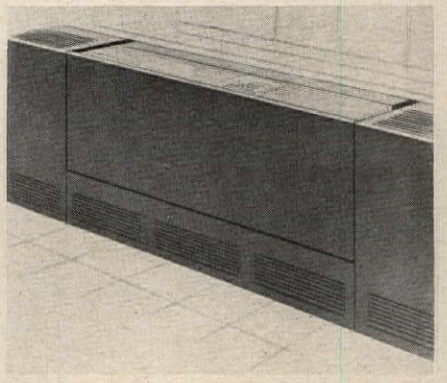
Product Reports

continued from page 222

Concealed Fire Escape
It looks like a drainpipe when closed, but even a child can flip the catch and fold out the full sized aluminum ladder which will support 2000 lb. *Safe-X-Scape* is available for two- and

three-story buildings and can be mounted outside any upstairs window. It cannot be opened from the ground. *Reynolds Metals Co., 19 E 47th St., New York 17, N.Y.*

Zonal Air Conditioning
Individual control of air conditioning and heating in high-rise buildings is possible with *Zoneline "42"* for cooling and *Thermaline "42"* for both cooling and heating. Both fit the same



case. An adjustable baffle front provides the user with alternate air direction flows. Zoneline "42" is available in three cooling capacities: 8,000, 12,000 and 14,500 Btu. Thermaline "42" comes in 9,000/10,000 and 13,500/14,000 Btu. *General Electric Co., Air Conditioning Dept., Tyler, Texas*

more products on page 230

These Three California Community Hospitals Achieve Life Long PERMANENCE & DEPENDABILITY With

Streamline® COPPER TUBE AND FITTINGS FOR SUPPLY AND DRAINAGE SYSTEMS

West Covina Hospital

Parkview Memorial Hospital

"... in operation over two years ... the copper drainage system has been entirely trouble-free. We would recommend the use of your system and product in any modern structure."

• —*Hospital Administrator*

In installations that must depend on clog-free, rust-proof, leak-proof, sanitary drainage, Mueller Brass Co. Streamline DWV tube and fittings are the logical choice. When compared with rustable materials, DWV Copper Tube and Fittings are MORE ECONOMICAL to install and will normally OUTLAST THE BUILDING ITSELF.

Woodruff Community Hospital

Write today for new Catalog S-361

MUELLER BRASS CO.

PORT HURON 8, MICHIGAN

MADE IN U.S.A. TO THE STANDARDS OF AMERICAN INDUSTRY

How you can keep quality up and costs down

Koppers has a unique group of building materials that bear directly on the problem of keeping quality up and costs down. These Koppers products and materials are either permanent in themselves or give permanence to other materials. The following

New Haven protects its investment with coal-tar pitch

Almost every major building you see here in New Haven has a Koppers Coal-Tar Pitch Built-up Roof—a watertight roof, bonded for 20 years of trouble-free service. Comparative studies of existing buildings have proved that coal-tar pitch built-up roofs perform better and last longer than any other type. There are now more than 370 Koppers bonded roofs in this one city protecting New Haven's investment in buildings.

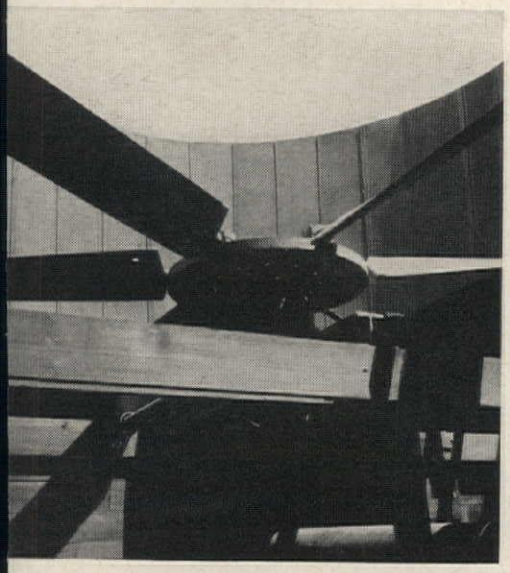
And because New Haven's current redevelopment program puts special attention on the use of the best possible material coal-tar pitch built-up roofs are being specified for new construc tion and modernization.

Hundreds of Koppers Built-up Roofs throughout the countr have already far outlived their 20-year guarantees. In many cas protection up to 40 years has been experienced.

Check the coupon for complete information about coal-t pitch built-up roofs.

with Koppers building products

stories show how Koppers products can also give you greater design flexibility because they protect the basic construction materials. And this greater flexibility and permanence are frequently possible with lower initial costs and lower maintenance cost.

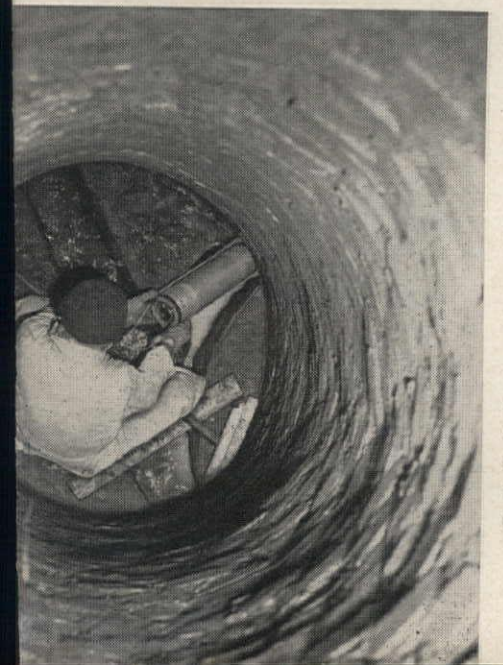


No decay problem in wood cooling tower

This 22-foot diameter, six-bladed aerodynamic fan is one of four built by Koppers Metal Products Division for the water cooling tower installation at the atomic reactor testing station near Idaho Falls, Idaho. These exceedingly efficient fans help the redwood tower cool 24,000 gallons of water per minute. And in spite of the heat and moisture, the wood has lasting protection from fungus and decay because it was pressure-treated with ERDALITH® salts, an *insoluble* Koppers preservative, driven under heat and pressure deep into the cells of the wood. Check the coupon for information on pressure-treated wood and vibration-free AEROMASTER fans.

Low budget your problem? Try pole-type buildings!

That's what H. J. HEINZ did to warehouse the stepped-up production of their Fremont, Ohio plant. They selected a pole-type structure because it could be built faster; it made a strong, *permanent* building that requires very little maintenance; and it cost about *half as much as other types of construction.* Koppers Pole Buildings using *pressure-treated* poles, require no excavating, no costly foundation, no custom fabrication and no long, drawn-out erection time. Interested in saving money on permanent construction? Check the coupon.



Pipeline coating stays "picture perfect"

Engineers used a specially designed waterproof camera to check the interior of this combination sanitary-storm sewer pipe in Jersey City. Six years ago the 24" diameter concrete pipe was lined with BITUMASTIC® Super Service Black, one of the protective coal tar coatings produced by Koppers. In spite of the daily flow of 500,000 gallons of raw sewage and abrasive washings from storm sewer interceptors, the BITUMASTIC coating was still in excellent condition; no cracks, breaks or peels. For more information about Koppers *tough* coal-tar coatings, check the coupon.

KOPPERS PRODUCTS FOR BUILDING AND CONSTRUCTION INDUSTRY

BITUMASTIC® PROTECTIVE COATINGS FOR STEEL, CONCRETE AND MASONRY

COLOR ON ALUMINUM

CREOSOTE FOR PRESSURE TREATMENT OF WOOD

DYLITE® BUILDING PANELS

NON-COM FIRE PROTECTED LUMBER

PAVEMENT SEALERS AND ROAD TARS

PENACOLITE® WATERPROOF ADHESIVES

PRESSURE-TREATED WOOD PRODUCTS
- Bridge Timbers
- Fence and Guard Rail Posts
- Foundation Piling
- Poles for Pole-type Buildings
- Utility Poles and Cross Arms
- WOLMANIZED® Lumber
- Wood Decking

ROOFING, WATERPROOFING, AND DAMPPROOFING
- Coal-Tar Emulsions
- Coal-Tar Pitch Built-Up Roofing
- Polyethylene Film
- Waterproofing Pitch

SOUND CONTROL
- AIRCOUSTAT®—Sound Traps
- Industrial Sound Control
- Soundproof Rooms

To: Earl F. Bennett, Mgr.-Architectural Sales
Koppers Company, Inc., Room 1322
Koppers Building, Pittsburgh 19, Pa.

Please send additional information about:

- ☐ Koppers Built-up Roofs
- ☐ Pole-type Construction
- ☐ BITUMASTIC® Coatings
- ☐ Cooling Tower Lumber
- ☐ AEROMASTER Fans

2-8

Name_____

Job Title_____

Company_____

Address_____

City_____ Zone_____

State_____

KOPPERS

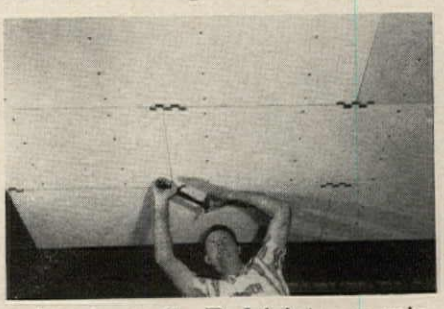
KOPPERS®

Divisions:
Chemicals & Dyestuffs
Engineering & Construction
Gas & Coke • Metal Products
Plastics • Tar Products
Wood Preserving
International

Product Reports

continued from page 226

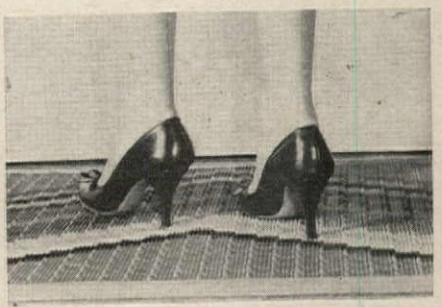
Fire Resistant Ceiling Panel
Armstrong *Fire Guard* mailing panel is a mineral product designed for fast, economical installation under steel bar joists. The panels—approximately 2 by 5 ft—can be fastened to standard nailing channels with an-



nular ring nails. End joints are reinforced with steel bridging clips at each panel intersection. The surface finish on the fire-resistant panel is smooth primed paint that provides a base for additional paint. *Armstrong Cork Co., Lancaster, Pa.*

Air Conditioner Certification
Manufacturers producing more than 85 per cent of all room air conditioners sold in the US have joined a certification program sponsored by the National Electrical Manufacturers Assoc. Starting with 1962 models, NEMA will certify the accuracy of Btuh capacity ratings of all models made by the participating companies. First publication of a directory listing certified units is scheduled for Jan. 2, 1962.

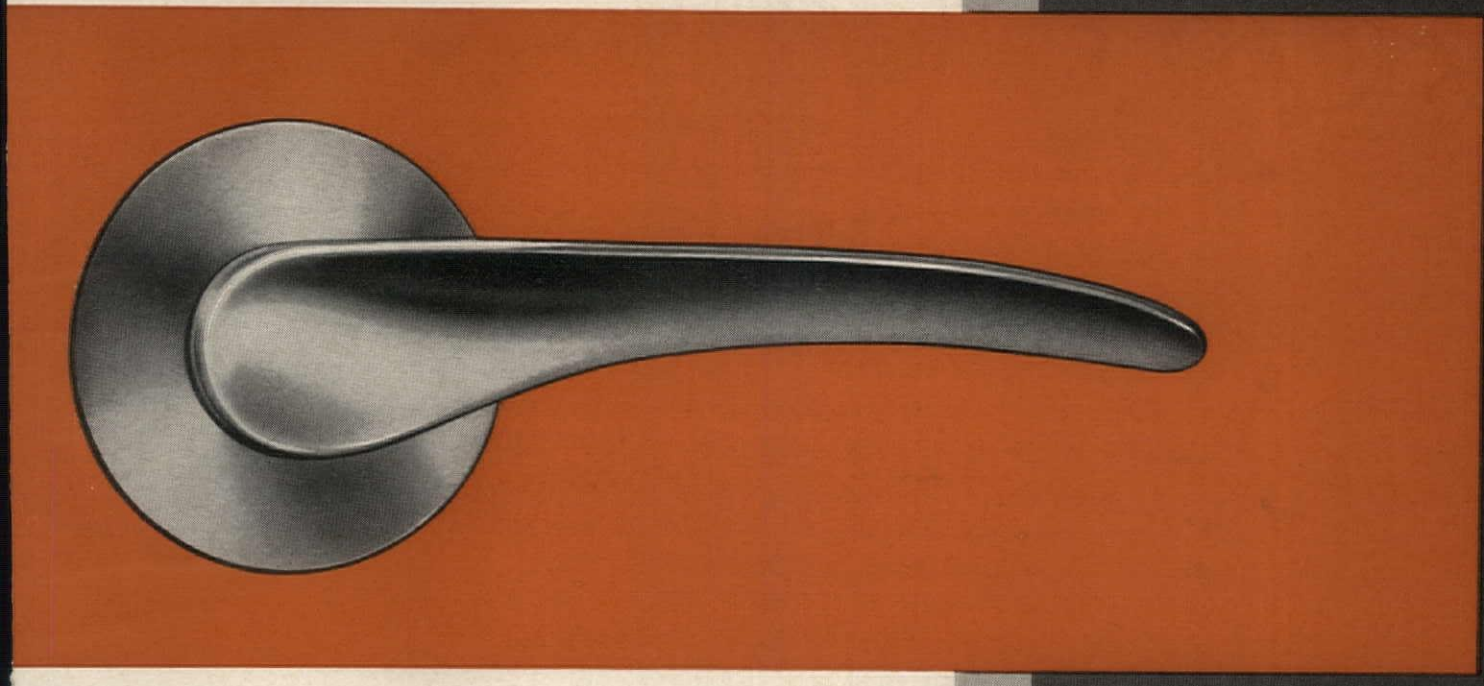
Heel Proof Mat
Both utility and design patents have been granted for a link mat with small tapered wiping blades on the



top of each link combined with drainage slits so that dirt and moisture are trapped, but slim heels are not caught. A variety of patterns are available. *Mat Craft, 330 S. Dearborn St., Chicago 4, Ill.*

more products on page 236

Always on the Level



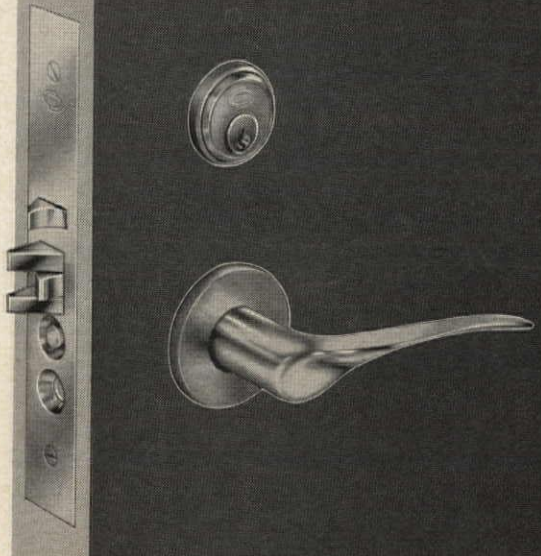
Here you have a fresh concept in lever lock performance and design. It's the new CORBIN MORTISE LEVER HANDLE LOCK!

This lever is unique in that it springs back to the level position after every use. An auxiliary spring and positive stop in the rose *keep* it level and smart-looking always.

And notice the graceful, curving sweep of the handle . . . shaped to fit the hand.

Now you can specify this stylish Lever Handle with any of the regular line of CORBIN Mortise Locks.

It pays to make it CORBIN—throughout!



CORBIN®

P. & F. CORBIN DIVISION
THE AMERICAN HARDWARE CORPORATION
NEW BRITAIN, CONNECTICUT

In brass, bronze or aluminum.

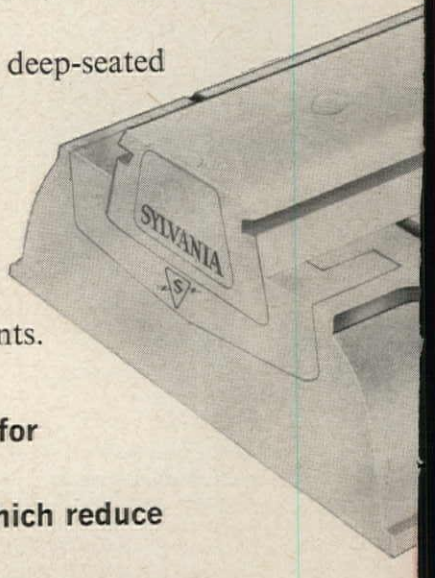
Mortise Locks are available in all functions, and can be masterkeyed with other CORBIN Locks.

The Ideal Answer to Your Industrial Lighting Problems... Sylvania's New

Here is a totally-new series of industrial lighting fixtures designed to make your lighting fixture selection simple and positive.

Sylvania's Power-V Series includes *all of the features you want* in industrial lighting equipment—ruggedness, versatility, adaptability, ease of installation and maintenance, trimness, simplicity, high efficiency, excellent lighting characteristics . . . and all at competitive prices.

This is a completely modern fixture series from the deep-seated channel design to the wide, rugged embossed reflector.



The Power-V Series is designed to provide the high level, quality lighting job you need to increase production and efficiency and to decrease rejects and accidents. Because of the wide choice of models and lamp types, you can practically custom-design a lighting system to fit your exact illumination requirements.

Each Power-V model features:

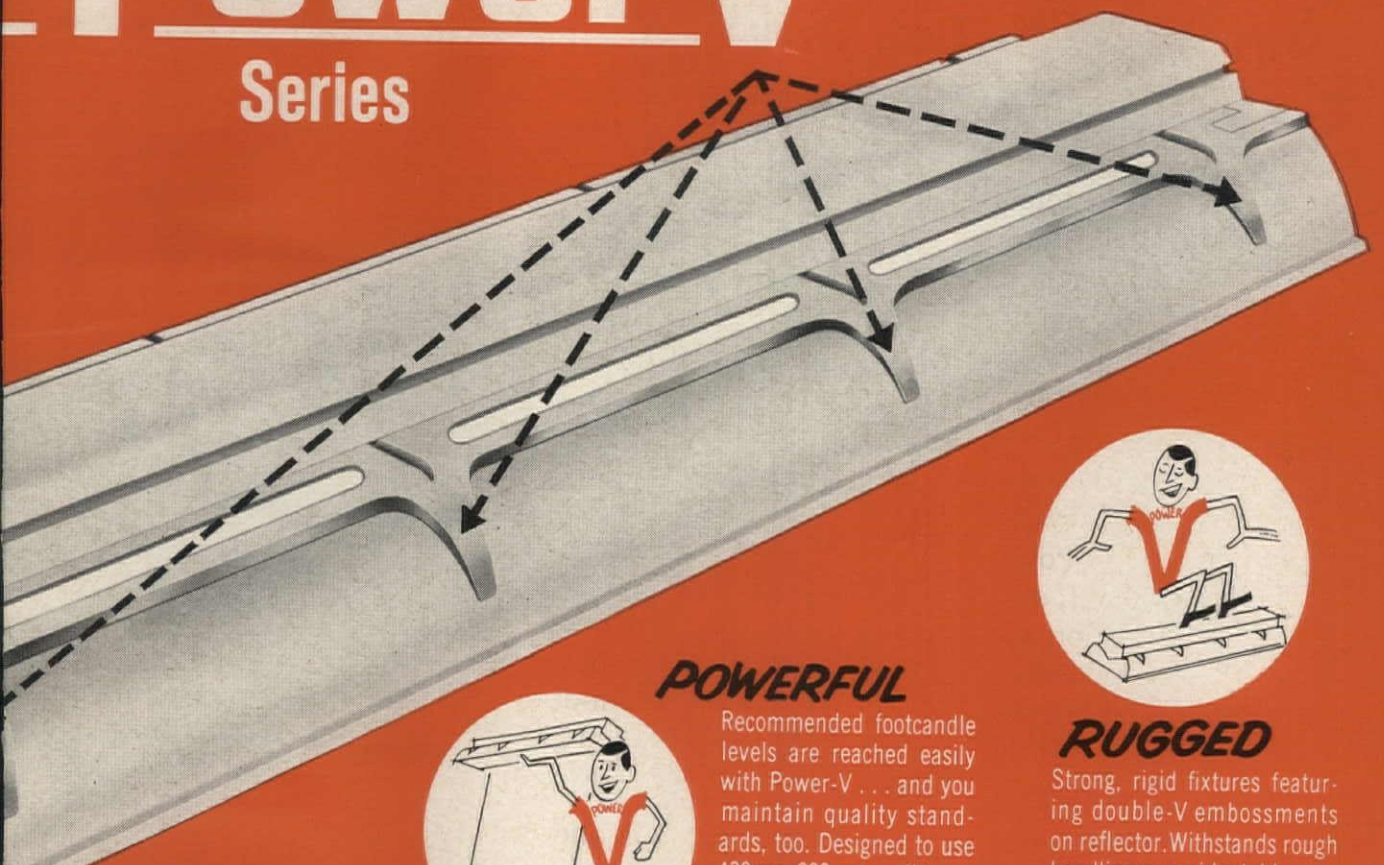
- **Reflectors with deep embossments and ribbing for strength and rigidity.**
- **Simplicity of design and labor-saving devices which reduce installation and maintenance time.**
- **Excellent lighting characteristics with 430 ma Rapid Start and Instant Start; 800 ma Rapid Start; or any size of the powerful 1500 ma Rapid Start lamps.**
- **A low silhouette to provide neat, trim appearance.**

From every angle, we believe the Power-V Series to be the finest line of industrial lighting fixtures ever produced. May we send you the details? Just write to:

SYLVANIA LIGHTING PRODUCTS
A Division of SYLVANIA ELECTRIC PRODUCTS INC.
One 48th Street, Wheeling, West Virginia

For New Construction or Industrial Modernization...
Be Sure to Investigate Sylvania's **Power-V** *Series*

Power-V Series



POWERFUL

Recommended footcandle levels are reached easily with Power-V . . . and you maintain quality standards, too. Designed to use 430 ma, 800 ma or all types of 1500 ma lamps.

RUGGED

Strong, rigid fixtures featuring double-V embossments on reflector. Withstands rough handling or accidental bumps and abuse.

NEAT

Trim, shallow appearance assured through positive integration of channel and reflector. Low silhouette enhances any installation.

SIMPLE

Clean design, minimum parts, labor-saving devices add up to simplicity of installation and maintenance.

LIGHTING FIXTURES BY

SYLVANIA

SUBSIDIARY OF

GENERAL TELEPHONE & ELECTRONICS

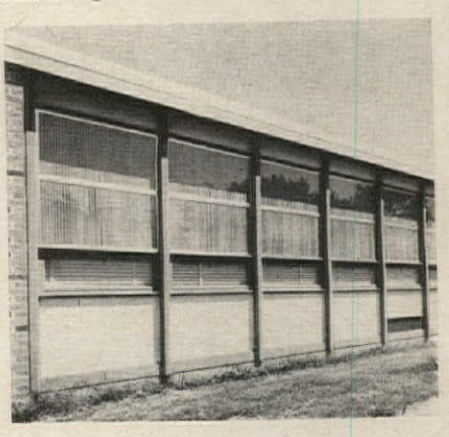
GENERAL SYSTEM

Product Reports

continued from page 230

Aluminum Combination Windows

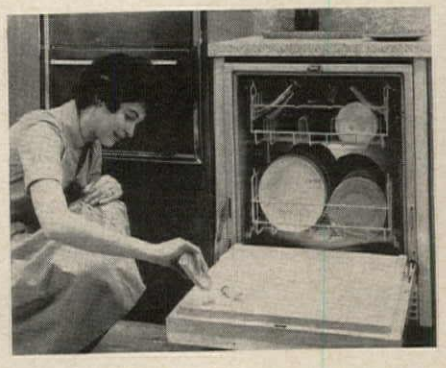
Aluminum combination windows with built-in sun control louvers help reduce room temperature by as much as 15 per cent. The miniature louvers made by Kaiser Aluminum allow diffused light to enter. The louvers are



sealed between two panels of glass and pressure fitted into a 1¼ in. wide channel frame of .040 formed aluminum sheet. In this way the aluminum screen is protected by the glass panels and provides a permanent solar heat block. *Humphrey Products, Inc., 719 E. Zimmerly St., Wichita, Kansas*

Gas Dishwasher

Final rinse water in Preway's gas dishwasher is preheated to 180F, the temperature set by health codes for commercial dishwashers, while the washing action is done at 160F. Both



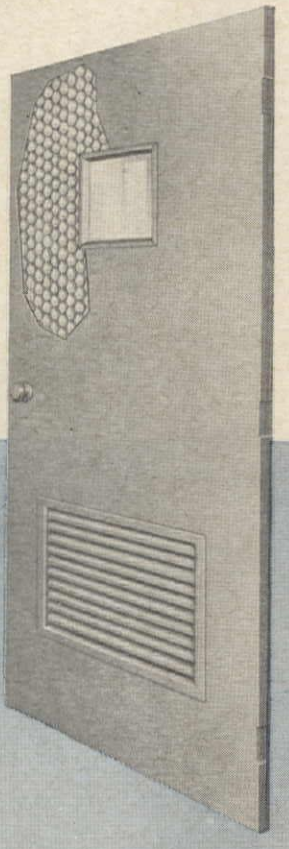
temperatures are above the 140F found in most homes, and are obtained through a built-in gas water heater. The unit incorporates rotating arms which insure better distribution of washing and rinsing water, thereby allowing greater packing flexibility. *Preway, Inc., Wisconsin Rapids, Wisc.*

more products on page 240

STEELCRAFT

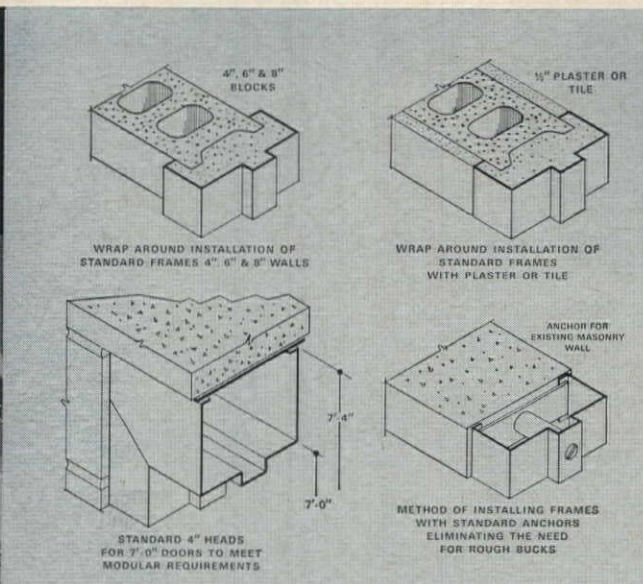
The finest name in...

METAL DOORS and FRAMES



Another suggestion from the Steelcraft Architectural Detail File.

Steelcraft's Indianapolis distributor, William Hanley, AHC, Central Indiana Hardware Co., discussing frame details and versatility with Werner Leeser, Chief Engineer, The Steelcraft Manufacturing Co.



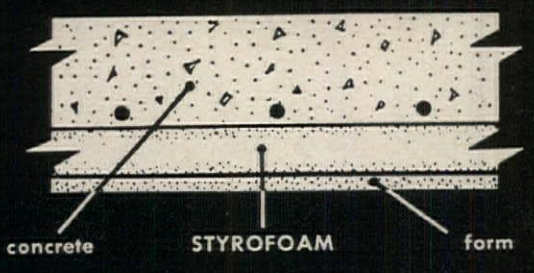
Honeycomb core—A Steelcraft development that provides new strength! A honeycomb core is permanently bonded to two layers of steel . . . deadens sound, adds ruggedness.

Steelcraft offers unmatched versatility with frames for all types of masonry construction, stocked locally in an endless variety of jamb depths and sizes . . . all designed to fit every Steelcraft door. Call your Steelcraft distributor for professional assistance in locally coordinating hardware, approval drawings and schedules for all of your metal doors and frame problems.

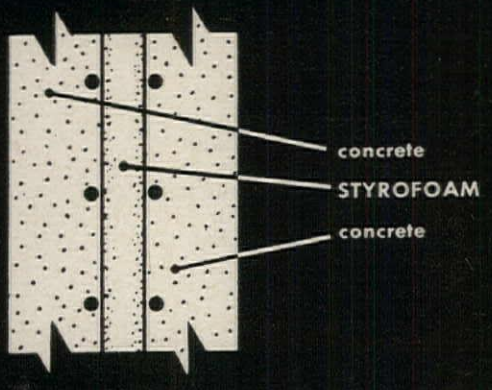
THE STEELCRAFT MANUFACTURING COMPANY
9017 Blue Ash Road, Cincinnati 42, Ohio

STEEL Craft METAL DOORS AND FRAMES

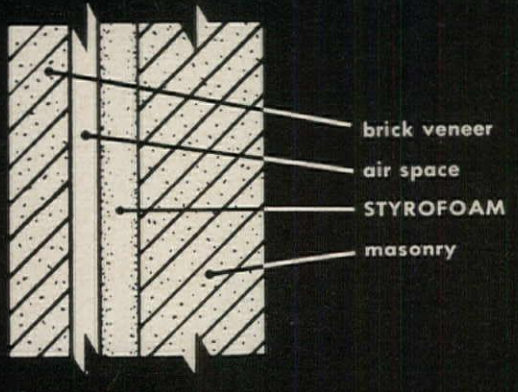
Form liner for poured roofs



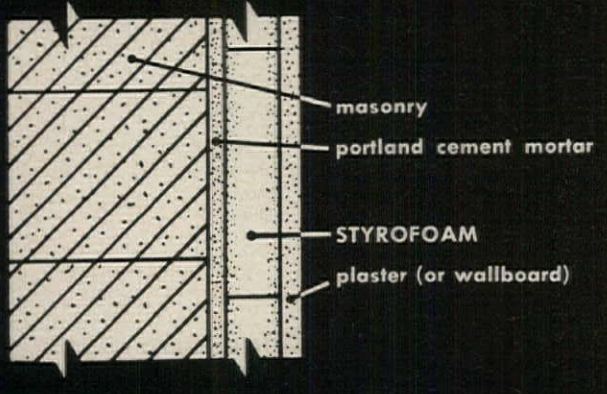
Insulating core for curtain wall panels



Insulation inside cavity walls

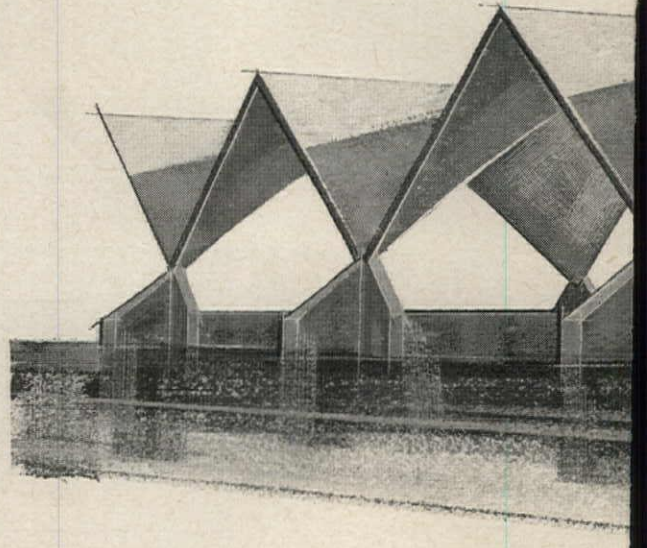


Insulating base for plaster



Styrofoam simplifies construction of insulated . . .

- **THIN-SHELL ROOFS**
- **CONCRETE CURTAIN WALLS**
- **CAVITY WALLS**
- **POURED CONCRETE AND BLOCK WALLS**



STYROFOAM®

solves design problems, speeds construction ... and adds permanent insulating values!

Styrofoam brand insulation board provides triple benefits for commercial building construction. Proved by long use, Styrofoam retains superior insulating values year after year . . . permits use of new, more efficient techniques . . . and cuts the time and cost of insulated construction.

Styrofoam insulation is both a superior insulating material and a rigid structural material. Styrofoam has a low "K" factor that stays low, because water and water vapor don't penetrate it and build up inside. Buildings stay more uniformly warm (or cool) and dry in any weather, saving on heating and cooling costs.

Styrofoam insulation makes new techniques practical. For example, lightweight, insulated concrete curtain walls can be produced quickly using Styrofoam as the core. Positive keying action to concrete minimizes need for fasteners or ties. The final concrete-insulation-concrete "sandwich" is strong, lightweight and economical.

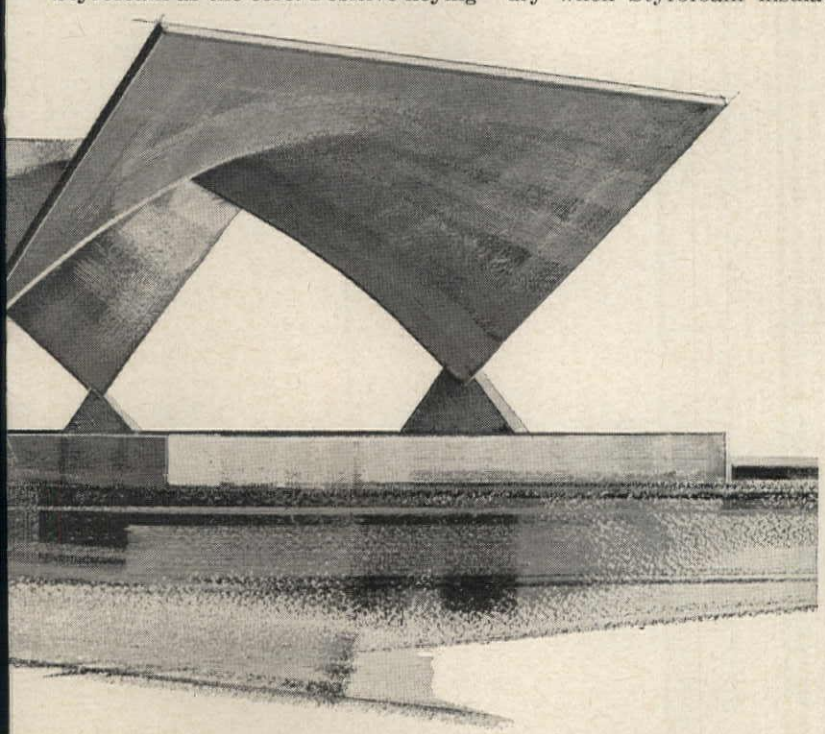
For thin-shell application, Styrofoam insulation is a valuable construction material and insulation. For form work of all kinds, it serves as form liner, permanent insulation, and vapor barrier applied in a single step! The use of Styrofoam in this way provides a minimum 70% reduction in heat loss.

Insulating plasterbase—Styrofoam insulation eliminates the need for furring and lathing when insulating masonry walls. Just adhere Styrofoam to the wall with portland cement mortar, then apply plaster . . . or wallboard, if you wish. The use of Styrofoam as an insulating plasterbase provides 35 to 45% reduction in heat loss.

Cavity-wall buildings stay warm and dry when Styrofoam insulation is in the cavity. Simply adhere it to the outside face of the inner wythe. Because of its high resistance to water vapor, Styrofoam eliminates the need to build in a separate vapor barrier. The addition of Styrofoam to cavity-wall construction provides a 50 to 60% reduction in heat loss.

Low-cost Styrofoam has no food value to attract insects, and will not rot. Installation and handling are quick and easy. For more information on Dow Building Products, write THE DOW CHEMICAL COMPANY, Midland, Mich., Plastics Sales Dept. 1502N1.

Styrofoam is a registered trademark of The Dow Chemical Company. It is applied only to the homogeneous expanded polystyrene made according to an exclusive Dow process. Styrofoam brand insulation board is available only from Dow and its authorized representatives.



This unique h-p roof was poured over Styrofoam, which was finished on the underside with two coats of plaster and a sprayed acoustical finish.

Styrofoam is laid over wood form and covered with reinforcing.

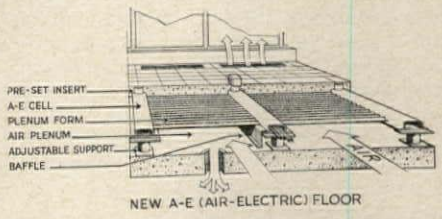
After removing form boards, the Styrofoam in the ceiling is ready for finishing.

THE DOW CHEMICAL COMPANY DOW Midland, Michigan

Product Reports

continued from page 236

Floor System
Mechanical and electrical systems are combined in the *"A-E (air-electric) Floor"* which provides for plenum distribution of conditioned air and cellular chases for power, telephone and other wiring. It may be used with any structural system in new construction and is adaptable for modernizing older structures. A secondary slab floor containing wire

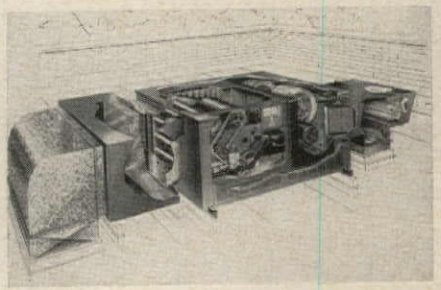


NEW A-E (AIR-ELECTRIC) FLOOR

chases rests on adjustable steel spacers supported by the main structural slab. The air space thus created carries conditioned air to either floor or ceiling air diffusers. The plenum can be varied in height and sub-divided with baffles for zoning. *Granco Steel Products Co., 6506 N. Broadway, St. Louis 15, Mo.*

Industrial Fluorescent Fixtures
Modern design and rugged construction are main features of Sylvania's *Power-V* series of industrial fluorescent lighting fixtures. The fixtures are adaptable to 430 ma, 800 ma and 1500 ma lamps. *Sylvania Lighting Fixtures, Wheeling, West Virginia*

Roof Top Heaters
A lower silhouette is a feature of a new line of roof top heaters offered with a choice of gas-fired, oil-fired or combination fuel models. They are



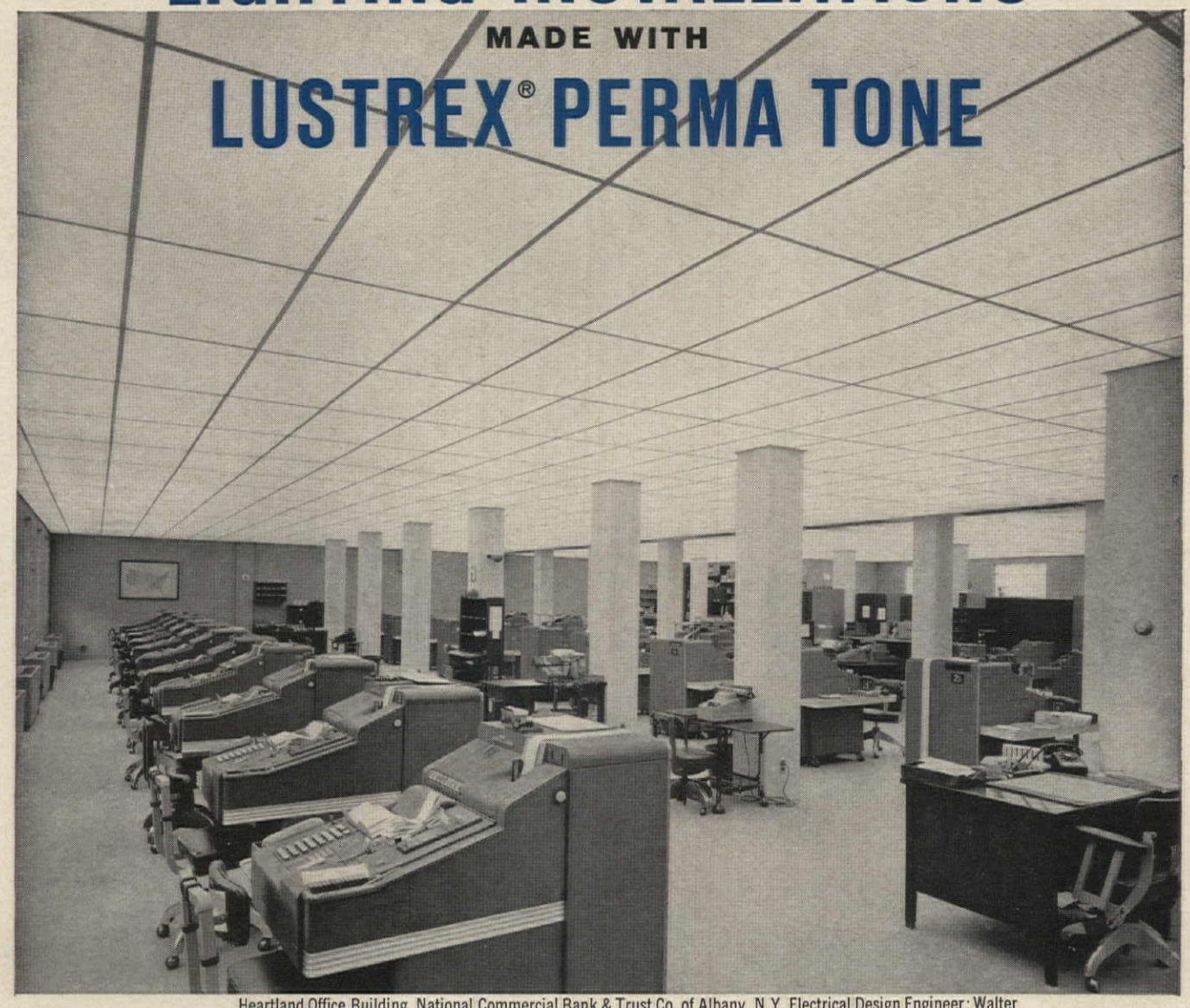
designed for heating only, heating and ventilating, and heating-cooling-ventilating. The heating output range is 28,000 to one million Btuh. Largest unit is 65 in. high. Additive direct expansion evaporator units give 10 to 45 tons of cooling. *Lennox Industries Inc., Marshalltown, Iowa*

Spruce up the old . . . Accent the new

LIGHTING INSTALLATIONS

MADE WITH

LUSTREX® PERMA TONE



Heartland Office Building, National Commercial Bank & Trust Co. of Albany, N.Y. Electrical Design Engineer: Walter S. Stewman, Albany, N.Y. General Contractor: Rosch Bros. Electrical Contractor: H. A. Collman Electrical Co., Inc.

Luminous ceilings, luminaires, louvers, refractors, diffusers and modules made with Monsanto Lustrex Perma Tone Styrene have given years of service as a dramatic and effective source of light in hundreds of buildings of all types—both new and old.

In major renovation projects, these lighting installations are an economical and easy way to brighten up dark corners with strong, yet softly diffused illumination. Over-high ceilings can be brought down and unsightly beams and pipes can be masked behind a ceiling of bright new beauty. In new construction, lighting installations made with Lustrex Perma Tone give you a highly flexible means of creating unique decorative effects and accounts.

Fixtures made of Lustrex Perma Tone deliver uniform surface brightness and excellent color stability. Exceeding IES-NEMA joint specifications for ultraviolet light stabilized styrene, Perma Tone assures the whitest of whites or a wide range of molded-in clear, permanent colors. Dimensionally stable, they are also light in weight for easy handling, installation and maintenance. To make sure you get this combination of performance at an economical cost, specify installations made with Monsanto Lustrex Perma Tone.

MONSANTO DESIGNER IN **PLASTICS**

If you would like additional data on Lustrex Perma Tone in lighting, and the names of manufacturers of fixtures molded of Lustrex Perma Tone, send coupon below to Monsanto Chemical Company, Plastics Division, Room 818, Springfield 2, Mass.

Monsanto

MONSANTO CHEMICAL COMPANY, Plastics Division

Room 818, Springfield 2, Mass.

Please send me comprehensive report on general-purpose and impact Lustrex Perma Tone Styrene, and other data on styrene in lighting. Also list of manufacturers of lighting fixtures of Perma Tone.

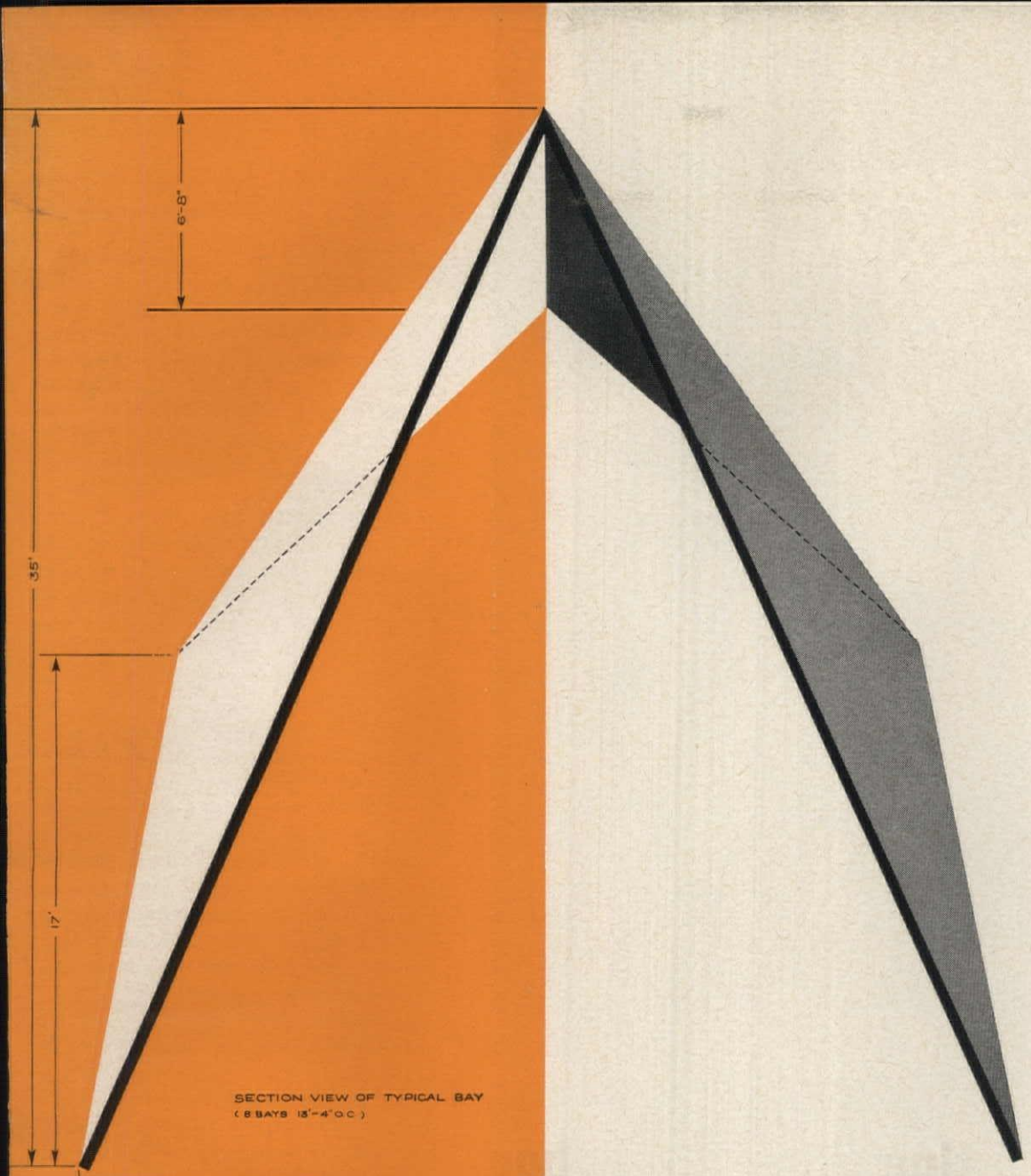
NAME_____ TITLE_____

COMPANY_____

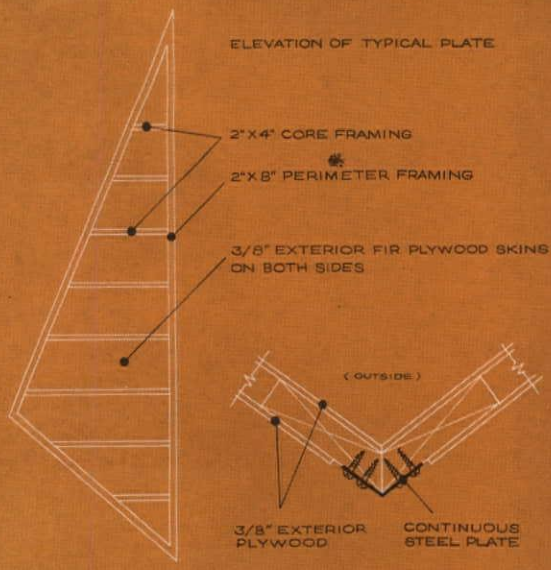
ADDRESS_____

CITY_____

the most exciting ideas take shape in fir plywood



SECTION VIEW OF TYPICAL BAY
(8 BAYS 18'-4" O.C.)



INDEPENDENT CONGREGATIONAL CHURCH

LOCATION:	St. Louis
ARCHITECTS:	Manske & Dieckmann, St. Louis
COMPONENTS:	Roof Structures, Inc., Webster Groves, Mo.
BUILDER:	A. H. Haeseler, St. Louis

THE NINE SOARING PINNACLES of this church, recalling the boldness of Gothic arches, are a vigorous expression of advancing plywood technology. The roof is a space plane, a step beyond the folded plate with more versatility than any other clear-span technique using wood.

Like all folded plates, the space plane acquires strength and rigidity from interaction of inclined plywood diaphragms. But its components may take shapes other than rectangular, to create more complex designs. Here they are triangular stressed skin panels. Forces are transferred from one to another, and the entire multi-faceted roof becomes a lid-like shell, supported only at edges. Steel buttresses anchored to foundations absorb lateral thrusts. Clear-span area is 32′ x 110′.

The absence of framework or posts is only one of several advantages this roof shares with space planes in general. It went up fast (15 days); huge plywood components were precisely fabricated to insure exact fit. Prefabrication also guaranteed close cost control and quality of workmanship and materials. In-place cost compared well with other means of obtaining a similar span.

For basic fir plywood design data, write (USA only) Douglas Fir Plywood Assn., Tacoma 2, Wash.

Office Literature

continued from page 206

Partition Catalog
An eight-page, two-color brochure contains specifications, detail and elevation drawings, and photographs of movable, free-standing, industrial and toilet partitions. *Marnay Sales Division, Rockaway Metal Products Corp., 41 E. 42nd St., New York 17, N.Y.*

Terne Roofing
(A.I.A. 12-A-31) Advantages and recent installations of seamless terne roofing are included in an eight-page bulletin. Specifications are also included. *Follansbee Steel Corp., Follansbee, W. Va.**

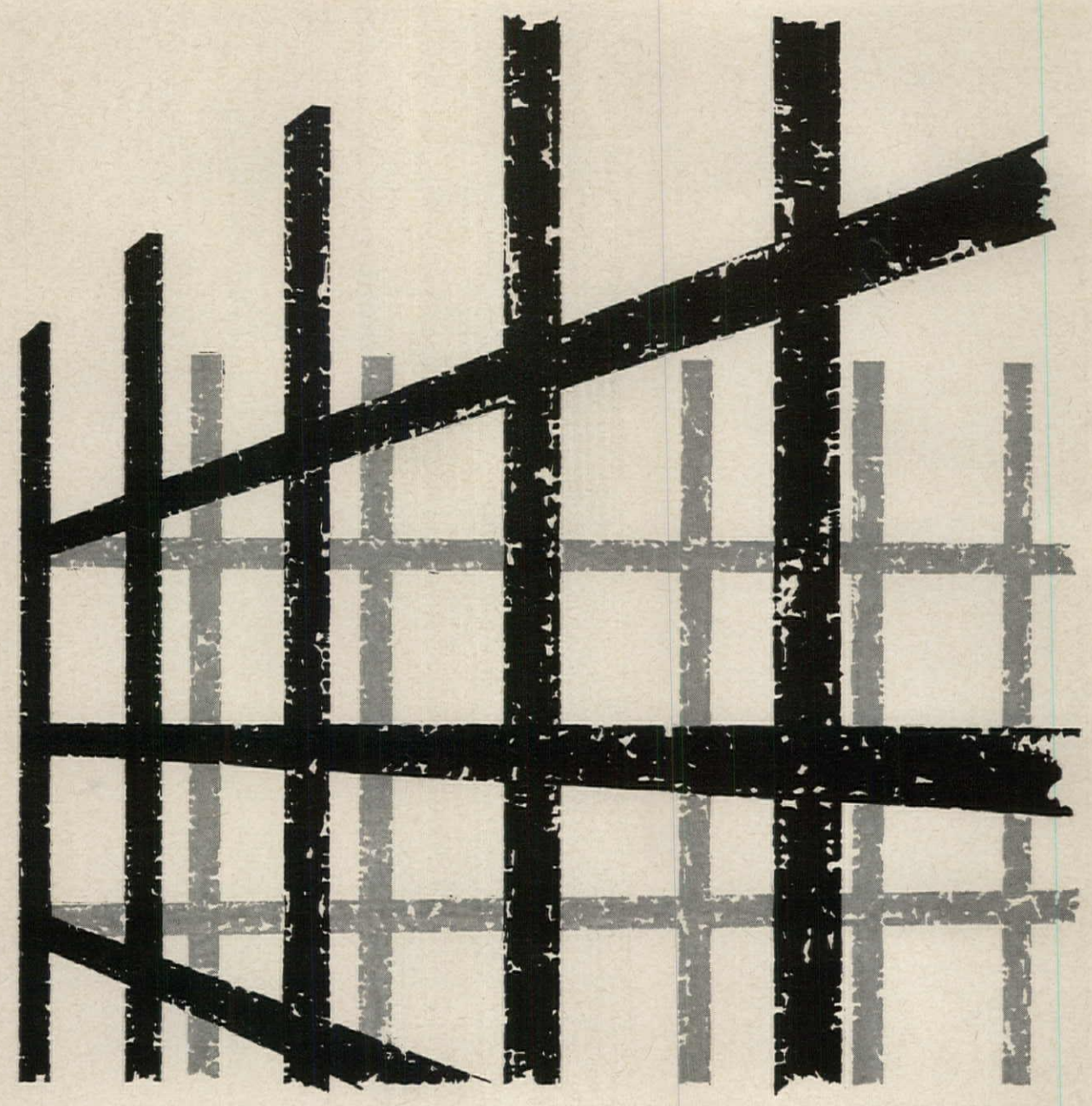
Acoustical Products
More than 440 types and qualities of acoustical products, ranging from perforated wood fiber acoustical tiles to integrated air conditioning-ventilating acoustical ceilings, are included in a 30-page illustrated catalog. Detailed technical information is provided. *Elof Hansson, Inc., Acoustical Division, 711 Third Ave., New York 17, N. Y.**

Indirect Luminous Ceiling
Brochure titled "Lighting in the Right Direction Engineered for Architects" features a lighting concept which combines versatility, efficiency and economy. *Silvray Lighting, Inc., 100 W. Main St., Bound Brook, N.J.*

Heating and Cooling
Technical data on industrial heating, cooling and heat transfer with *Panelcoil* are included in *Technical Data Bulletin 356*. It also provides charts and tables for figuring heating load, selecting heating surface, short cuts, etc. *Dean Products, Inc., 1042 Dean St., Brooklyn 38, N.Y.*

Fire-Protected Wood
(A.I.A. 19-A-3) Information about the economy and safety of Koppers *Non-Com* fire-protected wood is available in Bulletin W-365. The wood is pressure-impregnated with inorganic chemicals that protect it from fire, termites and decay. The six-page bulletin gives case histories. *Wood Preserving Division, Koppers Co., Inc., Pittsburgh 19, Pa.**

**Additional product information in Sweet's Architectural File*



New support for lowered construction costs

Armco Steel Corp. ↓
The Babcock & Wilcox Co., Tubular Products Div. ↓↑
The Carpenter Steel Co., Alloy Tube Div. ↑
Jones & Laughlin Steel Corp., Electricweld Tube Div. ↓
National Tube Div., United States Steel Corp. ↓
Ohio Seamless Tube Div., Copperweld Steel Co. ↓
Republic Steel Corp., Steel and Tubes Div. ↓↑
Sawhill Tubular Products, Inc. ↓↑
Southeastern Metals Co. ↓
The Standard Tube Co. ↓↑
Superior Tube Co. ↑
Trent Tube Co., Subs. Crucible Steel Co. of America ↑
Union Steel Corp. ↑
Van Huffel Tube Corp. ↓
Wall Tube & Metal Products Co. ↑

↑ PRODUCES WELDED STAINLESS STEEL TUBE
↓ PRODUCES WELDED CARBON STEEL TUBE

461

Much of the weight of cutting building costs can be borne by designing structural support of welded steel tubing. Recent developments resulting in larger sizes and heavier wall thicknesses open many opportunities: you get the efficiency of a thin-walled, hollow section with trimness of line that integrates well with other elements. No need for additional trim or finish unless you want it. Tubing can be formed to any shape—and it lends itself to pre-fabrication and rapid on-site assembly.

The practicality of utilizing the light-weight-to-high-strength ratio of welded steel tubing has been proved by recent experience — in modern office buildings, schools, commercial buildings — even homes. Best current example: supporting curtain walls. Many of the quality tube producers listed here can supply information, or write Department AR-4, Welded Steel Tube Institute, Inc., Hanna Building, Cleveland, Ohio.

WELDED STEEL TUBE INSTITUTE, INC.

WELDED STEEL TUBE INSTITUTE

Steel

WHEN THE INVITING WARMTH OF CALIFORNIA REDWOOD is made an integral part of the architect's design, buildings such as hospitals and schools have a charming naturalness rather than a forbidding "institutional look". Budget-conscious building committees also look with favor upon CRA Certified Kiln Dried redwood's well justified reputation for durability and easy, economical maintenance. If you do not have an up-dated copy of "The Architect's Redwood File", write Department A-8 on your business letterhead.

Architects: Ricciuti & Associates

CRA

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

CALIFORNIA REDWOOD ASSOCIATION • 576 SACRAMENTO STREET • SAN FRANCISCO

CRA-TRADEMARKED CERTIFIED KILN DRIED REDWOOD

The California Redwood Association coordinates the research, forest management, grading and consumer service activities of these member mills: GEORGIA-PACIFIC CORPORATION • UNION LUMBER CO. • THE PACIFIC LUMBER CO. • WILLITS REDWOOD PRODUCTS CO. • ARCATA REDWOOD CO. • SIMPSON TIMBER CO.

The Record Reports

continued from page 110

ing of a building, and his belief that eventually architect and engineer would be merged in a common profession.

Mr. Candela stated that he did not believe in the equal collaboration of the architect and the engineer: "A single person must be in control. Creation is a highly individual process." Science, he said, is based on the analytic process; art, a higher state, is based on the use of facts learned in the analytic process.

One of the questions from the audience was, "Where does shell design go from here?" To which Candela replied, "I don't know really. I am so busy, I never think really of the next development. I only work by pressure from the outside. If I have nothing to do, I do nothing, you see?"

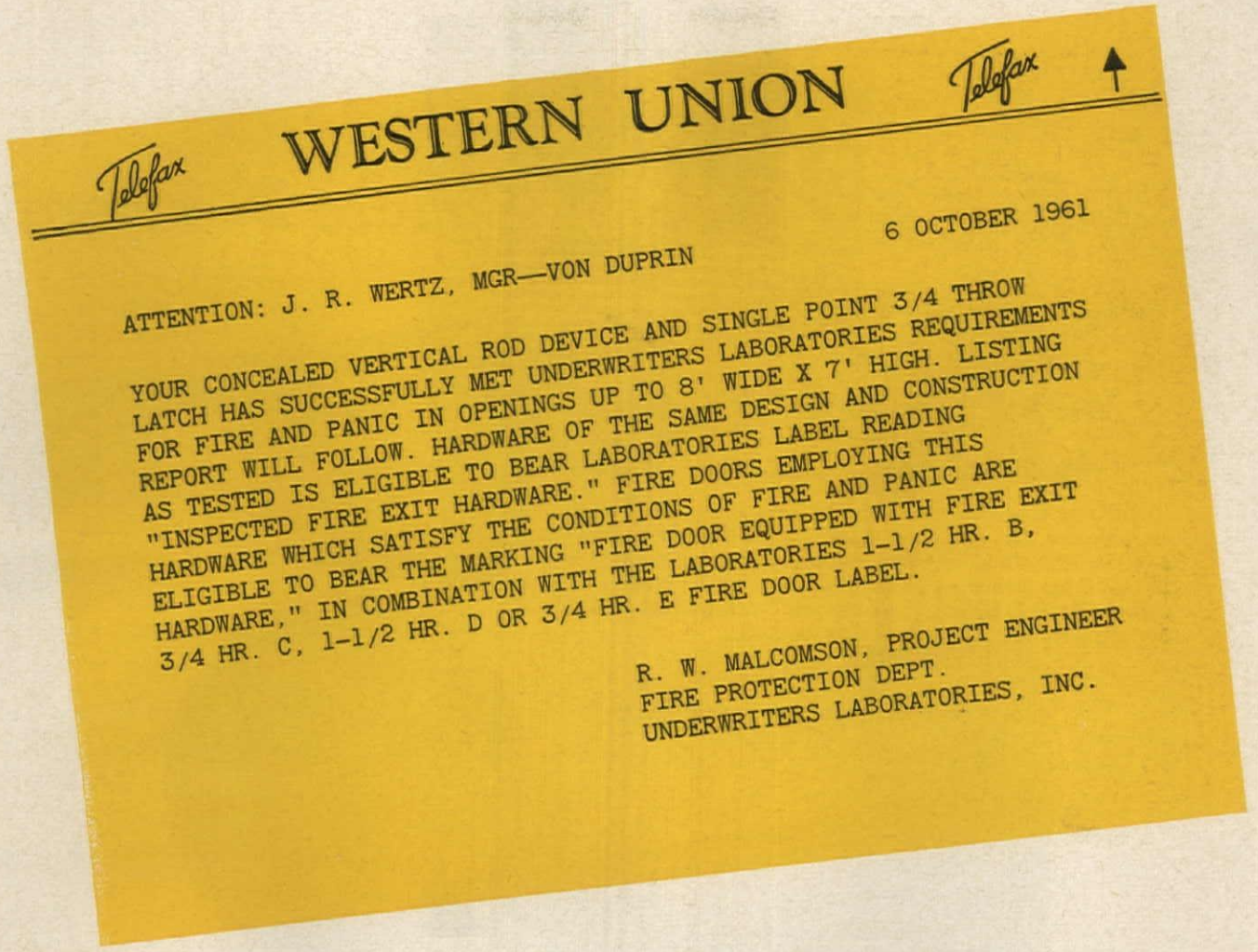
Architect-Engineer Education

Another question from the audience was, "How do you think architectural and engineering education can be improved?" "By a greater disposition on the part of the faculty to participate in actual practice," said Mr. Parkin. He continued, "Frequently students are misled as to the nature of what an architect does after graduation. They expect their names to be in lights. The fact that his performance will be largely anonymous ought to be conveyed to the student early." He added that the prima donna attitude of architects coming out of school is quite different from that of the engineer.

Mr. Candela answered that the role of the university in the world is not that of a factory to produce technicians, but to develop the more complete man. "I am against too much emphasis on the practical side of education," he said. Theoretical, not practical knowledge is the important thing.

Mr. Parkin countered by saying he did not mean that liberal arts should not come first, that education should ignore the humanities, or that technicians should be the result of education.

Dean Colbert stated that we must find a way to have inter-disciplinary exchange, architects must learn from other disciplines, and we need "long-term studies in depth." He said, "We *want* prima donnas, stars!"



This fire exit hardware may be used with several existing Von Duprin crossbar assembly designs. Detailed catalog information will soon be available. Just write, wire or call to reserve your copy as soon as the Bulletin is off the press.

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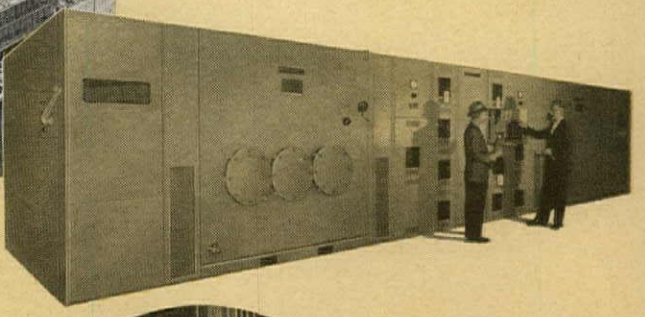
Square D--wherever



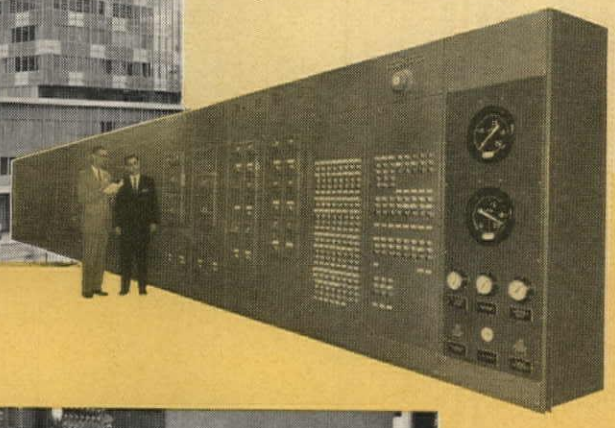
COBO HALL, world's largest, occupies 16 acres of Detroit's civic center. It provides 400,000 square feet of exhibit area. *Its 10,000 KVA of power is distributed and controlled by Square D equipment* which includes 11 substations (one of them is shown at right), 37 control centers, 28 switchboards, 550 panelboards, 19,000 feet of lay-in duct.

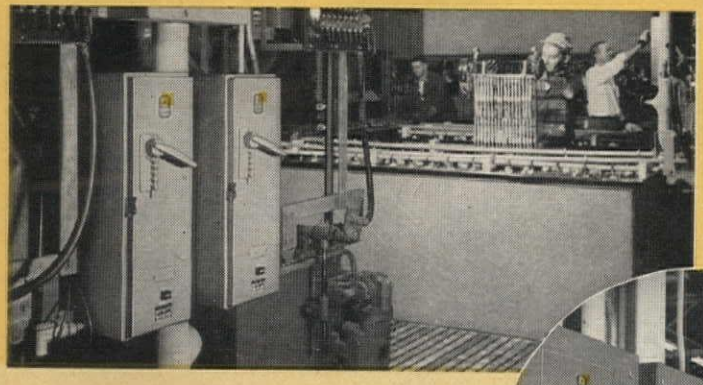
EL SAN JUAN INTERCONTINENTAL
One of the Caribbean's most beautiful resort hotels. *Square D equipment distributes and controls the electricity throughout this modern structure.* ABOVE—Square D control center centralizes all motor control for air-conditioning lobby, offices, dining rooms, night club and casino. Square D feed-in duct brings power from substation.

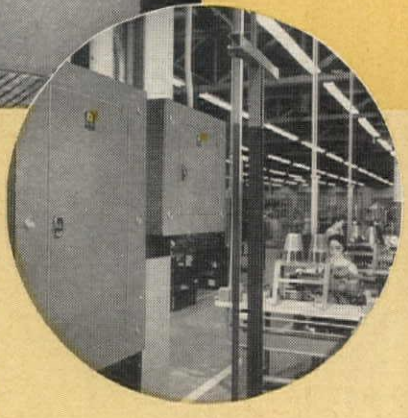
SQUARE D COMPANY

electricity is distributed and controlled

KROGER BUILDING
Its 29 stories contain more floor space under one roof than any other office building in Cincinnati—over 500,000 square feet. *Square D equipment is on duty throughout this beautiful building.* BELOW—a Square D switchboard which handles a multitude of protection, distribution and measuring functions. Panel in foreground visually reports entire system's performance.







AUTOMATIC ELECTRIC
This 1,520,000 sq. ft. plant, located at Northlake, Illinois, replaces 17 multi-story buildings—outstanding example of more capacity per square foot through straight-line production design. *Square D equipment plays an important part in many key operations.* ABOVE—Square D combination starters in plating department. There are hundreds of them serving dozens of departments. RIGHT—Square D lighting panelboards (hundreds of them) are used throughout the plant and offices.

EXECUTIVE OFFICES • PARK RIDGE, ILLINOIS

A *Complete* LINE OF ELECTRICAL DISTRIBUTION AND CONTROL EQUIPMENT

ADJUSTABLE SPEED DRIVES
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LIFTING MAGNETS
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LIMIT AND FOOT SWITCHES
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MAGNETIC BRAKES
METER MOUNTINGS
MOTOR STARTERS
PRESS CONTROL
PRESSURE, FLOAT, & VACUUM SWITCHES
PUSHBUTTONS
RELAYS AND CONTACTORS
RESISTORS
SAFETY SWITCHES
SERVICE ENTRANCE EQUIPMENT
STAGE DIMMERBOARDS
STATIC CONTROL
STEEL MILL CONTROL
SWITCHGEAR & UNIT SUBSTATIONS
SYNCHRONOUS MOTOR CONTROL
TERMINAL BLOCKS
TEXTILE MACHINE CONTROL
TIMERS
VOLTAGE TESTERS
WELDER CONTROL

The Record Reports

On the Calendar

November

4-7 National Retail Lumber Dealers Association Eighth Annual Building Materials Exposition—McCormick Place Exhibit Hall, Chicago

6-8 Annual convention, Structural Clay Products Institute; theme: Industry Research—Shoreham Hotel, Washington, D.C.

6-9 46th edition, National Hotel Exposition—The Coliseum, New York City

6-9 1961 conference and Atom Fair atomic exhibit, sponsored by the Atomic Industrial Forum and the American Nuclear Society—Conrad Hilton, Chicago

6-10 Annual convention, National Warm Air Heating and Air Conditioning Association—La Salle Hotel, Chicago

11-17 54th annual convention, National Association of Real Estate Boards—Miami Beach, Fla.

12-15 Annual meeting, Air Conditioning and Refrigeration Institute—The Homestead, Hot Springs, Va.

14-16 Building Research Institute 1961 Fall Conferences—Shoreham Hotel, Washington, D.C.

15-18 1961 Joint Convention, Gulf States Regional A.I.A. and Louisiana Architects Association, A.I.A.—Capitol House Hotel, Baton Rouge, La.

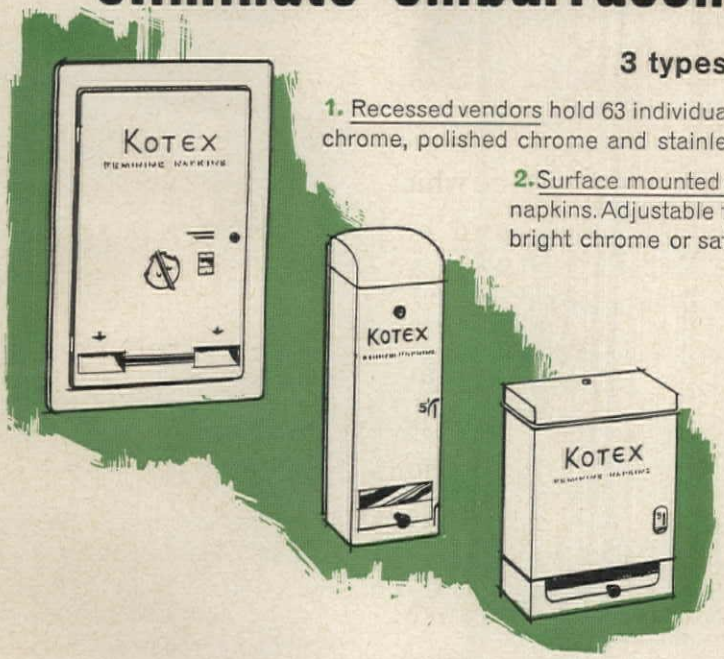
19-22 Seventh Annual Student Forum, sponsored by the American Institute of Architects and the Association of Student Chapters, A.I.A.—Octagon, A.I.A. headquarters, Washington, D.C.

20ff American Society of Mechanical Engineers Winter Annual Meeting; through Dec. 1—Statler Hilton Hotel, New York

21ff Exhibition, Stained Glass Windows by Chagall for a synagogue at the new Hadassah-Hebrew University Medical Center near Jerusalem, shown under sponsorship of Hadassah; through Jan. 7, 1962—

continued on page 256

Vendors for Kotex napkins lower absenteeism —eliminate embarrassment—raise morale



3 types to choose from!

1. Recessed vendors hold 63 individually wrapped napkins. Available in white enamel, satin chrome, polished chrome and stainless steel. Can also be surface-mounted, if desired.

2. Surface mounted vendor for boxed Kotex, holds 15 individually boxed napkins. Adjustable for free, five-cent or ten-cent vending. White enamel, bright chrome or satin chrome finishes.

3. Surface mounted vendor for envelope Kotex, dispenses 22 individually packaged napkins. Sturdy, 20-gauge steel cabinet available in white enamel, satin chrome or bright chrome. Operates as nickel, dime or free vendor.

The great convenience of restroom vendors is appreciated by both tenants and employees. And only Kotex offers three types—making it the most complete personal service available for your building. All are easy to install—all have trouble-free, longer-wearing cold-rolled steel coin mechanism.

Vending machines for Kotex belts augment this needed service.

More women prefer Kotex feminine napkins than all other brands

KOTEX is a trademark of KIMBERLY-CLARK CORPORATION

Kimberly-Clark Corporation, Department Number AR-111, Neenah, Wisconsin

Please send complete information on vending machine service for Kotex feminine napkins.

Name _____ Organization _____

Title _____ Address _____

City _____ Zone _____ State _____

The Record Reports

continued from page 252

Museum of Modern Art, New York

26ff American Society of Mechanical Engineers Winter Annual Meeting; through Dec. 1—Statler Hilton Hotel, New York City

27-30 39th Annual Meeting, American Institute of Steel Construction—Boca Raton Hotel and Club, Boca Raton, Fla.

28-30 Building Research Institute 1961 Fall Conferences—Mayflower Hotel, Washington, D.C.

December

3-7 18th Annual National Association of Home Builders Convention-Exposition—McCormick Place, Chicago

5-7 Building Research Institute 1961 Fall Conferences—Shoreham Hotel, Washington, D.C.

January

25-27 Annual meeting, Society of Architectural Historians—Boston

28-31 Semi-annual meeting, American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.—Chase-Park Plaza Hotel, St. Louis, Mo.

Office Notes

Offices Opened

Harry H. Graef and Martin M. Mintz have opened an office at 711 North Fayette St., Alexandria, Va. under the firm name of Graef-Mintz & Associates, Architects.

Paul Conklin Quigg, Architect, A.I.A., announces the opening of his office at 2060 North 14th St., Arlington 1, Va.

A new architectural office has been opened by Richard W. Snibbe, A.I.A., at 200 East 37th St., New York City

New Firms, Firm Changes

Luther W. Graef, Leonard P. Anhalt and Robert E. Schloemer have formed the following firm: Graef,

continued on page 260

Holds 9,385 times its own weight. Permanently.

The fastener you see is a Ramset #3601. It weighs a scant 120 grains, red tip and all.

Because we're a conservative lot—and build in safety factor upon safety factor—we rate its designed holding power at 160 pounds, anchored in 3,500 psi concrete. Almost 10,000 times its own weight.

(In a series of controlled tests, our austempered Eye Pin averaged 2,000 pounds holding power in tension. Almost 120,000 times its weight. Hmmm. Move over Archimedes. With a big enough fastener, we could hold the world.)

Astonishingly enough, Ramset powder-driven fasteners do their job with incredible speed. "In place" in less than 30 seconds. For setting an Eye Pin. For fastening steel to concrete or steel, wood to concrete or steel.

For a copy of our informative, 48 page "Fastener Handbook," with specifications and recommended applications, simply drop us a line on your company letterhead.

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301-K Winchester Ave., New Haven 4, Conn.

570 BROAD STREET BUILDING
Newark, New Jersey

A dramatic addition to Newark's Washington Park Area, developed by the century-old Mutual Benefit Life Insurance Company.

ARCHITECTS & ENGINEERS
Frank Grad & Sons
Newark, New Jersey

LENDING INSTITUTION
Mutual Benefit Life Insurance Co.
Newark, New Jersey

GENERAL CONTRACTOR
Wm. L. Blanchard Co.
Newark, New Jersey

LEASING & MANAGING AGENT
Peter F. Pasbjerg & Co., Inc.
Newark, New Jersey

EVERYTHING ABOUT THIS NEW OFFICE BUILDING WILL BE BREATHTAKING

. . . EXCEPT THE ELEVATORS!

Haughton *DYNAFLITE* Control

will provide fastest floor-to-floor time with *complete* comfort!

This is the 570 Broad Street Office Building, Newark, New Jersey. Now under construction, its 14 floors will be served by four Haughton Operatorless Elevators with totally new *Dynaflite* control. With this control, floor-to-floor time can be incredibly fast, because starts and stops are so precisely controlled every time, and are so gentle that passengers scarcely feel any motion at all. Thus Dynaflite combines speed and comfort to provide unmatched efficiency and passenger well-being . . . and enhance building prestige and rentability. Haughton Dynaflite control is ready to serve your buildings today, thanks to Elevonics* . . . the new technology in vertical transportation that has created new standards for excellence in elevator performance. Include Dynaflite's distinctive advantages in your building or modernization plans. Ask your Haughton representative for complete details, or write us, without obligation.

EMBLEM OF EXCELLENCE IN VERTICAL TRANSPORTATION

A HAUGHTON 7-PROGRAM SYSTEM

will anticipate in advance the varied traffic conditions encountered in the 570 Broad Street Building. An "electronic brain" will automatically dispatch cars at proper times, in the proper sequence . . . avoiding the congestion of "rush hours" and "coffee breaks." This type of predetermined service can work wonders in your installation.

*Haughton's advanced program in elevator systems research and engineering, with specific emphasis on the creative application of electronic devices and instrumentation for betterment of systems design and performance. Reg. in U. S. Pat. Off.

HAUGHTON ELEVATOR COMPANY
DIVISION OF TOLEDO SCALE CORPORATION
Toledo 9, Ohio — Offices in Principal Cities
PASSENGER AND FREIGHT ELEVATORS • ESCALATORS • DUMBWAITERS

STUCCO

for patterns unlimited...

New design, texture and color effects for walls! Architects have yet to find a more workable and idea-stimulating material than portland cement stucco. No other wall material lends itself to such individualistic treatment. Handle it with a bold sweep . . . or a subtle touch. Sculpture it. Comb it. Or achieve color and texture with an exposed aggregate like the panel featured above. Use it with traditional or contemporary designs. Use it for entire walls . . . or for dramatic accents. White portland cement stucco in fresh and intriguing forms is being used by more and more architects as today's modern material for modern living.

For the newest in homes . . .

LIVING CONCRETE

PORTLAND CEMENT ASSOCIATION

. . . A national organization to improve and extend the uses of portland cement and concrete

The Record Reports

continued from page 256

Anhalt & Schloemer, Consulting Engineers. The address is 6340 West Fond du Lac Ave., Milwaukee 18, Wis.

Gordon L. Schenck has been named a senior associate with the firm of Ballard Todd Associates, architects. New associates of the firm, which is located at 123 E. 77th St., New York, are Robert Cabrera and Paul F. Basile.

A new consulting engineering firm has been formed by Jacob Koton and William J. Donovan. Koton and Donovan, with offices at the Crossroads Plaza, West Hartford, Conn., will specialize in mechanical and electrical engineering in the air conditioning, refrigeration, heating, plumbing and electrical fields.

David John Lepore, formerly design and architectural supervisor for the Sheraton Hotel chain, has joined the staff of John S. Bolles, Architects and Engineers, San Francisco.

Harry E. Cooler, Don B. Fisher, Robert E. Lakin and Wm. C. Schubert, formerly with architectural firms in the Indianapolis, Ind. area, have formed a new firm called Architects Coordinate. The new organization is located at 4845 College Ave., Indianapolis.

Ray Stuermer has been appointed vice president in charge of the design department with Childs & Smith, Inc., 20 North Wacker Drive, Chicago 6.

Charles Bacon Rowley and Associates, Inc. and Ernst Payer announce the change of corporate name to Rowley, Payer, Huffman and Leithold, Inc., Architects and Engineers. Members are Charles Bacon Rowley, Ernst Payer, Emerson I. Huffman and Joseph A. Leithold. New offices are located at 1420 Keith Building, Cleveland 15, Ohio.

Associate professor Howard Barnstone, of the design department in the College of Architecture, University of Houston, has separated his private practice from the former firm of Bolton & Barnstone, Architects. The new office of Howard Barnstone and Partners is at 630 Esperson Bldg., Houston 2.

The architectural firms of Leon Brown and Thomas W. D. Wright, Grosvenor Chapman and Joseph Miller have been absorbed by the

continued on page 264

Domino luminaires — new beauty and versatility in lighting. Totally lens-enclosed, with an apparent depth of only 1½". Installs easily as a unit or in rows, for a free-flowing unbroken line of shadowless, non-glaring light. Easy to relamp. In acrylic or styrene, 2 or 4 Rapid-Start lamps. See your Smithcraft representative, or write for details:
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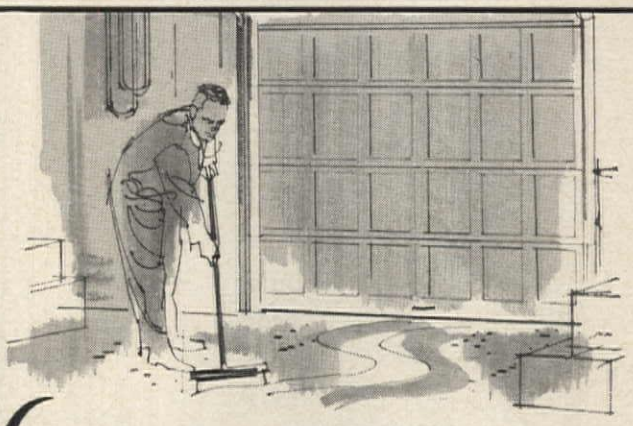
Smithcraft

DOMINO!

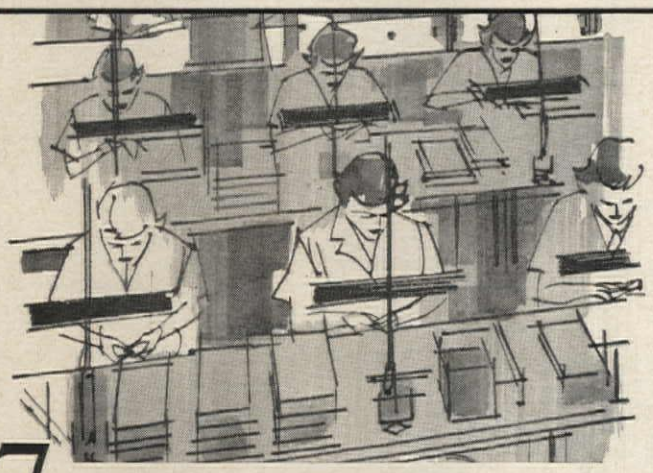
3 **"WALKING LABOR"** costs mount up fast. When a man leaves a production job or material-handling unit simply to open/close doors your client has another indirect cost. Barber-Colman strategically located switch controls and job-engineered electric operators provide the solution.

4 **HEATED OR COOLED AIR** is expensive to make, important to save. Do doors seal tightly, or are profits leaking out through "holes" you don't see? Seal the "holes" with Barber-Colman Cam Action doors and specially insulated sections.

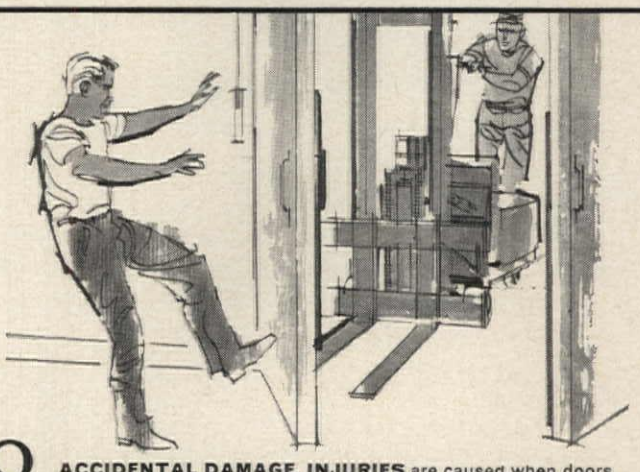
5 **DUST-FREE, DEHUMIDIFIED OR OTHER SPECIAL CONDITIONED AIR** may be necessary to maintain accurate quality control for a product. Provide complete sealing protection with Barber-Colman Cam Action doors.



6 **MAINTENANCE** costs go down . . . drafts, contaminated air, dirt, dust, grit are sealed out with Barber-Colman controlled operation and tight sealing.



7 **EMPLOYEE HEALTH, COMFORT** are affected by the efficiency of a plant's doors. Barber-Colman AID* Plan assures employee protection and increased productivity for your client.



8 **ACCIDENTAL DAMAGE, INJURIES** are caused when doors are inefficiently planned or operated. Anticipate and prevent these dangerous occurrences and unnecessary costs with the Barber-Colman AID* Plan.

BARBER COLMAN

BARBER-COLMAN COMPANY, DEPT. P 111, ROCKFORD, ILLINOIS

OVERdoors

...helping industry boost efficiency

continued from page 260

firm of Brown, Chapman, Miller, Wright, with offices at 1640 Wisconsin Ave., N.W., Washington 7, D.C. This firm represents a partnership of four architects whose objective is to provide complete services in the fields of architecture and urban design for private as well as government clients. In addition to the four partners, there are four project managers—Charles T. Downham, Harold Adler, Judith A. Byrns and Michel Parlier.

Donald W. Reidenbaugh has been made a general partner in the architectural firm of Ross W. Singleton. The firm will continue under the name of Singleton & Reidenbaugh. Offices are located at 466 Coho Bldg., Lancaster, Pa.

New Addresses

Aisner and Atwood, Architects, 920 Park Square Bldg., 31 St. James Ave., Boston 16.

Russell E. Collins, A.I.A., Architect, 2403 Moray Ave., San Pedro, Calif.

Ilmars Lagzdins, Consulting Civil Engineer, 212 J. St., Eureka, Calif.

McIntosh & Moeller, Architects and Engineers, 719 Main St. West, Hamilton, Ont.

Howard R. Meyer, F.A.I.A., Architect, 2727 Oak Lawn Ave., Dallas 19.

Edward H. Noakes & Associates, Architects, 7805 Old Georgetown Rd., Bethesda 14, Md.

Desmond J. Parker, Architect, Suite 102, Mainland Bldg., 1378 Fifth Ave., Prince George, British Columbia.

Full-time Faculty at Cooper Union Expands

Appointments to the full-time staff at Cooper Union School of Art and Architecture which began this fall were: Bernard Spring, assistant professor of mechanical and electrical equipment for buildings; Richard Bender, assistant professor of structural design; Norval White, assistant professor of architectural design.

The expansion of the faculty began in 1960 with the appointment of Nicholas Marsicano, assistant professor in painting.

These appointments have been added to Cooper Union's full-time faculty which consists of: Dana Vaughan, Dean of the School of Art and Architecture; Raymond B. Dowden, Head of the Department of Art; Esmond Shaw, Head of the Department of Architecture; and Matthew Wysocki, Supervisor of the evening session.

Cooper Union's full-time faculty expansion is only one of several long-time goals whose realization began in the Centennial year, 1959-1960. At the same time a new five-year curriculum in the day session of the Department of Architecture was established and a new four-year curriculum in the day session of the Department of Art. As a result, the first Bachelor of Architecture degrees will be awarded in 1964; the first Bachelor of Fine Arts degrees in 1963.

Another aim attained has been the completion of the new Engineering Building, the first major addition to the Cooper Union plant since 1912. (See Buildings in the News, p. 15).

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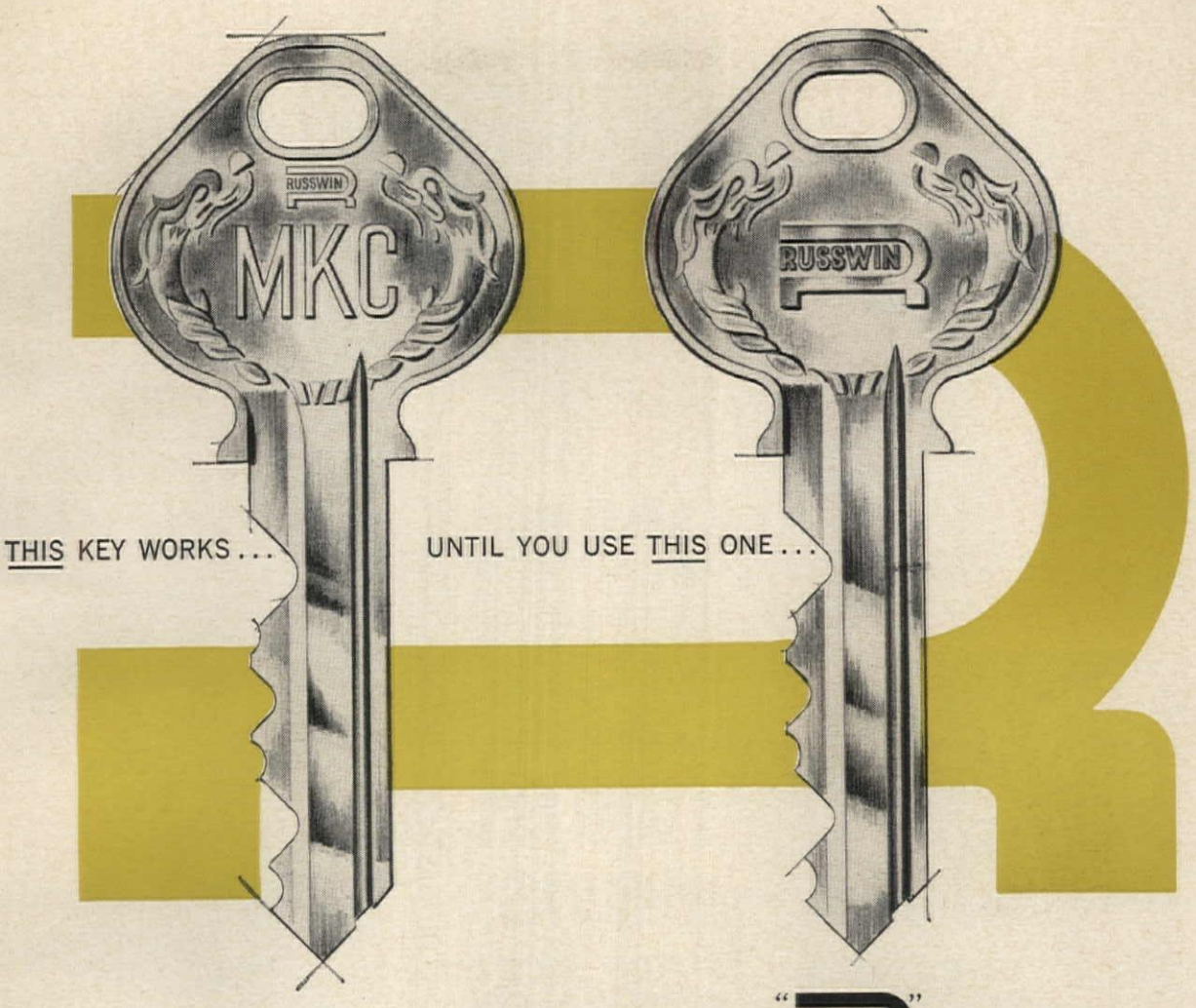


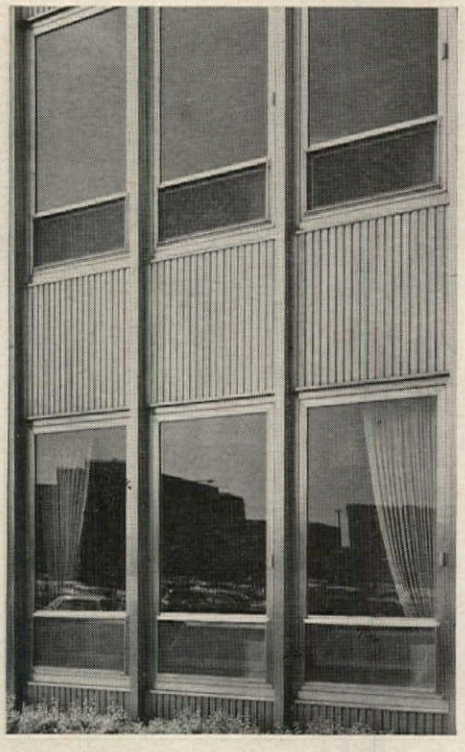
the russwin "R" ...what it means in building security

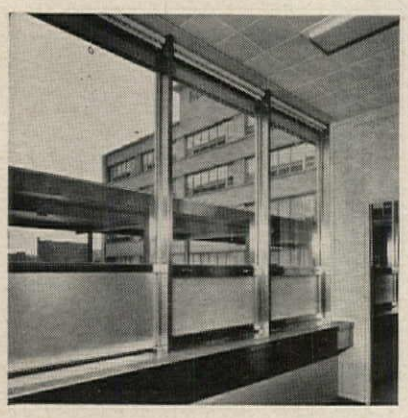
One set of keys operates locks during building construction. The other set (the owner's keys) cancels out the first set after work is completed. No lock cylinders or pins to change. Russwin's unique Master Construction Key* System makes security simple . . . fast . . . completely practical for *any* building. Look to Russwin . . . for the finest in doorware . . for the services of a specialist, your Russwin distributor. Russell & Erwin Division, The American Hardware Corporation, New Britain, Connecticut.

*Pat. appl'd. for

RUSSWIN

New steels are born at Armco





Stainless Steel

For Permanent Beauty, Economy, and Strength

STAINLESS STEEL WINDOWS COST LESS AND LOOK BEST OVER THE YEARS

Fantus Outpatient Clinic, Chicago
ARCHITECTS: **Richard W. Prendergast & Associates**
CONTRACTOR: **Mayfair Construction Co.**
STAINLESS STEEL WINDOW MFR.: **Flour City Architectural Metals Division, Hupp Corporation**

These attractive, durable stainless steel windows, used throughout the new Fantus Outpatient Clinic in Chicago, reflect the increasing use of stainless for this primary building product. Stainless steel windows are being specified more and more because standard and custom-designed units can be obtained at costs very close to those made of less durable materials. In addition, the extremely low maintenance expense of this architecturally-proved metal means costs are less on an over-all basis.

Where appearance is vital, help preserve at minimum cost the original beauty of the structures you create by specifying windows and other components in Armco Stainless Steel. Let us send you a copy of "Armco Stainless Steels for Architecture," a design and specification manual that shows how stainless steel can be used most economically. **Armco Division, Armco Steel Corporation, 2541 Curtis Street, Middletown, Ohio.**

ARMCO **Armco Division**

the latest in store *design* needs the latest in store *lighting*...

300 FOOTCANDLE and 55° LOUVERS by AMERICAN

ARCHITECT: Allen Grossman
New York, N.Y.

DESIGNERS: C. E. Swanson and Associates
Chicago, Ill.

One of the first 300 Footcandle installations in the country of American's recently-introduced 55° Louvers was in MADIGAN'S smart, new suburban store in Melrose Park, Ill. Maximum store illumination—softly diffused to flatter merchandise, customers, and store decor—was the aim of Madigan's management. The result was *perfect store lighting.*

Only American's exclusive 55° deep-cell styrene louvers could achieve such glare-free brightness while utilizing the full advantage of high-level, 300 candlepower illumination. They may be cut, grooved or sized to meet any requirement and... the cost is low. *Specify modern, sturdy 55° Louvers by American.*

Available in translucent white and a variety of colors, for use in individual fixtures, modular units and large areas. Cell size: $^{25}/_{64}$" x $^{25}/_{64}$" x $^{1}/_{2}$" high.

Engineers are available in your area to help solve your lighting problems. Or... write direct to us for expert, free consultation and advice.

Exclusive process by American Louver Company
U.S.A. Patent Nos. 2,566,817, 2,607,455
Canadian Patent Nos. 484,346, 497,047

american louver company

5308 NORTH ELSTON AVENUE • CHICAGO 30, ILL.

Greenewalt To Receive 1962 John Fritz Medal

Crawford H. Greenewalt, president of E. I. du Pont de Nemours & Company, will receive the highest honor of the engineering profession, the John Fritz Medal, on Dec. 5 in New York at the Annual Awards Banquet sponsored by the American Institute of Chemical Engineers.

Mr. Greenewalt is cited "For outstanding contributions . . . through leadership in research, in the translation of research achievements by way of sound engineering into useful products," and through his "able championship of the American free enterprise system both in the spoken and written word."

Presented not more than once in any year for "scientific or industrial achievement" in any field of pure or applied science, the John Fritz Medal is sponsored jointly by the American Society of Civil Engineers, the American Institute of Mining, Metallurgical and Petroleum Engineers, the American Society of Mechanical Engineers, the American Institute of Electrical Engineers, and the American Institute of Chemical Engineers. The United Engineering Trustees, Inc. is custodian of the award.

The award was established in 1902 as a memorial to the great engineer and steelmaker, John Fritz. It has been presented to some of the world's most distinguished engineers and scientists, including Westinghouse, Alexander Graham Bell, Edison, General Goethals, Orville Wright, Marconi, Sperry, Hoover, Pupin and Kettering.

I.E.S. Lighting Competition Winners Announced

First place in the Annual Applied Lighting Competition of the Illuminating Engineering Society held at the organization's National Technical Conference in St. Louis was won by Elizabeth A. Meehan, Philadelphia, and Carl R. Johnson, Upper Montclair, N.J.

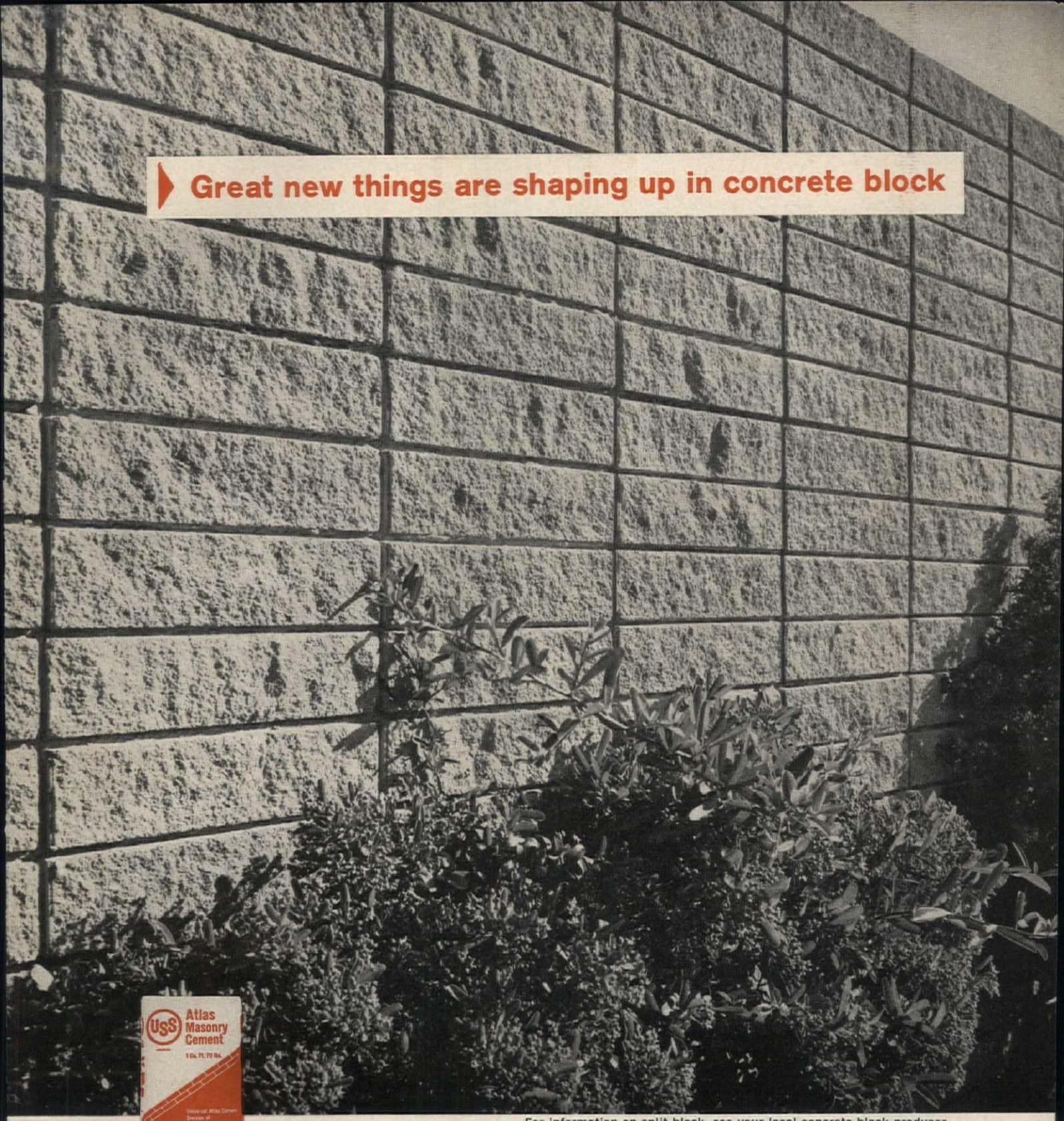
Miss Meehan, with the Philadelphia Electric Company, won first prize in the Residential Lighting Class for her presentation on "Light, Liberty and the Pursuit of Happiness." Mr. Johnson, with the Controlescent Lighting Corp., won first prize in the Commercial and Industrial Lighting Class with his presentation on "Integration of Lighting and Architecture."

Both winners received the Charles H. Goddard Trophy plus $100 and an award certificate.

Other winners were: *Residential Lighting*—2nd place, May Love Gale, Tennessee Valley Authority, Nashville; 3rd place, Peter R. Darnton, Pacific Gas and Electric Co., Salinas, Calif.; 4th place—tie—Hazel Harbauer, Toledo Edison Co., Toledo, and Grace Schoeni, Portland General Electric Co., Portland, Ore.; *Commercial & Industrial Lighting*—2nd place, Melvin Cohen, A. Epstein & Sons, Inc., Chicago; 3rd place, Fred L. Lantz, Giffels & Rossetti, Inc., Detroit; 4th place, Harold Stead, Arizona Highway Dept., Phoenix.

The second place winners received $50 and an award certificate; third and fourth place winners, $25 and $15 respectively, and a certificate.

more news on page 272



For information on split block, see your local concrete block producer.

Atlas Masonry Cement provides the right mortar

Split block is one of the most popular of the decorative types of masonry, with its rough texture and rugged contours that so closely resemble natural stone. It is available as a veneer block or a load-bearing unit in various sizes and colors. Use it for exterior and interior walls, partitions, chimneys, fireplaces, planters, etc. □ To lay up split block or any type of masonry, ATLAS MASONRY CEMENT continues to be the preferred cement for mortar. It produces a smooth, workable mix . . . saves labor . . . cuts waste . . . helps assure a good bond . . . gives durable mortar joints that are uniform in color. Complies with ASTM & Federal Specifications. For information on masonry cement, write: Universal Atlas, Dept. M, 100 Park Avenue, New York 17, N.Y.

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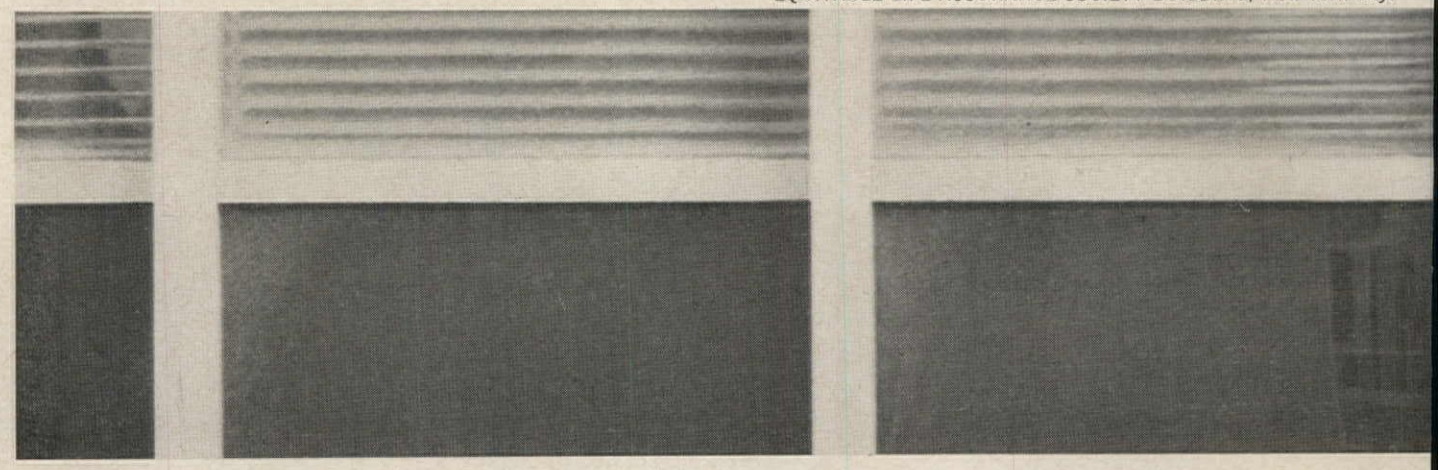

SEE HOW THIS FIBERGLAS CEILING FOLLOWS

A NEW FREEDOM HAS COME TO THE DESIGN OF ACOUSTICAL CEILINGS. Architects are achieving interesting results—a fresh simplicity with functional economics—through the new size availability of Fiberglas* Noise Control Products. The Equitable Life Building in New York City is an example. Here Skidmore, Owings & Merrill, the architects, wanted the 41-inch mullion module to be carried throughout the interior—in the lighting, the partition placements, and the acoustical ceiling. Acoustical units were to be 13⅔" x 41", a most unusual size.

Fiberglas Sonofaced Acoustical Tile was chosen because . . .

- *It could be obtained in the exact size of 13⅔" x 41";*
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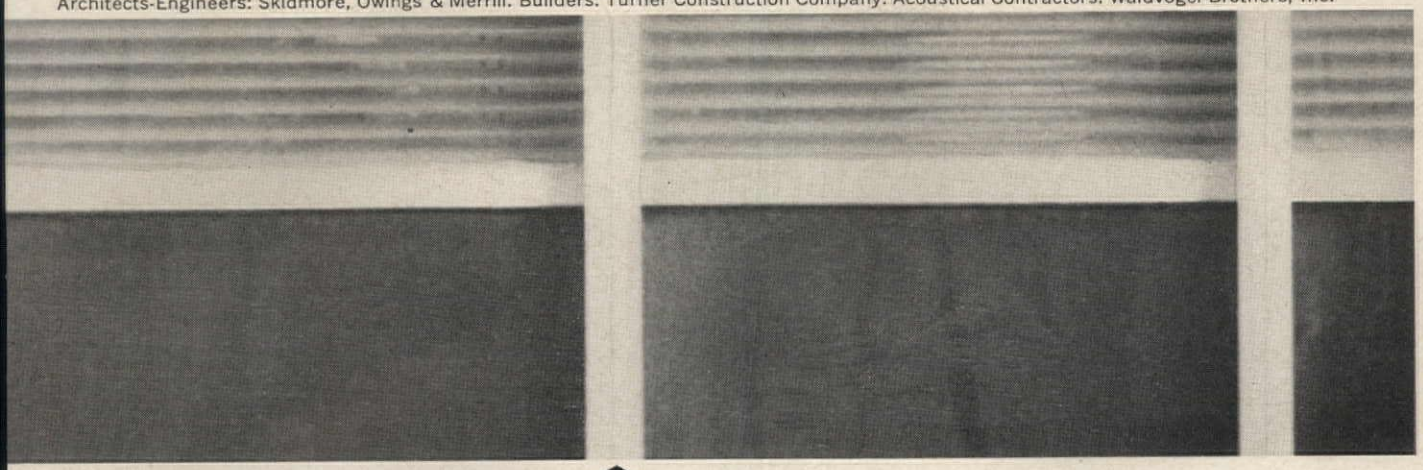
- *Like all Fiberglas Noise Control Products it would remain dimensionally stable.*

Architects-Engineers: Skidmore, Owings & Merrill. Builders: Turner Construction Company. Acoustical Contractors: Waldvogel Brothers, Inc.



THE 41" EXTERIOR MODULE . . . EXACTLY

Columns are 41" x 41". Partition sections are 41" wide. Joints fall on module lines, providing for easy re-location of partitions and lighting.

Sonofaced is only one of many Fiberglas Noise Control Products available in any size you want, and as big as you want—up to 48" x 48". This unprecedented flexibility frees you from the limitations of stock sizes and permits you to achieve simple, uncluttered effects.

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continued from page 268

New Civil Engineering Scholarships Awarded

Eight area students have been named as first winners in a new program of university scholarships for the study of civil engineering established by the Industry Advancement Program.

Administered by the General Building Contractors Association, Inc., these scholarships are a facet of a pioneering educational program carried on for the benefit of the public and some 500 firms engaged in commercial, industrial and institutional building in the Philadelphia area who contribute to the Industry Advancement Program. Contributions made are for hours worked by carpenters, laborers, cement masons and millwrights.

The scholarships are open to graduates of public, parochial and private secondary schools. Candidates must be residents of Bucks, Chester, Delaware, Montgomery or Philadelphia counties. Employes of firms contributing to the Industry Advancement Program also may apply. The scholarships are awarded to recipients who are planning to make a career in the building construction industry and who are accepted for admission by one of the schools involved.

An amount of $1500 each has been allocated for the 1961-62 school year to the University of Pennsylvania, Villanova University and Pennsylvania State University. An allocation of $2000 has been made to Drexel Institute of Technology for use in the five-year Co-Op work-study program.

Each of these universities has the option of giving the entire amount of the scholarship money to one student or of splitting it among two or more.

On this basis the following winners have been selected for study at the institution named: *Villanova University*—Ernest M. Allison, Oreland, $750; Thomas J. Hillegass Jr., Chestnut Hill, $750; *Drexel Institute of Technology*—Richard E. deFreyre, Havertown, $1000; Peter Poulsen, Upper Darby, $1000; *University of Pennsylvania*—Robert K. Huzzard, Royersford, $1500; *Pennsylvania State University*—Edgar S. Neely Jr., Trevose, $500; Lee Rosenberger, Souderton, $500; Howard B. Ratcliffe Jr., Philadelphia, $500.

N.Y.U. Architecture Graduates Re-establish Alumni Association

Graduates of the New York University School of Architecture and Allied Arts which closed in 1941 have recently re-established an alumni association.

Officers elected were: J. Stanley Sharp, partner in the firm of Ketchum and Sharp, president; Stanley H. Klein, Stanley H. Klein, Architects, vice president; Arthur W. H. Towne, vice president in the building construction firm of Barlow-Meagher Company, Inc., treasurer; Joseph Roberto, University Architect, New York University, recording secretary; and Carolyn Schor, interior designer, corresponding secretary.

more news on page 276

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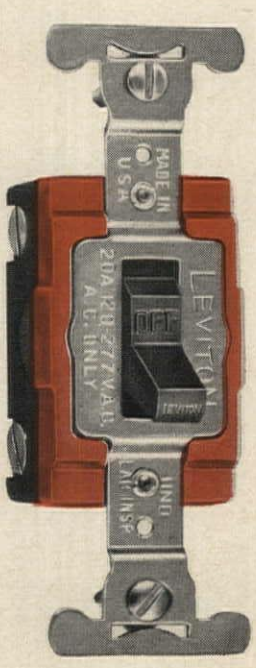

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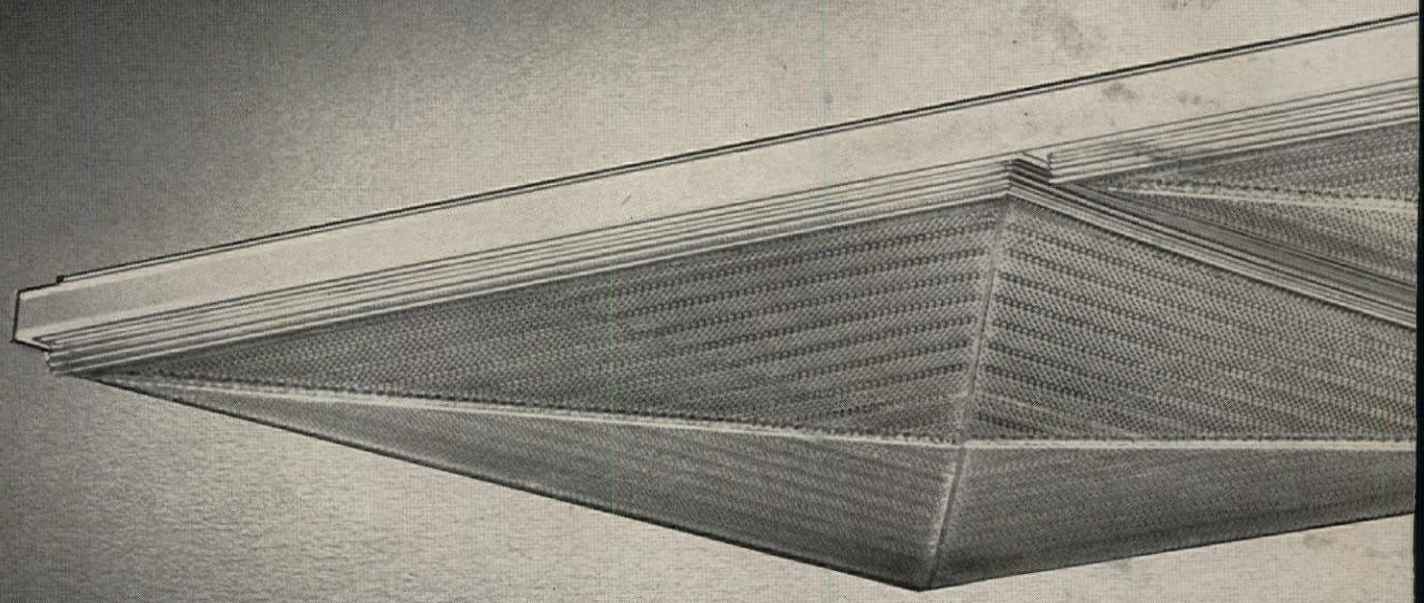

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Lens by Holophane Co., Inc.

continued from page 272

Design Competition: Mansion for California's Governor

The State of California has authorized a competition for the design of a Governor's mansion and the Capitol Building and Planning Commission delegated the authority to select the design. William W. Wurster, F.A. I.A., Dean of the College of Environmental Design, University of California, Berkeley, is professional adviser; Daniel Nacht, A.I.A., Sacramento, is assistant to the adviser for the purpose of conducting the competition.

The following jury has been appointed by the Commission: Pietro Belluschi, F.A.I.A., Dean, School of Architecture and Planning, Massachusetts Institute of Technology, Cambridge, chairman; Gardner Dailey, F.A.I.A., San Francisco; Frank W. Kent, Director, Crocker Art Gallery, Sacramento; Stephen C. Pepper, Professor Emeritus of Philosophy, University of California; and Lutah Maria Riggs, F.A.I.A., Santa Barbara.

The competition will be conducted in two parts, the first open to all architects licensed by and resident in California. From the designs submitted, the jury will select ten. The architects of these ten designs will participate in the second part of the competition, the jury selecting the winning design. The next three designs will be designated for second, third and fourth awards. There will be no cash awards. The architect of the winning design will be appointed by the Governor to prepare the plans and specifications for the mansion.

Requests for copies of the competition program should be addressed to the Professional Adviser, c/o Capitol Building and Planning Commission, Room 1173, State Capitol, Sacramento 14, Calif.

Applications will be accepted through Nov. 22. Deadline for mailing entries in the first part of the competition is Dec. 6. Judging to select the best ten designs will take place on Dec. 16. Mailing entry deadline for the competition's second part will be Feb. 7. Final judging will occur on Feb. 17.

N.P.S. Grant Aids Texas Architecture Research

A collection of more than 100 architectural drawings and photographs of the Alamo and other historic central and south Texas buildings have been compiled by Walter Eugene George Jr., associate professor of architecture at the University of Texas.

The work was supported by a $5100 research grant from the National Park Service as part of its national project to obtain records of structures with historical significance or outstanding architectural characteristics.

Professor George, whose special research field is architecture of the Southwest, spent last summer making the collection and compiling historical information on the various sites. Assisting him on the project were two University architecture students, James Emmrich and Jose Jimenez.

more news on page 280

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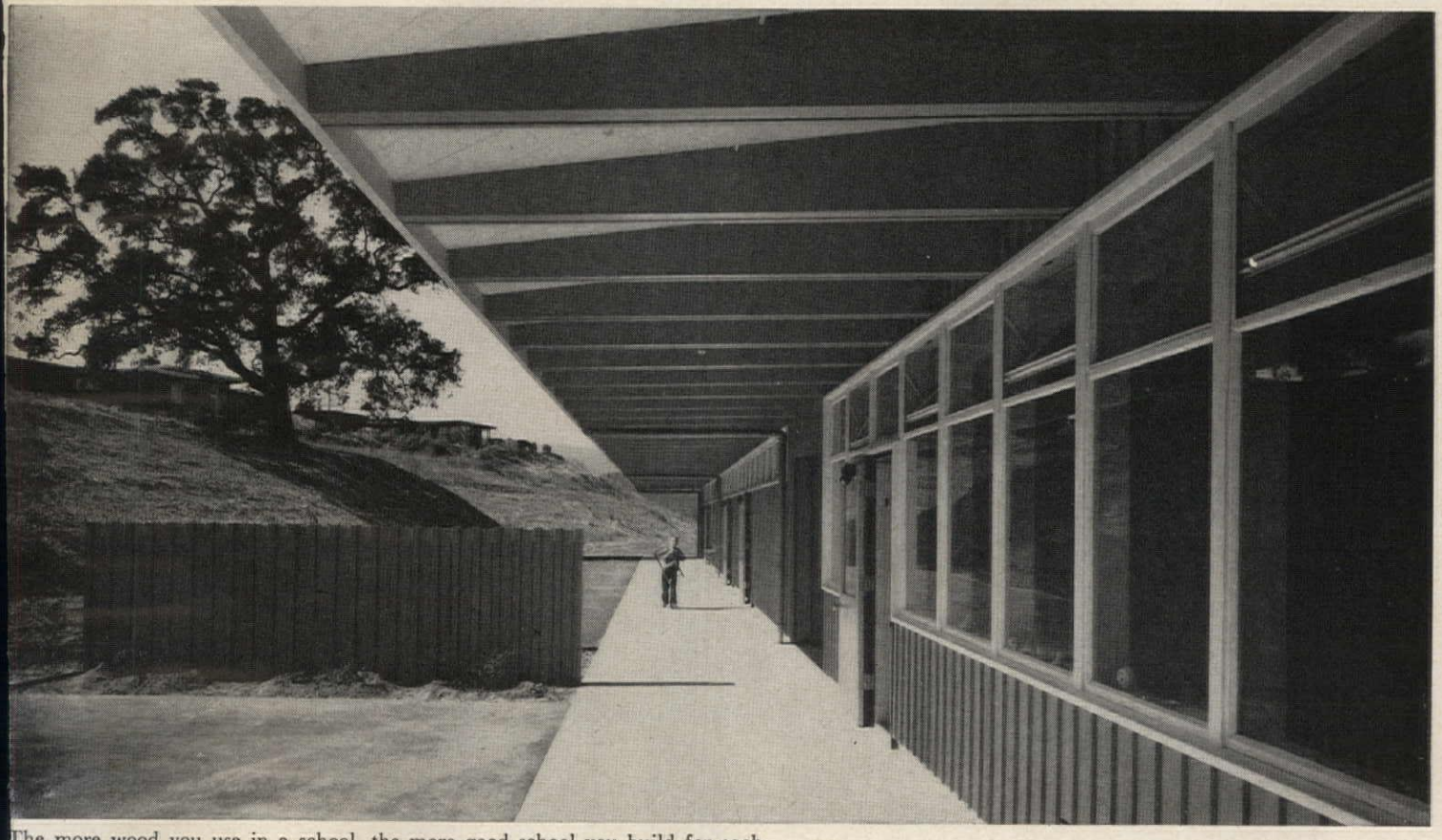


The more wood you use in a school, the more good school you build for each ax dollar. Many of America's most successful new school designs have been nspired and made possible by wood construction. Peter Kump, architect.

continued from page 276

Denmark's Royal Academy Studies Island Architecture

Studies made by a Danish team from the Royal Academy of Fine Arts in the Virgin Islands this past summer will provide the basis for recommendations for historic preservation and town planning programs for the Islands.

According to National Park Service Director Conrad L. Wirth, studies of the surviving colonial Danish architecture in the Islands were made by a team of 25 students and faculty members of the school of architecture of the Royal Academy. Assisting in the study were two National Park Service employes stationed in the Islands: resident architect Frederik C. Gjessing, who has a Fulbright Visiting Professorship at the Royal Academy, and historian Herbert Olsen, who has a Henrik Kauffmann Fellowship from the American-Scandinavian Foundation.

The studies, which included architecture, town planning, furniture and interior design and contemporary design, were confined to the towns of Charlotte Amalie, St. Thomas, and the towns of Christiansted and Frederiksted and some of the outlying colonial plantations, on St. Croix.

The Government of the Virgin Islands has taken particular interest in the town-planning studies. As a result, $5000 has been appropriated by the Legislature for the preparation by the Danes of a preservation and urban renewal plan with recommendations for zoning and building codes.

The Danish studies will also make available important materials—measured drawings, sketches and photographs representative of the old Danish economy and way of life in the Islands—for addition to the data collected by the Park Service in connection with its Historic American Buildings Survey Program. Three National Historic Sites containing important examples of Danish architecture are maintained.

The work of the Danish team was professionally sponsored by the Historic American Buildings Survey. Financial aid came from the Jackson Hole Preserve, Inc. and the Danish Ministry of Education, as well as private contributors in Denmark and the Virgin Islands. The Jackson Hole Preserve, Inc. is the nonprofit conservation organization headed by Laurance S. Rockefeller, which donated the lands for the Virgin Islands National Park. American participation in the Royal Academy of Fine Arts program reflects the conservational and educational interests fostered alike by Jackson Hole Preserve, the Danish Institution and the National Park Service.

First Research Appointment Made at Cornell

Barclay G. Jones, assistant professor of city planning at the University of California since 1957, has received the first research appointment in the Cornell University College of Architecture under the new Dean's Fund in Architecture.

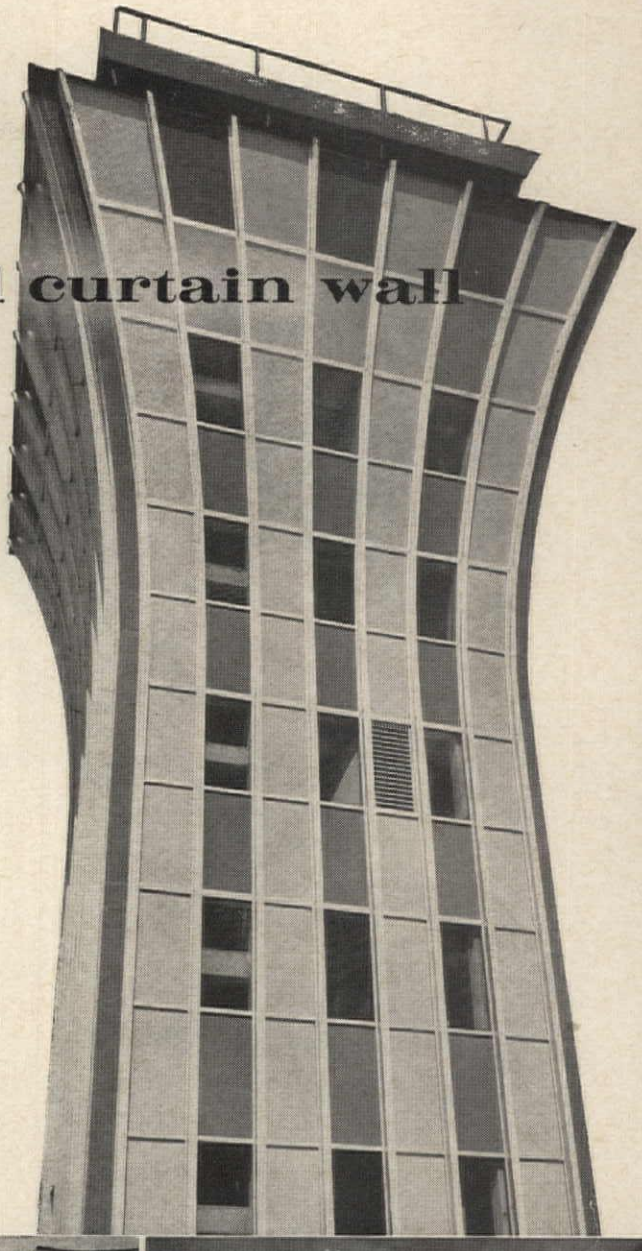
Now associate professor in the department of City Planning, Professor Jones has a Bachelor of Fine Arts

continued on page 284

for the tower

compound curved curtain wall

from MARMET



Maintaining rigid quality control in the factory over the usual type of curtain wall sections . . . to assure easy, tight sealing fit at the job site . . . is demanding enough . . . but when architects Fehr & Granger designed the tower in the Robert Mueller Municipal Airport to complement the curved forms in other parts of the structure . . . special fabricating and pre-tested assembly of wall components was devised.

Mullions for the tower had to be reformed, after extruding, with compound curves of varying radii in each mullion. Horizontals and operating sash carefully fitted between, had to go into place upon erection with watertight precision fit.

MARMET assigned a project engineer to the task. Special rigs, shown below, were built in a research wing of the factory. The success in execution, now stands in gleaming symmetry at Austin, Texas.

Robert Mueller Terminal Airport
Austin, Texas

Architects:
Fehr & Granger
Austin, Texas

Photos by Dewey Mears, Austin

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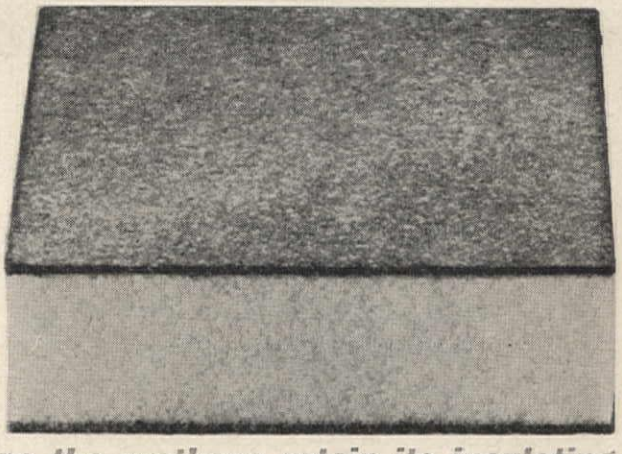

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and bachelor of architecture from the University of Pennsylvania and a Master of Regional Planning and Doctor of Philosophy from the University of North Carolina.

The new Dean's Fund in Architecture has been established by special trustee action to develop research in the College of Architecture. It represents an expanding research program in this field at Cornell.

Among short-term appointments at the University is that of Lee F. Hodgden, assistant professor at the University of Oregon, as associate professor in the department of Design.

Miami U. Student Wins $1000 Competition Prize

John G. Shmerykowsky, a University of Miami architectural engineering student, has been awarded a $1000 prize in a recent competition sponsored by the Heftler Construction Company for his design of a reasonably-priced home for the average family.

The competition called for the design of a house with three bedrooms, two baths, kitchen, carport and a living-dining area, occupying 1200 sq ft, excluding carport, on a 75 x 100 ft lot. Selling price for the house would be about $15,000.

Competition supervisor was Professor James E. Branch, chairman of the University's department of architectural engineering, and Professor John E. Sweet. Judges were: John L. Avant, president of the South Florida chapter of the Associated General Contractors of America; Mrs. Betty Jane Bissett, Univ. of Miami assistant professor of home economics; Robert M. Little, Miami architect; Sebastian Pollera, vice president of Heftler; and Miss Jane E. Ward, A.I.D., of Richard Plumer.

Mr. Shmerykowsky's design emphasizes Florida "indoor-outdoor" living, but retains privacy for the home-owner in a crowded residential area. Exposed concrete block is used as a feature of the decor, and the home utilizes a courtyard that can be economically planted. Windows placed above normal eye level contribute to privacy.

Placing second in the contest was Frank E. Offerle of Miami; and third, Michael R. Botwin of Coral Gables.

Lincoln Arc Welding Awards Made to Undergrad Engineers

The James F. Lincoln Arc Welding Foundation of Cleveland has granted awards to 53 engineering undergraduate students for their outstanding entries in the Foundation's annual "Engineering Undergraduate Award Program for Arc Welded Designs of Machines or Structures." Awards totalling $10,000 were made in this de-

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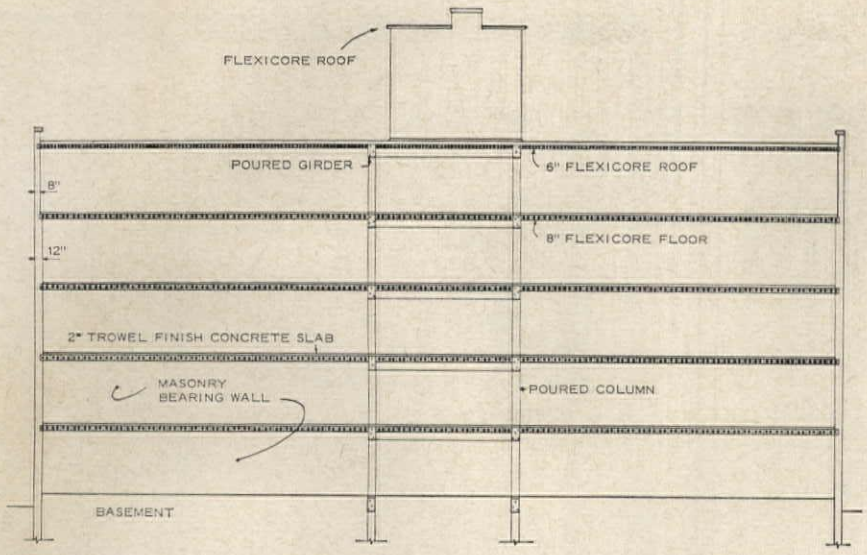
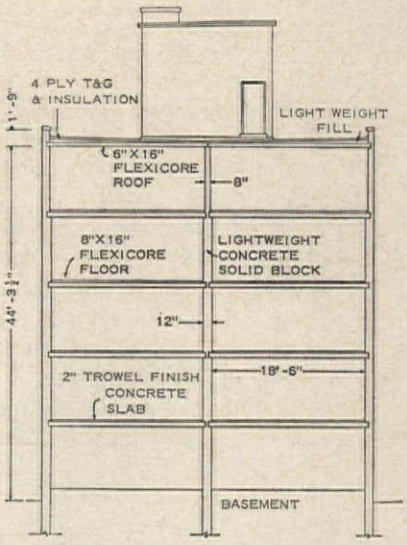
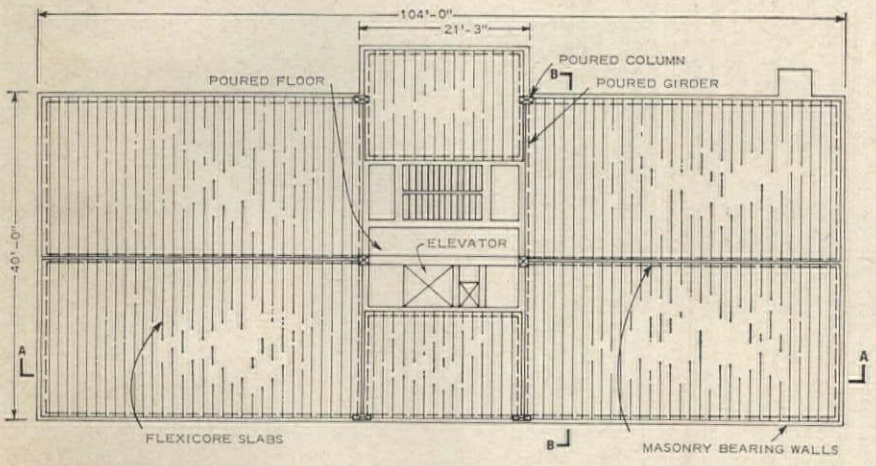


SECTION AA. Precast cellular concrete Flexicore decks provide fireproof structural floors and roofs at Fairmay Apartments, Chicago. The five buildings are masonry wall-bearing except for reinforced concrete stairway and elevator core. Design called for 75 psf live load.

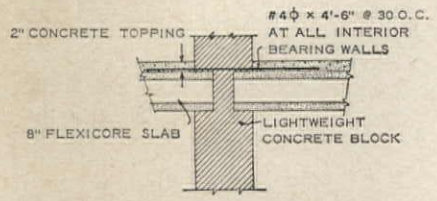


SECTION BB. Clear span of 18'-6" between masonry bearing walls permits simplified design and fast construction. Underside of Flexicore deck is exposed for finished ceiling.

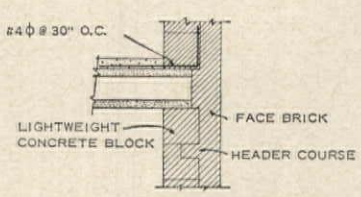


TYPICAL FLOOR FRAMING. Each 3800-sq. ft. Flexicore deck was placed, leveled and grouted in two days. Available on third day as work deck for erection of walls and frame for next story.

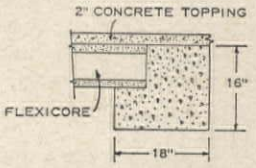
How to Design a Low-Cost, Fireproof Apartment Building



FLOOR ANCHOR RODS
INTERIOR WALLS



FLOOR ANCHOR RODS
EXTERIOR WALLS



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Edward Marks, Architect, Evanston, Illinois

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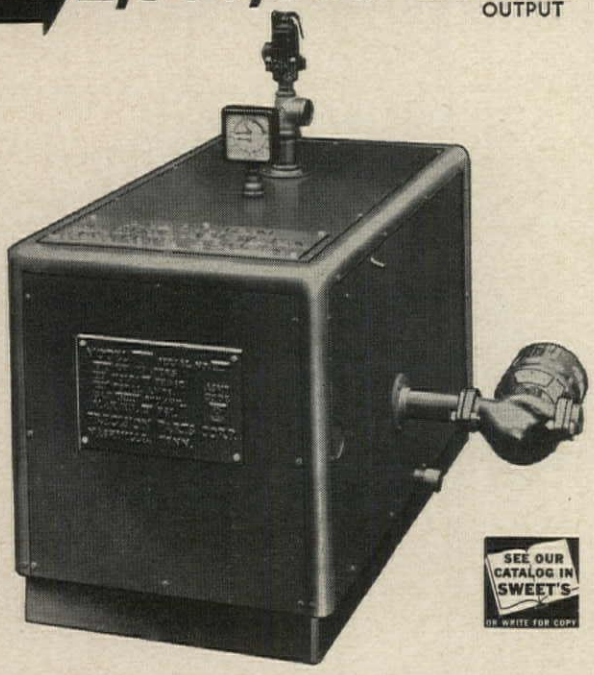

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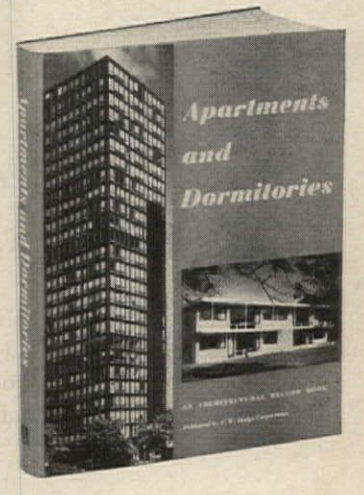

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The Record Reports

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sign competition established by the Foundation in 1947 to stimulate interest, scientific study and research in the practical design and use of arc welded steel. Winners represent 29 colleges from all over the country.

Entries were in two separate, non-competing divisions: Machinery and Structural. Awards are given for the best papers describing the design of a machine or structure in which the efficient use of welded steel has improved performance or appearance or reduced cost.

First award of $1500 in the Structural Division was granted James M. O'Neal, architectural engineering student at Rensselaer Polytechnic Institute, for his design study of "An All Welded, Prefabricated Space Frame." The $750 Second award went to co-authors Perry L. Horacek and Stewart McMinimy, architectural engineering students at Oklahoma State University, for their paper presenting the design of a "Steel Pedestrian Overpass." The $500 Third award was granted co-authors Donald Olson and Richard A. Soderberg, civil engineering students at Northwestern University, for their paper applying the principles of hipped plate construction to the design of steel highway bridges.

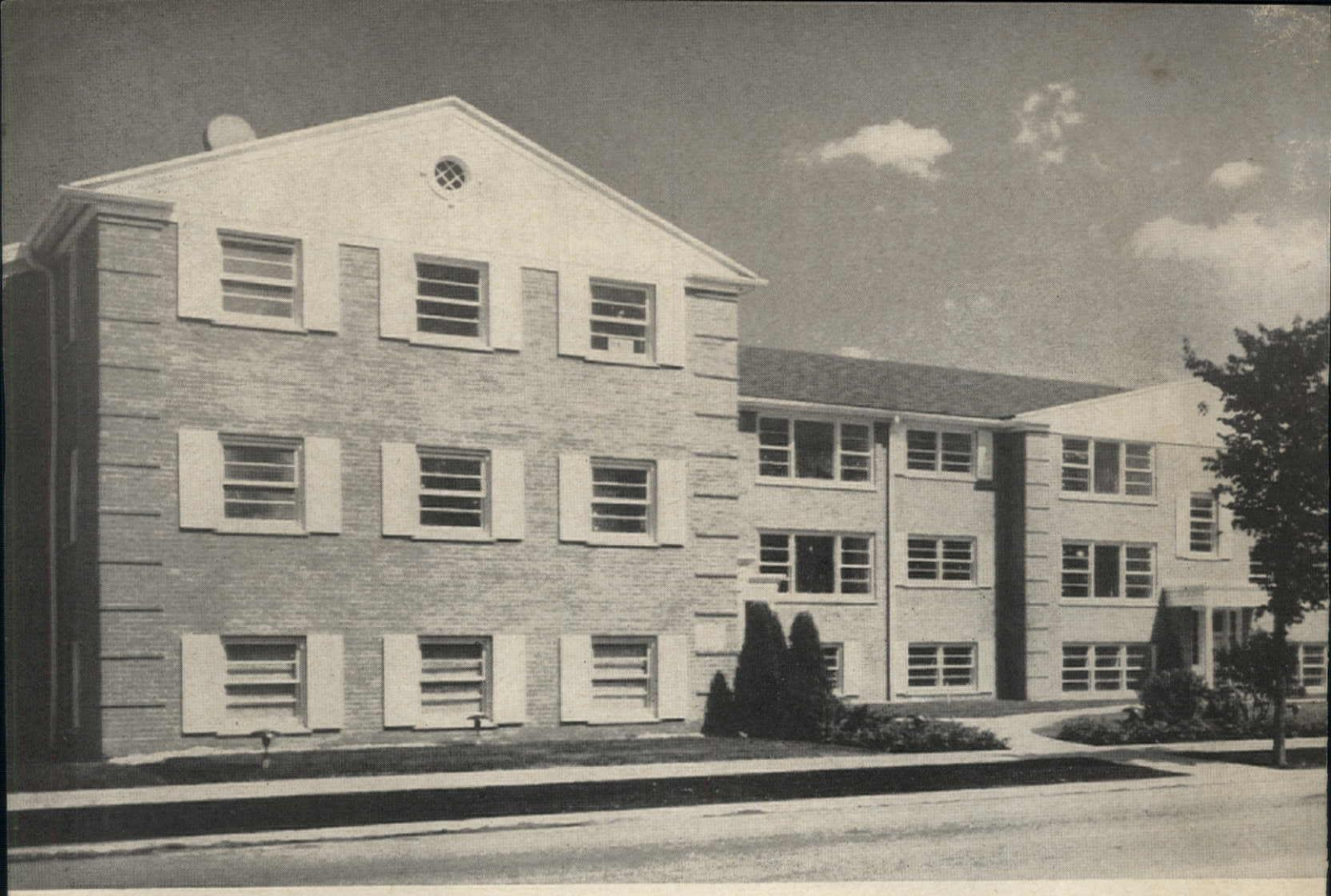
$250 Fourth awards were granted Jon Ronald Garcia, California State Polytechnic, and Lilvon L. Michael, University of Wyoming, both mechanical engineering students; and Joseph M. Garcia, New York University, and Stanley E. Panko, Washington State University, both civil engineering students.

In the Mechanical Division, First award went to Roland W. Gerstenberger, an electrical engineering student at the University of Miami, Fla.; Second award to Alfred E. Barkman, a mechanical engineering student at the University of Wyoming; Third award to Glenn F. Balfanz Jr., a mechanical engineering student at Northwestern University.

A.S.H.R.A.E. Research Lab Moves to Kansas State U.

One of the world's largest and best equipped environmental research laboratories is being transferred from

continued on page 292



Chicago builders get greater crack resistance at no extra cost with the

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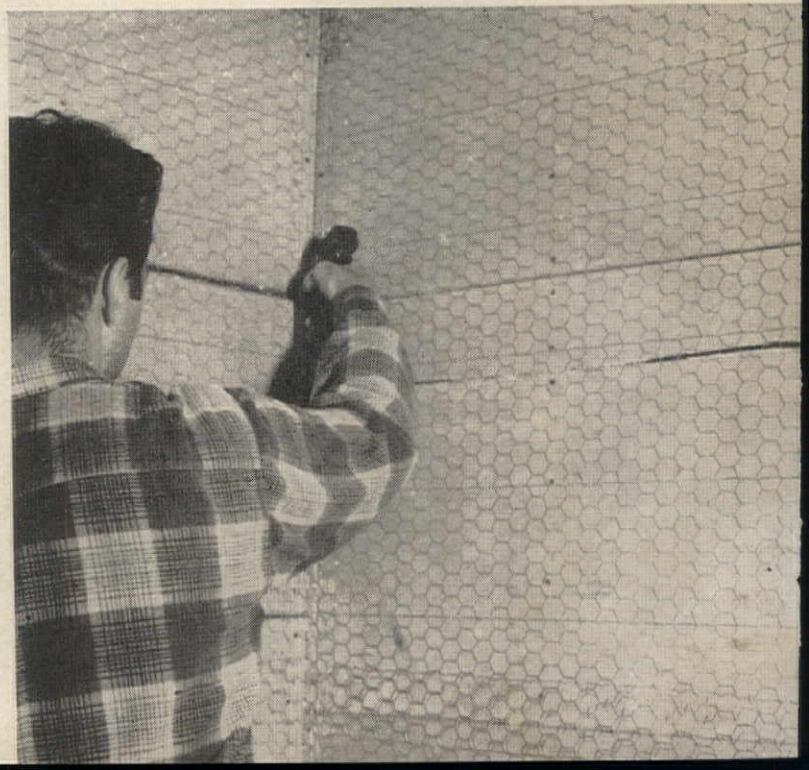
Lasting beauty and low maintenance are built into the new Williamsburg Apartments located in Chicago, Illinois. That's because greater plaster-crack resistance is assured by reinforcing the lath and plaster walls.

Valenti Builders, Inc., Chicago, found it cost no more to get this extra reinforcing quality. By specifying Keymesh, Keycorner and Keystrip galvanized reinforcing lath, the builders got top quality reinforcement with greater resistance to cracks and fire.



Tiled bathrooms in the Chicago project have lasting beauty with KEYMESH reinforcement. The portland cement plaster reinforced with Keymesh provides a strong, maintenance-free base for the tile. You'll find Keymesh makes any gypsum lath and plaster wall stronger and more crack resistant.

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KEYSTRIP is a new addition to the Keystone line of plaster reinforcement. Here, this flat strip reinforcement is stapled over joints where narrow strips of gypsum lath are used. This use of Keystrip adds strength where needed.

KEYSTRIP can be used as a reinforcement for plaster in a space too narrow for strips of gypsum lath. A full bond of Keystrip to the plaster is assured. Keystrip also adds strength to points of stress above doors and windows.

three keys to stronger plaster

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The Record Reports

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the present research facilities of the American Society of Heating, Refrigerating and Air-Conditioning Engineers in Cleveland to Kansas State University, Manhattan, for K-State's Institute for Environmental Research.

The laboratory and its associated equipment, which represent a total investment of approximately $150,000, will be housed in a $160,000 building for which the University received an $80,000 National Institutes of Health grant.

Under the agreement between A.S.H.R.A.E. and the University, K-State will carry on several of the Society's current research projects, with the Society financing this research on a cooperative basis. A number of other outside sources will be contributing substantial support to the research programs planned for the Institute, according to K-State President James A. McCain.

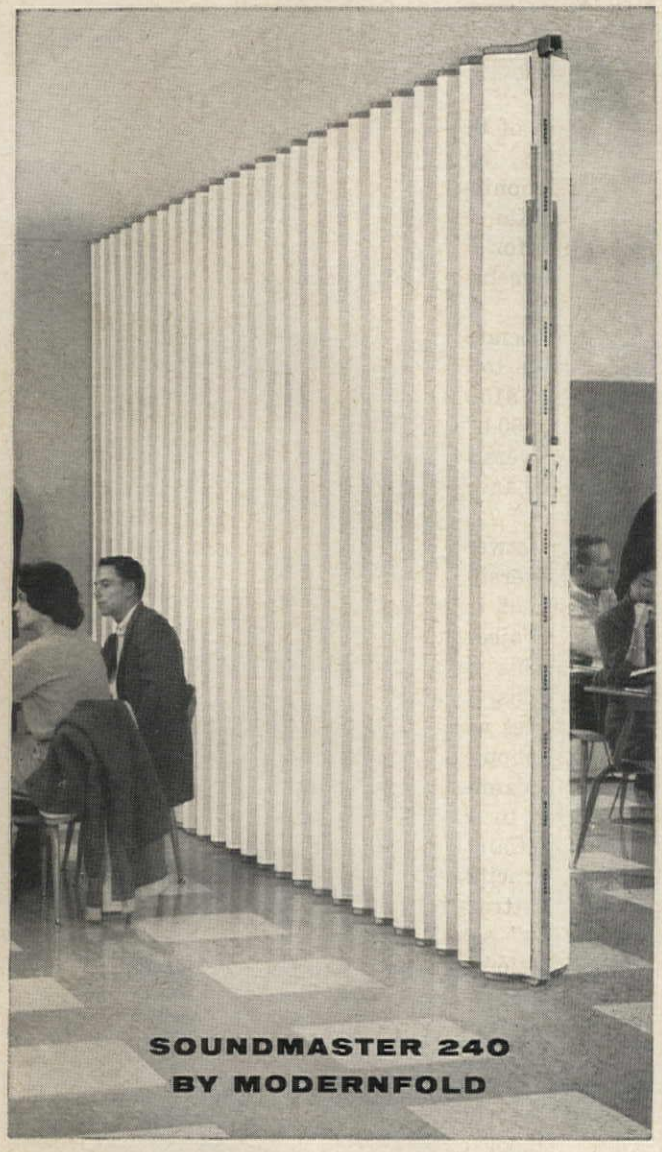
"This type of technical facility should have unusual value in attracting new industry to Kansas," said President McCain. "The selection of Kansas State University for this program is a tribute to the outstanding research contributions in the environmental field by Dr. Ralph Nevins, head of the mechanical engineering department in K-State's School of Engineering and Architecture." Dr. Nevins will direct the new Institute.

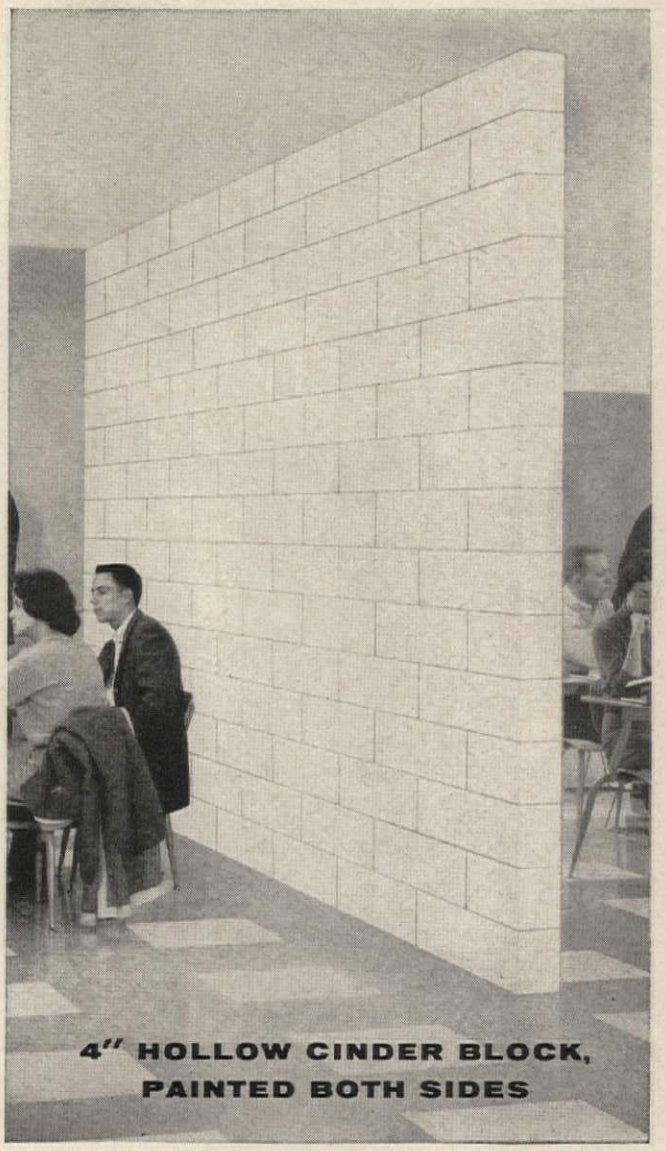
The A.S.H.R.A.E. laboratory is a test room 12 x 24 ft in size. With its associated equipment including heaters, air conditioning units, fans, etc., it is possible to control temperatures on all six wall surfaces, as well as to control the temperature, humidity, movement and cleanliness of the air. The test room will be incorporated into the $160,000 addition to the engineering lecture hall which is now being planned to house K-State's Institute for Environmental Research.

In addition to the environmental room, Institute facilities will include an air-pollution laboratory, a biological heat-transfer laboratory, an instrument room and office space.

A.S.H.R.A.E. has operated its environmental lab for a number of years, this past year completing a series of experiments to re-evaluate the A.S.H.R.A.E. comfort chart

continued on page 300





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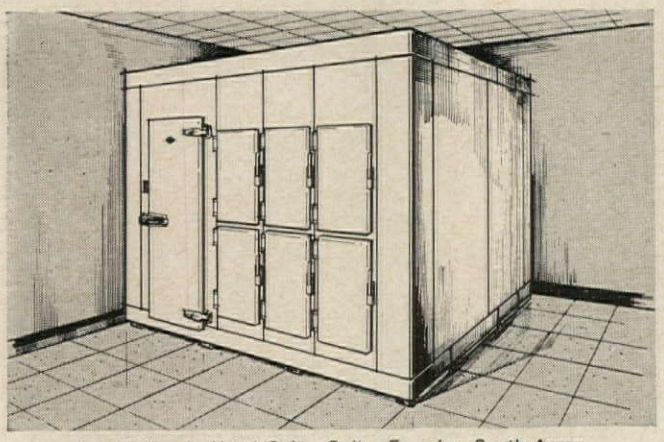

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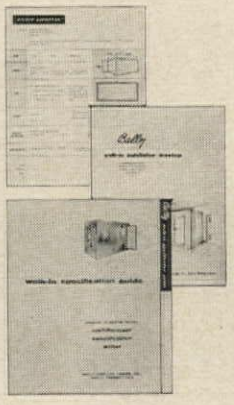

See Sweet's File section 26a/Ba.

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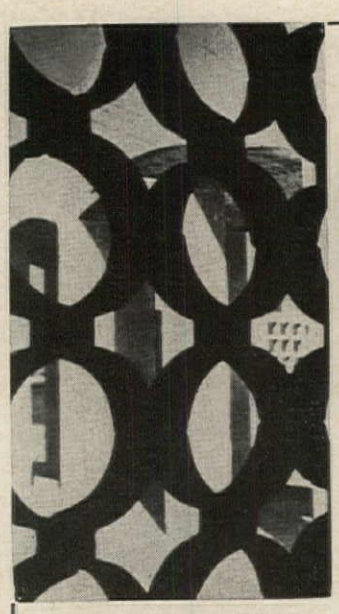

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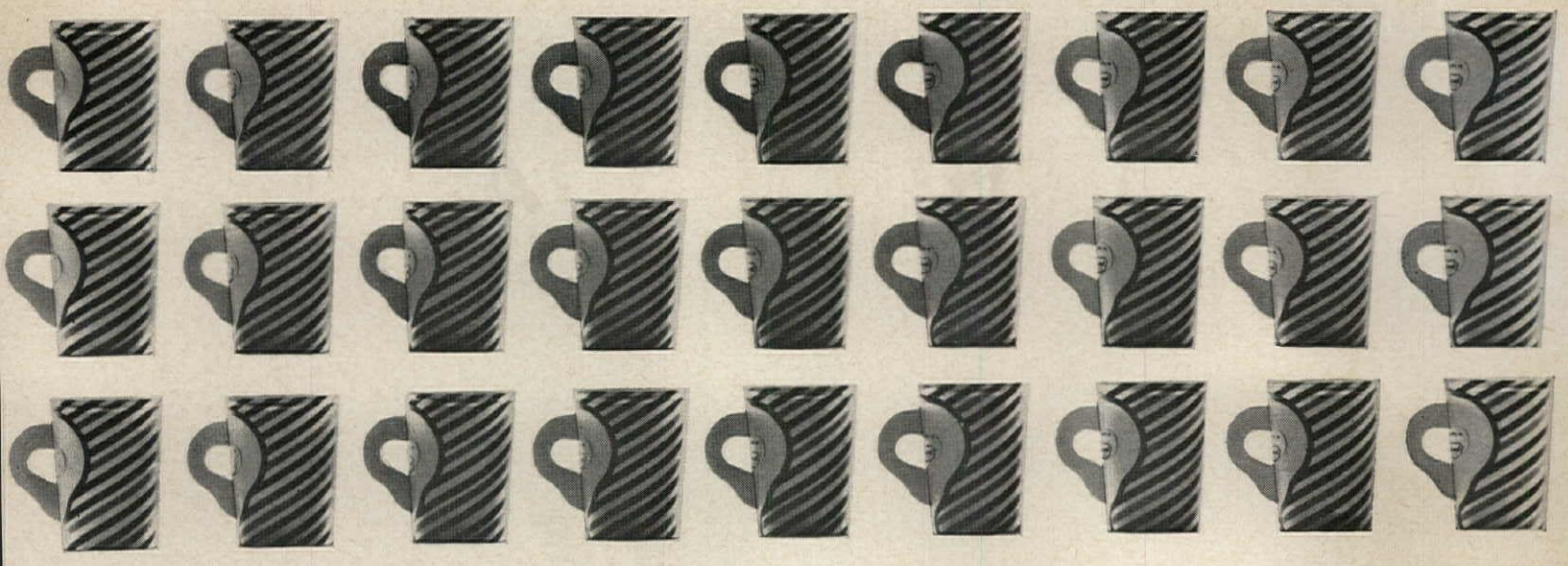

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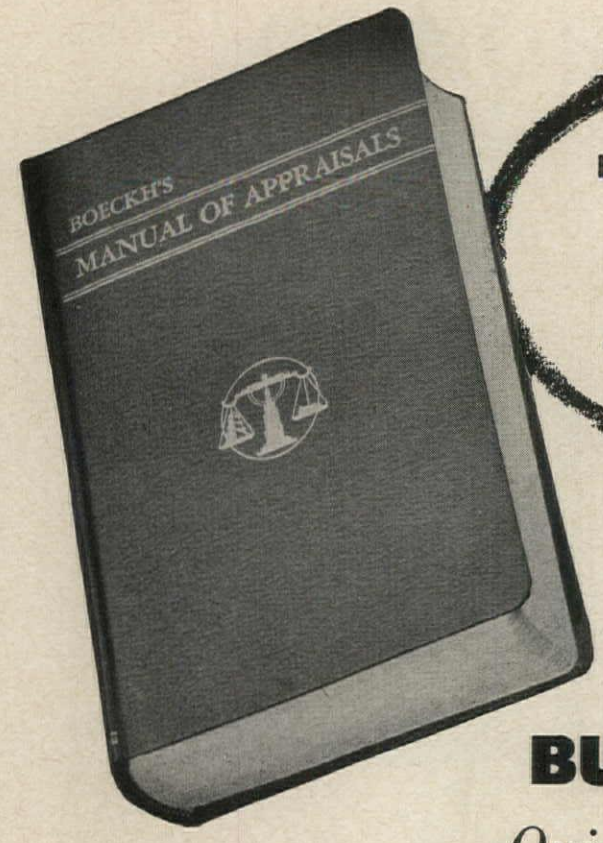

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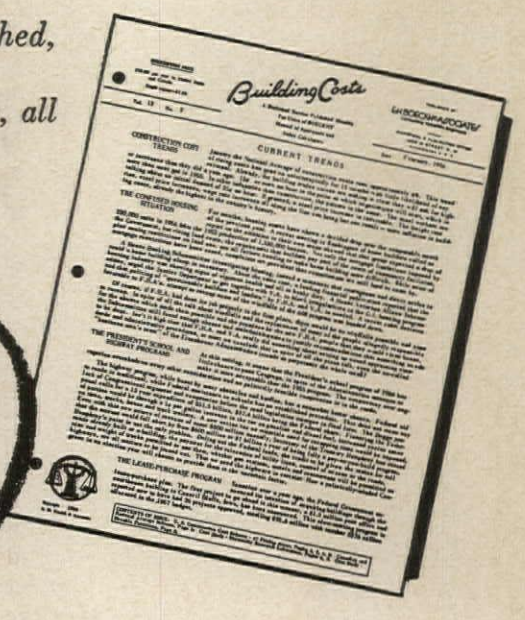

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Associated architects: Anderson, Beckwith & Haible and Paul Rudolph
General Contractor: George A. Fuller Co

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Photographs by: Joseph W. Molitor

The Record Reports

continued from page 292

based on research done in the 1930's.

Dr. Nevins, an A.S.H.R.A.E. member, and other University researchers have been working on similar problems for several years. A cooperative project between the University's mechanical engineering department and the American Society of Heating and Ventilating Engineers (a predecessor of A.S.H.R.A.E.) was initiated in the late 1940's and since 1950 a study of the effect of floor surface temperatures on comfort has been in progress. As part of this research, the University built a 10-ft cube psychrometric room. Current studies concerned with floor surface temperatures are supported with a National Institutes of Health grant.

K-State's willingness to carry on A.S.H.R.A.E. research work also was a factor. Dr. Nevins has been closely identified with this research program as a member of the organization's research panel on physiological research and human comfort and he is currently chairman of the panel.

Dr. Nevins points out that research into environmental conditions is still in the exploratory stage. The amount of research required, before a clear picture is obtained of the human response to all aspects of the environment, is almost boundless, he says. Among the K-State research projects being contemplated are studies for comfort under various levels of activity, effects of drafts, air pollution and biological heat-transfer engineering problems.

Personnel from psychology, architecture, veterinary medicine, student health and the statistical laboratory are expected to be involved. Within two to three years, Dr. Nevins expects 20 to 30 staff members and graduate students to be working on experimental studies in the Institute.

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continued on page 308

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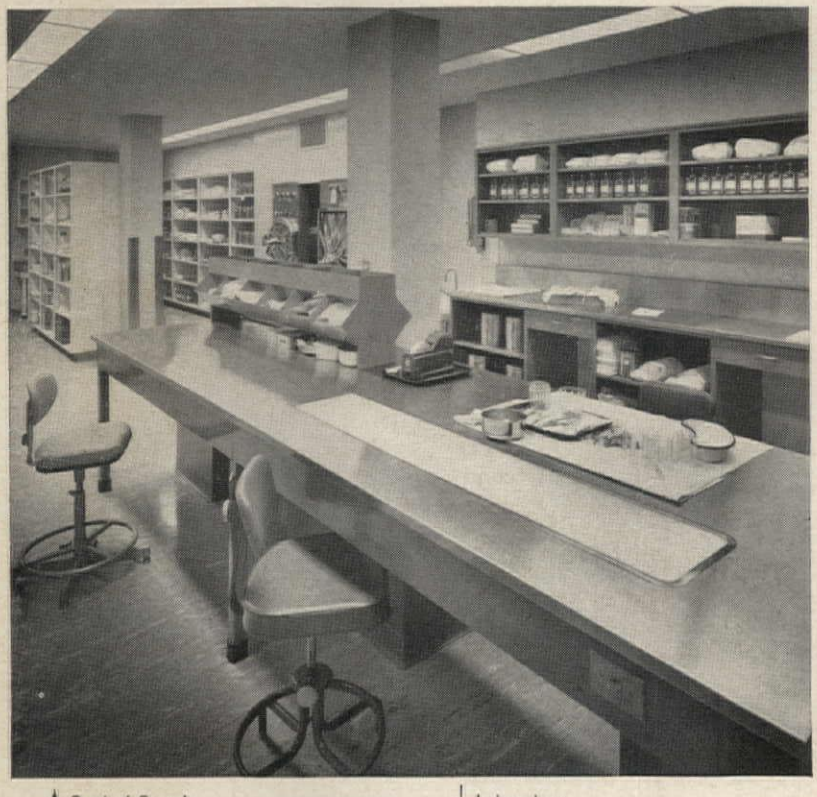

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A witty and stimulating collection of personal observations about architecture and related matters by a world-famous designer. The insight and sparkle of Ponti's commentaries have had striking effects upon the readers of the original Italian version; they have applauded its brilliance, been astounded by his mental leaps, and stung by his outspokenness. With irreverent remarks, the author has punctured many of the inflated concepts that obscure the proper role of architecture and the architect in today's life. A deep feeling about the serious goals of architecture pervade his work; he speaks with strong emotion about the fundamental values that architecture can and must serve. (1960)

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by Louis Dallavia

Provides an accurate, foolproof system for estimating all direct production costs in earthwork, reinforced concrete, masonry, structural steel, and carpentry. This unique system can be applied at any time and in any place with equal validity, and can never go out of date. It was developed and perfected by the author during his 22 years as an estimator in heavy construction and building.

Presents an index set of unit costs for typical shift crews, against which you compare local crews, arriving at a productivity percentage. By checking that figure against only three tables, you arrive at shift cost output range, and unit cost for the operation. There is a total of 160 tables and checklists in the book. (1957)

205 pages, 6 x 9, $8.50

MOTELS, HOTELS, RESTAURANTS AND BARS (Second Edition)

by the editors of Architectural Record

This revised and expanded book, presents, in one place, an up-to-date, detailed study of physical designs in motels, hotels, restaurants, and bars. The important relationship between good design and good business is graphically shown in over 700 photographs, drawings and plans of successful establishments. The well-planned, practical design has—in each case studied—paid off in flourishing trade and satisfied clientele. The clear text gives expert answers to the hundreds of questions asked by owners and prospective architects, designers and investors in this important type of building. (1960)

327 pages, 8¾ x 11⅝, $9.75

APARTMENTS AND DORMITORIES

by the editors of Architectural Record

In response to numerous requests for information on this building type, the editors of *Architectural Record* have selected 48 superior examples of apartment houses, college residence halls, and other multiple dwellings, designed by some of the world's leading architects. The buildings range in size from two-family houses to vast housing projects.

In addition to the buildings, there is a section containing useful technical information, and a series of studies on trends in apartment buildings and community development. Over 250 illustrations. (1958)

238 pages, 8¾ x 11⅝, $8.95

ELEMENTARY STATICS OF SHELLS (Second Edition)

by Alf Pflüger

This practical volume contains a simple and comprehensive presentation of the principles of shell theory. Designed to help the practicing engineer in the calculation of simple shell structures, it will also be of use to students as a supplement to classroom lectures. Primarily a graphic study of the spatial interplay of forces in shells, this approach permts the visual interpretation of equations. Once the basic equations are set down, their results can be interpreted easily in tables and graphs. Over 135 line drawings. (1961)

122 pages, 6 x 9, $8.75

EXHIBITION AND DISPLAY

by James Gardner and Caroline Heller

An eminently practical study in which every aspect of exhibition and display receives analysis and evaluation. Useful to those in charge of store displays and to those designing industrial or government exhibits up to international scale. This new book studies the problems of designing exhibits and displays that explain, create atmosphere, and sell.

Over 350 photographs and drawings showing exhibitions, good and bad, past and present, from nearly every region of the world make the analysis more graphic. Covers in detail such topics as: What a display can and cannot do, Displaying goods, Selling ideas, Catching the eye, Goods and services, Ideas and information. Analysis of 1958 Brussels World Fair. Anyone who plans or uses exhibitions or displays will find this new book a valuable guide. (1960)

190 pages, 8⅞ x 11½, $13.75

THE SELECTION OF RETAIL LOCATIONS

by Richard L. Nelson

This book contains the newest trends and techniques in site selection and potential volume analysis for stores, shopping centers, banks, restaurants and other establishments. (1958)

422 pages, 6 x 9, $9.00

DESIGN FOR MODERN MERCHANDISING

by the editors of Architectural Record

A detailed study of the physical design of stores, shopping centers, and showrooms. (1954)

247 pages, 8¾ x 11⅝, $8.95

PLANNING STORES THAT PAY

by Dr. Louis Parnes

This book demonstrates the amazing degree to which good design speeds and increase sales in department stores and specialty chain stores. (1948)

313 pages, 8⅜ x 11, $12.75

HOW TO BUILD MODERN FURNITURE (Second Edition)

by Mario Dal Fabbro

Clear, easy-to-follow instructions for building your own professional quality furniture, plus step-by-step plans for 53 contemporary pieces, by a famous furniture designer.

The first section gives instruction in basic woodworking operations, selection of materials, joints, assembly, wood finishing, and upholstery. Standard measurements of all furniture pieces are listed. The second section presents 53 separate pieces: hi-fi cabinets, chests, tables, chairs, beds, and many others. Test is brief and clear—unique exploded diagrams do most of the teaching. Each project contains a list of materials and directions for assembly. Over 1200 diagrams and drawings. (1957)

224 pages, 7⅛ x 9¾, $4.95

HOW TO MAKE BUILT-IN FURNITURE

by Mario Dal Fabbro

Step-by-step instructions for constructing 102 contemporary built-ins. This practical book presents unique sequence plans and illustrations which virtually eliminate the errors and miscalculations which arise in these projects. All pieces can be built from standard grades of wood using common woodworking tools.

Included are pieces for living rooms, kitchens, bedrooms, playrooms, attics and cellars. Hundreds of variations and adaptations can be made from these plans, and the book is also an excellent source of data for designing your own built-ins. (1955)

259 pages, 7⅛ x 9¾, $6.95

DESIGN OF PRESTRESSED CONCRETE BEAMS

by William H. Connolly

A rational and clear-cut method for the design of pretensioned and post-tensioned concrete members. Through the use of design tables, emphasis is put on the reduction of the tedious trial and error normally involved in design problems. These tables are presented with explicit instructions that make this book uniquely practical. Contains over 90 illustrations of stress diagrams and cross-sections. (1960)

264 pages, 6 x 9, $11.50

PRACTICAL DESIGN OF STRUCTURAL MEMBERS

by Thomas A. Lucy

This comprehensive manual contains hundreds of time-saving short cuts and methods which are applicable to all conditions and requirements of stress analysis. Developed to meet the special design problems encountered by the structural engineer, this data is readily adaptable to any individual or office procedure. Contains hundreds of useful tables, charts, and diagrams, plus comprehensive analyses and discussions. Over 170 tables and charts. (1957)

432 pages, 6¾ x 10, $12.00

TIMBER DESIGN AND CONSTRUCTION HANDBOOK

prepared by Timber Engineering Company

The complete master handbook of timber design and construction written and edited by 34 engineers and timber specialists. Serves two purposes: it is a comprehensive timber design reference, and it is also a practical field handbook. Offers every bit of essential information needed to develop and construct the best wood structures.

The first portion covers the fundamental structural characteristics of wood. Lists types, grades, and ways of preservation. The next ten chapters analyze preliminary design considerations, design details, fabrication and erections. The final chapter presents 129 pages of design and engineering specifications and precise tabular data allowing easy conversion for particular grades and species. (1956)

622 pages, 6 x 9, $12.75

THE CONTEMPORARY CURTAIN WALL

its design, fabrication and erection

by W. Dudley Hunt, Jr.

One of the most important recent developments in the construction industry, curtain wall construction is still so new that there is a great demand for information on proper methods of design, construction and installation. Meeting that demand, this book presents, for the first time in one place, a wealth of information about this construction system.

Analyzes and evaluates the walls, their functions, their component parts, materials and installation. Lists and tables give all the known data about insulation, fire resistance, dimensional stability. Amply illustrated with drawings and photographs. (1958)

454 pages, 7 x 9¾, $12.75

BOILERS:

types, characteristics, and functions

by Carl D. Shields

A practical engineering approach to boilers and their selection, application, and performance. Intended to help all those involved in the specification, design, installation, and operation of all types of boilers, this book contains 32 chapters organized within 6 major sections: Boiler Classification, Boiler Design, Steam Generating Equipment, Boiler Construction, Industry Regulation, and Industry Status.

This up-to-date reference covers the experience of the entire industry. It will have specific appeal to stationary engineers, operators, installers, maintenance personnel, and buyers, sellers, and owners of boilers. Over 500 drawings and photographs. (1961)

566 pages, 7⅛ x 10, $15.00

UNFIRED PRESSURE VESSELS

the ASME code simplified

by Robert Chuse

Revised, enlarged, and updated to cover current changes in Section VIII (Unfired Pressure Vessels) and Section IX (Welding Qualifications) of the Code, the new fourth edition of this practical manual presents complex vessel requirements and specifications at a glance. Contains 66 tables, charts, and diagrams designed to give complete, accurate Code calculations in just a matter of minutes. Greatly simplifies the work of designing, building, ordering, repairing and inspecting pressure vessels. (1960)

144 pages, 6 x 9, $8.75

CENTRIFUGAL PUMPS:

selection, operation and maintenance

by Igor Karassik and the late Roy Carter

A comprehensive reference book for users of centrifugal pumps throughout industry. Component parts, pump drives, performance characteristics, system-head curves, controls, and priming are discussed from the point of view of the buyer and user of pumping equipment.

Covering the entire field of centrifugal pumps, their appurtenances, and control, this work describes and thoroughly illustrates all types of pumps, including vertical, self-priming, and regenerative; it also discusses pumps for various areas of industrial service. This book will be of everyday use to anyone concerned with moving liquids or gases in bulk. The consulting engineer, specification writer, buyer, layout man, plant designer, operator, maintenance man, salesman or anyone concerned with centrifugal pumps will find this a valuable sourcebook. (1960)

480 pages, 7⅛ x 10, $15.75

PLANT ENGINEERING PRACTICE

by the editors of Plant Engineering

The mammoth new reference work of plant operation and maintenance. Presents 226 separate case studies, each of which is designed to save time, work and money for the plant engineer and his staff, and architects and engineers doing industrial building work.

Written by over 100 experts in their fields, it is virtually an encyclopedia of practical, hard-earned experience. Organized into 13 sections: Sites and Layout, Construction, Housekeeping and Safety, Materials Handling, Maintenance, Plants and Protective Coatings, Mechanical Power and Piping, Electric Power, Lighting, Utilities, Heating and Air Conditioning, Quality Control, Shop-work. 12-page master index. Over 800 illustrations. (1958)

704 pages, 8¾ x 11⅝, $18.50

INDUSTRIAL BUILDING DETAILS

by Duane F. Roycraft

The only master reference of architectural details for the industrial building designer. It presents over 1,500 detail drawings which have been proved in use by architects, draftsmen, and engineers. Each is sharp and clear, drawn precisely to scale, and is large enough to trace or protect for direct use or adaptation.

Every part of the contemporary industrial building is shown —from roofs and parapets to catch basins and manholes. Text is kept to a minimum, appearing only to introduce each of the seventeen major sections. Will save many man hours of tedious searching through files and folders. (1959)

352 pages, 8¾ x 11⅝, $12.75

INDUSTRIAL ARCHITECTURE

by James F. Munce

An up-to-date, comparative survey of industrial building design in Great Britain, Germany, and the United States. Provides a stimulating review of the basic principles and newest developments upon which a factory design must be based.

Developments in such areas as design, use of master plan, employee movement, architectural character, and costs are considered. Attention is also given to the development of existing areas, the planning of new parks, and automation and factory design. Most useful of all are the chapters on the structure and fabric of the factory, and on services. These deal with general structural requirements, adequate day-lighting, maintenance, air-conditioning, lighting, sanitation and drainage. This original work will be welcomed by architects, engineers and contractors doing industrial jobs as well as businessman responsible for the planning and construction of new facilities. (1960)

240 pages, 9⅛ x 12¼, $14.75

BUILDINGS FOR INDUSTRY

by the editors of Architectural Record

An outstanding selection of new industrial buildings, together with a series of informative studies on trends and factors in present-day industrial building design. 74 projects from all over the United States, as well as a few from overseas, are completely analyzed. Explains choice of site, plan, lighting, colors, loading docks and rail spurs, employee facilities, and many more features. Over 700 illustrations. (1957)

315 pages, 8¾ x 11⅝, $9.75

DODGE

BOOKS

BUILDINGS FOR RESEARCH

by the editors of Architectural Record

This timely book analyzes in detail a wide variety of research facilities—44 separate projects—built by industry, government agencies, and universities. Over 500 illustrations. (1958)

232 pages, 8¾ x 11⅝, $9.50

ELECTRICAL EFFICIENCY IN INDUSTRIAL PLANTS

by E. S. Lincoln

A practical engineering guide to lower power costs. Designed to eliminate power waste and its resultant drain on industrial productivity. The author shows in detail the practical methods of making surveys of power load, voltage, and electrical protection —complete with a discussion of the necessary instruments and their use.

An analysis of power costs is included as well as all the elements in the distribution system. Such troublesome matters as power factor, choice of voltage, and equipment maintenance are presented directly and simply. Supplemented by helpful illustrations and tables. (1960)

235 pages, 6 x 9, $9.50

LANDSCAPE ARCHITECTURE:

the shaping of man's natural environment

by John O. Simonds

An articulate plea for intelligent landscape planning by a landscape architect who has drawn upon his years of study and world-wide travel, his practice, and his capacity for direct, clear statement. It explains what sensitive and sensible landscape planning is, why and how it can enrich our lives, and what we have lost through neglecting it.

The author begins his discussion by surveying the fundamental considerations: man, nature, landscape character, natural and man-made forms, forces, and features. He proceeds in clear, painless steps to build a framework encompassing the entire scope of landscape planning: Site Considerations, Organization of Spaces, Visual Aspects of Plan Arrangement, Circulation, Structures in the Landscape, and Planning the Region. Contains line drawings by the author, as well as a generous collection of photographs and sketches. (1961)

244 pages, 8¾ x 11⅝, $12.75

GROUNDS MAINTENANCE HANDBOOK

(Second Edition)

by Herbert S. Conover

The only comprehensive reference work of grounds development and maintenance. Contains all the detailel information you need to plan, supervise and maintain grounds of every type and size.

It is a big book (503 pages), and fully illustrated (over 175 illustrations). It consolidates all the needed information on planning, turf maintenance, planting and care of trees and shrubs, equipment selection, control of weeds, insects and diseases, materials specifications and erosion control. Throughout the book practical, economical methods and materials are stressed. (1958)

503 pages, 6 x 9, $10.75

THE ART OF HOME LANDSCAPING

by Garret Eckbo

Here is the book which helps the user recognize his landscaping needs, plan them on paper, substitute pencil work for shovel work, and eventually provide useful, beautiful outdoor space to the limits of his lot. Especially valuable to the new home buyer or builder, who cannot afford the services of a landscape architect, and cannot afford to make costly mistakes in his basic planning.

Covers in detail such topics as: Recognizing your needs, Plans, Scheduling work and money, Screenings, Walls, Drainage, Soil conditions, Solar orientation, Weather considerations, and many more. Profusely illustrated. (1956)

278 pages, 6⅝ x 9¾, $5.95

LANDSCAPE FOR LIVING

by Garret Eckbo

The professional-level study of the purposes, problems and practices of landscape design. (1950)

268 pages, 8 x 10½, $10.00

HOSPITALS, DOCTORS, AND DOLLARS

by Robert M. Cunningham, Jr.

A stimulating collection of reports and opinions on the hospital scene by the editorial director of *The Modern Hospital*. Keenly aware of what is wrong, and right, with hospitals, the author examines problems which are closely allied to the medical field: the high cost of medical care, labor problems, the emotionally tangled issues of socialized medicine, and the ethics of professional practice. On the lighter side, he includes anecdotes and stories on the memorable characters and events he has encountered in his years of reporting medical and hospital affairs. Anyone interested in the complexities and lighter moments of the medical field will find this book both informative and amusing. (1961)

288 pages, 5⅜ x 7½, $6.95

HOSPITALS, CLINICS, AND HEALTH CENTERS

by the editors of Architectural Record

Here, in one book, are the newest, most effective ideas for the planning of hospitals and other medical facilities. Divided into four sections, this valuable source covers almost the entire range of medical building types: hospitals, special facilities, rehabilitation centers, health centers, clinics, and doctors' offices. Contains sixty presentations and discussions. Each project studies a particular planning problem and its solution, and is graphically illustrated with interior and exterior photographs, floor plans, and diagrams. Includes authoritative technical articles on planning such specific elements as x-ray suites, pediatric units, and surgical suites. (1960)

256 pages, 8¾ x 11⅝, $9.75

PLANNING THE SURGICAL SUITE

by Warwick Smith

This unique guide explains how the intended functions of a surgical suite affect its organization and design, and describes the methods of translating these needs into actual facilities. It prepares the way for a complete analysis of the function and lesign of the surgical suite; and considers the size, plan, and location of the clean and sterile supplies; sterilization; the detailed arrangement of the rooms, with particular emphasis on the major and specialty operating rooms and the recovery room; materials and finishes; heating, ventilating, and air conditioning; and engineering services. Contains numerous drawings and an exhaustive checklist keyed point-by-point to specific discussions in the text. (1960)

480 pages, 6 x 9, $12.75

PLANNING HOMES FOR THE AGED

by Geneva Mathiasen and Edward H. Noakes

The first comprehensive planning guide on the problems of designing and building homes for the aged and infirm. The editors —an expert in the problems of aging and a noted institutional architect—provide written and graphic assistance in the physical planning of such homes. Included are chapters prepared by eleven specialists on such topics as site planning, the residence unit, health needs and the infirmary, construction materials and costs, design and the function of the architect. (1959)

119 pages, 8¾ x 11½, $12.75

NURSING HOME MANAGEMENT

by R. C. Williams, M.D. and others

The unique, complete handbook on the operation, organization, and management of nursing homes and similar institutions. Written by five authorities in the fields of public health, medicine, nursing care and administration, this book answers the unusual and the everyday problems of nursing home operation. It shows how to provide the best possible service while maintaining sound, economical business policy.

Eight chapters include establishment and organization, business management, medical and nursing care, recreational facilities, food service, housekeeping, buildings and grounds, and safety. Well illustrated with photographs, checklists, and informative appendices. (1959)

224 pages, 6 x 9, $8.50

SCHOOLS FOR THE NEW NEEDS

by the editors of Architectural Record

A graphic presentation of 66 school buildings from all parts of the country, which best demonstrate today's sweeping advances in concept and design. The result of today's pressing need for economy, all of these schools are working proof that sound planning can pay off in better school buildings at lower cost. Divided into 3 extensive sections: Cost Studies, Elementary Schools, Secondary Schools. Each section contains about 20 case studies, profusely illustrated with photos, plans, charts, and diagrams—over 900 in all. (1956)

312 pages, 8¾ x 11⅝, $9.75

SCHOOLS FOR THE VERY YOUNG

by Heinrich H. Waechter and Elisabeth Waechter

Beginning with a brief discussion of the development of child education, the book goes on to relate the daily pre-school activities to the environmental needs of the child and the teacher. Essentially a practical manual which concerns itself with design, layout, orientation of rooms, lighting, heating, ventilation, and other important considerations. 110 photographs, plans, and drawings included. (1951)

197 pages, 7 x 10, $6.50

TOWARD BETTER SCHOOL DESIGN

by William W. Caudill

A common-sense approach to designing school buildings of all types, from elementary grades through college. It penetrates the maze of superficiality involved in school planning, gets to the heart of the matter in a lucid, thought-provoking manner. Contains 91 case studies of schools where adherence to an approach based on the specific problems involved has resulted in better schools which give the taxpayer the most for his money. (1954)

271 pages, 8¾ x 11⅝, $12.75

SCHOOL PLANNING AND BUILDING HANDBOOK

by N. L. Engelhardt, N. L. Engelhardt, Jr. and Stanton Legett

The only practical handbook dealing with every phase of planning and executing the school building program. Specifically, this book will 1. Analyze, define, and assign the exact duties and responsibilities of every party involved; 2. Set up detailed checklists and procedures for every aspect and step of your program; 3. Provide complete checklists and specimens of contracts; 4. Give specific advice about law, accounting, plans, inspection, and other specific problems. (1956)

626 pages, 6 x 9, $12.75

FIELD INSPECTION OF BUILDING CONSTRUCTION

by Thomas H. McKaig, B. Arch., C.E.

A guide to the supervision of construction for architects, engineers, and field inspectors which charts a clear path through the maze of owner-architect-contractor-subcontractor relations and responsibilities. Defines responsibilities for such matters as quality of materials and workmanship, coordination of work by different trades, safety precautions, safeguarding of work in place, and many more.

Outlines the pitfalls the inspector should avoid, and gives him guidance in safeguarding the owner's interest against a variety of contingencies, without exposing him to charges and possible claims for interference or delay. (1958)

337 pages, 6 x 9, $9.35

PRACTICAL HOUSES FOR CONTEMPORARY LIVING

by Jean and Don Graf

Here are 40 houses whose owners had the foresight to follow the three cardinal rules of home planning: Know what you want—Know what you need—Know what you can afford.

Price-wise, the houses range from $7500 upward, proving that a limited budget is no bar to good design. They represent a cross-section of styles including Colonial, Georgian, the popular ranch-type, and the outright "modern." Each is displayed with four or more pages of photographs, floor plans, and brief text which points up useful ideas on design, decor, and landscaping. (1953)

174 pages, 8¾ x 11¼, $6.95

APPLIED STRUCTURAL DESIGN OF BUILDINGS

by Thomas H. McKaig, B. Arch., C.E.

A practical office manual containing simple, standardized procedures for solving structural design problems. This unique handbook had its inception as a series of notes used by the author in his instruction of architects and engineers preparing for state licensing examinations. Strictly a practical work, with no attempt made to develop theory.

The structural designer will find here short cuts, tables, formulae, sketches—a wealth of practical information—all designed to save countless hours of detail, help standardize office practice, and simplify the designer's work. All of this information has been tested by actual experience and proven to be reliable and useful. (1956)

442 pages, 7⅛ x 10, $12.50

ARCHITECTURAL ENGINEERING

by the editors of Architectural Record

100 case studies which present the latest developments in architectural engineering. Each study is a detailed source of specific information for which there is current professional demand. Each is graphically complete with plans, diagrams, illustrations and photographs—over 1,400 in all.

The book is composed of six sections: The Building Shell, Environmental Control, Utilities, Site Planning, Materials, Special Problems. Contains simplified cost cutting methods, new uses for old and new materials, new structural systems and new mechanical and eleltrical equipment. (1955)

494 pages, 8¾ x 11⅝, $12.75

A TREASURY OF CONTEMPORARY HOUSES

by the editors of Architectural Record

50 architect-designed contemporary houses, selected from plans of thousands of new homes. The houses within these pages are the experts' choice, designed by some of the world's leading architects, the ultimate in house perfection.

There is nothing sketchy about this book. Most of the houses are depicted in 10 or more photographs, illustrations and plans. Over 600 superb illustrations accompany a pertinent, lucid text by the elitors of the world's leading architectural magazine. The story behind each house is presented simply in its essentials with no frills or involved technical language. (1954)

215 pages, 8¾ x 11⅝, $6.95

THE SECOND TREASURY OF CONTEMPORARY HOUSES

by the editors of Architectural Record

A magnificent collection of 44 contemporary houses superbly described by text, photographs, drawings and plans. They are examples of the spirit of originality and individuality that is becoming ever more important in mid-twentieth century architecture, and they are distinctive in the success with which they met the physical and esthetic requirements of their owners. Selected from the outstanding *Record Houses* annuals of 1956, 1957 and 1958. Ranging from the inexpensive to the luxurious, and representing the various climates of this country, these houses will furnish a genuine treasury of ideas to architects, contractors, and layman alike. 8 pages in full color. (1959)

216 pages, 8¾ x 11⅝, $7.75

RECORD HOUSES OF 1961

by the editors of Architectural Record

The sixth annual volume of the year's outstanding contemporary houses. After considering hundreds of architect-designed houses, the editors of *Architectural Record* selected the 20 presented here. Representative of contemporary architecture's exceptional adaptability to the cultural, social, and day-to-day living needs of the American family, they cover every climatic region of the country—from Massachusetts to Hawaii. Their price range spotlights the dramatic capabilities of the architect to serve the living needs and aspirations of families with widely varying budgets.

Presentation of each house includes: overall floor plan, accurately scaled, complete photographic coverage of exterior and interior, brief text telling why the architect designed as he did, and the equipment and materials of his choice. Half of the residences are shown in full color, one outstanding residence is featured in a special, lengthier spread. (1961)

190 pages, 8¾ x 11⅝, $2.95

The Record Reports

continued from page 300

Although commercial buildings have become increasingly mechanical in their operation, costs continue to rise. This increase in automation, and the corresponding decrease in number of operating employes, indicates a need for good technical information. A survey made by the new Chicago firm reveals that architects and engineers would like better technical information for the operators.

The Reynolds group is made up of technical manual experts in the construction field who are concerned with these rising costs—up to $4.00 per sq ft in some areas. They believe that tailor-made instructions on servicing techniques and maintenance procedures, covering all materials and equipment for a given structure, will considerably reduce its cost of operation. Although aimed at new construction, the service is available for existing buildings as well.

For effective coverage of good operating procedure, the firm plans to work closely with architects, engineers, contractors and manufacturers of installed equipment. For this reason they feel that the architects-engineers—the men who specify material and equipment—should contract and supervise the work, although compensation would ultimately come from the building owners.

ADDENDA

Further information on the Idlewild story, published in ARCHITECTURAL RECORD, September 1961: Important contributions on the Northwest-Northeast-Braniff Terminal were made by Carl R. Kohler and Donald J. Newbauer, associates of White & Mariani, Architect-Engineers.

Louis Allen Abramson was architect of the snack bars and coffee shop and associated architect of the restaurant and cocktail lounge of the International Arrival Building. The Curtain wall units of the Arrival and Wing Buildings are framed in aluminum, covered with stainless steel on the exterior.

We regret the omission of credit to Ara Derderian for his renderings of I. M. Pei's Multi-Airline Terminal on page 168.

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Shure has prepared a special 8 page booklet on Total Communications multiple microphone placement. Also, technical data sheets and catalogs on the world's finest family of public address system microphones are available for your own use. Ask your sound consultant or write on your letterhead to:
Shure Brothers, Inc., 222 Hartrey Ave., Evanston, Illinois, Dept. 18K.

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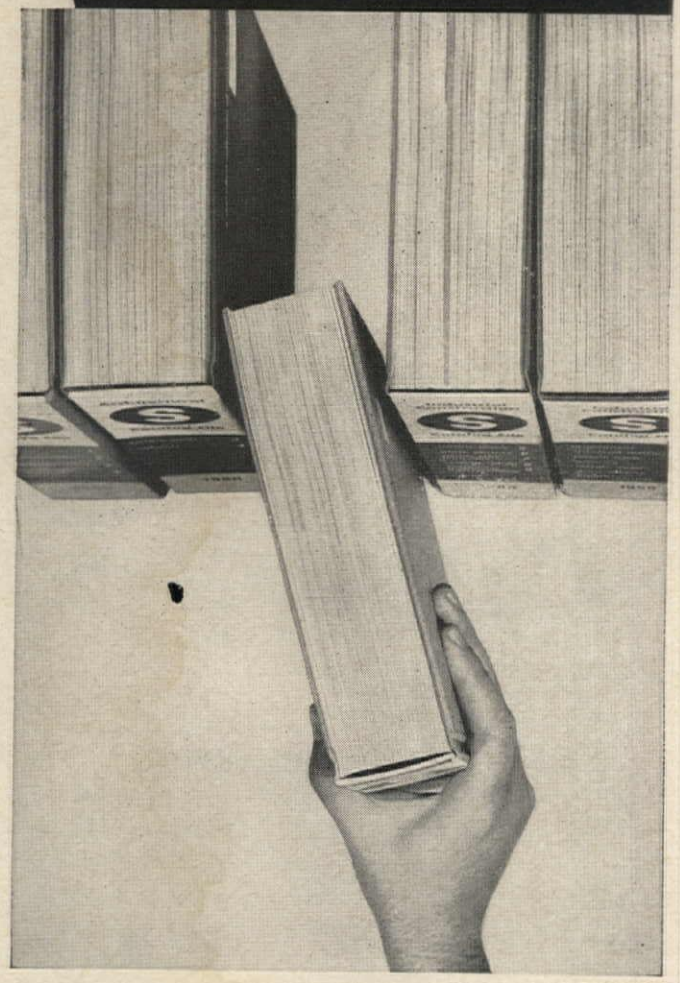

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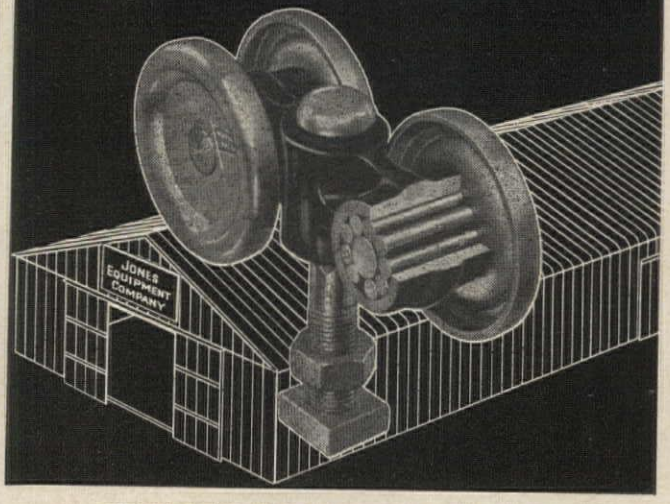

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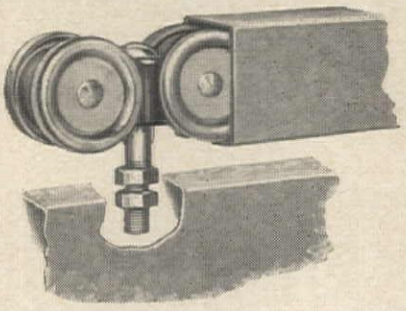
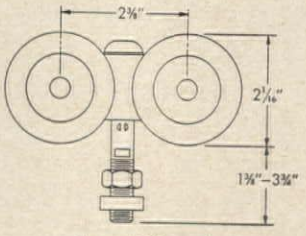


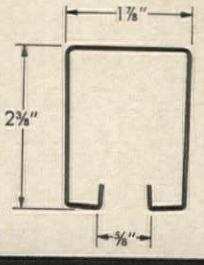
No. 50 TROLLEY HANGER

This versatile trolley is adaptable to a variety of commercial applications. Can be used to hang metal or wood doors weighing up to 400 lbs. Door weight is distributed equally to four 2 1/16-in. steel wheels. Trolley has cast truck and hardened steel roller bearings... provides both lateral and vertical adjustments.



No. 51 TROLLEY RAIL

For use with No. 50 trolley. Carefully formed to give an even, perfect tread. Supplied in lengths 4 ft. to 20 ft., galvanized finish. Rail can be punched to specifications for direct overhead mounting to metal or wood header.



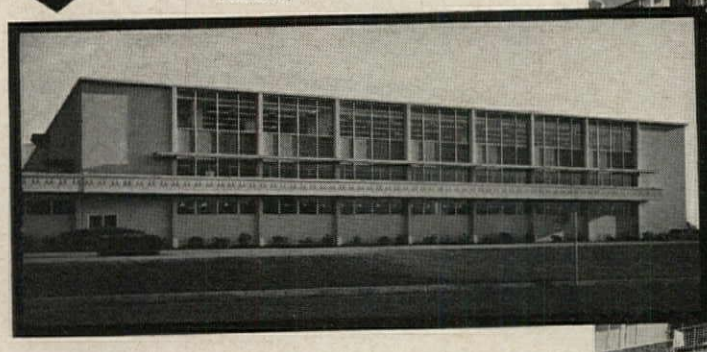
Check SWEET'S Industrial Construction File... 13g/Na

National provides a full line of quality builders' hardware through retail lumber, builder supply and hardware dealers. See SWEET'S Architectural File 18d/Nat and Light Construction File 7a/Nat for complete specifications on interior sliding and folding door hardware.

NATIONAL MANUFACTURING CO.
28111 First Ave. Sterling, Illinois

BELCHER APARTMENTS, SAN FRANCISCO, CALIF.

MOTOROLA TRANSISTOR MANUFACTURING PLANT, PHOENIX, ARIZONA



GAIN EXTRA STORIES IN SAME BUILDING VOLUME WITH PRESCON

Prescon System of Prestressing Can Add Much Leasable Square Footage

IN SAN FRANCISCO working within a height limit of 105 feet, prestressed concrete construction using the Prescon System allowed *two* additional floors in the Belcher Apartments . . . an increase of about 7,000 square feet . . . over conventional construction.

IN PHOENIX enough extra floor space was gained in the Motorola Transistor plant to include a cafeteria and other employee facilities without increasing total building size. (Space frame area converted to complete second floor housing service, utility equipment, cafeteria, etc.)

Increased need for more useable square footage within a specified building volume is being answered by using the Prescon System of post-tensioning prestressed concrete. Long, slender, shallow joists, with beam bottoms at a common elevation, produce attractive overhead construction. Unless furred space is needed, the underside of the slab can be textured as the finished ceiling, or acoustical tile cemented to it. Column spacing can be expanded and varied to allow large open work spaces of 40 and 50 foot bays.

Great freedom of architectural design and choice of construction method . . . poured-in-place, lift slab, or precast . . . are additional advantages in using the Prescon System of post-tensioning prestressed concrete. For many other examples of all types of structures using this system, see your Prescon representative.

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