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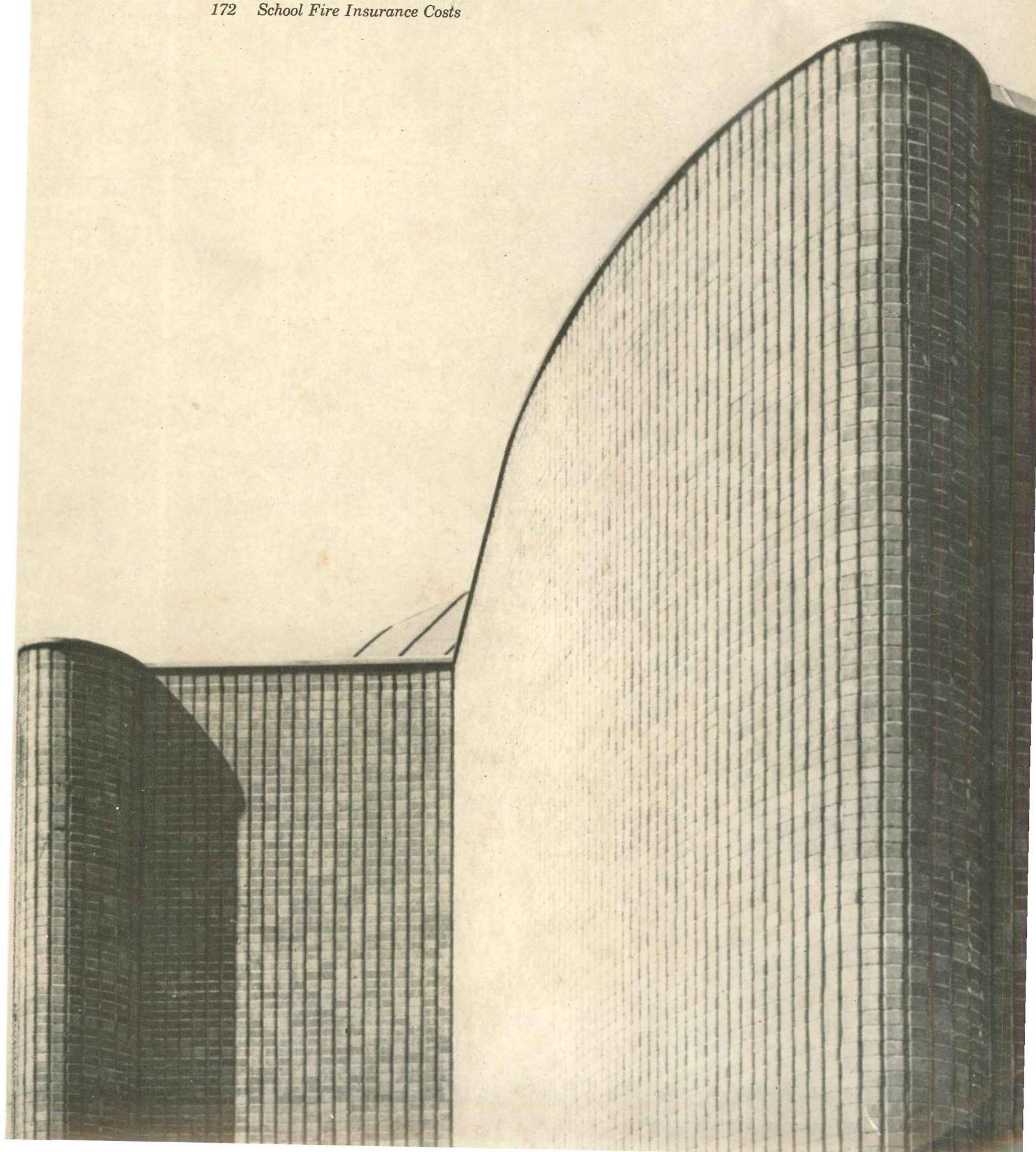

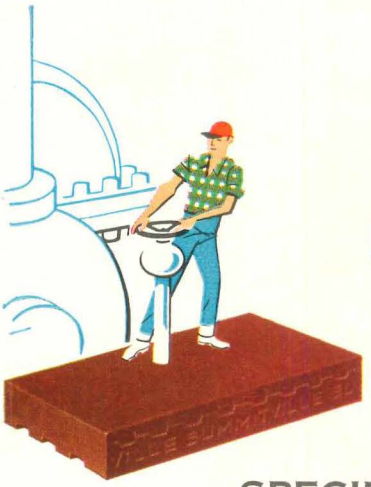

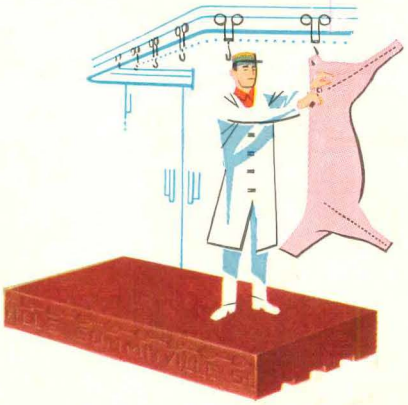

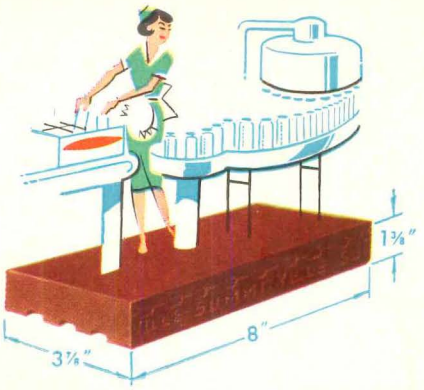

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House of Culture, Helsinki, Finland. Alvar Aalto, Architect. Jane Davis Doggett, photo.

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Coming in the Record

ARCHITECTURE AND SCHOOLS

Ever wonder what real architectural conviction might accomplish in the school field? One answer comes from Sarasota, Florida, where an enlightened school board and a group of enlightened architects combined to produce a whole series of architecturally significant buildings virtually all at once. Our February Building Types Study will present them all.

BANKS AND ARCHITECTURE, TOO

Some big banks have broken into headlines with slick new architectural achievements, and small banks have rapidly been breaking out of the Grecian temple tradition. A minor feature will present several banks that have identified themselves with progress via architecture.

PARASOLS AND FUN

In the fun-and-games department Richard Aeck has come up with an unusually happy combination of architectural high spirits in a huge recreational pavilion, open on the sides and roofed over with a series of great concrete parasols. Complete with details.

OTHER F. W. DODGE SERVICES: Dodge Reports—Dodge Construction Statistics—Sweet's Catalog Services—Dodge Books—Dodge Mailing Service—The Modern Hospital—The Nation's Schools—College and University Business—Hospital Purchasing File—Chicago Construction News—Daily Pacific Builder—The Daily Journal (Denver)—Real Estate Record & Builders Guide.

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Is Art Necessary?

One of the more *gemütlich* events of the unfolding New York season was the assembling of Isamu Noguchi, Richard Lippold, Alexander Calder, William Zorach, Harry Bertoia and Adlai Hardin, come together at the Architectural League to honor fellow-sculptor Costantino Nivola on the occasion of the December opening of his one-man show (see page 20). Also gathered to partake of Rock Cornish hen and talk of reconciling the fine and building arts: architects Paul Nelson, Thorne Sherwood and Richard Stein, painter Adolph Bloch and museum-men James Johnson Sweeney and Arthur Drexler. During the after-dinner discussion it seemed clear that the architects were the group who felt most keenly the lack of sculpture, and painting, in modern buildings—the lack, as Mr. Stein put it, of "a subtle indication that the human spirit still has a place in building." Mr. Nelson and Mr. Sweeney both felt that the architect failed to leave room in his buildings for the artist. (*Mr. Sweeney:* the architect today "sometimes ignores even the function of a building to create a piece of sculpture himself." *Mr. Nelson:* "I believe that architecture should never be perfect—it should be only a background to life. We must create those moments in architecture when the sculptor and the artist can take their places.") As to how to effect a collaboration, what Mr. Sweeney defined as "unity in variety"—no one could suggest an easy solution: Mr. Sherwood felt it began with a "conviction, a state of mind—and an interested client"; Mr. Bertoia said it required "a variety of people of one mind"; Mr. Lippold that it meant "the right architect and the right artist finding each other." Only Mr. Drexler, apologetically but firmly, refused to worry about the divorce of art and architecture: "This is not one of the great pressing problems of the 20th Century. If we don't have art in our buildings, it may be because we don't want it—that we feel it's not the time or the place."

Or—Why Integrate?

A few weeks earlier, in another part of town, a Cooper Union panel on "The Integration of Architecture and the Allied Arts" unanimously came to Mr. Drexler's conclusion. Severally, the architect, the sculptor and the painter rose to ask, "Why should the arts and architecture be integrated?" Said painter and graphic designer Hannes Beckmann: "The historical fact that architecture and the allied arts were integrated doesn't necessarily mean that they must be. They can live side by side complementing each other." Sculptor James Rosati, pointing out that the artist's attitude was that he had only recently achieved his freedom to make a personalized expression and that he was unwilling to surrender it to the exigencies of building, suggested that "art should come into a building after the space has evolved; if the architect feels he needs it, he should go after the completed work and choose it for the existing space." And architect Louis Kahn thought that the architecture itself, not the architect, must invite the artist in: "The space itself should talk to the painter. A wall assigned to a painting will be only a poster."

Dealing With Cold Facts

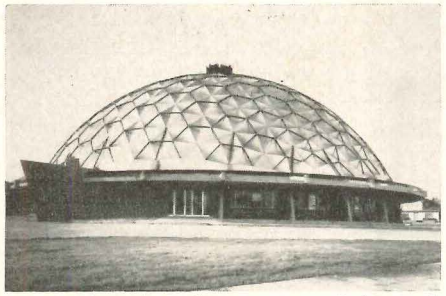
The accumulation and exchange of "know-how" is not the only problem besetting our booming redevelopment schemes. Albert M. Greenfield, banker and former chairman of Philadelphia's Planning Commission, addressing a recent meeting of the American Planning and Civic Association, freely predicted that city planners would be the "heroes of tomorrow," but drew attention to that perhaps less soul-stirring yet highly necessary commodity, money. It is the smaller cities, he said, who are hindered by the lack of enough locally available credit to program important renewal schemes. His suggestion: "I believe it is now timely that [the planning commissions in Pittsburgh, Philadelphia, Cleveland, Buffalo, New Haven, Chicago, Fort Worth, St. Louis and New York], joined by nationally known and reputable developers, form a council or conference through which they will coordinate their experience, their resources and finances, and their investment potential. This council would serve as a clearing house for planning information based on methods and practices of the various planning conferences and commissions throughout the country. They would serve as a focal group through which the required national legislation, state legislation and national, state and city policy might be promoted to advance urban renewal on a broad base throughout the nation. This council would undertake to search our financing methods for individual projects, and seek to make money available to communities which come before it with balanced, feasible and proper plans. As the World Bank operates to receive, screen and provide investment money for development programs throughout the world, this council would afford similar services on a private, voluntary level to the cities of the nation in urban renewal activity. Their sympathetic interest and approval of separate programs would give assurance of continuity in the development and success of such programs."

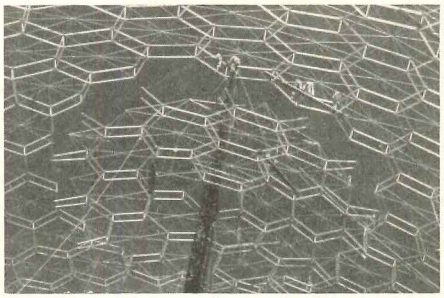
Our Times

From the *Vassar Alumnae News Letter*: "Noyes House [Eero Saarinen, architect] has just preempted the place of Marcel Breuer's [Ferry House] as the most radical structure on the campus . . . but Ferry now belongs to that venerable company of [dormitories] which Vassar women will visit perennially, less in a spirit of inquisitiveness than out of a desire to reminisce." . . . From the Urban Land Institute: "A ten-year boom period in shopping center construction has changed 1949's 'untapped field for regional shopping centers' to today's almost saturated market condition." . . . From Thomas Jeffers, sponsor of a one-man One World program: "Also new World Super-Markets, occupying miles of area, could be built in each country of the world! They would contain a Mexican store with Mexican products, Mexican salesgirl, etc. Also Dutch, Swedish, etc." . . . From Yale's Christopher Tunnard, on writers of the "Beat Generation": "They have a sense of the modern city not to be found in older writers. Instead of rejecting it like the older writers, they carry it comfortably with them wherever they go." . . . On a small Southern restaurant, newly renovated and bedizened with pierced concrete screens: "The New Grille Grill."

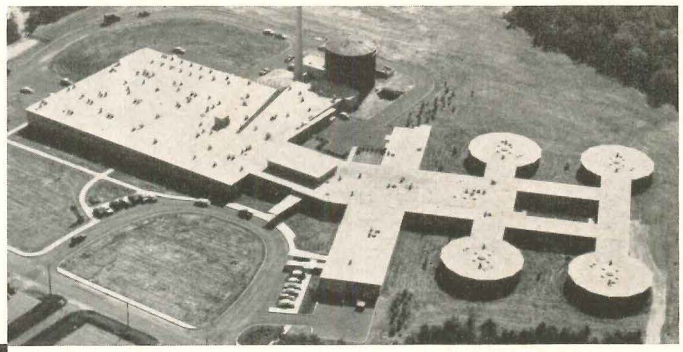
Buildings in the News

The Berlin Hilton, recently opened in West Berlin by Hilton Hotels International, is the eighth of the hotels abroad operated by the organization, wholly owned subsidiary of Hilton Hotels Corp. The Berlin hotel is owned by Hotelbau Gesellschaft. The 13-story, 350-room building (AR, May 1957, pp. 228-9) is on a seven-acre site in West Berlin's new business center. The largest hotel in West Berlin, it has 273,555 sq ft and parking for 426 cars. Its amenities include a coffee shop, rotisserie (restaurant with open spits), the Ambassador restaurant, Golden City Bar, ballroom, roof garden. Interior design features decorative work by local artists. The basic structure is reinforced concrete; all supports are either 5.33 or 10.66 m apart. Double walls enclosing acoustical mats separate rooms. White pastel mosaic tile is used on the exterior, with blue poured concrete mullions. Architects: Pereira & Luckman, Los Angeles. Working drawings and supervision: Schwebes & Schoszberger, Berlin

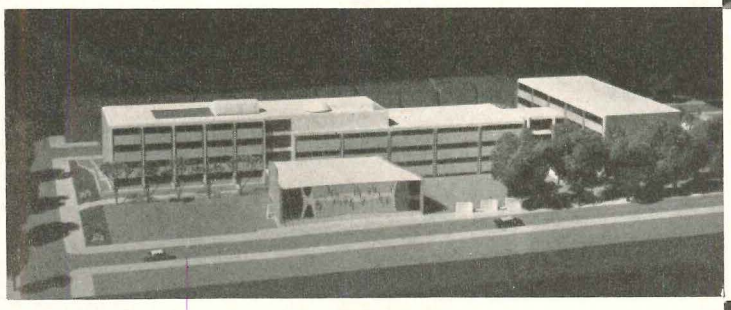




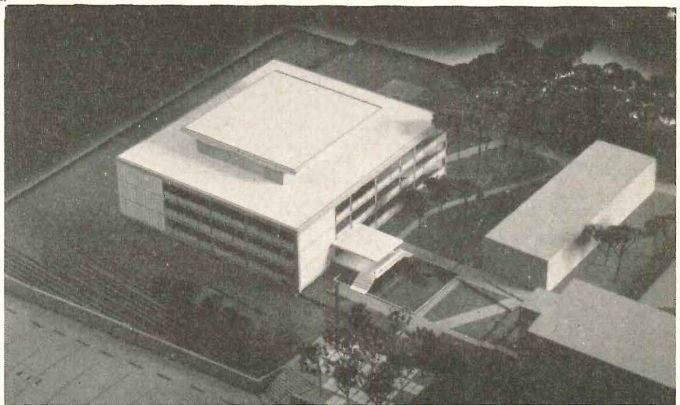
A pair of geodesic domes: stressed skin and open-work space lattice. *Left and center:* Citizens State Bank of Oklahoma City. The aluminum dome (anodized gold panels, anodized black struts) rests on a concrete and glass wall which also supports a 10-ft cantilevered canopy. The building, 70 ft high and 145 ft in diameter inside, cost $500,000. Architects: Bailey, Bozalis, Dickinson & Roloff. Dome designed and developed by: Kaiser Aluminum & Chemical Corp. (after designs of R. Buckminster Fuller). General contractor: Secor Building Co. *Right:* American Society for Metals' dome near Cleveland, shown as final section was being placed; part of A.S.M.'s headquarters building will be underneath. Of aluminum tubing 4 and 6 in. in diameter, the dome is 250 ft in diameter, 103 ft high. Designer: R. Buckminster Fuller in conjunction with John Terence Kelly, architect. Tubing produced by: Kaiser Aluminum & Chemical Corp. Builders and engineers: Gillmore-Olson Co. Erectors: Mak Construction Co.



Right: The Medical Research Center at Brookhaven National Laboratory, Upton, L.I., N.Y., dedicated last month. Included is the world's first nuclear reactor designed specifically for medical use, at rear in round steel building, 60 ft in diameter, with stack for cooling air. The main laboratory building is at left and four circular 12-bed nursing units for research patients at right, with hospital service area in between. Total cost: $6.5 million. Architects-engineers: Eggers & Higgins. Mechanical engineers: Syska & Hennessy. Structural engineers: Weiskopf & Pickworth. Reactor core, instrumentation: Daystrom Nuclear Division, Daystrom, Inc. General contractor: Malan Construction Corp.



Left: Construction is soon to begin on the Temple University Science Building, Philadelphia, first unit of a new university science center. The $4-million building will be financed and constructed by the General State Authority of the State of Pennsylvania. Reinforced concrete, its exterior is cast stone with facing aggregate of two different textures and colors. The 150,000-sq-ft building will accommodate 2200 students. Facilities include 35 laboratories, 24 faculty labs and offices, 32 classrooms, complete TV installation. Architects: Nolen & Swinburne



Right: The contract was recently awarded on the LaSalle College Science Building, Philadelphia, an 80,000-sq-ft structure with student capacity of 900-1000. Cost: $2 million. The building is reinforced concrete with exterior wall panels of Georgia marble and limestone spandrel facings. The central core is air-conditioned and contains the lecture rooms and all mechanical services. On the perimeter are 26 student laboratories, 15 office-labs, and a library. Architects: Nolen & Swinburne. General contractor: McCloskey & Co.

"Worthington air conditioning pays off in comfort and production efficiency," says Hallmark Cards

From the first, Hallmark Cards was determined to make its new home in Kansas City reflect the very best in working comfort. This included air conditioning by Worthington.

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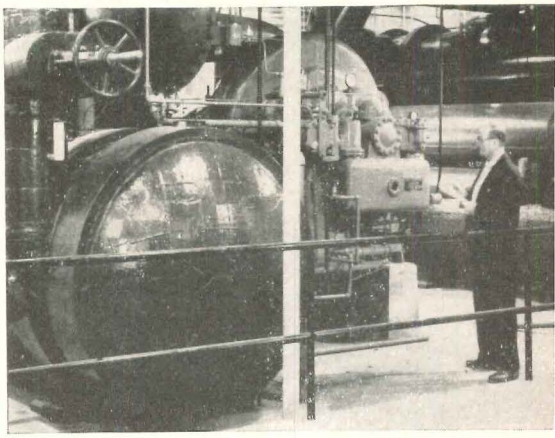
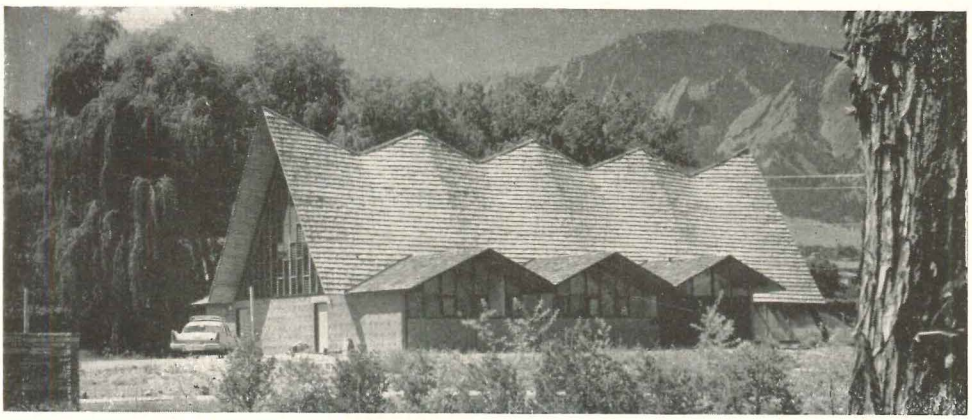
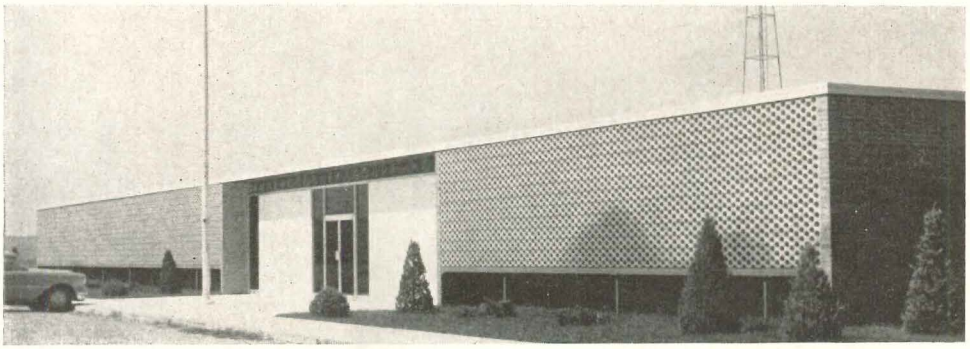
WORTHINGTON

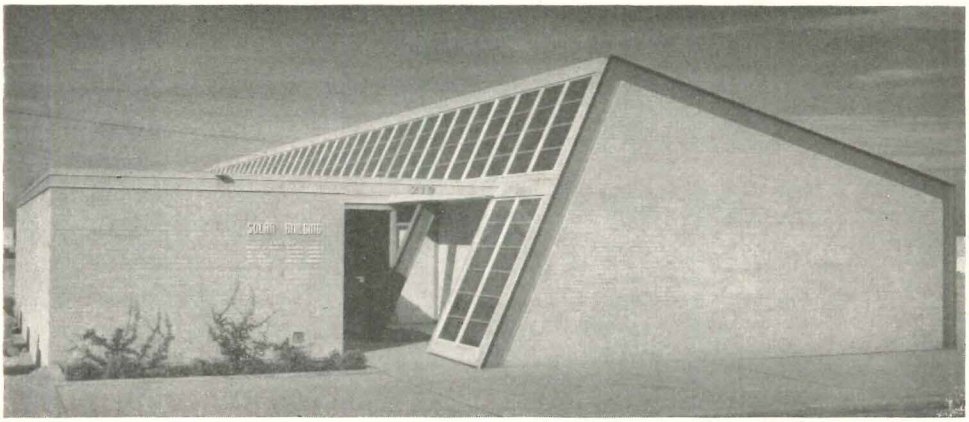


A 1,500-ton Worthington air conditioning system creates a controlled climate for the new Kansas City home of Hallmark Cards, Inc.

SEE WORTHINGTON EQUIPMENT ON DISPLAY AT THE INTERNATIONAL HEATING & AIR CONDITIONING EXPOSITION. BOOTHS 129 and 133.



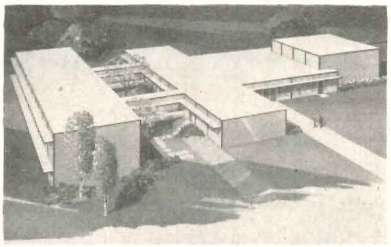


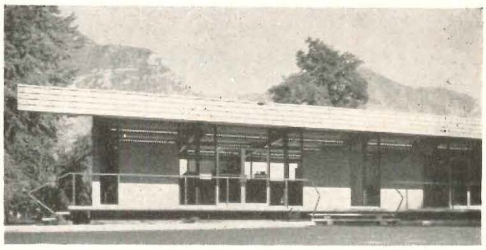


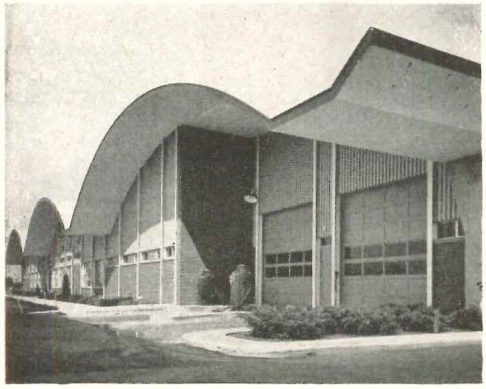
WESTERN MOUNTAIN REGION A.I.A. HONOR AWARDS

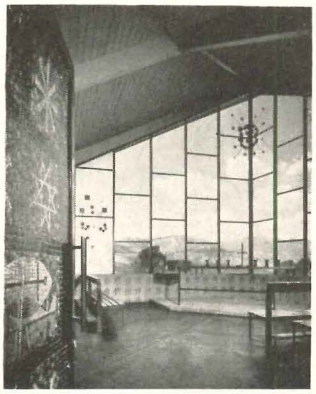
Top: Wesley Foundation Methodist Student Center, University of Colorado, Boulder; Hobart D. Wagener, Architect; Ketchum & Konkle, Structural Engineers; R. C. Grayban, Contractor. *Center:* Banner County Courthouse, Harrisburg, Neb.; Robert W. Ditzen, Architect; David E. Rowland, Associate Designer; Fullen Construction Co., General Contractor. *Bottom:* Solar Building, Albuquerque, N. M.; Stanley & Wright, Architects; Bridgers & Paxton, Mechanical Engineers; Paul Priest, General Contractor

AWARDS OF MERIT



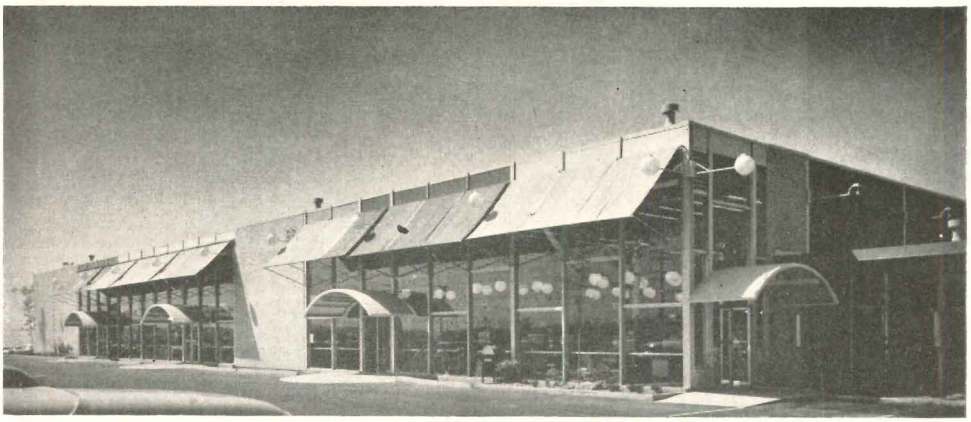


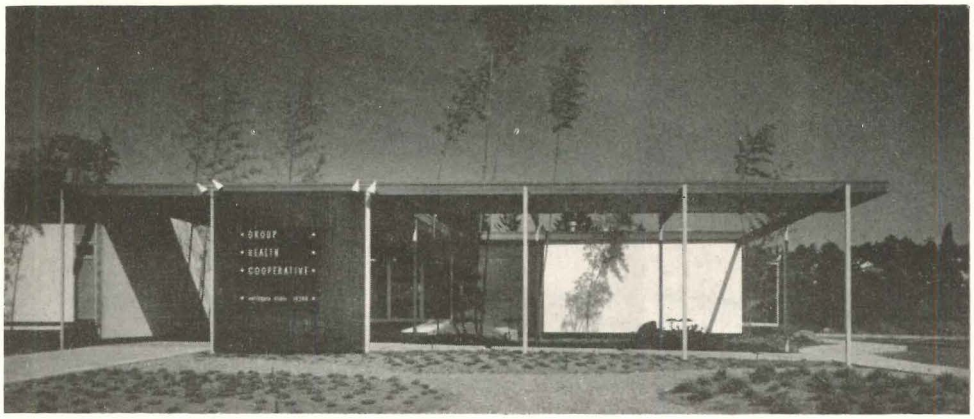




Top row: 1. Residence for Dr. George Lof, Denver; James M. Hunter & Associates, Architects; Fred Keller Construction Co., Contractor. 2. West Lakewood Elementary School, Lakewood, Colo.; William C. Muchow Associates, Architects; Phillips, Carter & Osborn, Structural Engineers; F. R. Orr, Contractor. 3. Monson Building, Provo, Utah; Bruce R. Dixon, Architect; Lee C. Knell and Kenneth D. Long, Associates; Jess H. Monson, General Contractor. *Bottom row:* 1. Rainbo Bread Company, Adams City, Colo.; T. J. Moore, Architect; A. H. Bush, Associate; Ketchum & Konkel, Engineers; Brown & Schrepferman & Co., Contractor. 2. Chase McPherson Memorial Chapel, Fort Lewis A. & M. College, Durango, Colo.; James M. Hunter & Associates, Architects; Craftsmen Construction Co., Contractor

SOUTHWEST WASHINGTON AND WASHINGTON STATE A.I.A. HONOR AWARDS





Top: M. B. Shopping Center, Renton, Wash.; Johnston & Campanella, Architects; Baugh Construction Co., Contractor. *Center:* Island Park School, Mercer Island, Wash.; Bassetti & Morse, Architects; E. F. Shuck Construction Co., Contractor. *Bottom:* Group Health Cooperative, Northgate Clinic, Seattle; Paul Hayden Kirk, Architect; Donald S. Wallace and David A. McKinley, Jr., Associates; Riley Pleas, Inc., Contractor

The annual honor awards program of the Western Mountain Region of the American Institute of Architects was held during the seventh annual regional conference (page 25).

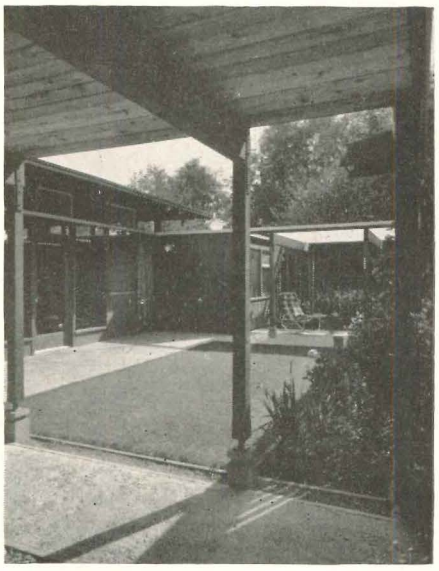
There were more than 60 entries, and eight, shown on opposite page, were honored.

The jury consisted of Elisabeth Kendall Thompson, senior editor, ARCHITECTURAL RECORD, chairman; Thomas H. Creighton, editor, *Progressive Architecture;* Morris Ketchum, Jr., Ketchum & Sharp, New York; N. G. Petry, contractor; and Ralph Rapson, head, School of Architecture, University of Minnesota.

An honor awards program, the first to be held in connection with the Northwest Regional Conference of the American Institute of Architects (page 25), was held this year by the Washington State and Southwest Washington chapters, meeting at Harrison Hot Springs.

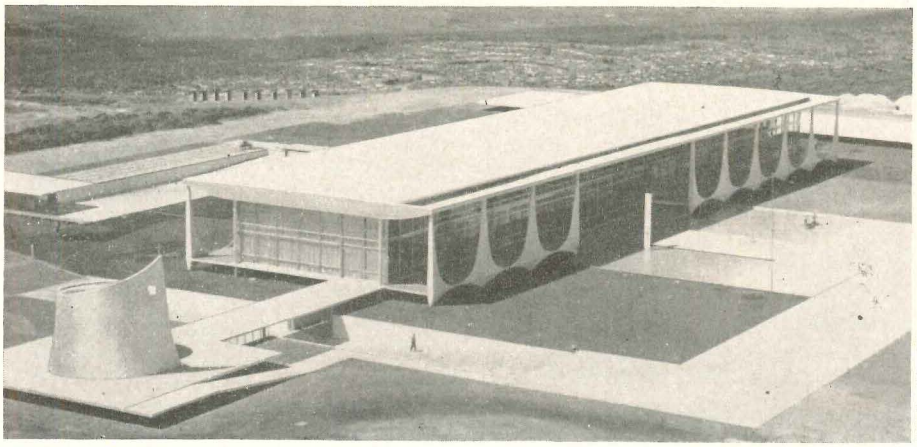
There were more than 70 entries, and four, shown on this page, were honored.

The jury consisted of Louis I. Kahn, architect, Philadelphia; Charles Edward Pratt, architect, Vancouver; and John Noble Richards, president, American Institute of Architects.



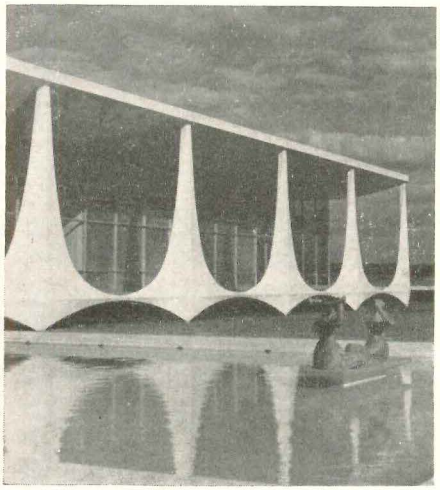
Residence for Mr. and Mrs. Paul Lange, Mercer Island, Wash.; Albert O. Bumgardner, Architect; G.A.N. Co., Contractor

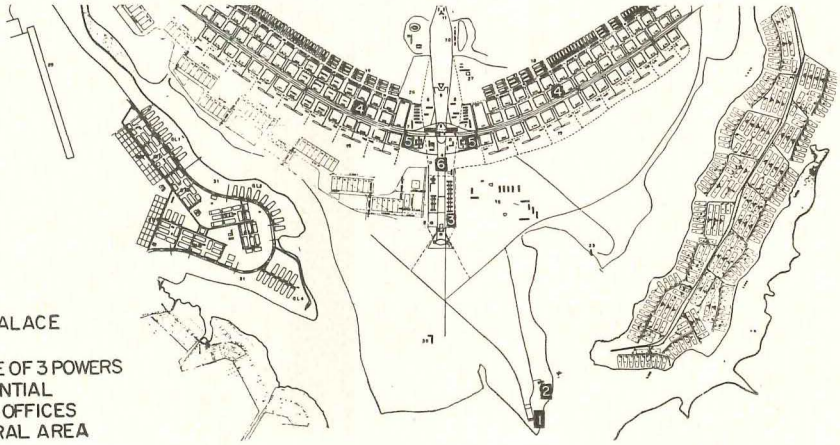
BRASILIA: A NEW CITY RISES



Wide World

The Palace of the Dawn, the presidential residence, is now completed (as are the hotel, shown below, some workers' housing, and the airport). Cast concrete pillars, shown in the detail, support the 300-ft-long, two-story building. Niemeyer comments: "We dedicated special attention to the columns, carefully studying their spacing, forms, and proportions . . . These led us to a solution of continued and undulated rhythm, which lends lightness and elegance to the construction, making it appear as if it had lightly landed upon the soil"

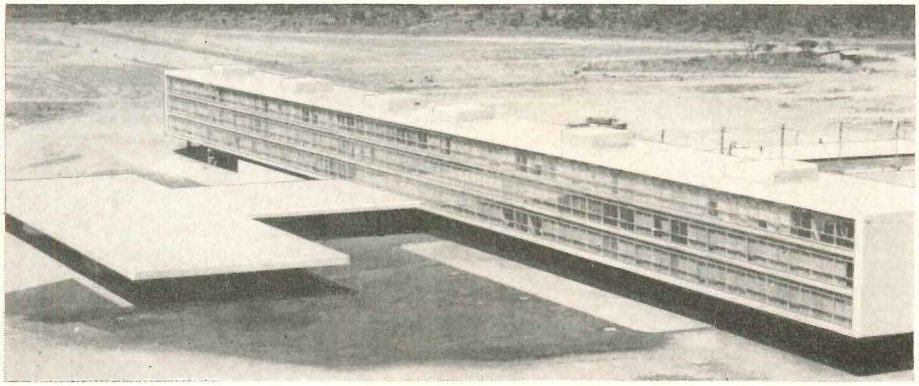




Oscar Niemeyer is the architect and Lucio Costa the planner of Brazil's new capital, Brasilia, now being pushed to completion by an army of workers living in temporary buildings. The location, 600 miles from Rio de Janeiro, was chosen because it is in the rich undeveloped interior far from the overcrowded seacoast; the 37,000-acre site in the state of Goias is at an altitude of 3000 ft, with a mild, dry climate.

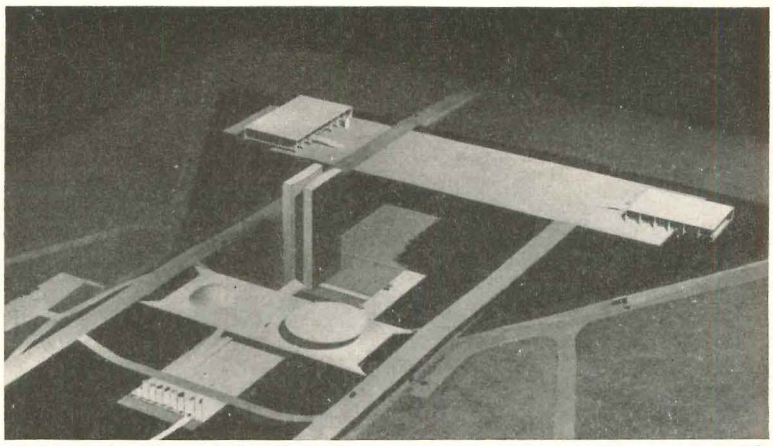
A new capital for the country was a dream for many years, but only recently has it become possible, largely through the determination of President Juscelino Kubitschek. After the site had been selected by a commission (aided by a report from Donald J. Belcher and Associates, development engineers of Ithaca, N. Y.), the president appointed the Companhia Urbanizadora da Nova Capital do Brasil to build the new capital and arrange transfer of the government from congested Rio; Novacap, as the organization is called, is headed by Israel Pinheiro. The total cost of building is estimated at $300 million—government and private funds and a $10-million loan from the United States—to be spent by 1960.

President Kubitschek asked Niemeyer to design the first buildings and sketch a layout of the city. The architect, however, advised a national competition for the plan. The conditions were issued in September, 1956, and six months later Costa's airplane-shaped scheme was judged the winner. Niemeyer, who is em-



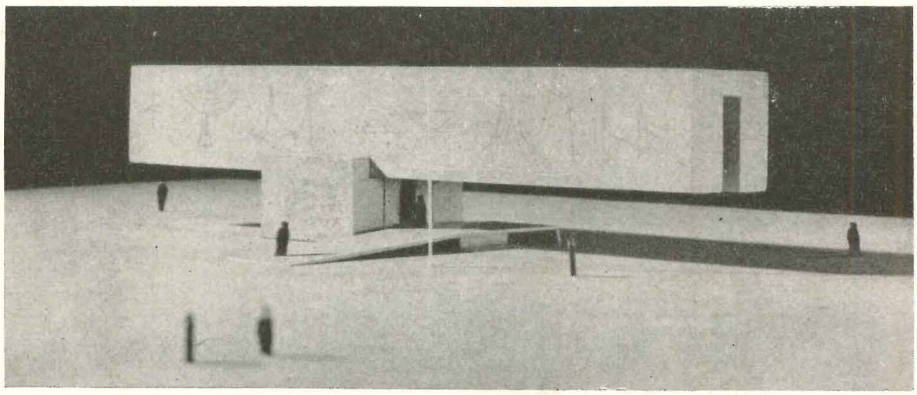
Wide World

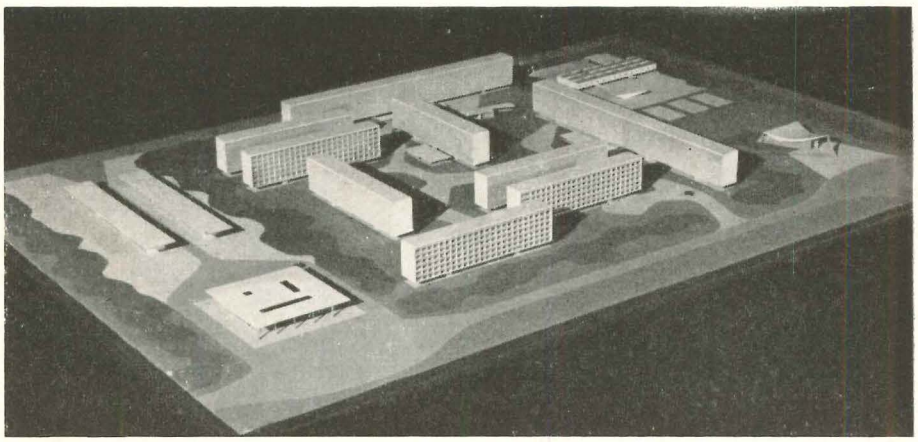
The completed tourist hotel is a four-story structure containing 180 apartments and accommodating 350 guests. The hotel and presidential palace are a little over four miles from the center of the city. *Right:* The Palace of the Tableland or Government House. *Far Right:* Reinforced concrete chapel



Model of the Plaza of the Three Powers. Costa's plan puts Niemeyer's buildings at the corners of a terraced equilateral triangle. Left background: the executive Palace of the Tableland (shown also below left); right background: the Supreme Federal Tribunal. Foreground: the Palace of the National Congress, with circular Senate and House. Congressional administrative services are to be in the twin 25-story buildings

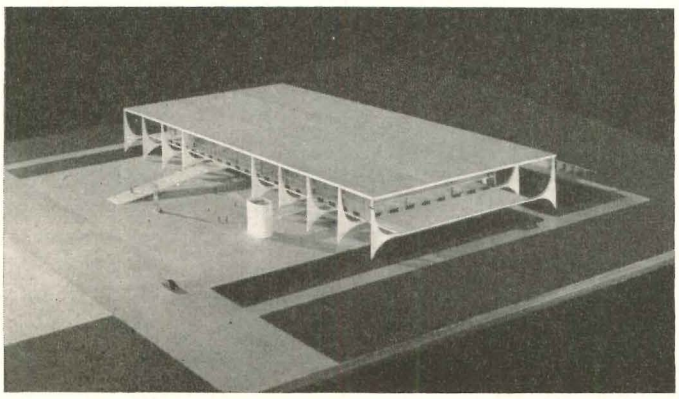
Right upper: The museum. *Right lower:* A "super-block," with apartments, school (far corner), chapel (right front corner; shown also below right); shops and market (left edge). Costa explained in his report accompanying his winning plan: "The residential buildings in the super-blocks can be arranged in varying manners, though always in obedience to two general principles: uniform height regulations—perhaps a maximum of six stories above the pilotis—and segregation of motorized traffic and pedestrian transit, especially near the entrances to the primary school and the urban amenities located in each super-block."

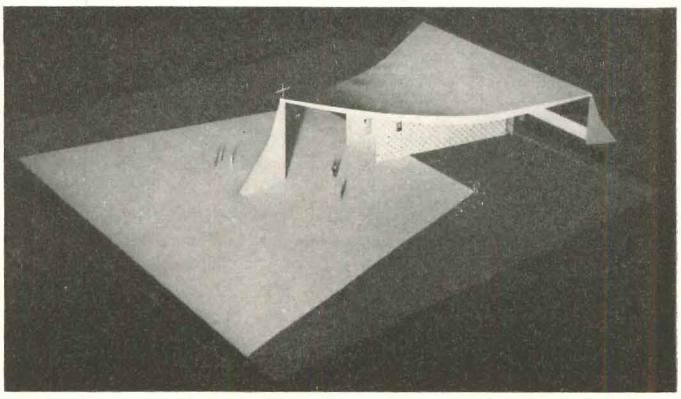




ployed by Novacap, is designing all public buildings, approving all private ones, and supervising the whole undertaking.

Brasilia is scheduled to become the official capital in April, 1960, when President Kubitschek intends to transfer his government. The city, which is supposed to be mostly completed about a year later, is expected ultimately to have a population of half a million. (Some vacated Rio buildings will become museums; others will continue in use.)





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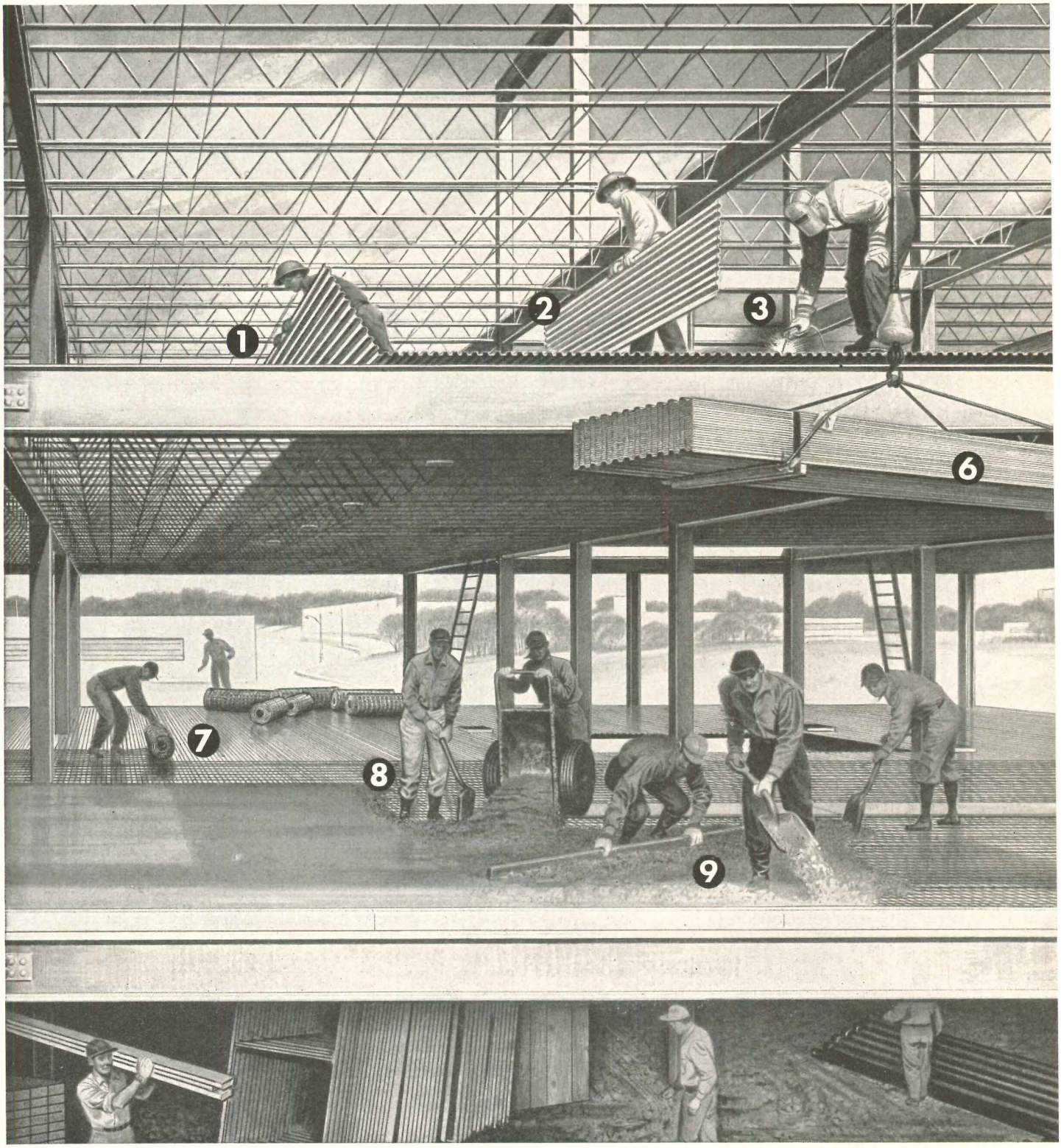

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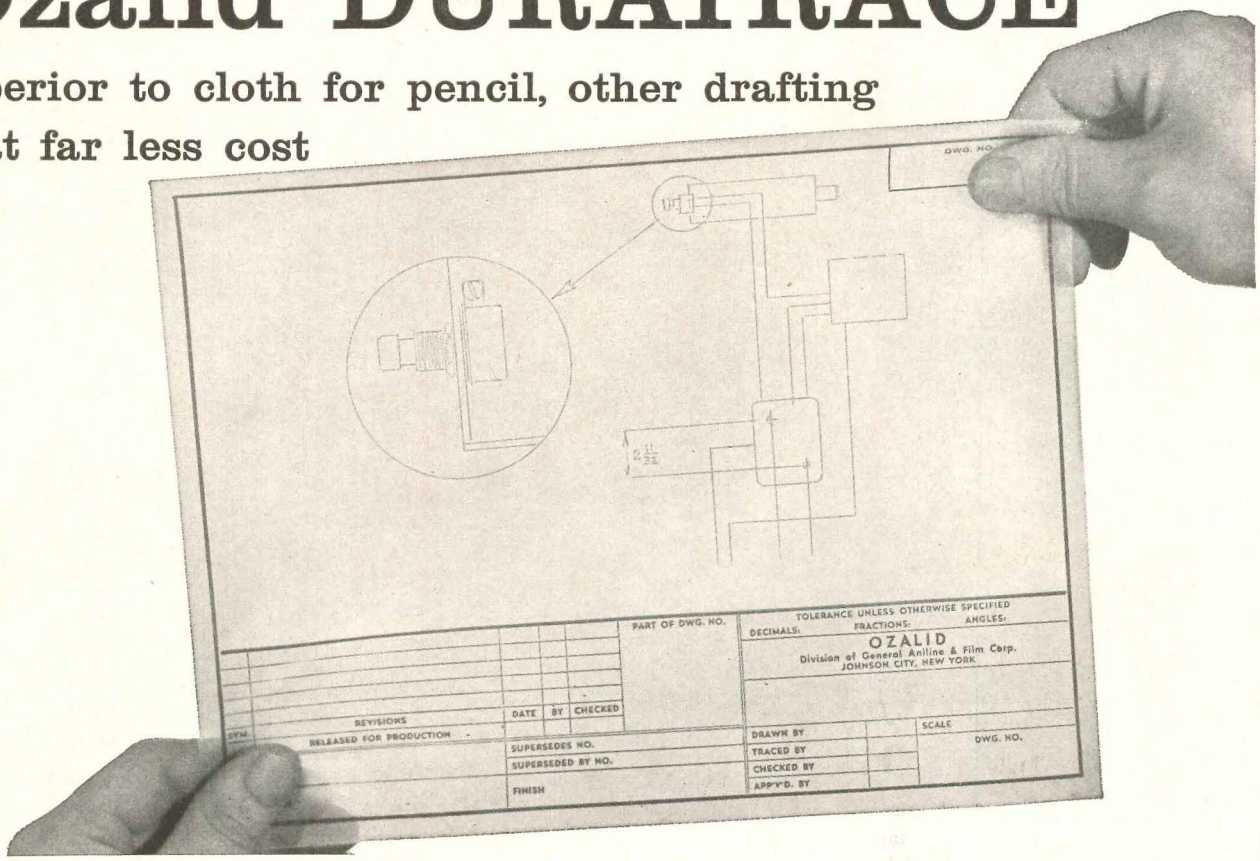

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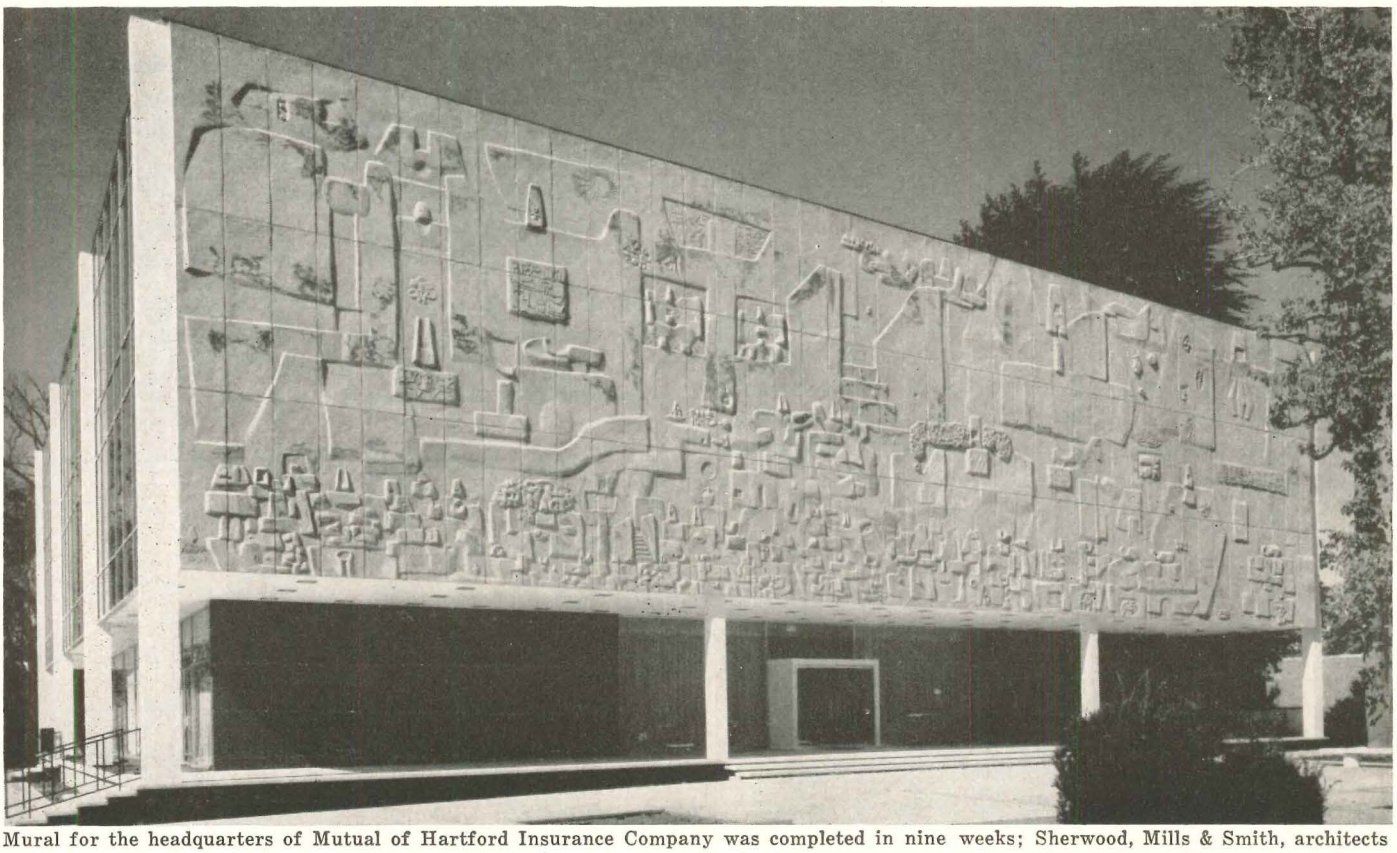
Cast stone sculptures, mounted on metal poles, were featured in a street exhibit in Mr. Nivola's native Sardinia in 1958

Also in Orani, Sardinia, a graffito mural on the façade of a small chapel, executed by Mr. Nivola in 1958

SCULPTURE AND ARCHITECTURE: NIVOLA'S WORK ON EXHIBIT

New York's Architectural League honored Costantino Nivola recently with one of its rare one-man shows. Not since 1930, when it exhibited the work of Frank Lloyd Wright, has the League held anything but group shows. This was the first time, too, that a sculptor had a one-man show there.

The exhibition of Mr. Nivola's recent work, which was on display at the League's headquarters December 8-19, is scheduled to be seen this spring at the Milan Triennale. On its return from Italy, the show will make a tour of the country under the auspices of the American Federation of Arts.



Robert Stahman

Mural for the headquarters of Mutual of Hartford Insurance Company was completed in nine weeks; Sherwood, Mills & Smith, architects

Meetings and Miscellany

—Drawn for the RECORD by Alan Dunn

Western Mountain A.I.A. Meeting

"Living with the Sun," the provocative theme of the seventh annual conference of the Western Mountain region, A.I.A., drew more than 300 architects and their wives to Denver in September and gave them a new outlook on the familiar star both as ultimate fuel source and as immediate architectural design factor.

Besides hearing from Dr. Walter Orr Roberts, director of the High Altitude Observatory at Climax, Colo., of the subtle changes within the sun itself and of their effect on climate and buildings, the conference heard architects Morris Ketchum of New York; Ralph Rapson, dean of the University of Minnesota's School of Architecture; Vernon DeMars of Berkeley, Calif., and the University of California; and John Noble Richards, national A.I.A. president; and the Octagon's Edmund Purves. John Yellott, until recently director of the Association for Applied Solar Energy in Phoenix, described present practical applications of solar energy.

Highlight of the conference was the visit to the Air Force Academy at Colorado Springs. The annual awards program, in which members from all five of the region's states participated, drew over 60 entries, eight of which were honored (see photos, page 12). Regional business included the welcoming by regional director Frederic Porter of Nevada's two chapters (formerly a part of the California-Nevada-Hawaii region) into the Western Mountain region.

T. J. Moore of Denver was convention general chairman and James M. Hunter was program chairman.

—*Elisabeth Kendall Thompson*

Design Contest

The third Mars Outstanding Design Contest (sponsored by Mars Pencils) has been announced. There is no specific deadline. Winning projects are reproduced in the technical publications in which the Mars Outstanding Design Series appears. A winning designer, who is given full credit and retains all rights, also receives $100. Broad interest and attractive presentation are important in judging the projects, which may be architectural, engineering, or industrial; they should be submitted to J. S. Staedtler, Inc., Hackensack, N. J.

Northwest Region, A.I.A.

Four days of pouring rain failed to dampen the spirits of the 250 Northwest architects and their wives and guests who met October 9-11 at Harrison Hot Springs, B.C., for their annual conference. Held for the first time outside the U.S., the conference was jointly sponsored by the Architectural Institute of British Columbia and the Northwest Region, A.I.A.

The conference theme, "Toward a Better Environment," was developed in four sessions by a philosophy professor, an industrial designer and two architects. But the highlight of the conference was the talk by architect Louis Kahn of Philadelphia, whose often controversial remarks provided the basis for succeeding discussions both formal and informal.

An honor awards program, new to the Northwest's conference, was held this year by members of the Washington State and Southwest Washington chapters. Some 20 entries were chosen for submission to the jury at the conference from the 70 or more entered by chapter members (see photos, page 13).

Architects who returned to their homes by way of Vancouver were entertained at lunch and taken on a tour of buildings in the area by members of the A.I.B.C. under conference chairman Rand Iredale and Institute president John Dayton.

Albert O. Bumgardner was convention chairman. Donald J. Stewart is regional director.

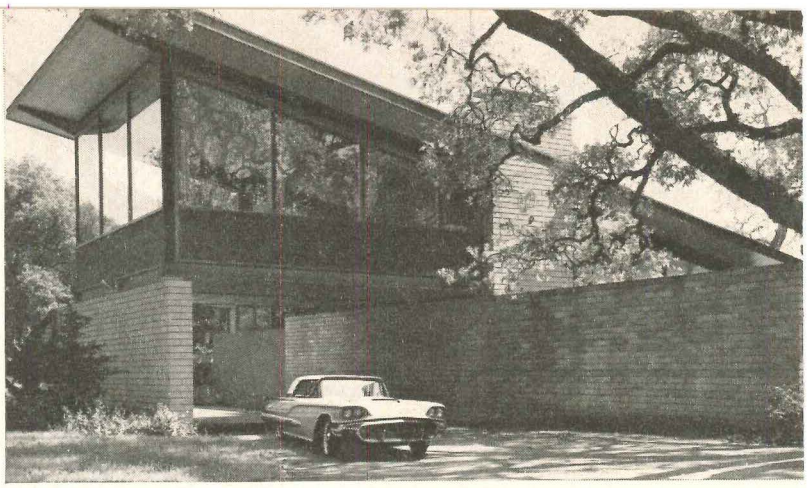
—*Elisabeth Kendall Thompson*

Florida Association Conference

"Opportunity in an Expanding Era" was the theme of the 44th meeting of the Florida Association of Architects, held in Miami Beach, November 19-22. Speeches, panels, and discussions were concerned primarily with the ever-widening future of architecture and the broadening scope of the architect's services. Host for the meetings was the Mid-Florida Chapter, A.I.A., Joseph M. Shifalo, president and convention chairman.

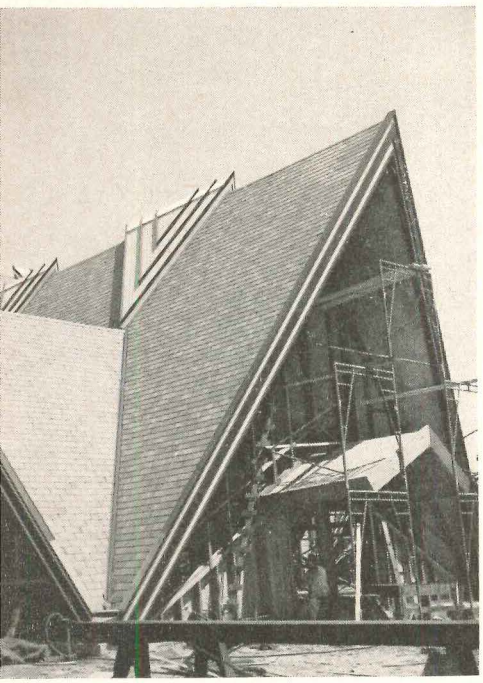
Major speeches were made by architects John Noble Richards, A.I.A. president; Philip Will, Jr., first vice president of A.I.A.; and Walter A. Taylor. Opportunities in space were discussed by J. Paul Walsh, Naval Research Laboratory, and Charles Blaney, of Martin-Orlando Co. Workshops on the scope of architectural services and public relations were held with Herbet C. Millkey and Edward G. Grafton as moderators and including as panel members Grayson Gill and Vincent G. Kling.

The honor awards jury, composed of John Noble Richards, immediate A.I.A. past president Leon Chatelain, Jr., and Philip Will, Jr., presented nine awards.



Residence in California

Design with steel...

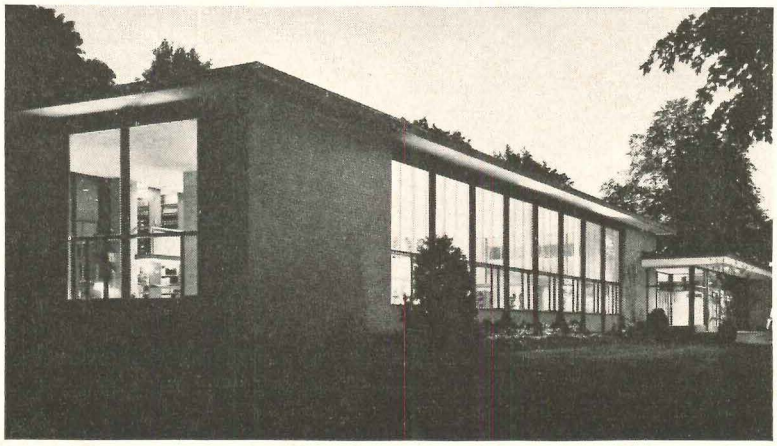


Church in California

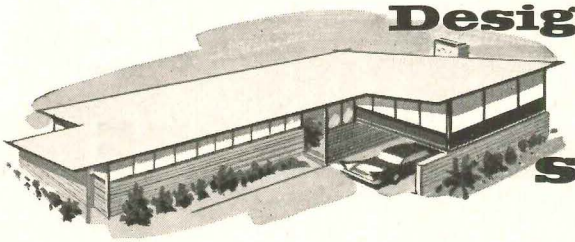
Imaginative design.

Steel framing challenges the designer's imagination. It offers unlimited possibilities for bridges, schools, churches, houses, parking structures, industrial buildings. Structural shapes are readily adaptable to many architectural forms. When left exposed, many striking effects are possible.

Interior of house above



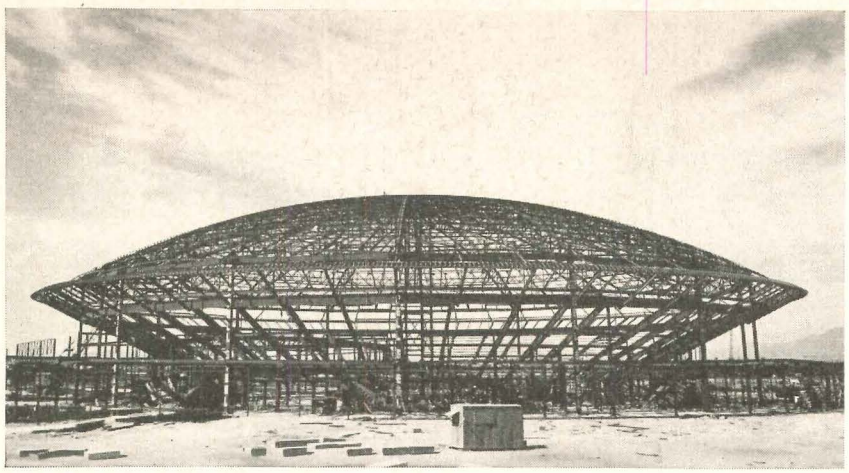
Library in New Jersey



Design with steel...

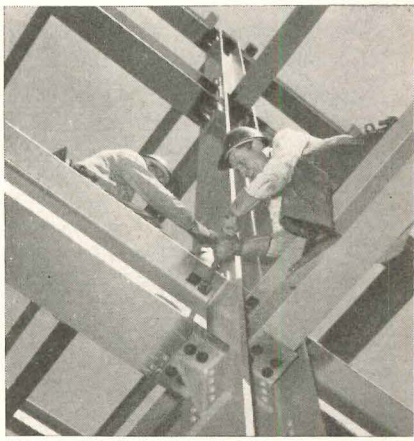
Build with steel...

Steel makes sense

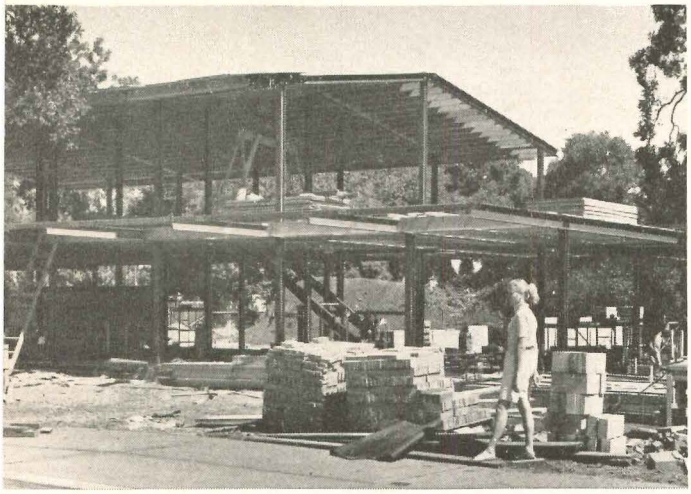


Convention Center
in Nevada

Build with steel...



High-strength bolts speed erection



Steel frames go up quickly...
leading the way to
fast completion

Fast Erection.

Steel framing goes up faster than any other type of fire-safe material. It can be set in any kind of weather in which men can work. Other trades can move in quickly to speed the building's completion. Another important time-saver: high-strength bolts, which eliminate the need for field riveting.

Steel makes sense

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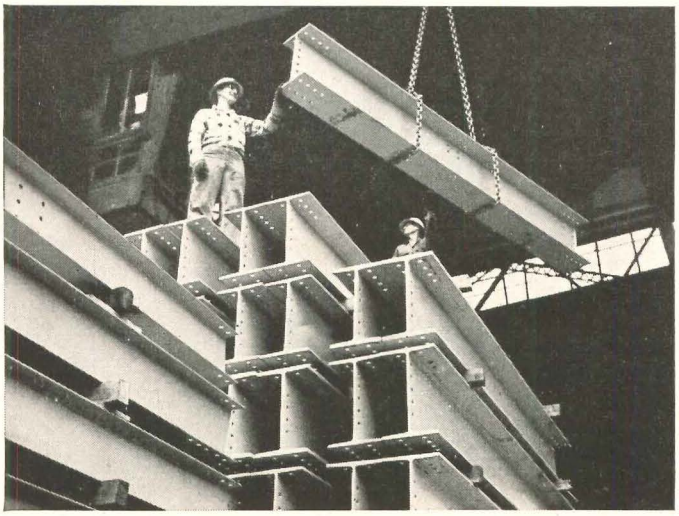

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An entirely new slate of officers was chosen for 1959. They include: John Stetson, president; Joseph M. Shifalo, treasurer; Francis R. Walton, secretary; and Arthur Lee Campbell, Florida North District vice president.

—*Dudley Hunt, Jr.*

California A.I.A. Convention

The largest number of architects ever to register for a California Council, A.I.A., convention turned out this year for the annual convention held October 15-19 on the Monterey peninsula. Unusual in many respects, from its "decentralized" housing and meeting place to the large number of architects who attended, the convention was even more unusual in its professional program. Actually a conference within a convention, the program centered on the theme "Creativeness in Architecture," a panoramic picture of the processes of architecture developed through five sessions and 16 speakers.

From the first panel on "The Creative Mind," in which a group of non-architects focused on the factors involved in creativity, to the last sessions, which were specifically architectural, the attendance was record-breaking (never less than 300 at meetings, and—on the final day—more than 750). The roster of speakers reads like an architectural *Who's Who:* Paul Thiry, Walter Netsch, Robert Billsbrough Price, Victor Lundy, Harry Weese, with California architects William W. Wurster, Gardner Dailey, Robert Alexander, and Henry Hill as moderators for the various sessions. The distinguished engineer, Fred M. Severud, was introduced by ARCHITECTURAL RECORD editor Emerson Goble.

The speakers offered no magic formulae for being creative; nor were criteria for creative effort set up. One significant thing pointed out by psychologist Dr. Donald MacKinnon, director of the University of California's Institute of Personality Research and Assessment, is that the creative person is no arty Bohemian but a really hard worker who has what the psychologists call the "briefcase syndrome."

A special session for young architects and students featured Neill Smith of John Carl Warnecke's office, Richard Hein of Anshen & Allen, and James Langenheim of Pereira & Luckman. Loy Chamberlain of Oakland was convention advisory committee chairman.

William Glenn Balch and John Austin of Los Angeles were awarded the Council's Distinguished Service Citation at the convention.

From now on California will be a region to itself, with Ulysses Floyd Rible of Los Angeles as regional director. Hawaii becomes a part of the Northwest region, and Nevada of the Western Mountain region.

—*Elisabeth Kendall Thompson*

George F. Lamb, recently appointed executive secretary of the Construction Specifications Institute, Washington. Mr. Lamb, who leaves the presidency of the Southern Calif. C.S.I. chapter, is the first executive to be employed by C.S.I. in its 10-year life; volunteers have performed administrative functions until now. Mr. Lamb is national chairman of C.S.I.'s Committee on Codes and Building Regulations

Below: Two photos taken during the meeting of the Florida Association of Architects. *Upper:* Joseph M. Shifalo, Mid-Florida chapter president; John Noble Richards, A.I.A. president; Leon Chatelain, Jr., past A.I.A. president; Philip Will, Jr., of Perkins & Will; H. Samuel Kruse, F.A.A. president. *Lower:* Charles Blaney; William B. Harvard, panel moderator; Dr. J. Paul Walsh

Below: At the Northwest Regional A.I.A. Conference were Louis Kahn, Philadelphia; C. E. Pratt, Vancouver; John Noble Richards, A.I.A. president

Right: Two photographs taken during the Western Mountain Regional A.I.A. Conference. *Above:* Carl Kloverstrom, Denver, Colorado chapter president; Frederick Porter, Cheyenne, regional director; T. J. Moore, Denver, Conference chairman. *Below:* Bradley P. Kidder, Santa Fe, retiring regional director, and John Noble Richards, A.I.A. president

Three pictures taken during the California Council, A.I.A., convention. *Top:* Walter Netsch; James Langenheim of Pereira & Luckman; Richard Hein of Anshen & Allen; Paul Thiry; Neill Smith of John Carl Warnecke's office; Emerson Goble, editor, ARCHITECTURAL RECORD. *Center:* Gardner Dailey; Victor Lundy; Paul Thiry; Walter Netsch. *Bottom:* Lee Kline, Pasadena, C.C. A.I.A., vice president, left, presents Council citation to C.C.A.I.A. past president Glenn Balch, Los Angeles, with Fred Richards, C.C.A.I.A. president, and Mrs. Kline looking on at right

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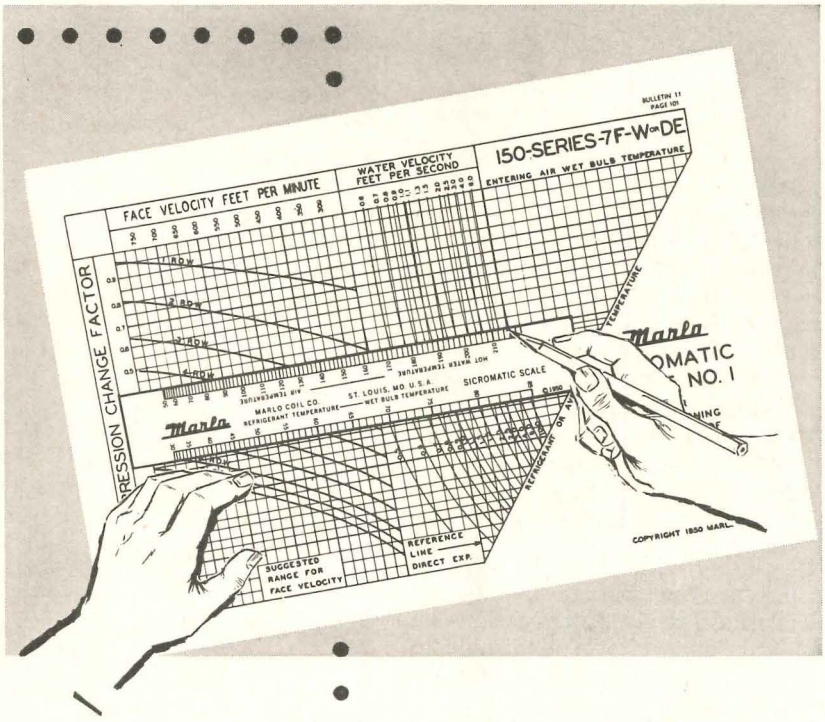

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FIRST GOALS REACHED IN STANDARDS PROGRAM FOR ARMED FORCES BUILDING

Five years now have gone by since the Department of Defense began its program of technical guidance for the armed services in their construction activities. Virtually every repetitive-type facility is covered in the 15 separate instructions establishing these standards and criteria, and it remains only for the office in charge of this program to keep the publications up to date, adding new ones in limited number as the need might arise.

Many Types Covered

Beginning with the more common permanent-type barracks, Defense officials have devised instructions on standards and criteria applicable to the broader areas encompassing the greater volume of all military buildings. After adding air conditioning and allied systems to the permanent-type barracks, officials began work on standards for bachelor officers' quarters, administrative facilities, messing facilities, automotive parking, fire protection maintenance, military hospitals, even getting into the religious, morale, welfare and recreational types. Family housing and military hospitals are among those instructions issued more recently. And there was a report of construction costs included in the series earlier.

These standards and criteria have been developed as guides for the design and construction of military facilities themselves within the three services. While no exact figures are available on the precise amount of money the application of these standards has saved in taxpayers' dollars, those close to the program in the Pentagon have testified before Congress that substantial savings have been effected and will continue to be made as these and the limited number of unannounced instructions on certain classified work are applied.

Three Services Cooperate

The program was launched late in 1953 with the idea of indicating an acceptable quality of design that would bring about uniform costs and more uniform facilities as far as possible within the Army, Navy and Air Force. Cooperating in the establishment of the criteria are the Army Corps of Engineers, the Navy's Bureau of Yards and Docks and Air Force Installations.

The services follow the broad principles laid down in these instructions in programming and designing the types of structures covered. Typical quality of construction is covered in each. And there are what the Pentagon has called "allowances" for plumbing fixtures, mechanical and structural features. Space allowances as well as fire safety and fire protection standards are included.

Some Revisions Already Effected

Three revisions are included in the current list: those for 1) air conditioning, evaporation cooling, dehumidification and mechanical ventilation, 2) parking for nonorganizational vehicles, and 3) family housing.

The major work of the office responsible for the standards and criteria now will center on revision of the existing documents to keep them up to date. In this way, they will be made to serve their objective of providing broad technical guidance for the three services in their vast construction efforts.

Through its full range over the past five years, this drafting of DOD instructions has been under the supervision of Max Barth, chief of the Technical Division. Edward J. Sheridan is director of construction, serving under the Assistant Secretary of Defense for Properties and Installations, Floyd S. Bryant. The Technical Division is part of the Director's Office.

A complete current list of the Instructions establishing standards and criteria follows. Copies of these instructions are not available for distribution to other than the military departments, but may be examined in the Technical Division, Office of the Assistant Secretary of Defense (Properties and Installations), the Pentagon, or in the appropriate construction offices of the three military departments in Washington, Mr. Barth said.

4270.4, June 16, 1954: Standards for Construction—Permanent-Type Barracks

4270.7 Aug. 1, 1956, revised Aug. 2, 1957: Air Conditioning, Evaporative Cooling, Dehumidification & Mechanical Ventilation

4270.8, Nov. 5, 1954: Standards for Construction—Permanent-Type BOQ's

4270.9, Nov. 5, 1954: Criteria for Construction of Permanent-Type Barracks

4270.10, Mar. 30, 1956: Report of Construction Costs (DD-P&I (AR) 262)

4270.11, Mar. 23, 1955: Standards and Criteria for Construction—Permanent-Type Administrative Facilities

4270.12, Apr. 1, 1955: Standards and Criteria for Construction—Permanent-Type Messing Facilities for Enlisted Personnel

4270.13, June 30, 1955, revised Oct. 23, 1958: Standards and Criteria for Construction—Parking for Nonorganizational Vehicles

4270.14, July 5, 1955: Standards and Criteria for Construction—Fire Protection for Installed and Stored Critical Material

4270.15, Aug. 10, 1955: Standards and Criteria for Construction—Permanent-Type Installations Maintenance Facilities

4270.16, Sept. 12, 1955: Standards and Criteria for Construction—Permanent-Type Military Hospitals

4270.18, Nov. 29, 1955: Standards and Criteria for Construction—Permanent-Type Religious, Morale, Welfare & Recreational Facilities, and Personnel Support and Service Facilities

4270.21, June 28, 1957, revised July 17, 1958: Standards and Criteria for Construction—Family Housing

6015.2, May 22, 1957: Definitive Plans for Military Hospitals

1330.3, Mar. 2, 1954: Department of Defense Criteria for Adequate Religious, Morale, Welfare and Recreational Facilities

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Washington Topics by Ernest Mickel

Coming Up in the 86th Congress: Education, Airports, Housing

A new Congress, convening this month, faced a heavy and controversial schedule of legislative considerations involving construction programs.

The annual arguments over Federal aid for building had their earlier indications following the close of the 85th Congress last year. Proponents of increasing largess on the part of Uncle Sam lost no time in warning of the new battles. The election overtones made talk of more liberal programs in building commonplace. Against this trend on Capitol Hill was an announced determination on the part of President Eisenhower to make every effort to curtail budget spending, and some of the heavy work programs could be expected to feel the axe as far as budget bureau proposals were concerned. It could well be a year of increasing vetoes and more acrimonious relations between Congress and the White House.

Private groups were considering this to be a more propitious time, perhaps, to go after some of the programs they hadn't quite been able to secure from Congress in the past. The National Education Association, for example, said it believed 1959 would be a good time for getting Congressional approval of a sizeable Federal-aid-to-education measure. It was talking in terms of one of the most liberal bills proposed last year.

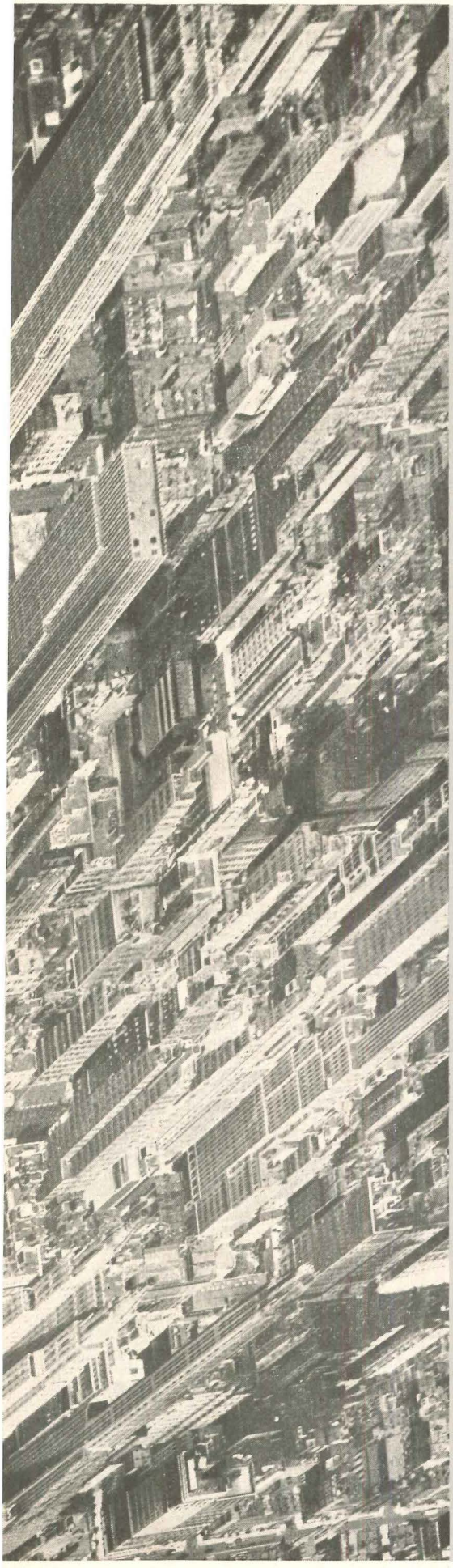
The American Association of Land Grant Colleges and State Universities came out with a proposal that Congress establish a Federal program of loans to institutions of higher learning for classrooms and other academic facilities. This represented a broadening of its program for Federal aid to higher education as it prepared for an estimated doubling of enrollment in the next 10 to 15 years. The group said it would also like to see the existing college housing program continued and expanded. Its statement urged continuance of the present interest rate formula of 2.78 per cent and recommended the same rate for its proposed academic facilities loan program.

Proponents of continued aid to Federal airport construction and improvement used the earliest possible moment of this session to begin anew their drive for legislation to reinstate the vetoed airport construction effort. Proponents of the aid were incensed when Presidential action terminated the program and predicted freely that new legislation to reestablish construction grants would pass quickly in view of the need for early improvement of airports to accommodate jet transports.

As the Federal aid-to-airports program played out its final function, aid was extended to more than 300 airfields for construction of new or the improvement of existing facilities.

A similar situation, legislatively, existed with housing proposals. Here, final enactment of an omnibus housing bill failed in the closing days of the last Congress and there was a feeling of urgency among nearly all housing factions over the need for speedy passage of a new Act to bolster urban renewal, FHA-insured and other shelter efforts. Items for consideration as the Banking committees tackle their housing bills include long-range urban renewal and slum clearance planning, a central mortgage bank to underpin the private mortgage market, government-insurance of the top portion of conventional loans, more liberal terms for FHA-insured sales housing, a program for trade-in housing, homes

continued on page 246



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Construction Cost Indexes

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

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

NEW YORK

PERIOD	RESIDENTIAL Brick	RESIDENTIAL Frame	APTS., HOTELS, OFFICE BLDGS. Brick and Concrete	COMMERCIAL AND FACTORY BLDGS. Brick and Concrete	COMMERCIAL AND FACTORY BLDGS. Brick and Steel
1930	127.0	126.7	124.1	128.0	123.6
1935	93.8	91.3	104.7	108.5	105.5
1939	123.5	122.4	130.7	133.4	130.1
1946	181.8	182.4	177.2	179.0	174.8
1947	219.3	222.0	207.6	207.5	203.8
1948	250.1	251.6	239.4	242.2	235.6
1949	243.7	240.8	242.8	246.6	240.0
1950	256.2	254.5	249.5	251.5	248.0
1951	273.2	271.3	263.7	274.9	271.8
1952	278.2	274.8	271.9	265.2	262.2
1953	281.3	277.2	281.0	286.0	282.0
1954	285.0	278.2	293.0	300.6	295.4
1955	293.1	286.0	300.0	308.3	302.4
1956	310.8	302.2	320.1	328.6	324.5
1957	318.5	308.3	333.1	345.2	339.8
August 1958	335.1	320.7	357.7	377.4	366.7
September 1958	335.1	320.7	357.7	377.4	366.7
October 1958	335.9	321.5	358.7	378.2	367.5
	% increase over 1939				
October 1958	172.0	162.7	174.4	183.5	182.5

ATLANTA

PERIOD	RESIDENTIAL Brick	RESIDENTIAL Frame	APTS., HOTELS, OFFICE BLDGS. Brick and Concrete	COMMERCIAL AND FACTORY BLDGS. Brick and Concrete	COMMERCIAL AND FACTORY BLDGS. Brick and Steel
1930	82.1	80.9	84.5	86.1	83.6
1935	72.3	67.9	84.0	87.1	85.1
1939	86.3	83.1	95.1	97.4	94.7
1946	148.1	149.2	136.8	136.4	135.1
1947	180.4	184.0	158.1	157.1	158.0
1948	199.2	202.5	178.8	178.8	178.8
1949	189.3	189.9	180.6	180.8	177.5
1950	194.3	196.2	185.4	183.7	185.0
1951	212.8	214.6	204.2	202.8	205.0
1952	218.8	221.0	212.8	210.1	214.3
1953	223.0	224.6	221.3	221.8	223.0
1954	219.6	219.1	233.5	225.2	225.4
1955	225.3	225.1	229.0	231.5	231.8
1956	237.2	235.7	241.7	244.4	246.4
1957	241.2	239.0	248.7	252.1	254.7
August 1958	245.3	240.8	257.8	264.7	263.9
September 1958	245.3	240.8	257.8	264.7	263.9
October 1958	246.5	242.0	259.3	265.9	265.1
	% increase over 1939				
October 1958	185.6	191.2	172.7	173.0	179.9

ST. LOUIS

PERIOD	RESIDENTIAL Brick	RESIDENTIAL Frame	APTS., HOTELS, OFFICE BLDGS. Brick and Concrete	COMMERCIAL AND FACTORY BLDGS. Brick and Concrete	COMMERCIAL AND FACTORY BLDGS. Brick and Steel
1930	108.9	108.3	112.4	115.3	111.3
1935	95.1	90.1	104.1	108.3	105.4
1939	110.2	107.0	118.7	119.8	119.0
1946	167.1	167.4	159.1	161.1	158.1
1947	202.4	203.8	183.9	184.2	184.0
1948	227.9	231.2	207.7	210.0	208.1
1949	221.4	220.7	212.8	215.7	213.6
1950	232.8	230.7	221.9	225.3	222.8
1951	252.0	248.3	238.5	240.9	239.0
1952	259.1	253.2	249.7	255.0	249.6
1953	263.4	256.4	259.0	267.0	259.2
1954	266.6	260.2	263.7	273.3	266.2
1955	273.3	266.5	272.2	281.3	276.5
1956	288.7	280.3	287.9	299.2	293.3
1957	292.0	283.4	295.2	307.1	302.9
August 1958	298.3	289.2	306.3	320.1	315.2
September 1958	298.3	289.2	306.4	320.2	315.5
October 1958	298.9	289.8	307.2	320.6	316.3
	% increase over 1939				
October 1958	171.2	170.8	158.8	167.6	165.8

SAN FRANCISCO

PERIOD	RESIDENTIAL Brick	RESIDENTIAL Frame	APTS., HOTELS, OFFICE BLDGS. Brick and Concrete	COMMERCIAL AND FACTORY BLDGS. Brick and Concrete	COMMERCIAL AND FACTORY BLDGS. Brick and Steel
1930	90.8	86.8	100.6	104.9	100.4
1935	89.5	84.5	96.4	103.7	99.7
1939	105.6	99.3	117.4	121.9	116.5
1946	159.7	157.5	157.9	159.3	160.0
1947	193.1	191.6	183.7	186.8	186.9
1948	218.9	216.6	208.3	214.7	211.1
1949	213.0	207.1	214.0	219.8	216.1
1950	227.0	223.1	222.4	224.5	222.6
1951	245.2	240.4	239.6	243.1	243.1
1952	250.2	245.0	245.6	248.7	249.6
1953	255.2	257.2	256.6	261.0	259.7
1954	257.4	249.2	264.1	272.5	267.2
1955	268.0	259.0	275.0	284.4	279.6
1956	279.0	270.0	288.9	298.6	295.8
1957	286.3	274.4	302.9	315.2	310.7
August 1958	291.4	276.5	313.3	329.2	322.8
September 1958	291.4	276.5	313.3	329.2	322.8
October 1958	292.0	277.1	314.2	329.7	323.3
	% increase over 1939				
October 1958	176.5	179.0	167.6	170.5	177.5

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

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

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

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

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

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

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

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

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

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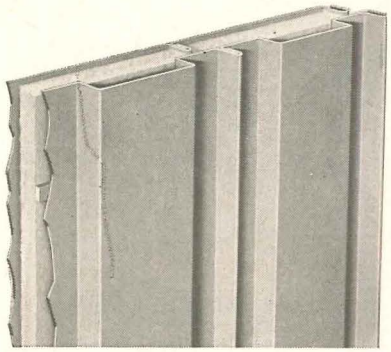
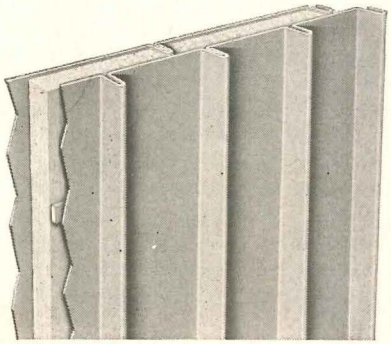
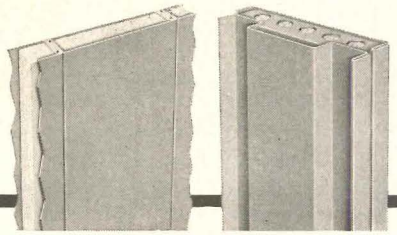


MAHON FLUTED WALL
FIELD CONSTRUCTED



MAHON RIBBED WALL
FIELD CONSTRUCTED



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Required Reading

A Scholarly and Solid History Of Architecture Since 1800

ARCHITECTURE: NINETEENTH AND TWENTIETH CENTURIES. *By Henry-Russell Hitchcock. Penguin Books, Inc., 3300 Clipper Mill Rd., Baltimore 11. 498 pp. plus 192 plates. $12.50.*

BY VINCENT SCULLY
Department of the History of Art, Yale University

No one is better qualified than Professor Hitchcock to write a comprehensive history of the architecture of the past 150 years. His numerous books and articles on various aspects of the modern period have peculiarly fitted him to undertake the presentation of it as a whole, and it is precisely the whole story of architecture from 1800 to 1957 that his newest volume attempts to tell.

It is therefore radically different in intention from such a work as Giedion's *Space, Time and Architecture,* which set itself the task of winnowing out the building of the 19th century in order to concentrate on those particular aspects of it which seemed to lead forward toward what the author considered to be the most progressive developments of the present day. Giedion's method simplified the scholar's problem considerably, since he could ruthlessly eliminate all artists and works which did not fit his rubric. Hitchcock's task is infinitely more difficult, since he could not in all conscience leave out anything which was important in its time, even though it might not seem so significant to ours.

Consequently, Hitchcock's book is dense and packed with names, dates, and buildings, the latter usually inadequately illustrated. One paragraph may contain reference to four or five architects and nine or ten of their works, none of them illustrated or referred to again. Because of this the book is not easy to read, but because it attempts to deal with the whole of the problem it is also history, not polemic; and it is difficult, as history has to be.

The difficulties of organization, for example, are enormous. Hitchcock attempts to solve them by dividing his text into three chronological sections: 1800-1850, 1850-1900, 1900-1957. Within these loose and not entirely satisfactory time divisions the chapters differ markedly in kind and content. All of this makes for a pace which tends to be jumpy and erratic—like that, one should add, of the period with which the book deals —and the reader often has a fairly difficult time in attempting to follow anything through.

Despite the necessarily superficial criticisms made above, this reviewer finds the book both strong and solid. It is almost a handbook, but its level of scholarship is the highest, and in some areas it publishes material not available before. Its treatment of the development of the house in England and America during the later 19th century is masterly, representing a major contribution toward synthesizing our knowledge of that period. Indeed, nowhere other than in this volume can so comprehensive and knowledgeable a treatment of the 19th century as a whole be found. In a sense, this holds true also for the 20th century, since only here has the available body of work been presented by anyone approaching Hitchcock's encyclopedic knowledge of the subject.

All those who are interested in architecture must own this volume, and all who wish to do serious work in the modern field will be required to use it as a work of reference. Professor Hitchcock has served the Pelican History of Art series well by producing a useful treatment of one of the most complicated art historical topics imaginable. He has also served the architectural profession wisely once more by continuing to hold up to its face an historical glass, not a polemical mirror.

Wright's Early Years Portrayed

FRANK LLOYD WRIGHT TO 1910: THE FIRST GOLDEN AGE. *By Grant Carpenter Manson. Reinhold Publishing Corp., 430 Park Ave., New York 22. 228 pp., illus. $10.*

BY HUGH MORRISON
Department of Art and Archaeology, Dartmouth College

This is the first volume of Grant Manson's long-awaited saga on the life and work of Frank Lloyd Wright. It takes the story to 1910, a turning point in Wright's professional career and private life. Two later volumes will cover "The Lean, Lost Years: 1910-1935," and "The Second Golden Age: 1936 to the present."

If the superb quality of this first volume is any indicator, it seems very probable that the trilogy may come to be regarded as the definitive work on America's Old Master. It would seem that Grant Manson was ordained for this job. Born in Chicago, within sight of the Prairie Style houses, he fell in love with the Husser house at the age of six and has remained an F.L.W. enthusiast ever since. Twenty years of research have gone into the study, beginning with a Harvard doctoral thesis in 1938. He has had the immense advantages of a long-time friendship with Wright and complete access to the archives at Taliesin. In fact, Wright once introduced him as "Grant Manson, who knows more about me than I do."

continued on page 64

Research Facilities Examined

BUILDINGS FOR RESEARCH. *By the Editors of Architectural Record. F. W. Dodge Corp., 119 W. 40th St., New York 18. 224 pp., illus. $9.50.*

This book is organized to attack the problem of good design in two ways. In a section by leaders in the field of research-building design, the many elements common to all laboratories are fully discussed. Considered are such basic factors as safety measures, waste removal, corrosion prevention, vents and drains, modular units. Special attention is given the unique problems of the nuclear laboratory.

In its second section, *Buildings for Research* offers comprehensive studies of 44 research projects organized as nuclear laboratories, industrial laboratories, university laboratories, and military research centers. The special requirements of each project are thoroughly treated, and the design solutions to the specific problems of each are fully explained. There are more than 500 photographs, drawings, and plans.

Corbu's Modulor Revisited

MODULOR 2. *By Le Corbusier. Translated by Peter de Francia and Anna Bostock. Harvard University Press, Cambridge 38, Mass. 336 pp., illus. $8.*

The last words of Le Corbusier's *The Modulor,* published 10 years ago, were: "Let the user speak next." Now a sequel has appeared, collect-

continued on page 298

Typical Cadet Room, U. S. Air Force Academy, Colorado Springs. *Skidmore, Owings and Merrill, Architects*

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Required Reading

Wright . . . *cont. from page 60*

An architect and a trained scholar and critic, Manson has the important gift of knowing how to write and be read. His narrative is engrossing and at times movingly eloquent. It is superbly illustrated with 280 photographs, drawings, and plans, and these are located directly on the text pages and form a vivid and integral part of the unfolding story.

The book gives, more than does Wright's autobiography, a sense of the parental heritage and the youthful influences which helped shape the man. With the motto of the Lloyd-Jones clan, "Truth Against the World," and a turbulent creative spirit to drive him on, one can understand Wright's recent statement, "I saw early that it was better to take a position of honest arrogance than of hypocritical humility."

Although there were some echoes of Sullivan in Wright's work up to 1900, the younger man took giant strides in his own boots—"at the age of 24 he became the father of a new architecture not yet discovered." From this point we are taken in an orderly account through all of Wright's work to 1909—clearly presented, critically analyzed, carefully documented—in all of which we feel the productivity of the man and the fertility of his mind. Manson details the major successes of this period—the Prairie houses, Wright's excursions into industrial architecture, and his brief fling into church architecture with Unity Church. There are sketches and plans, not only of all Wright's executed buildings, but of "those that went astray —the office tragedies."

With the painstaking research of an historian, the critical eye of an architect, and the psychological perceptions and skill of a novelist, and —it must be admitted—a fascinating subject to start with, Manson has given us a book that sets a new high in the roster of writings, already numbering several hundred in half a dozen languages, on a very great architect. May the succeeding volumes be as fine!

Also of Interest

THE BUILDING OF TVA: AN ILLUSTRATED HISTORY. *By John H. Kyle. Louisiana State University Press, Baton Rouge 3. 162 pp. $7.50.*

A CENTURY OF ART AND ARCHITECTURE IN MINNESOTA. *By Donald R. Torbert. University of Minnesota Press, Minneapolis 14. 62 pp., illus. (pamphlet). $1.*

more books on page 298

ARCHITECTURAL RECORD JANUARY 1959

ALVAR AALTO

Opposite page: the library, exhibition hall and house, as well as the combined factory and workers housing project, only suggest the span and the range of Aalto's work which also includes sanatoriums, dormitories, technical schools and many kinds of public buildings

Finland and Architect Aalto

by John E. Burchard

Sibelius said if you publish three words to explain music, at least two words are wrong. This may be true also in my architectural philosophy. In ordinary discussion in recent decades, the traditionally imitative has been pointed out as the main enemy of contemporary art. I think, however, the enemy number one today is modern non-traditional formalism where inhuman elements are dominating. True architecture—the real thing—is only to be found where man stands in the center. ALVAR AALTO

Five majestic living men stand like colossi athwart the last thirty years of Western architecture. Among them, they are responsible for all the important fundamental ideas. The Swiss, either of the Germans, the American, the Finn, each has his own recognizable achievement, his own recognizable personality. You cannot confuse either the works or the men if you know them at all. Alvar Aalto is sprite and Platonist, the reconciler of the irrational with the functional. His spirit is that of Erasmus rather than Michelangelo. He never lets himself be overabsorbed in theory; he never seeks caprice for its own sake but this does not make him fear caprice. He never forgets that his stairs and his terraces and his rooms and his walls are made for men of ordinary size. In this awareness of the human scale he has no peer.

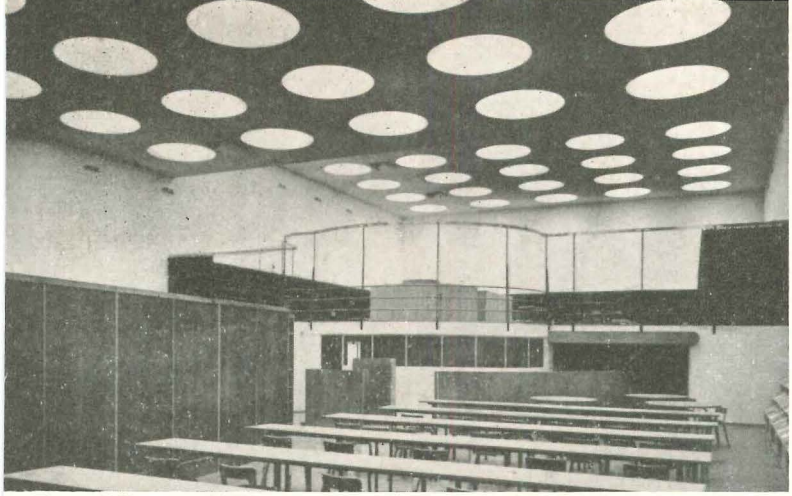
His friends search for him everywhere, and successfully only by telephone. When they find him it is as likely to be in Baghdad, Tashkent, Madrid, Rio, Paris, Rome or New York as in Helsinki. But wherever he is, Finland is with him, as Giedion perceived long ago. Finland is present in his sensitivity to the form, substance, and surface of wood and brick. It follows him in his forms which so steadily recall the shore lines of the lakes. They appear consistently on a ground plan for Kautuaa, the ceiling of Viipuri, the terrace at Paimio, the wall at M.I.T., or in the shapes of his chairs and his vases. But though Finland follows Aalto abroad, he is at his best when he is home.

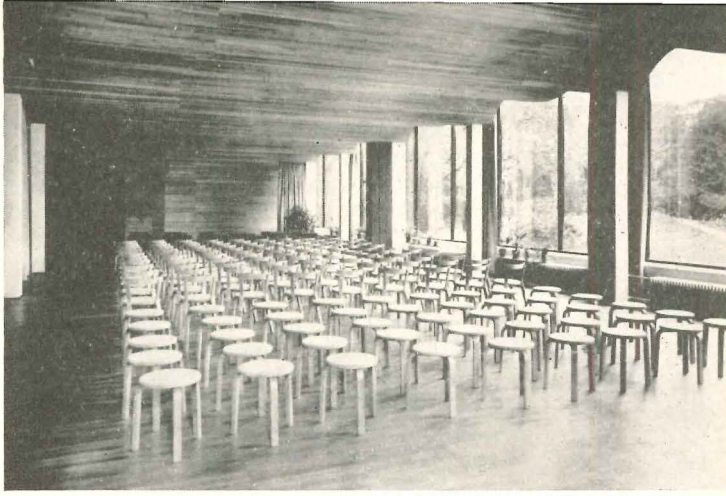
It is a good country to be in. Its scenery and its weather are more amiable than the stranger imagines. Its people are strong and serious, but they are gay too, and strongly poetic, even mystical. Finns are sensible enough to admire their composers above their generals, their architects above their bankers. They reward their artists well in money but particularly they reward them with honor. For the Finns, Aalto stands close behind the shoulder of Sibelius. Any taxi driver in Helsinki can take you to the home of Architect Aalto without further address; Architect Aalto may find ways to demolish an offending neon sign which would bring jail to an architect here; Architect Aalto can be called on by a prime minister to settle a major political dispute concerning the city plan of the capital. He will settle the dispute and the price the loser will demand for the settlement is that Aalto shall design his building. All this honors Alvar Aalto. It also honors Finland.

Aalto's stories are expansive and apochryphal but never without point, whether they involve the lady from Buenos Aires and her fur boa or the bear that ought to be able to get in the window of a primary school.

Like Aalto, the stories are more than capricious. The caprice is there and the gayety, but there is a plangent and sober note like the strain that runs through the life and history of his little country whence no one has ever been able to lure him for long. He has never frozen his work into a self-satisfied and classical mold, but he has never insisted on perpetual innovation, and new versions of themes or experiments can be seen through all his work. Certain problems always have concerned Alvar Aalto, the problems of ceilings and light, the problems of sinuosity, the problems of platforms, the problems of texture, the problems of open stairs, and more subtly but quite as firmly the problems of the genuinely human scale.

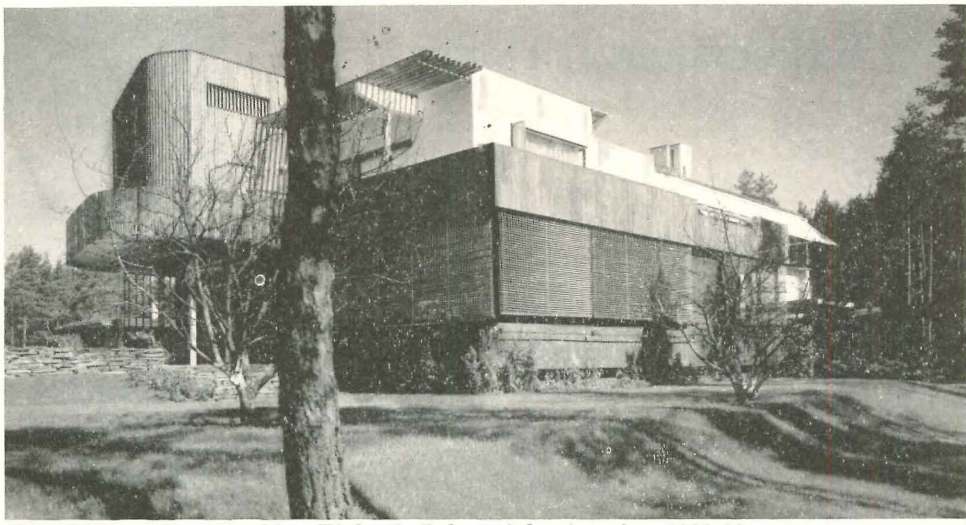
Because he has been truly above dogma and above monotony, his work is as uneven as his temperament or the Finnish climate. It is not always fine, maybe it is never impeccable. It is so human that it is never majestic, perhaps not even monumental. But at its worst it is lovable and at its best it is miraculous.





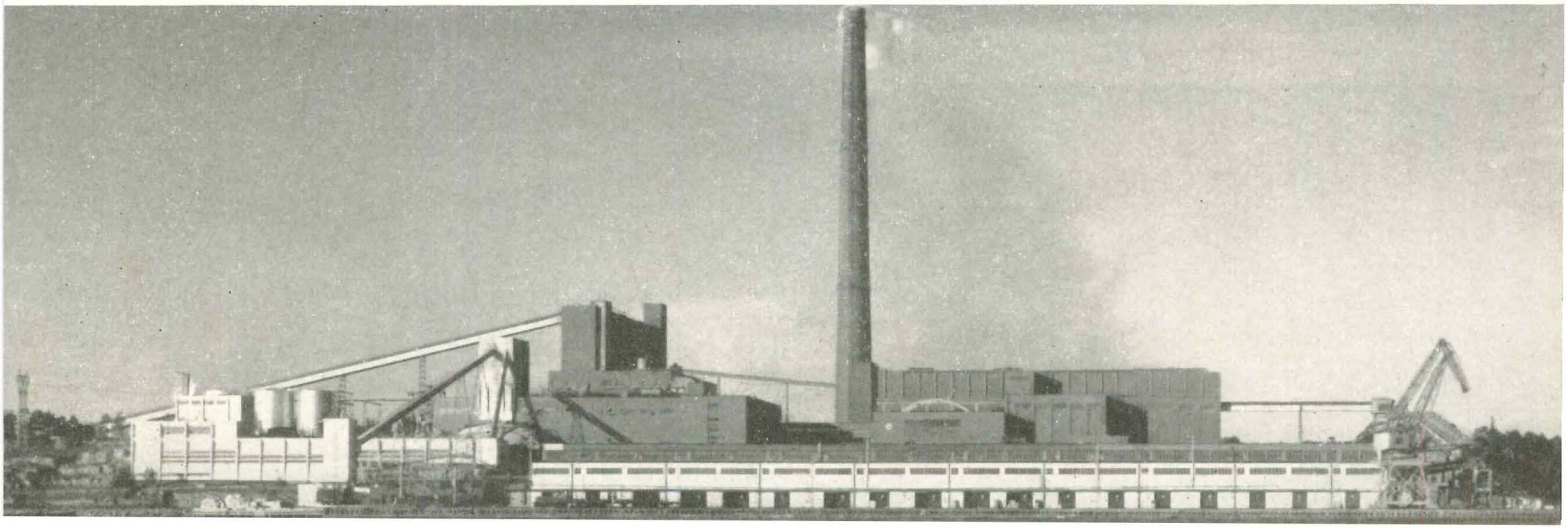
Town Library of Viipuri. 1927-35 (destroyed in war) Note early experiment in light control (left) and of undulant theme (right)

Finnish Pavilion, New York World's Fair. 1939



Villa Mairea, Noormarkku, Finland. *Below right:* interior. 1938-39

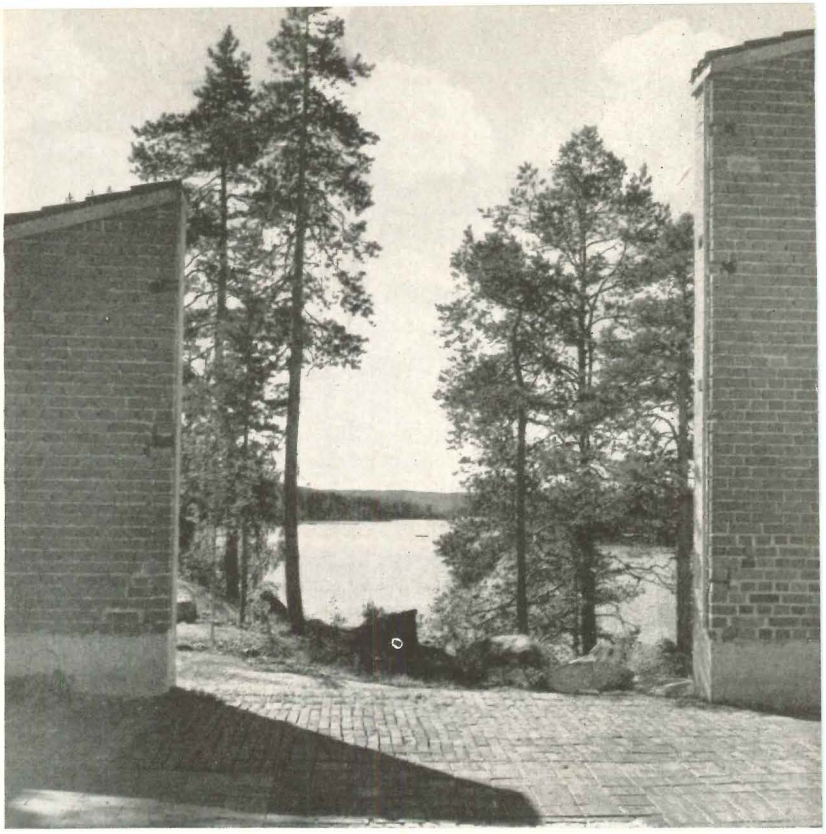
Above left and below: sulphate pulp mill of Sunila and workers housing. 1936-39, 1951-54



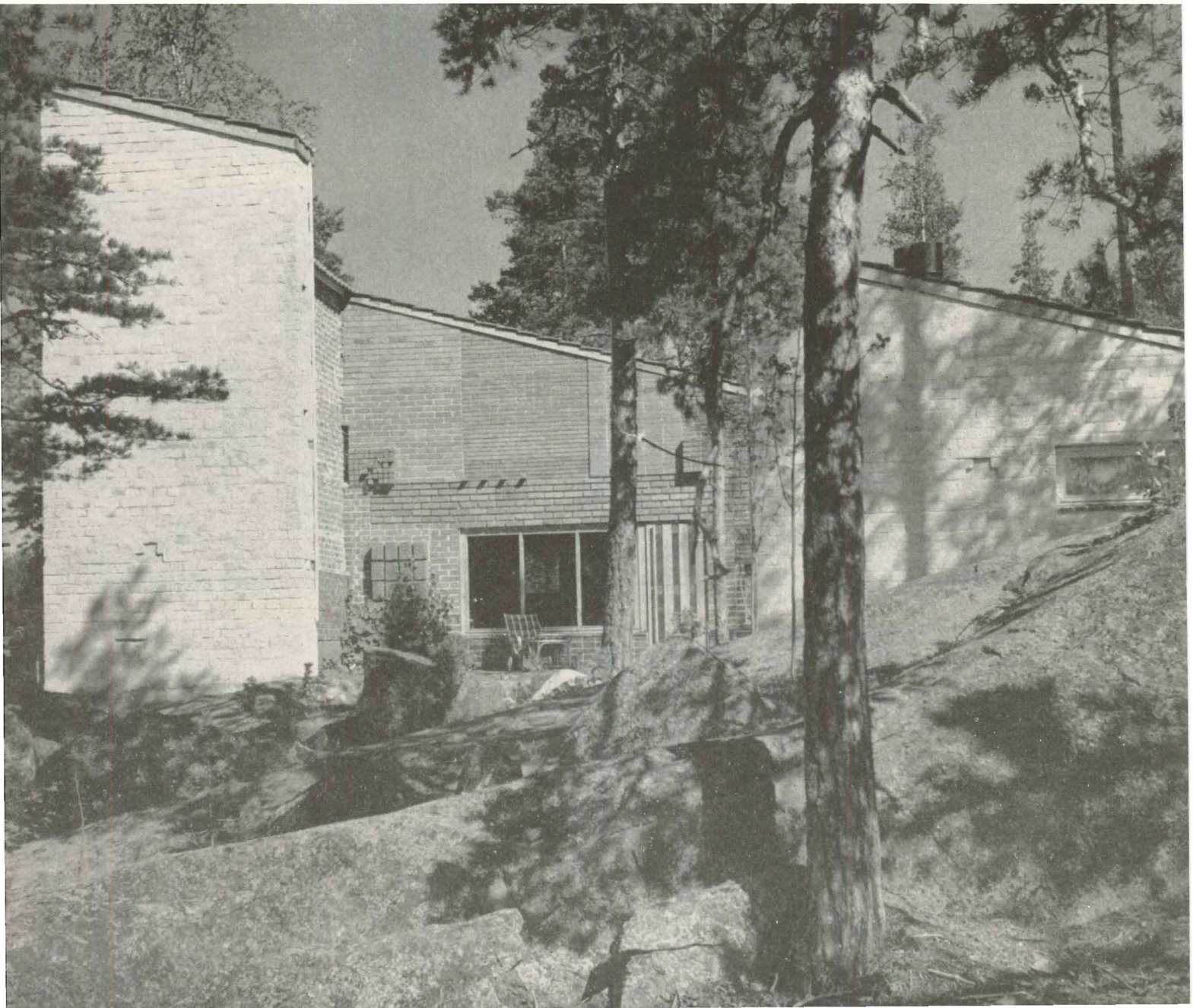
Aalto

Aalto was born sixty years ago in Jyväskylä, a town in central Finland. His summer house, built in 1953, is at Muuratsalo in the same region. At the head of a lake and inaccessible by road, it can be reached only by boat or by a rough hike overland. A forecourt with a central outdoor hearth opens to a view of the lake. The wall of the main building and part of the other walls of the forecourt carry out many brick patterns, some experimental, but many reminiscent of various successful brick arrangements Aalto has used. The history of his work is expressed in these brick textures

Experimental House

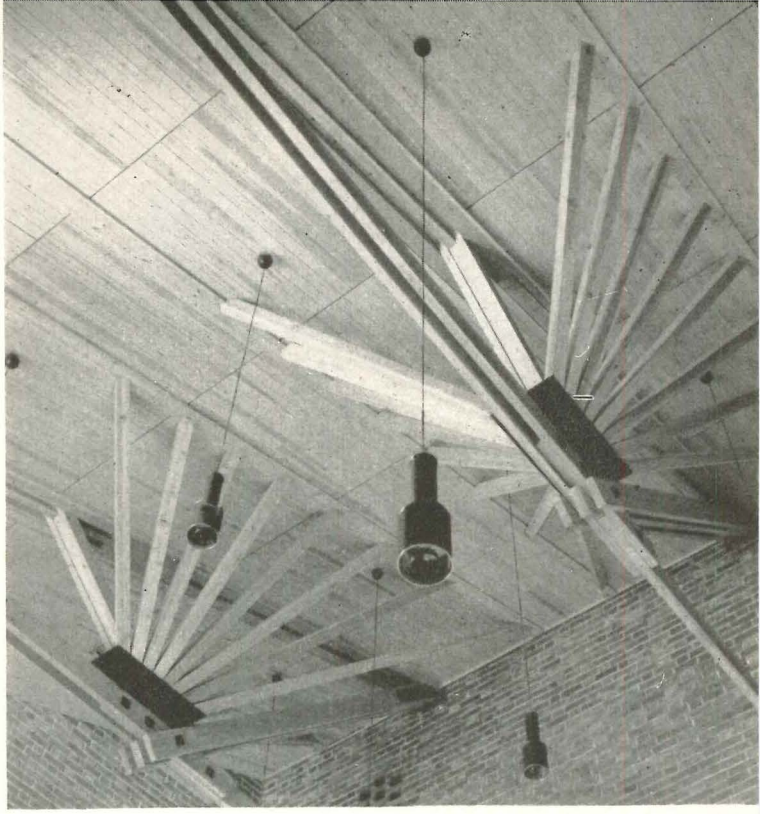


Valokuva Oy

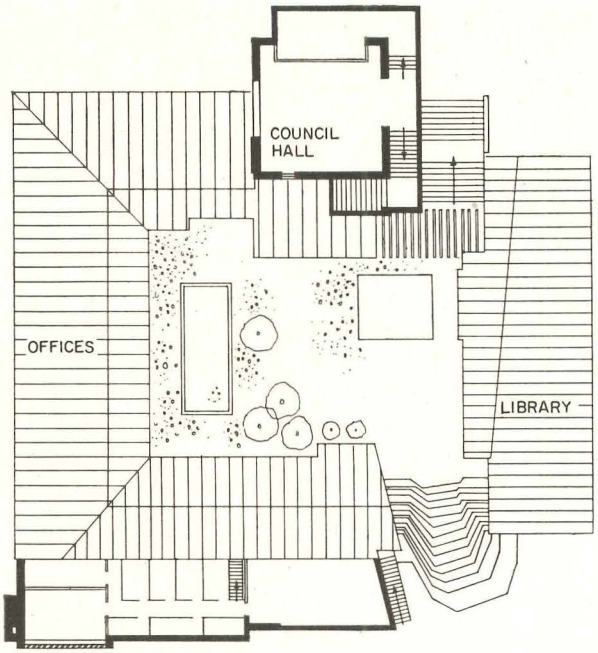


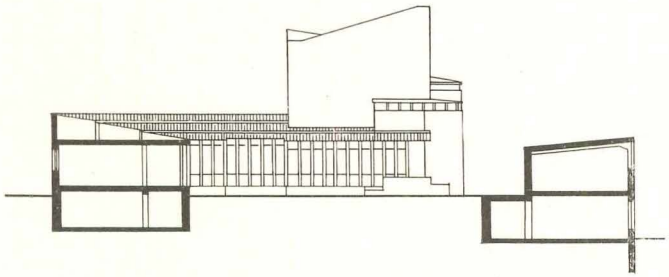
The island of Säynätsalo, near Aalto's birthplace, has about 3,000 inhabitants most of whom work in a plywood factory, and come to the plant in their boats from lakeside houses. The village hall, built entirely of brick and natural wood, combines a bank, stores, a post office, public library, administration offices and a council hall into a single small, compact, tightly knit complex. Like many of Aalto's commissions, it was won through competition (in 1949, erected in 1950-51)

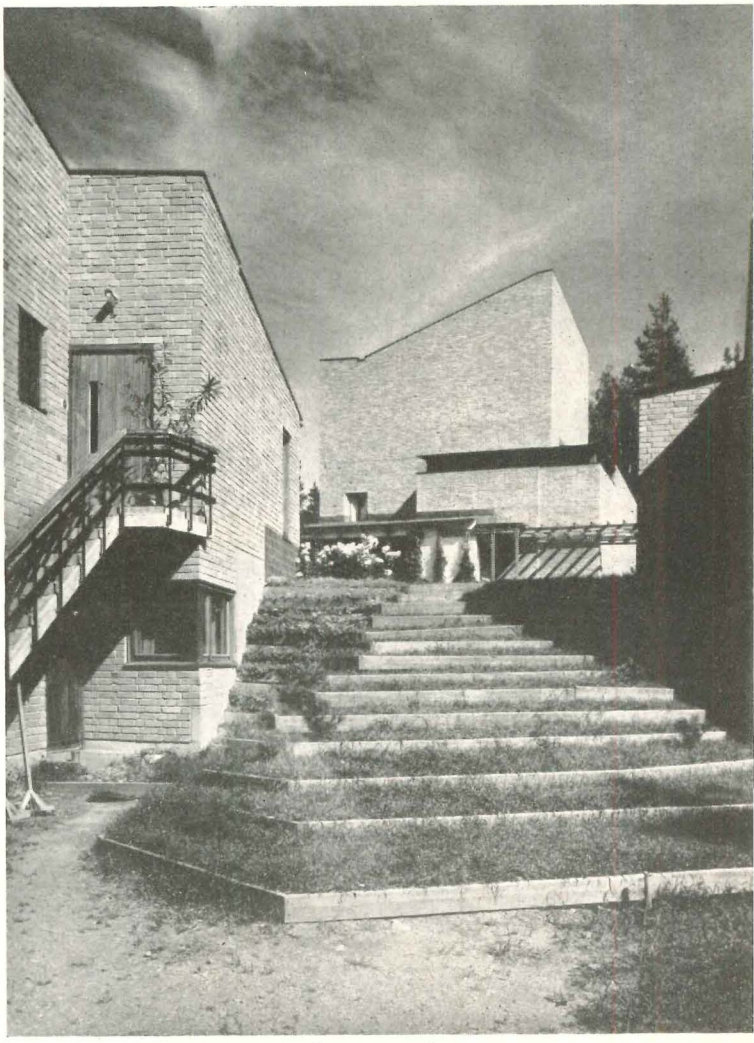
Village Hall of Säynätsalo



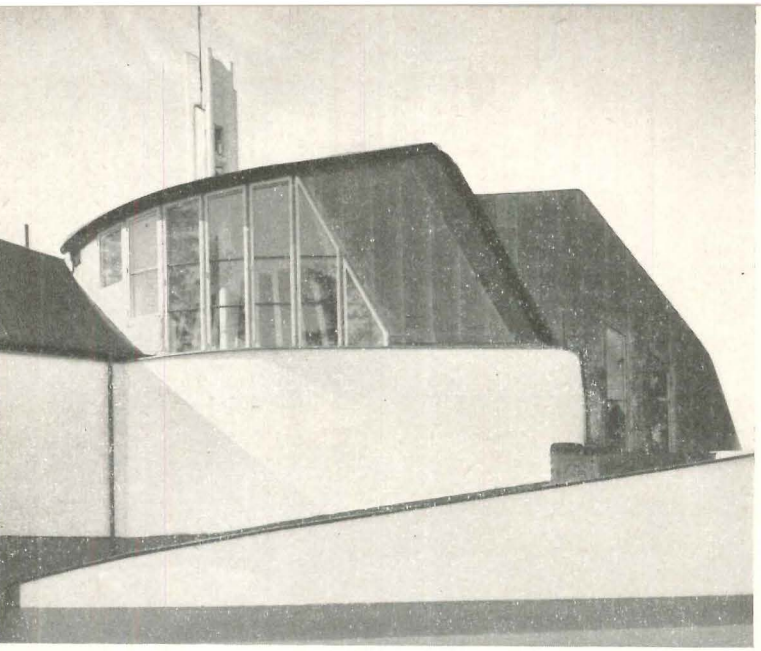
Ceiling trusses of the council hall carry loads from three parallel wooden beams, and suggest the skeleton of a vault





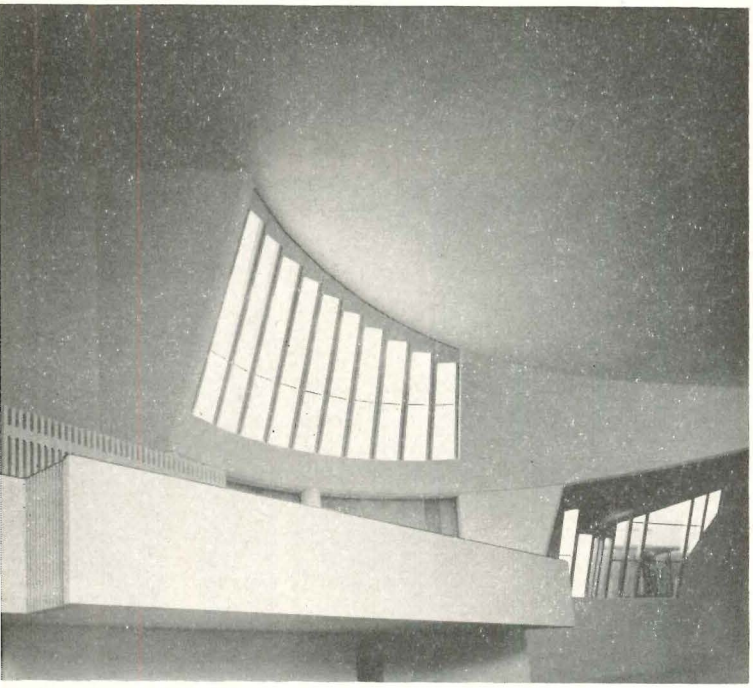


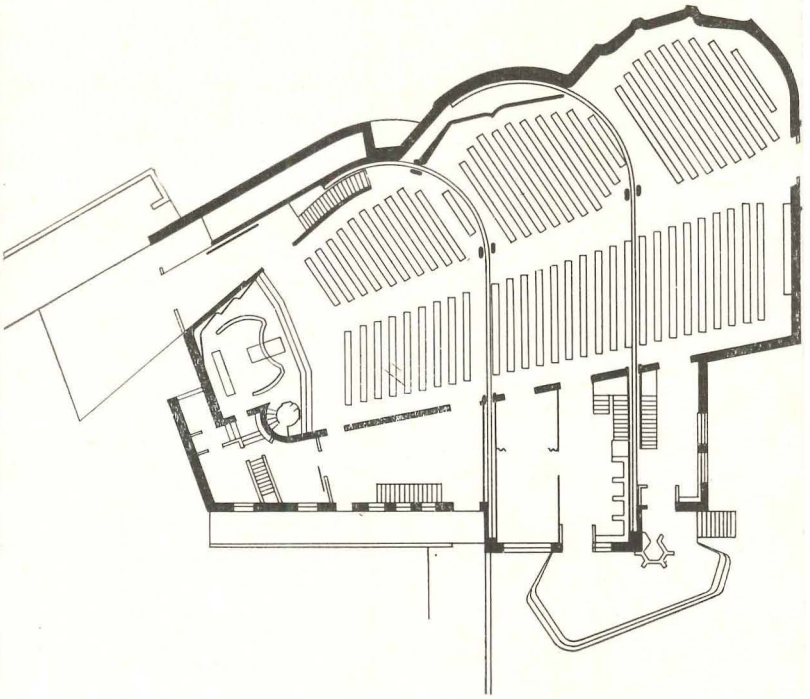
Plan and section show raised courtyard. Shops are below library. Pergola which connects library with low element in front of council hall not shown in section. Meeting hall of the village council is on second floor. Administrative offices beneath it carry around and join those on opposite side of the terrace

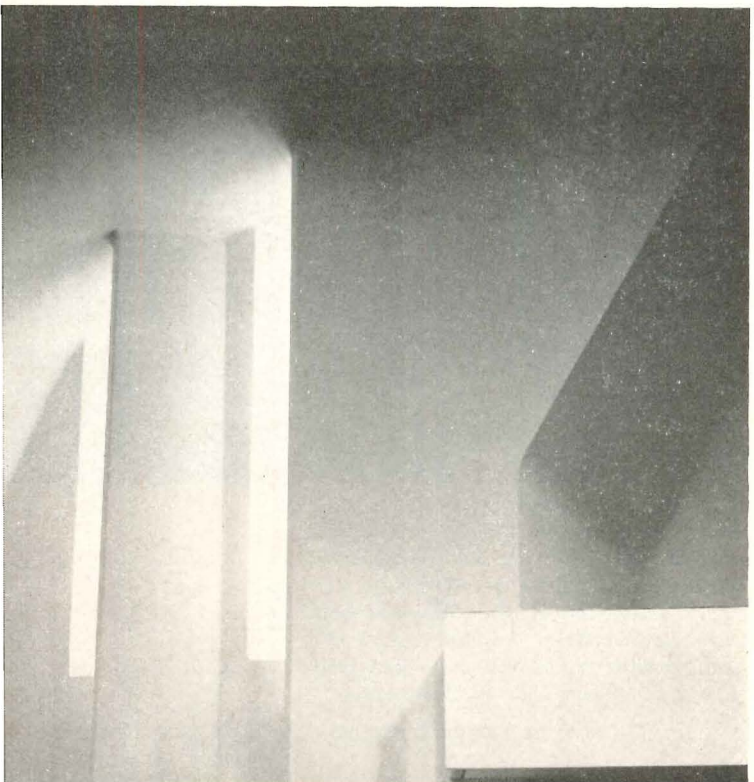


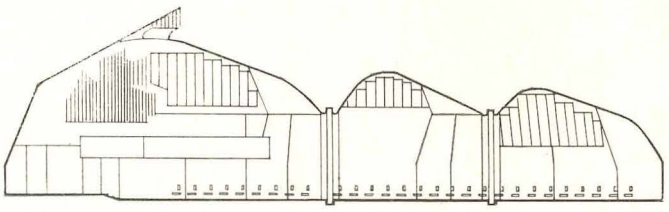
One of the major buildings which are part of Aalto's great decentralized plan for the 60-square-mile region of Imatra near the eastern border of Finland, this not yet completed church is in the new neighborhood unit of Vuoksenniska. The forms which are characteristically Aalto are accentuated here. Curving walls and ceilings are more complex than ever, and the control of light more elaborate. Some light is diffused by interior glazing set several feet in front of exterior windows. (See photo at top left)

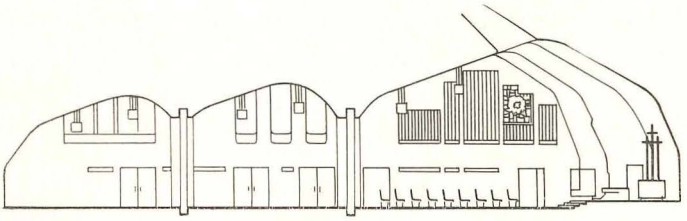
Church in Imatra



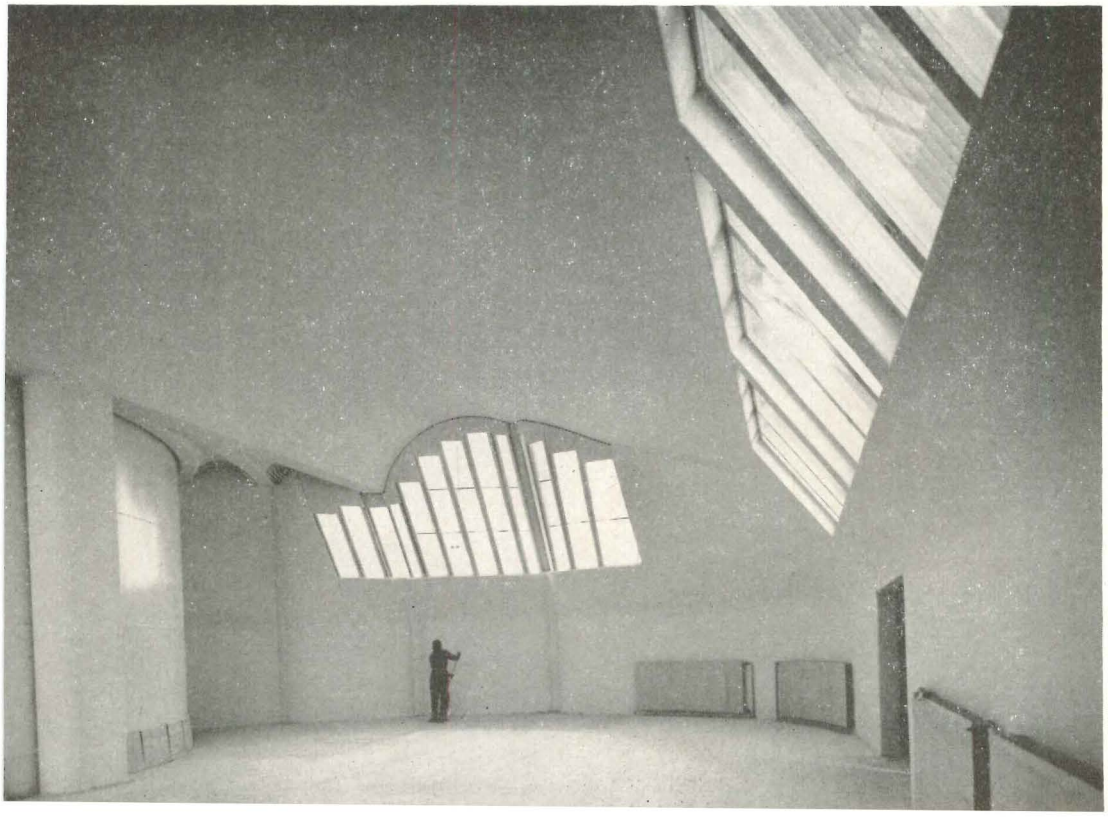


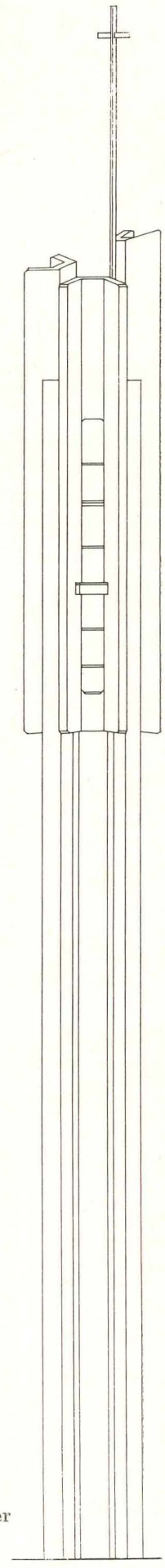




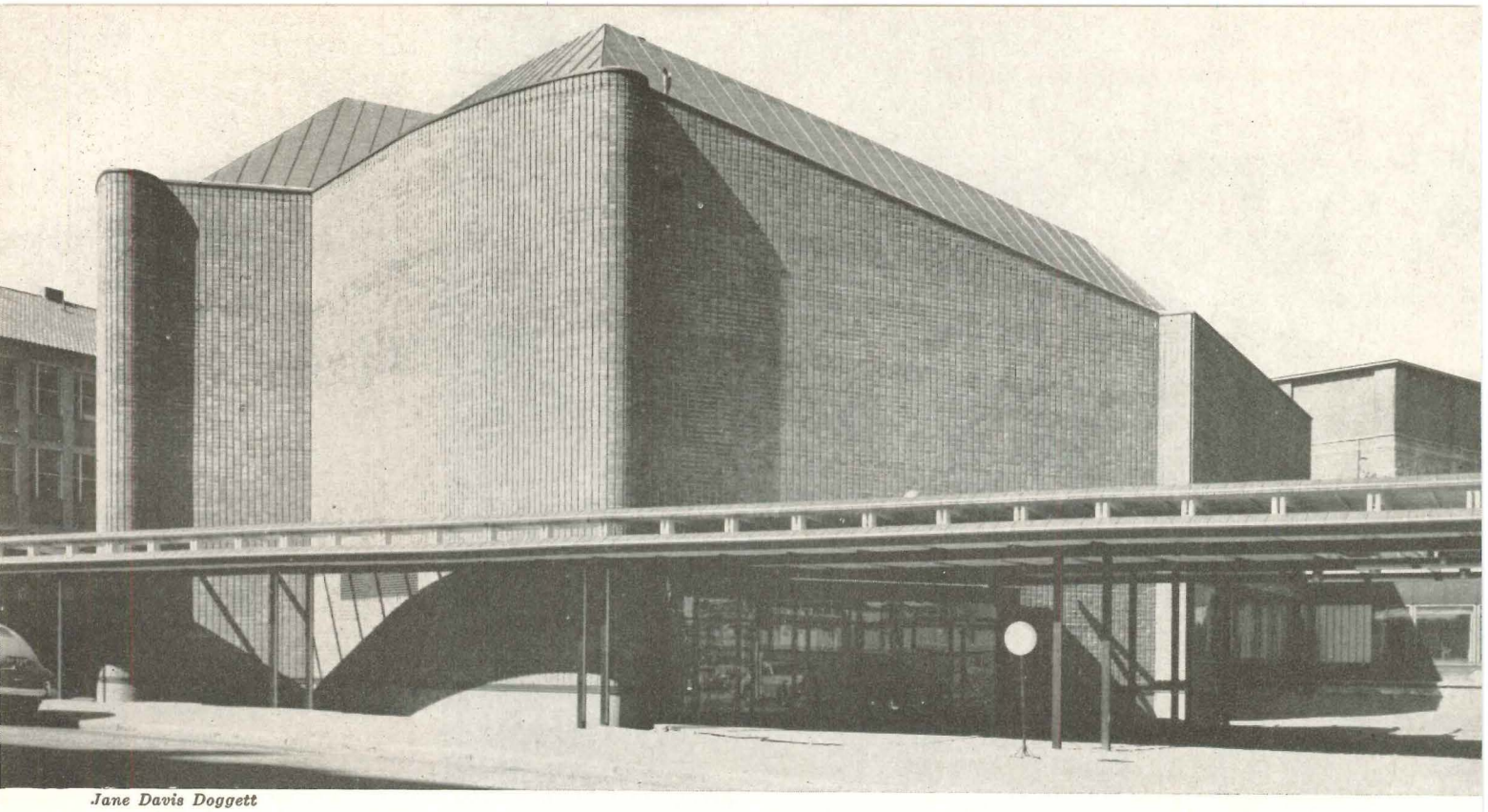


Jane Davis Doggett



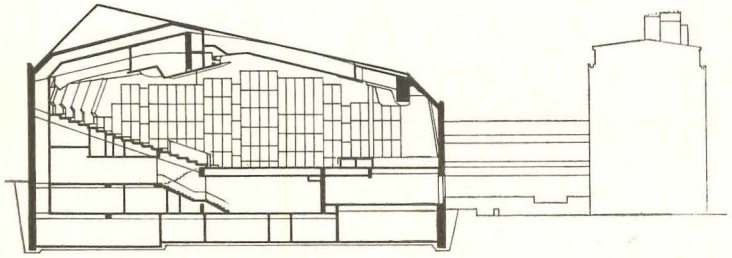


Tower

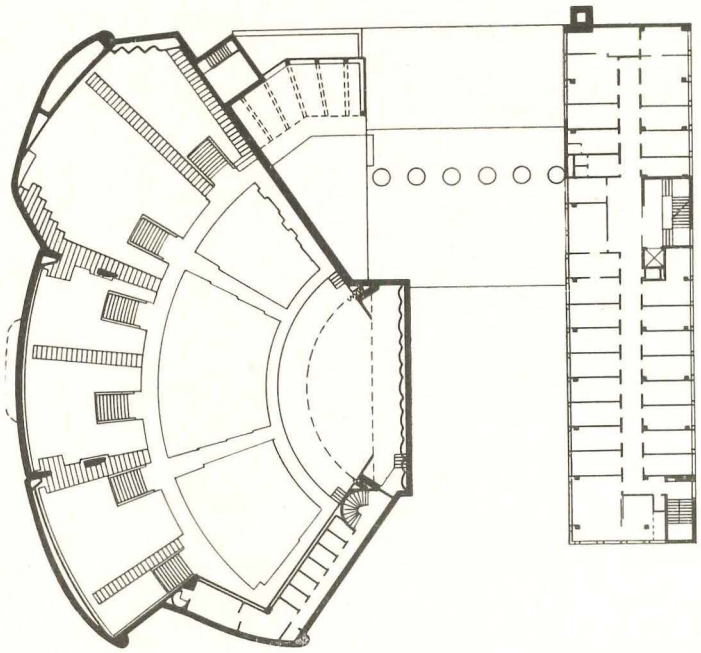


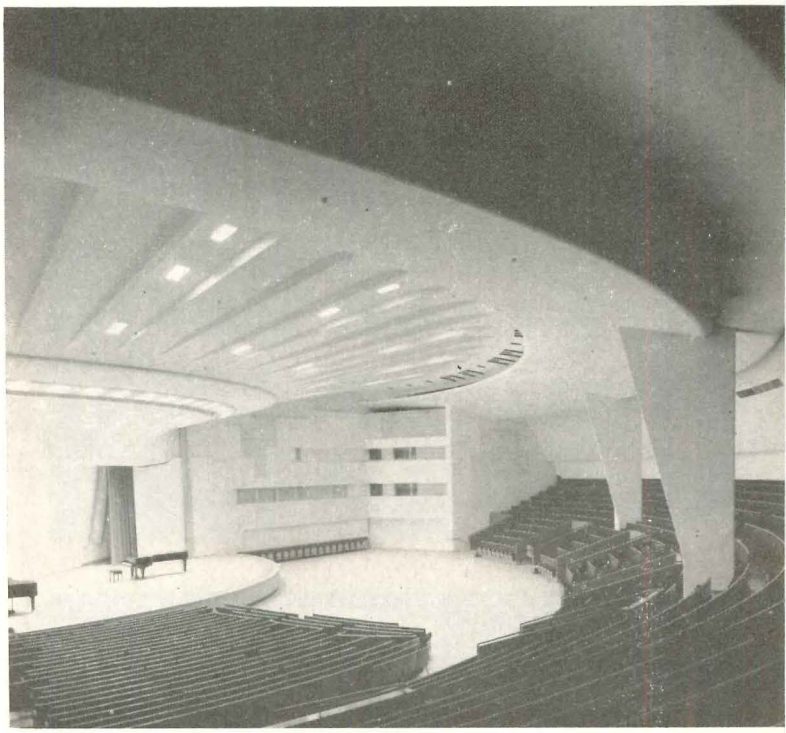
Jane Davis Doggett

House of Culture

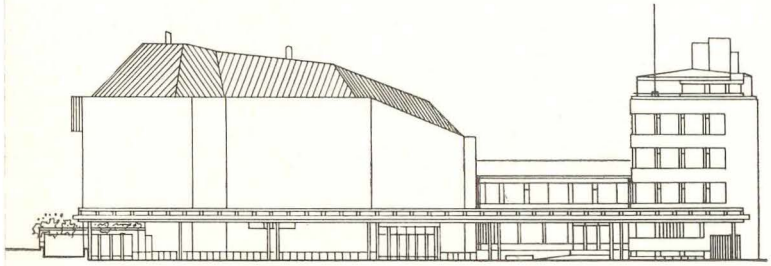


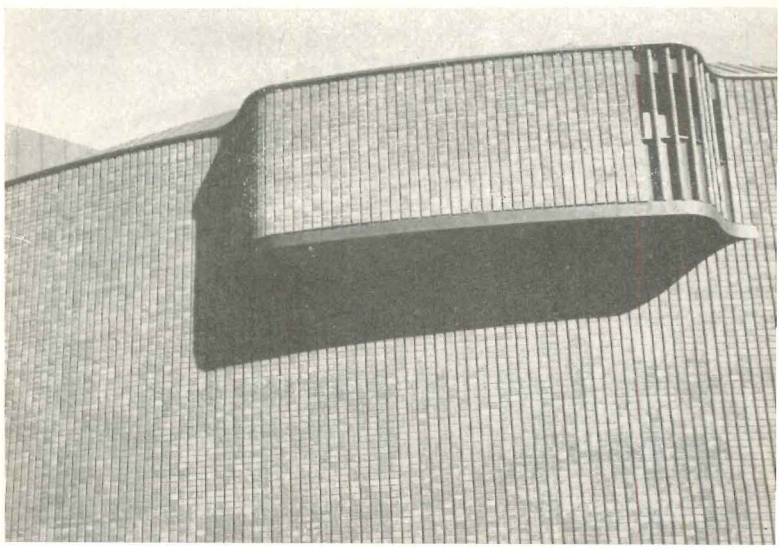
Helsinki's new concert and congress hall is part of a larger complex which includes rooms for cultural activity, physical training, and organizational work. Sponsored by the People's Democratic League, it was begun in 1955 and ready for use in 1958

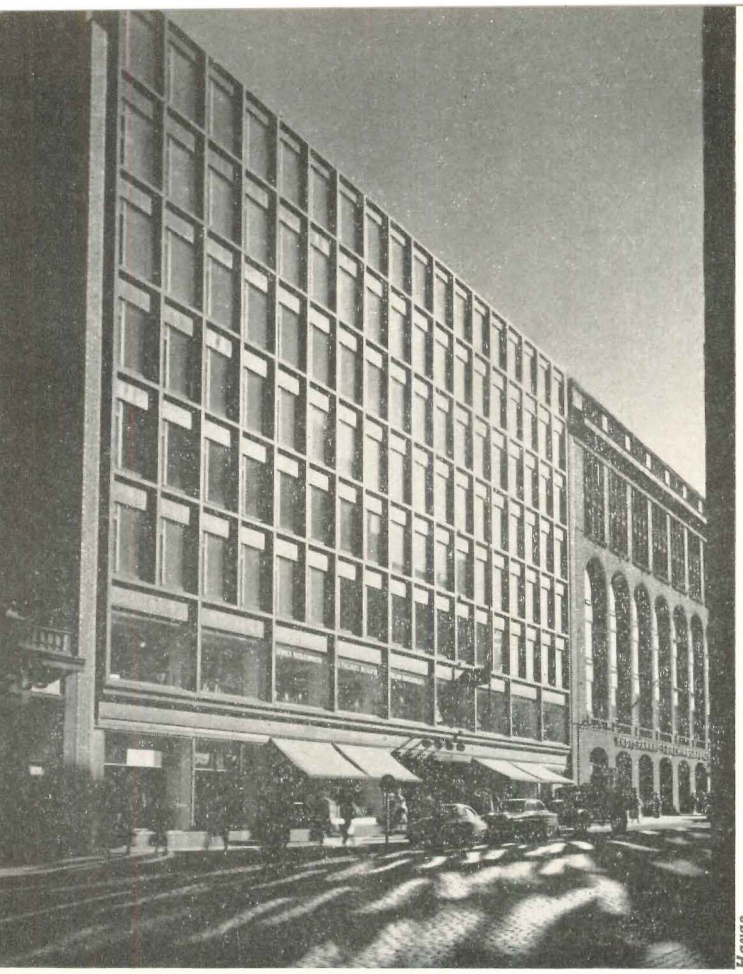




Outer walls of concert hall are massively built to eliminate street noises. A thick soundproof concrete wall is used inside the brick surface. The free shape of the hall required the design of wedge-shaped hollow bricks to follow the changing radii of the exterior wall. For interior surfaces, wood was used for its acoustic qualities



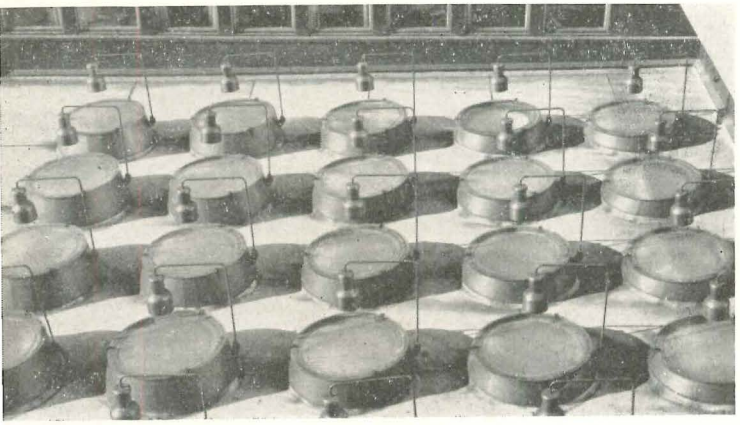


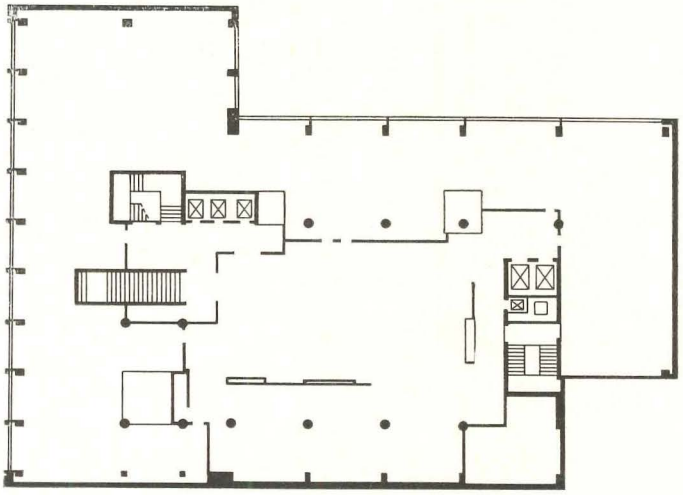


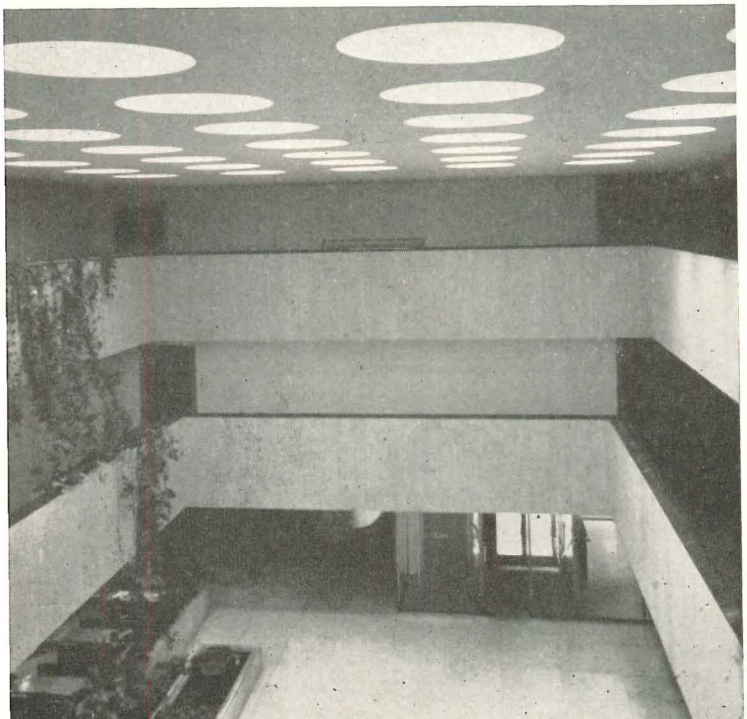
Havas

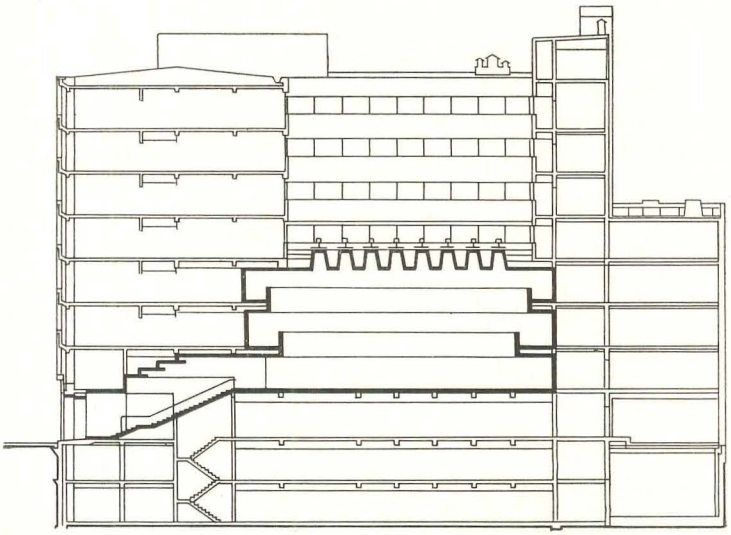
This office structure, placed between two existing buildings on a busy street in the commercial district of Helsinki, was built between 1952 and 1954. Most of Aalto's buildings are in areas large enough to permit his intricate, sculptural massings. Here, however, his complexities are hidden behind a tightly ordered urban façade studied in relation to the building which adjoins it. An Aalto trademark, the parabolic walled bullet holes, whose depth is related to the natural order of the sun in its latitude, are the source of lighting the central main hall

Iron House





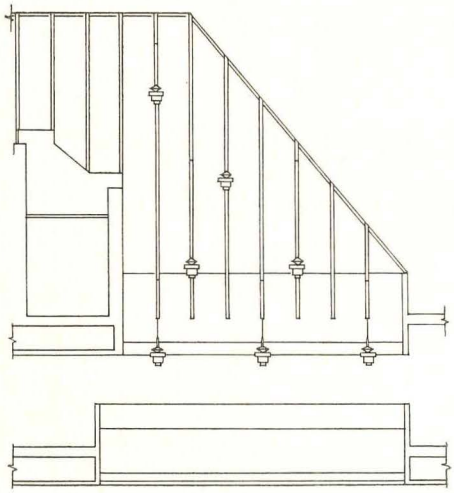




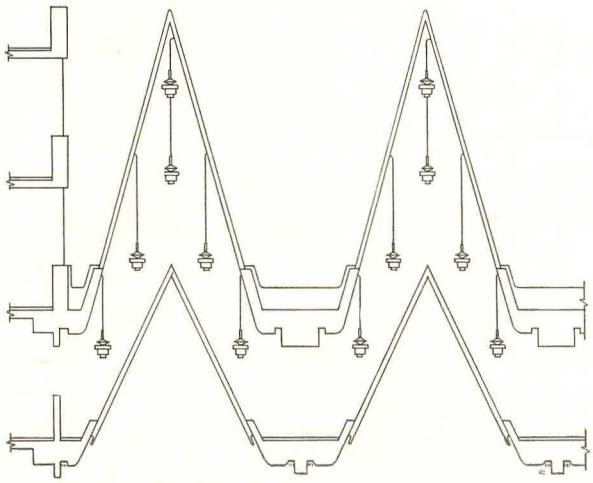
A large building with many projecting levels and wings (only a portion of the biggest unbroken mass appears in the photograph), this office grouping in Helsinki was designed for the administration of social welfare. Begun in 1954, it was finished in 1956. At the core of the plan is a two-story inquiry hall, fitted with carefully detailed private booths in which pension advice is given. This hall is illuminated by one of Aalto's most elaborate skylight systems. Inside the exterior skylight from which incandescent lamps are suspended, is another of lower and flatter pitch, carefully proportioned to the interior

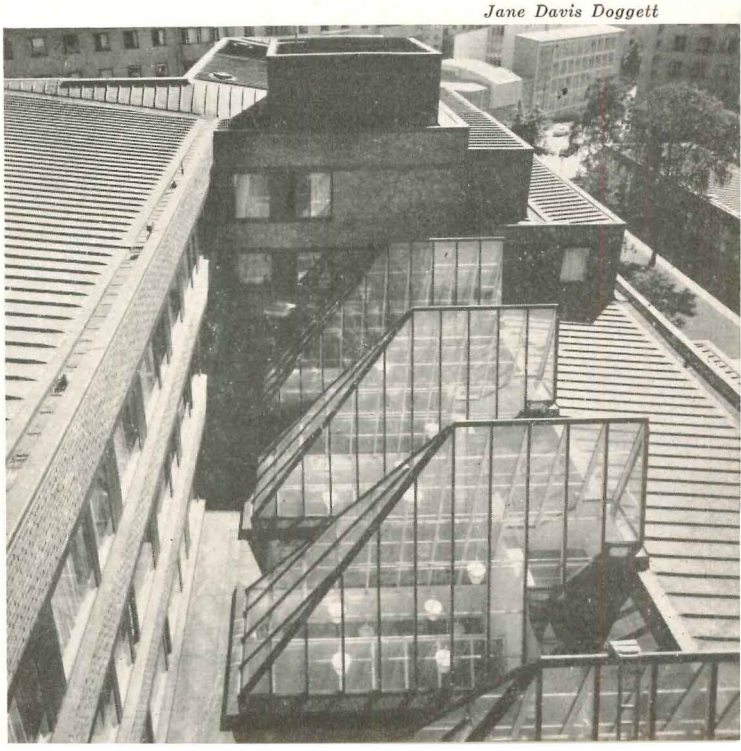
National Pension Institute

Havas



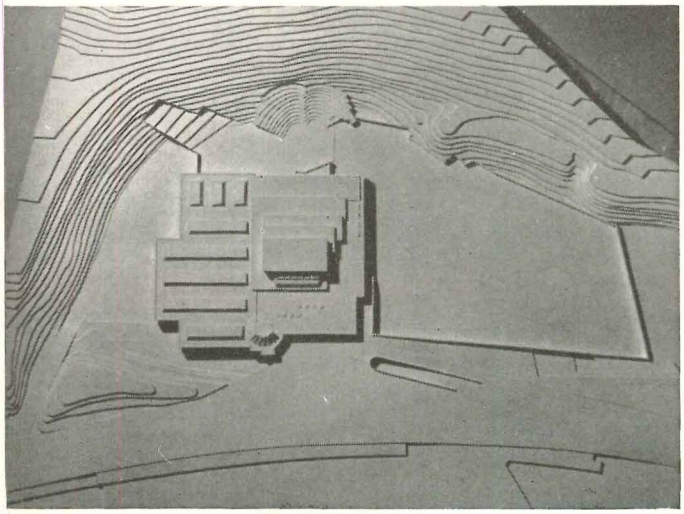
Jane Davis Doggett



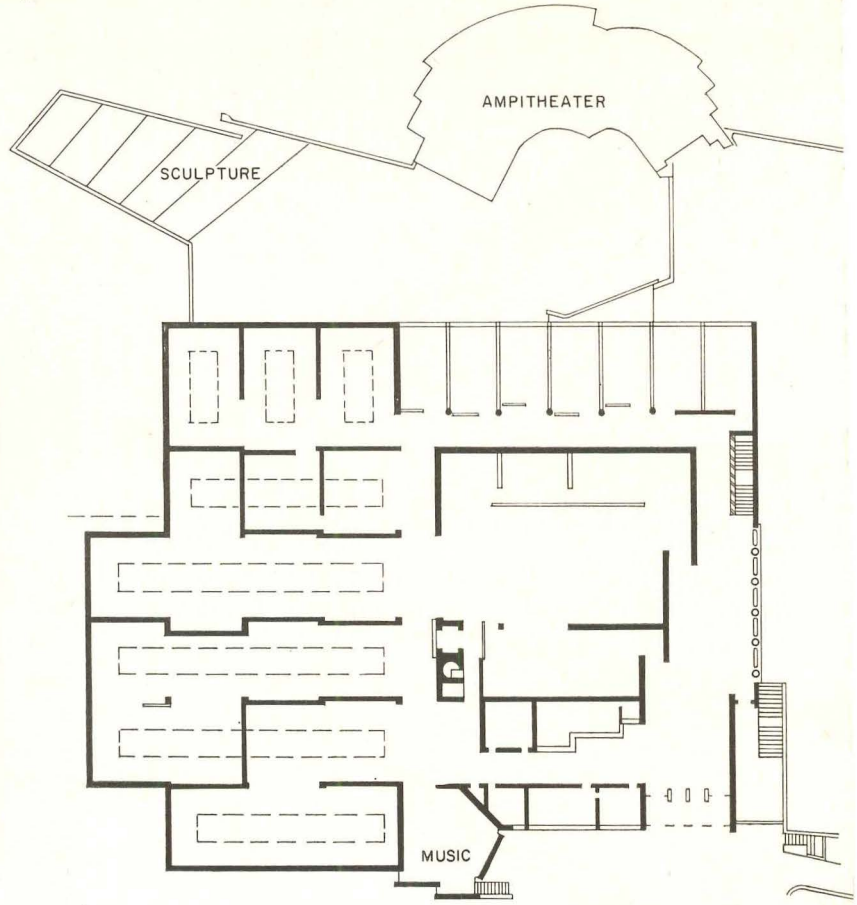


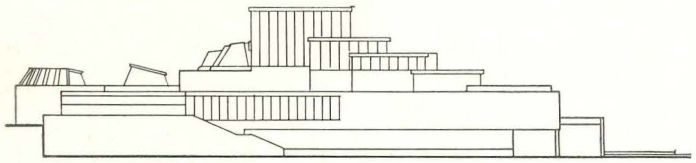
Art Gallery

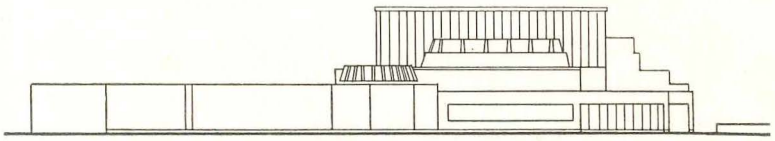
A winner in a competition among Scandinavian architects for a gallery at Aalborg, Denmark, this project was designed by Elissa and Alvar Aalto and Jean-Jacques Baruël in 1958

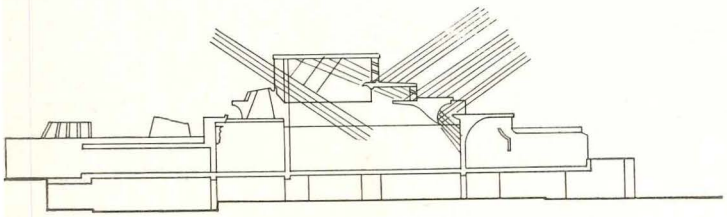


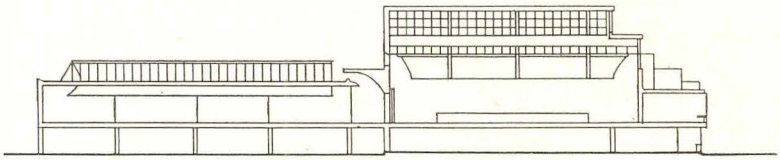
Havas



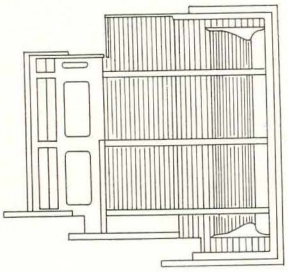


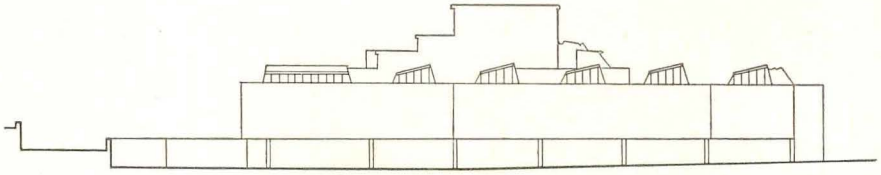


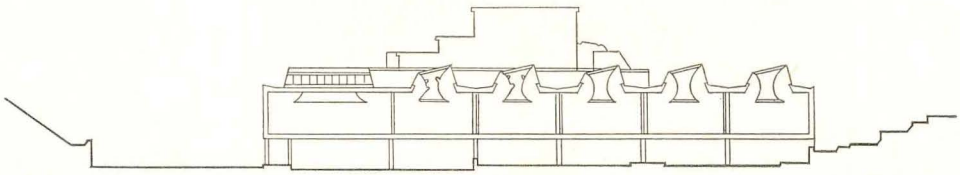


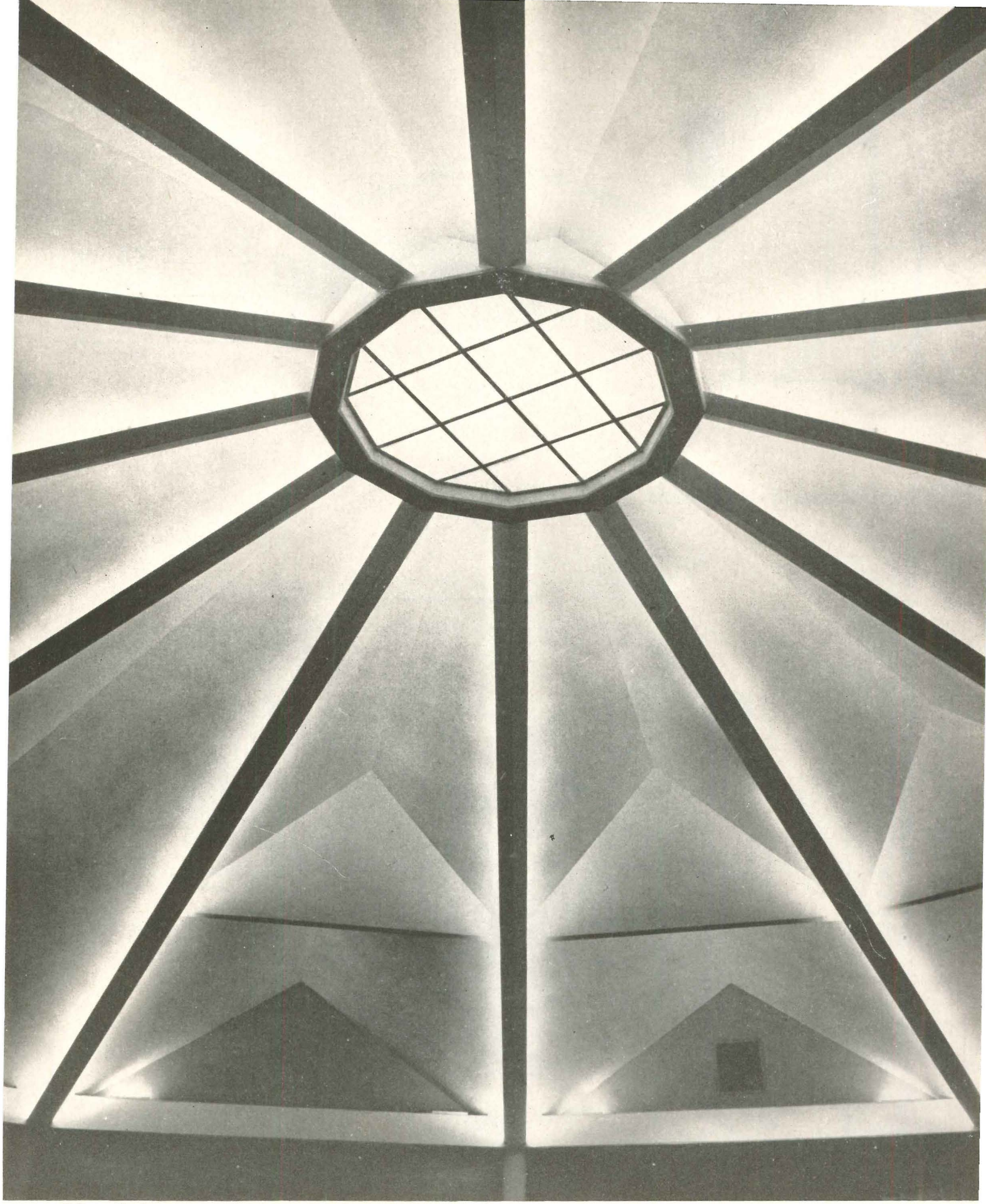


Lighting has been given primary attention in this proposal, and an effort has been made to achieve asymmetric lighting of different character and angles. The central exhibition hall has a special lighting system shown in section above and ceiling plan below





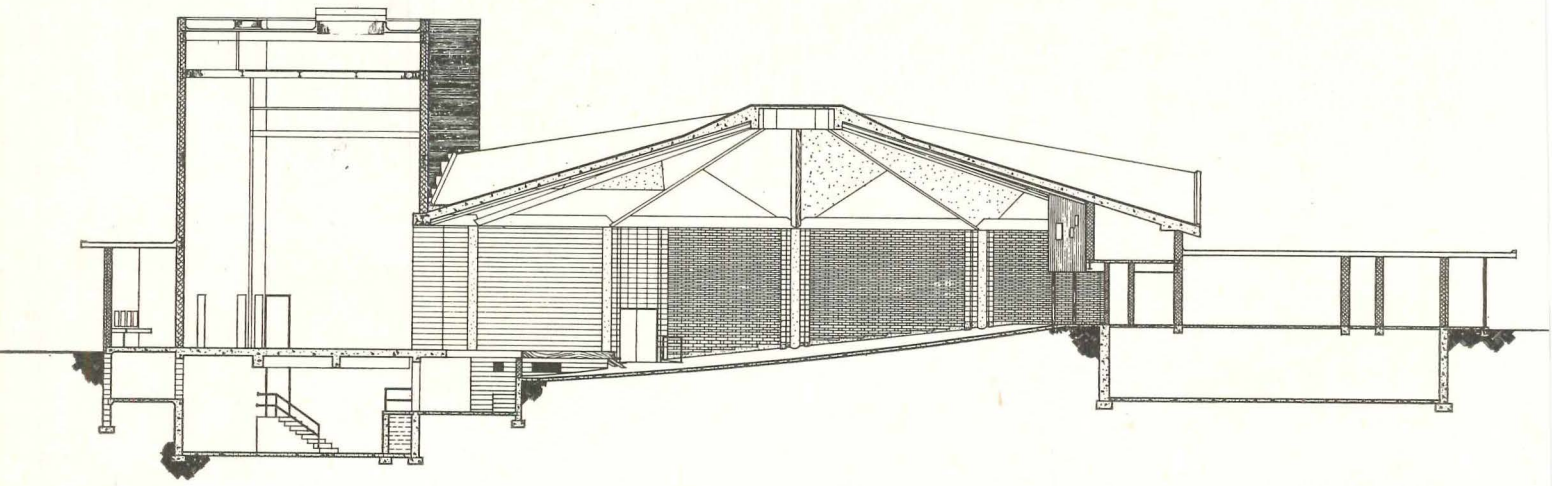




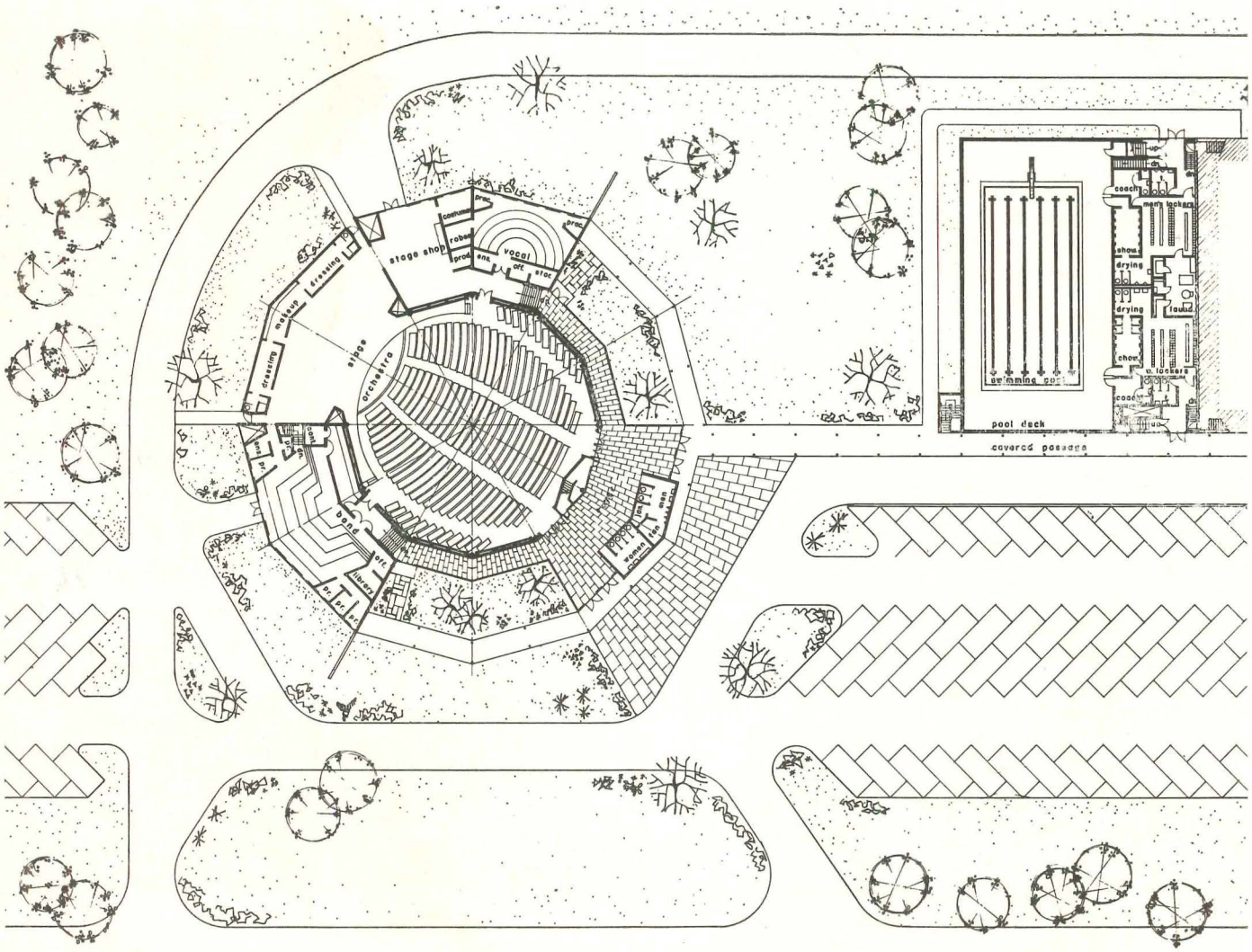
Baltazar Korab

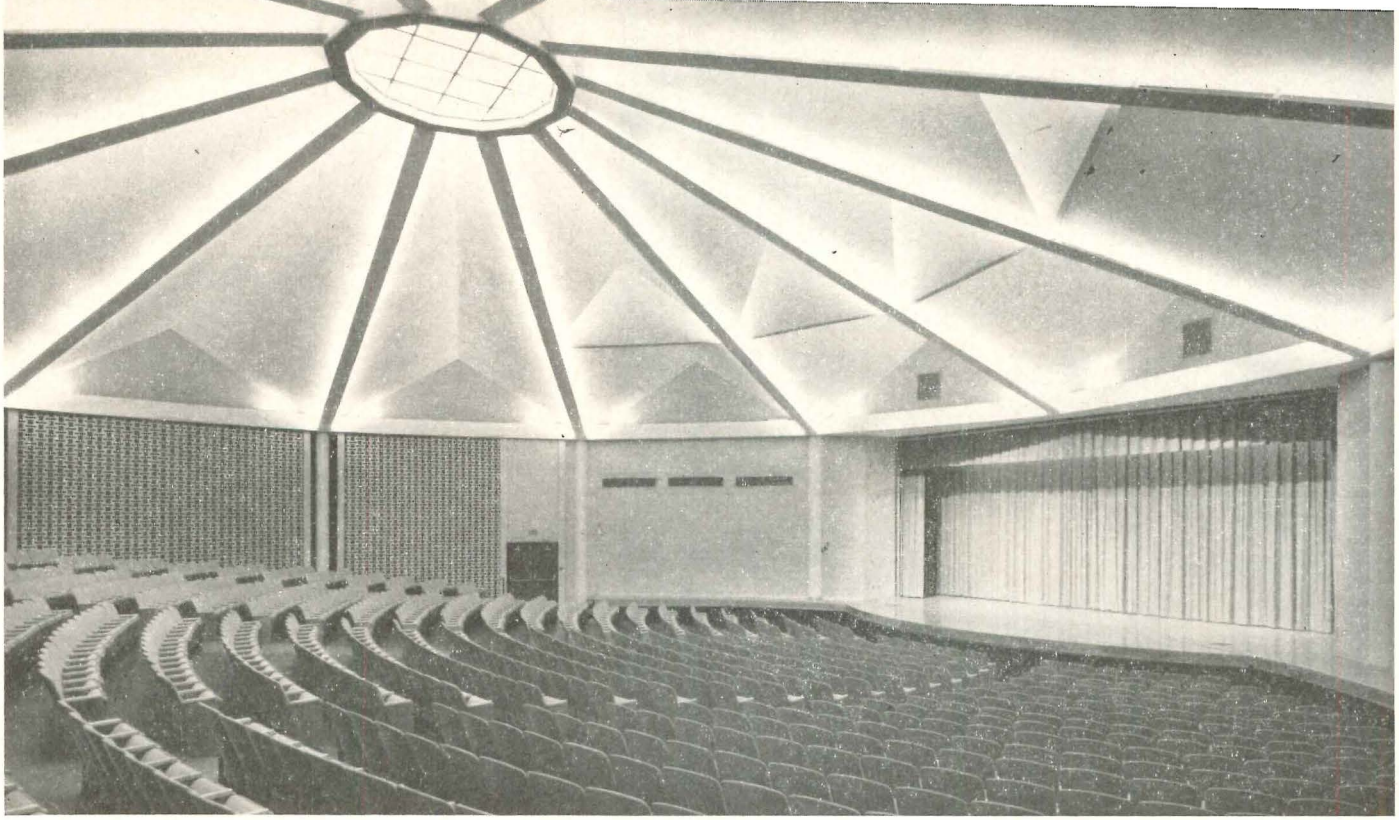
WAYNE MEMORIAL COMMUNITY AUDITORIUM

Wayne, Michigan



Wayne Community Auditorium





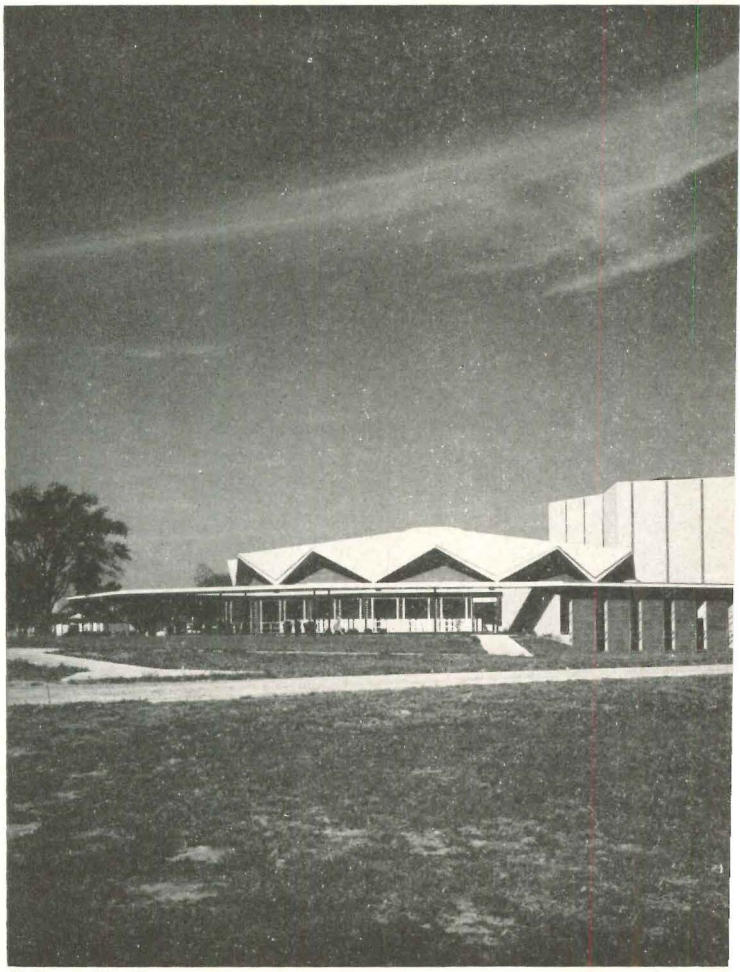
This 1000 seat auditorium building—serving both the community and the adjacent high school—is, in form, a 12-sided polygon constructed over two concentric circles.

The 100 ft diameter inner ring encircles the seating area and is roofed over by a folded V-plate slab that spans 45 ft and rises 15 ft from perimetric tension ring to central compression ring. Circular concrete columns support this slab, which varies in thickness from 4 to 6 in., ridge to valley.

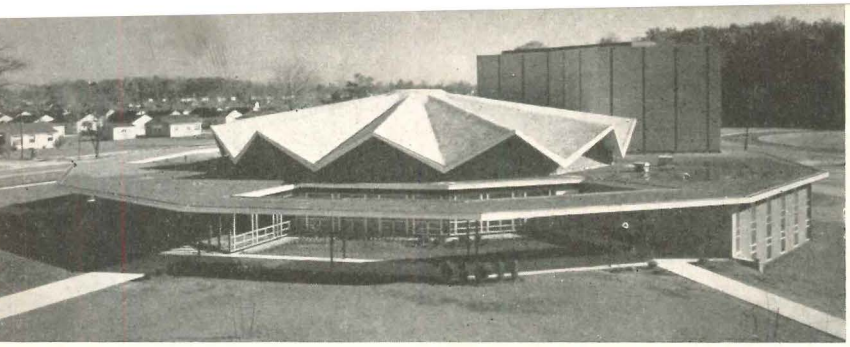
The flat-roofed, outer polygonal ring contains the lobby with its flanking courtyards; a band room; a choral room; the stage, stagehouse and their ancillary spaces. In order to furnish the flexibility necessary for a variety of presentations—concerts, drama, movies, speeches, convocations—the forestage can readily be removed to open up a pit which will accommodate an 80-piece orchestra.

Since the building serves both as part of the nearby high school and as community cultural center, it was made a detached, self-contained unit. The circular auditorium shape, the relatively steep seating incline, and the extended stage with side-wings were all aimed at making the audience become—as much as possible—part of the performance.

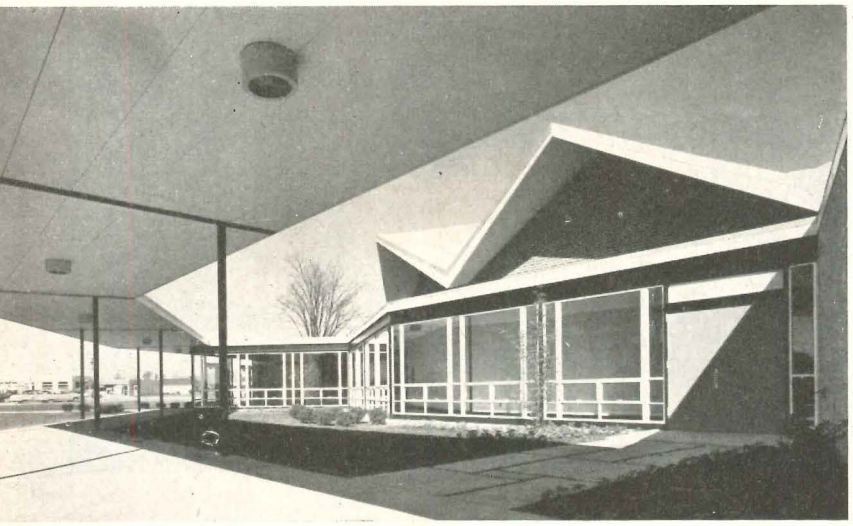
Eberle M. Smith Associates, Architects & Engineers; Tobias J. Gersbach, Design Associate; Lyndon Welch, Structural Engineer. Bolt, Beranek & Newman, Acoustical Consultants. A. Z. Shmina & Sons, General Contractors.



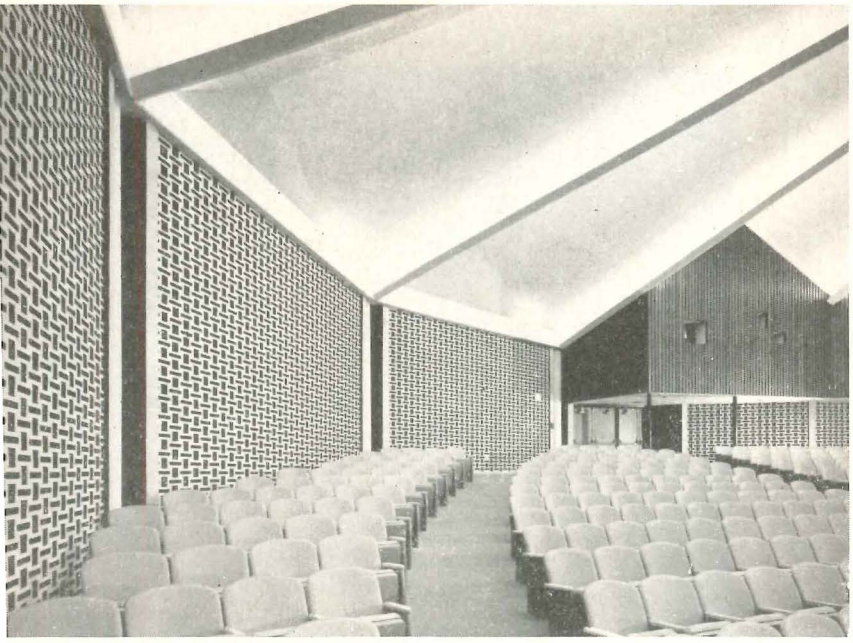
Baltazar Korab



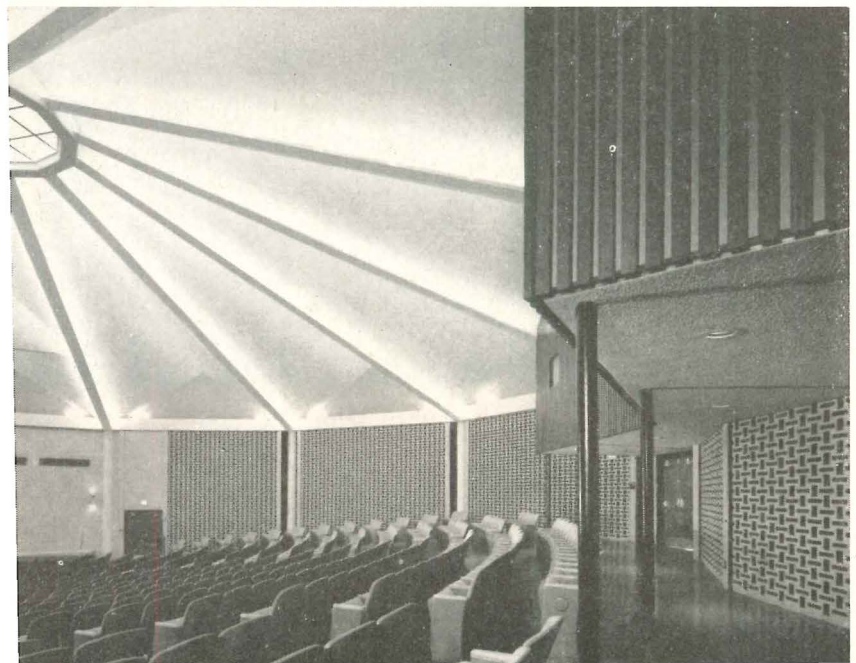
Baltazar Korab



Baltazar Korab



Lens-Art



Lens-Art

Wayne Community Auditorium

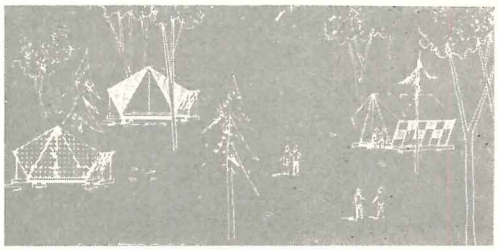
Two measures were taken in order to render the auditorium space acoustically lively, yet not too reverberant. Alternate planes of the folded ceiling are covered with acoustic plaster for sound absorption, while the remaining natural concrete planes serve as sound reflectors. Side and rear walls are made absorbent by covering them with acoustic material placed in back of a decorative screen composed of standard shale block cut into halves and painted.

General "house" lighting—entirely indirect and from fluorescent sources—consists of a radial pattern of troffers suspended from the valleys of the V-plate roof slab, supplemented by coves about the perimeter of the space. Such a scheme makes a decorative pattern of the overhead structural system.

Three factors contributed to the low cost of the building: none but standard products and materials were used; there were no suspended ceilings; and the structural and mechanical systems were carefully integrated during design

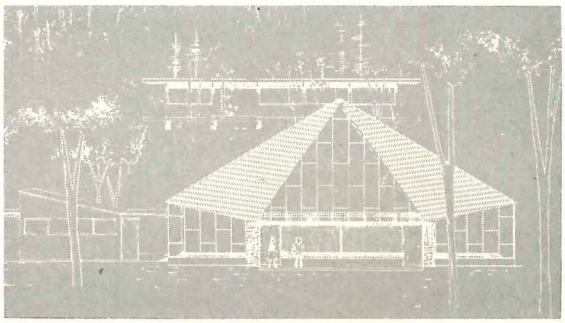
Barnes

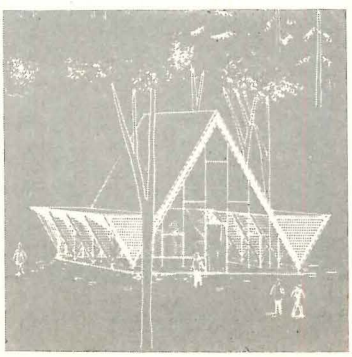
A ROMANTIC DISCIPLINE FOR THE WOODLANDS

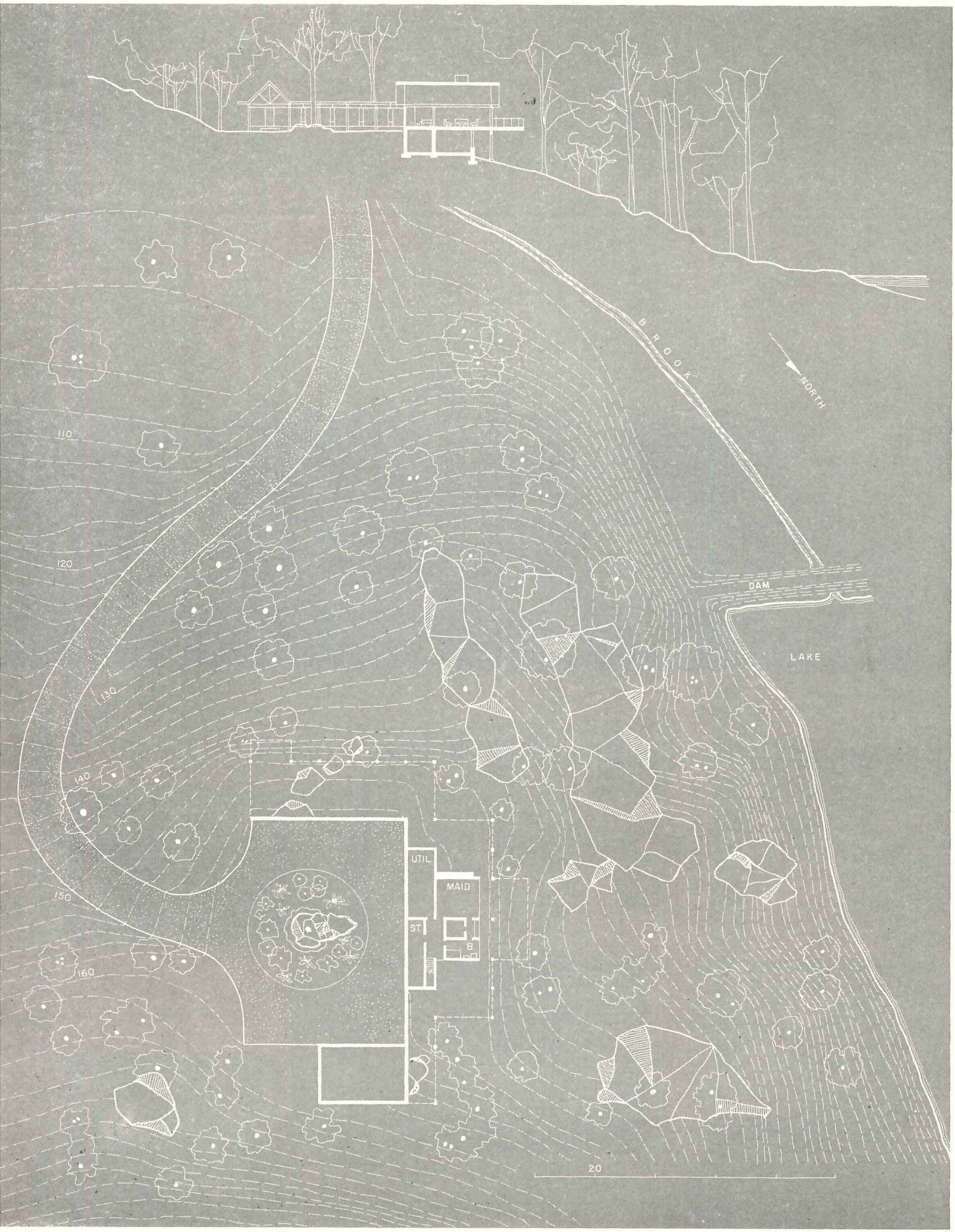


"A woodland site seems to demand forms which are a part of the atmosphere of the woods: organic forms advancing and receding among the trees and never fully visible. But within such a romantic approach there still must be discipline."

Edward Larrabee Barnes






BROOK
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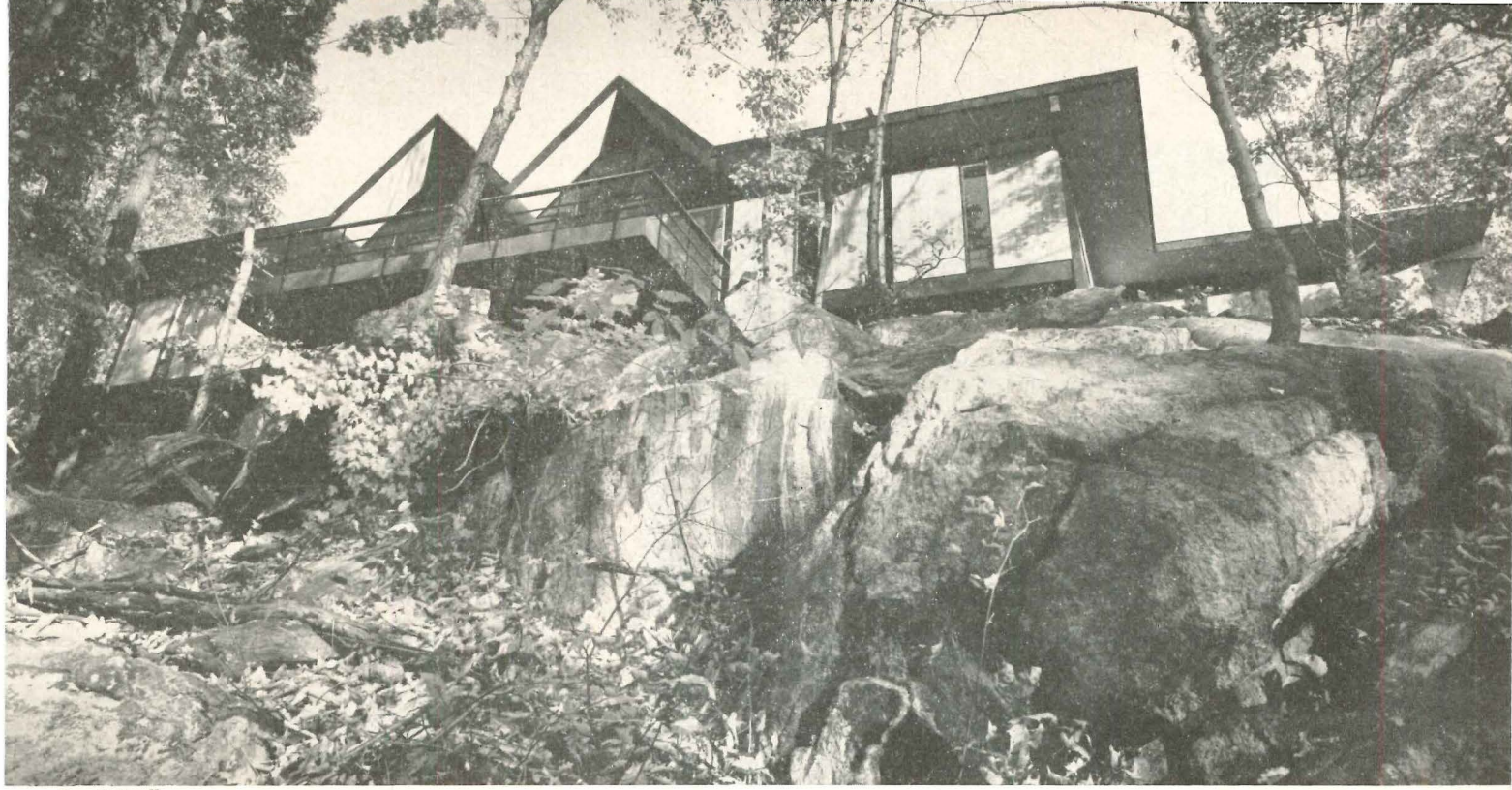


Ben Schnall

Woodland House

In designing houses for rugged and beautiful woodland sites, Edward Barnes has developed a new idiom contrasting sharply with his well known "platform houses" (ARCHITECTURAL RECORD, October, 1956). The crisp white, horizontal structures of the latter are raised on carefully landscaped earth "platforms" to stand apart from the rough, unmowed fields.

Here, the dynamic rock outcroppings, linear trees and country quiet are echoed in the forms and colors of the house. Its wooded site (which remained unsold for years because of the difficulty of building on it) slopes steeply up to a small flat shelf with a sharp rocky drop to a lake on the west. The little bit of flat land was saved for an entrance court, with the house slung on stilts over the undisturbed side of the hill. Thus, one side of the house looks into a formal manicured gravel court with island planting and flowering shrubs, and the other side looks down through tree tops to the lake below. The woods come up to the house all around.

Residence for
Mr. and Mrs. Donald Miller, Jr.
Chappaqua, New York

Edward Larrabee Barnes
Architect

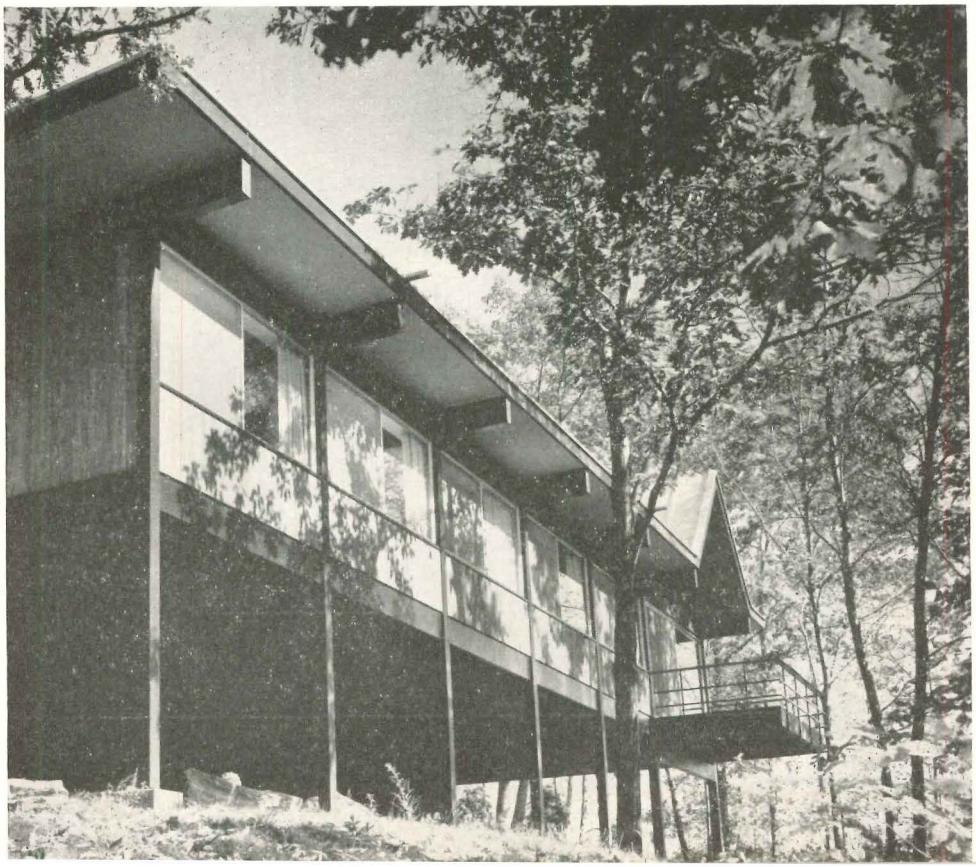
Benjamin Spivak
Mechanical Engineer

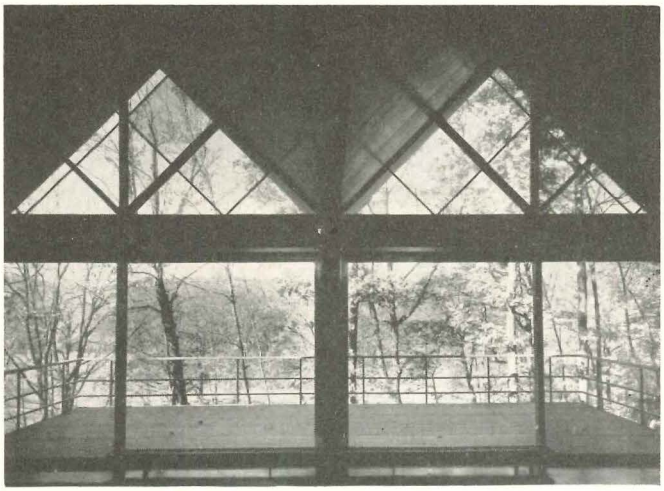
William Atlas
Structural Engineer

O'Brien & Kinkle, Contractors

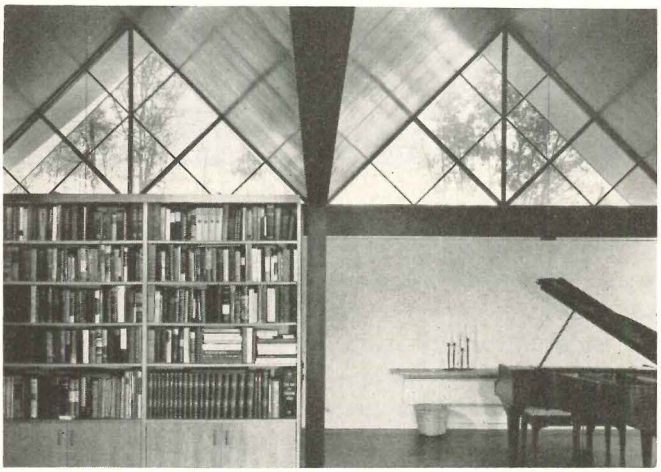
Mary Barnes and Emily Malino
Interior Furnishing

Bye & Herrmann
Landscape Architect

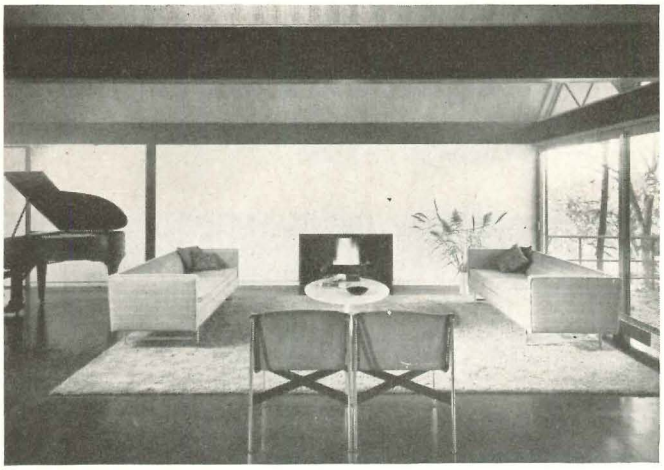




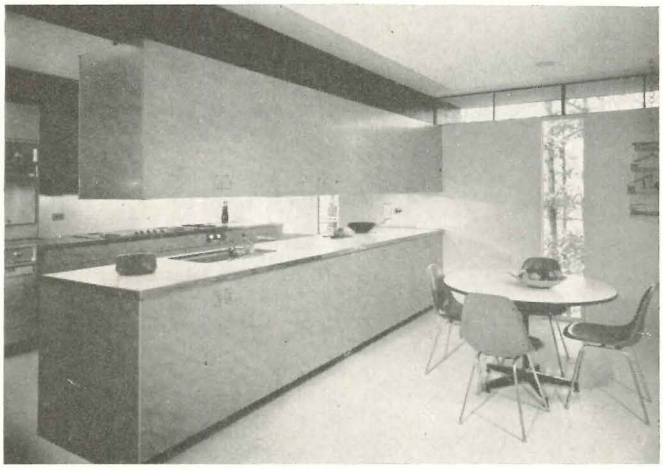
From the twin peaks of the living-dining area, one looks out through woods to the lake. Each peak has half blue, half green glass. Heating grilles run above and below sliding glass doors



The entrance side of the living area also gives glimpses of woods through the vibrant colored glass. The bookcase units screen off an entrance vestibule, contain storage cabinets on the back



The black stained structure is boldly exposed inside and out. Interiors are all orderly and restrained to contrast with the woodland setting. The floor here is cork tile, walls are painted plasterboard



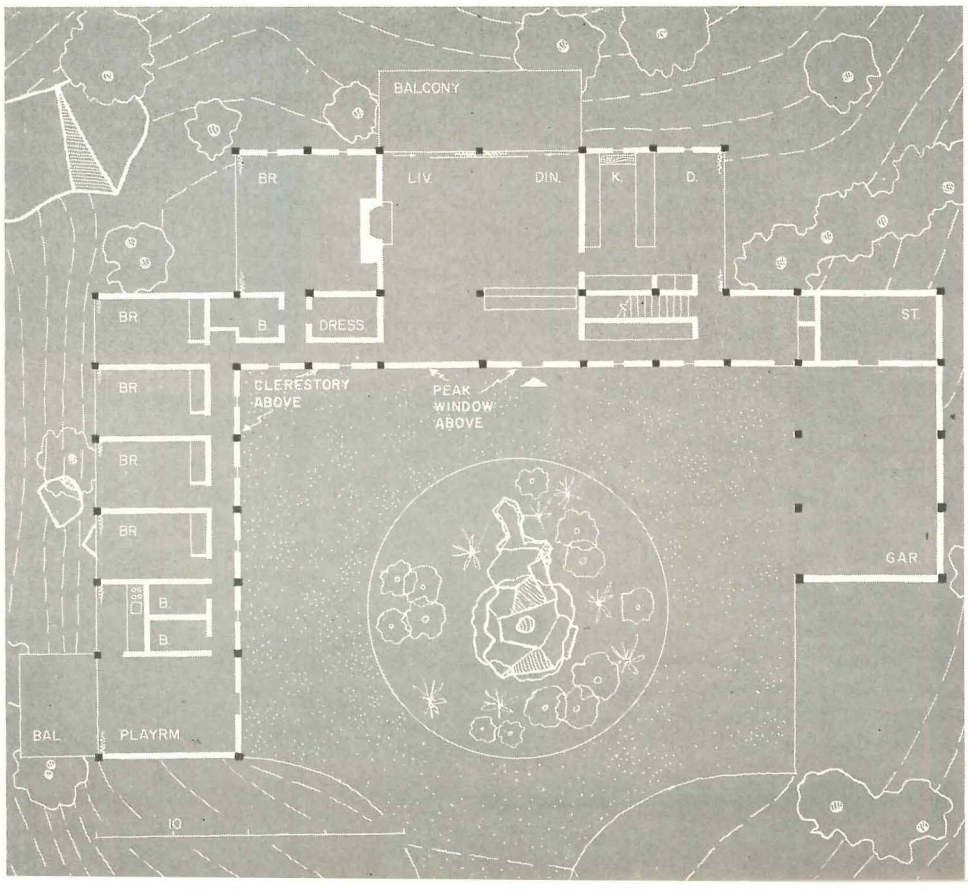
Narrow vertical windows and a colored glass clerestory range all rooms without peaks, affording a variety of little vistas, and great elegance. The kitchen (left) has area for family dining

Ben Schnall

Woodland House

In the entrance court and interiors of the house, one senses discipline and order. Despite a somewhat "Wrightian organic interaction of house and site," there is clarity of construction and precision of detailing. A laminated wood frame is used in regular modular bays. Only one size of sliding windows is used throughout the house; any variations are fixed panes of glass. Cypress siding is narrow, to avoid shrinkage, and carefully set in each bay. Inside, white plasterboard walls are articulated in panels with metal corner beads, and modular materials—such as acoustic tile in the kitchen and oak plywood ceilings in the peaks—are detailed on grid lines.

The exterior colors are illusive: a black laminated frame, brown stained siding, a black-green foundation wall, a blue soffit, and big sheets of deep blue and green glass in the peak and clerestory windows. A white gravel border separates the house from the turning space in the court. In full summer, the architecture is mixed with the woods—never fully visible.



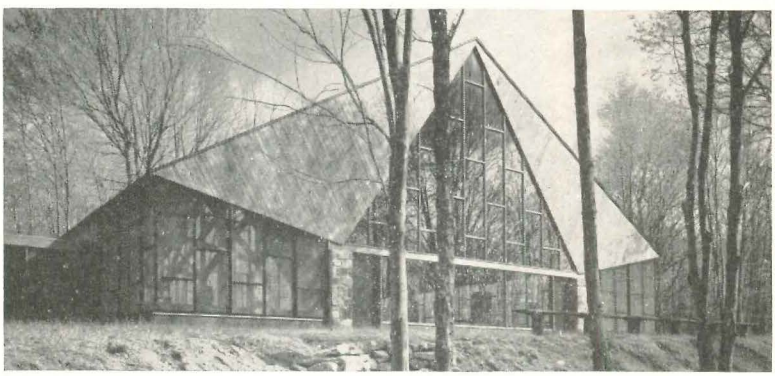
The plan is arranged according to functions. All bedrooms look south; the children's wing is set apart with its own entrance through the playroom. The living room and balcony look west to the lake. Note how the peaks define entrance, dining and living areas. Kitchen and utility room are entered directly from the carport, which forms a sort of porte cochère. The carport is carefuly detailed, with a little clerestory of colored glass in back, a black cement floor, and an ample storage room adjoining. In daily life this is the major entrance for the family. Downstairs is a room for a couple—a separate apartment

Ben Schnall

Woodland House

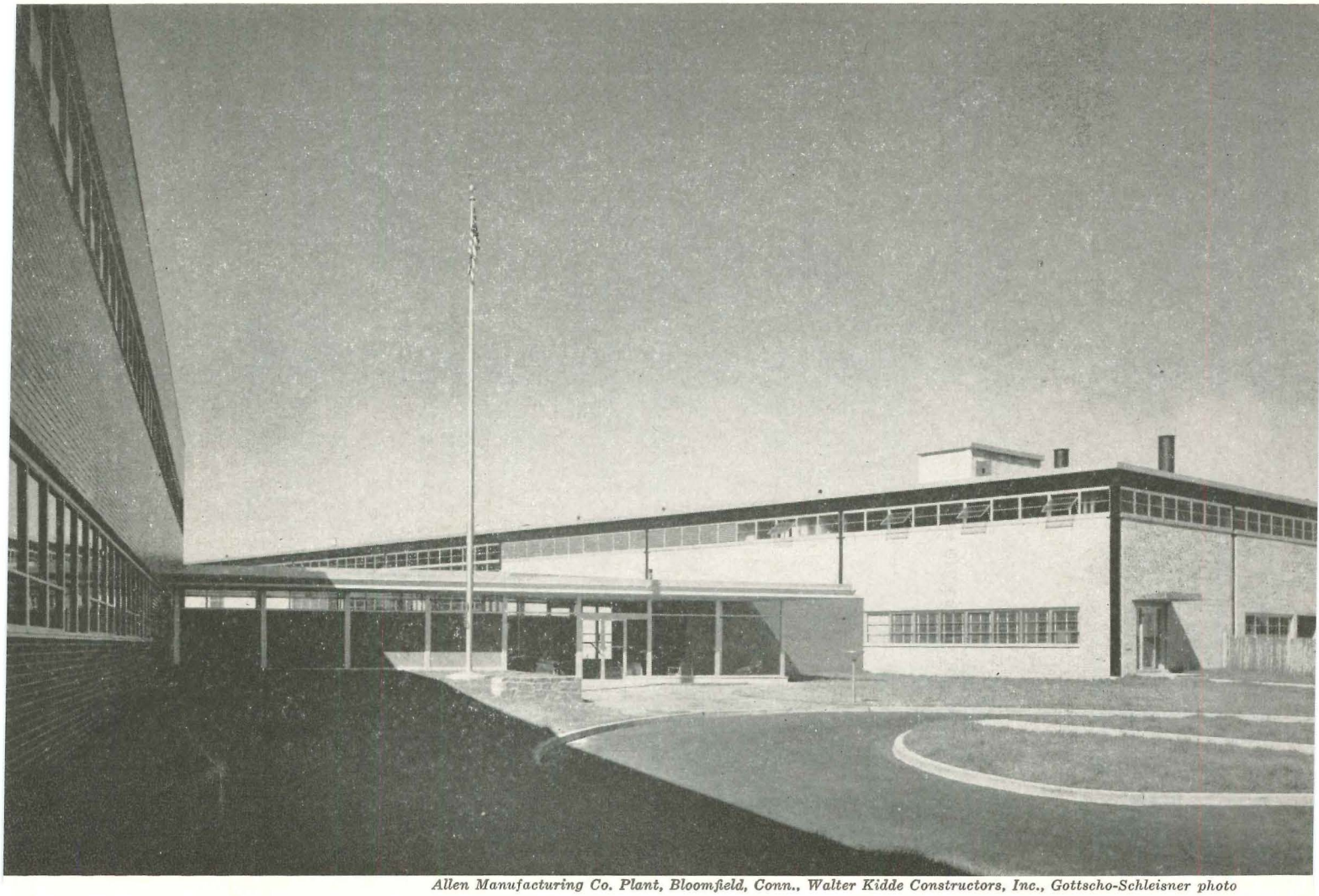
Design origins for the Miller House (top) stem from the buildings Edward Barnes did for the Herald Tribune Fresh Air Fund Camps in Fishkill, New York. Three of these are shown at right. The house is a more refined and sophisticated reflection of these vigorous forms.

Barnes sums up his scheme for woodland architecture as "dark stained wood, black columns, dark paint colors, views up to tree tops through peak windows and skylights, buildings set up on stilts so as not to disturb the rocks and leaves. Colored glass in big sheets of blue and green used to deepen the woodland colors (the black and white photos have not caught the depth of the colored glass—the effect is more Victorian than Japanese). At the same time—within this romantic silence of things—there should be structural and technical integrity, and the plans must work as organic entities. What is needed is more poetry without abandoning the discipline we have learned."



BUILDING TYPES STUDY 266
®

INDUSTRIAL BUILDINGS

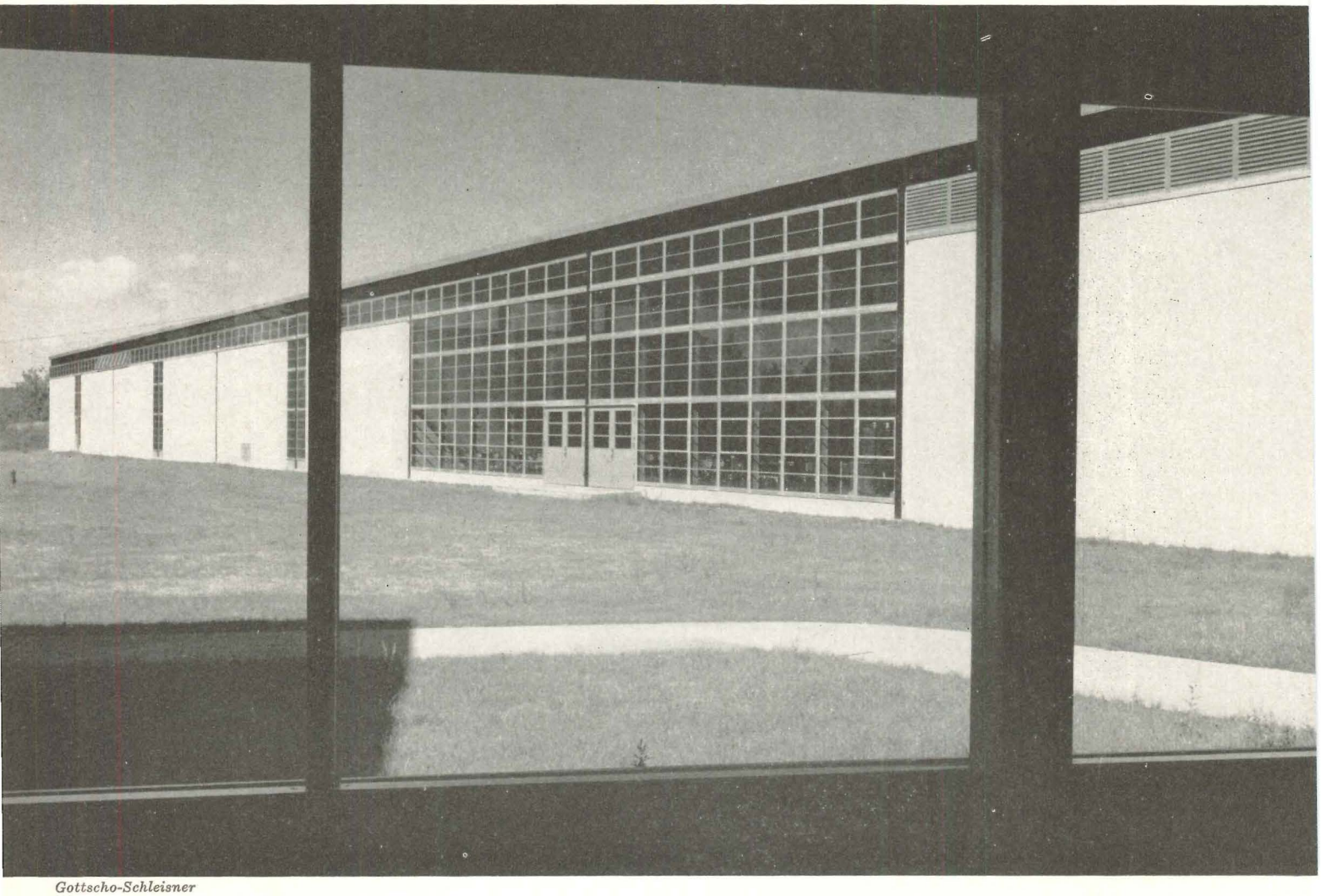


Allen Manufacturing Co. Plant, Bloomfield, Conn., Walter Kidde Constructors, Inc., Gottscho-Schleisner photo

In its annual preview of estimated construction volume (ARCHITECTURAL RECORD, November 1958), F. W. Dodge Corporation predicts for next year a 14% rise in industrial construction (from 123 to 140 million sq ft, as compared to 1958). This will result in expanded opportunities for architects in this field. The present study examines solutions of industrial problems and their integration into coherent architectural expression. Long-range planning, site selection and use, flexibility, expandability, materials-handling, mechanization, automation, and the like are considered. The examples indicate the results of attention to basic considerations of production processes and the related circulation and flow patterns, as well as to the problems of research, programming, design, cost control, planning and so on. They show, too, the opportunities for invention and experimentation in form and structure and in other important aspects of their design

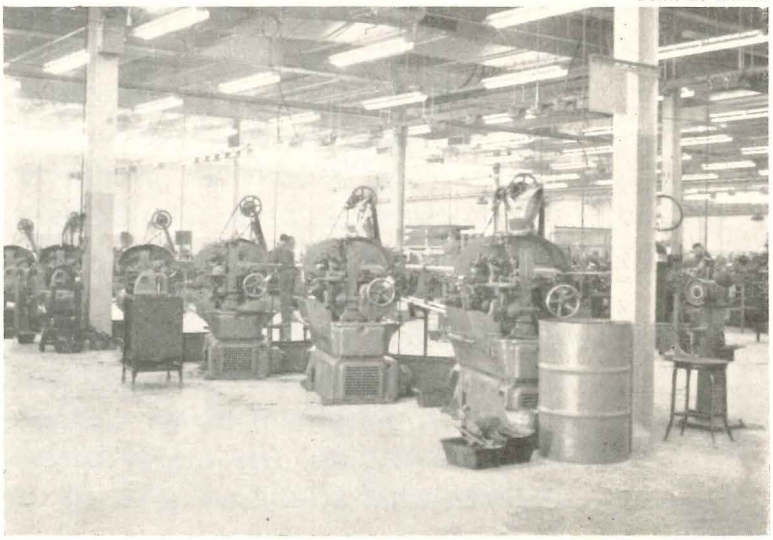
SIMPLIFIED FLOW LINES DICTATE PLANT LAYOUT AND DESIGN

"The major design purpose in a manufacturing plant is the provision of the most economical and flexible operating conditions. Therefore, the flow patterns are of prime importance. In making new flow layouts, it is necessary to understand the existing plant patterns to avoid loss of special skills and methods," say the designers



Gottscho-Schleisner

John T. Weeks



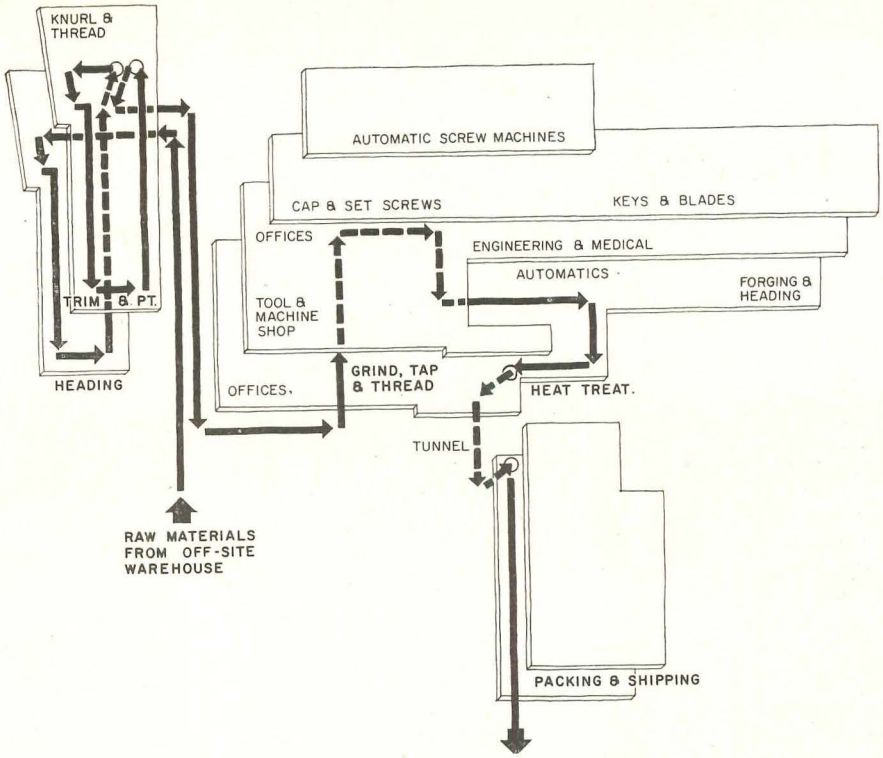
Allen Manufacturing Company Plant
Bloomfield, Connecticut

Walter Kidde Constructors, Inc.
Designers and Builders

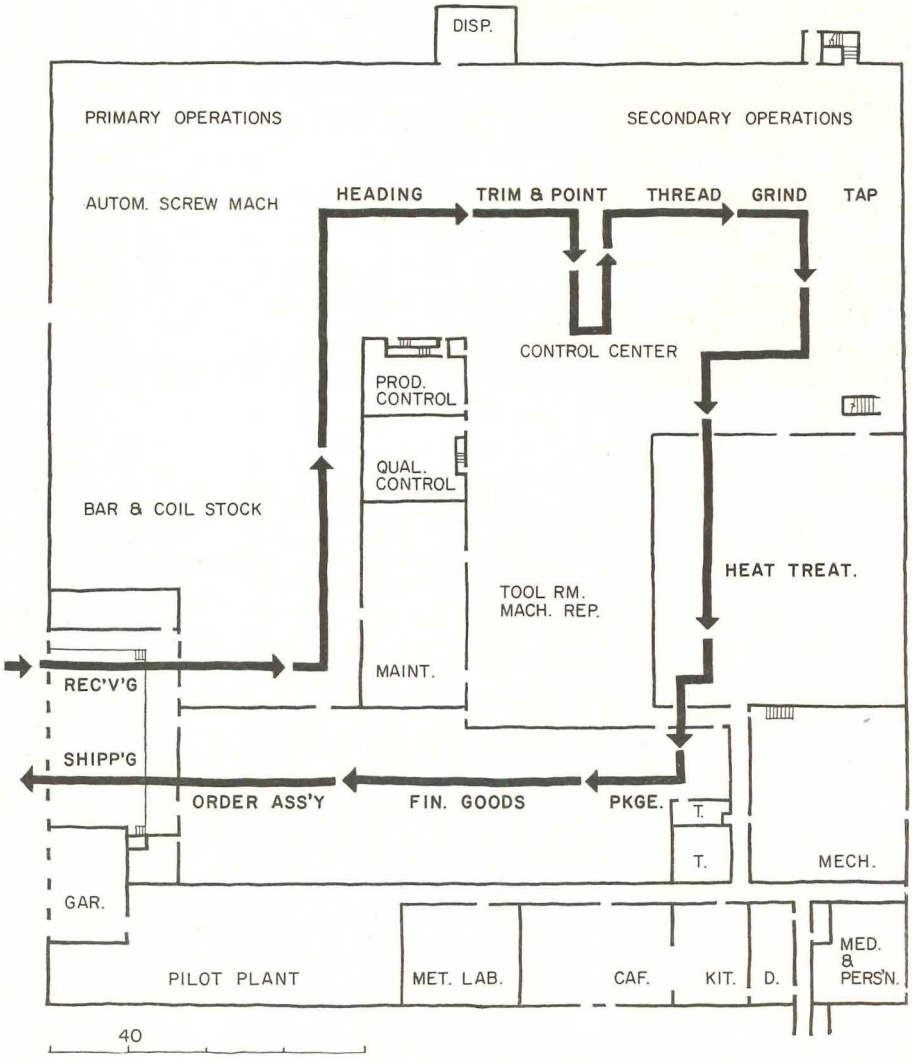
This plant manufactures socket-head screws and similar related products.

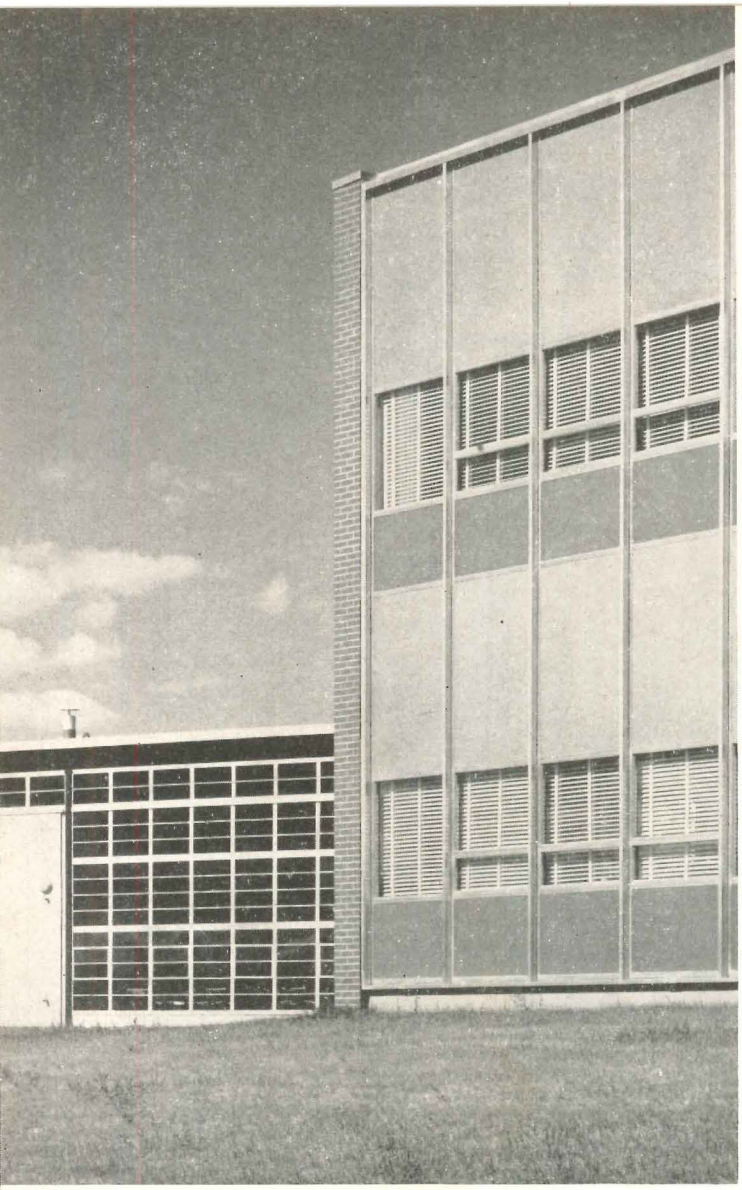
Its design began with the preparation of flow studies and diagrams of the existing processes. Complete drawings were made of the existing facilities, operations, and machinery. Study of this data lead to revised flow diagrams, plant layouts, and machinery lists. Integrated with these studies were a survey of product capacities in the past and a projection of the future capacities. Studies were made of past inventories and estimates made for the future use of raw materials by types, quantities, weights, and sizes. Also surveyed were work in progress at particular times, semi-finished products, and finished products by types and sizes. A thorough investigation of the handling of special orders was made and general principles developed for handling these without disrupting the general operational patterns within the plant.

Further study allowed the subdivision of the major functions into operational groupings as follows: 1. Warehouse—for receiving and storage of raw materials; 2. Primary operation machinery—that performing operations fed by basic raw materials; 3. Secondary operation machinery—that fed by blanks or semi-finished materials from the primary machines; 4. Heat-treating equipment—including annealing, tempering, and so on; 5. Auxiliary operation machinery—used for chipping, washing, cleaning, etc.; 6. Machinery for finished inventory handling—sorting, picking, packaging, crating, and shipping. Other operations not part of the main production process include Tool Room, Maintenance, Machine Repair, Research and Development and Pilot Plant, Laboratories (Mechanical, Physical, Chemical).



Flow lines for typical product are shown in the diagrams. The illustration above shows the method of routing the product in the building formerly used. In this case, the flow starts on the ground floor, is routed up to the second floor, returned to the ground floor, then down into a tunnel and up into the packing and shipping department. The diagram below shows the new flow which is generally circular, all on one floor, and operates much more smoothly than old method





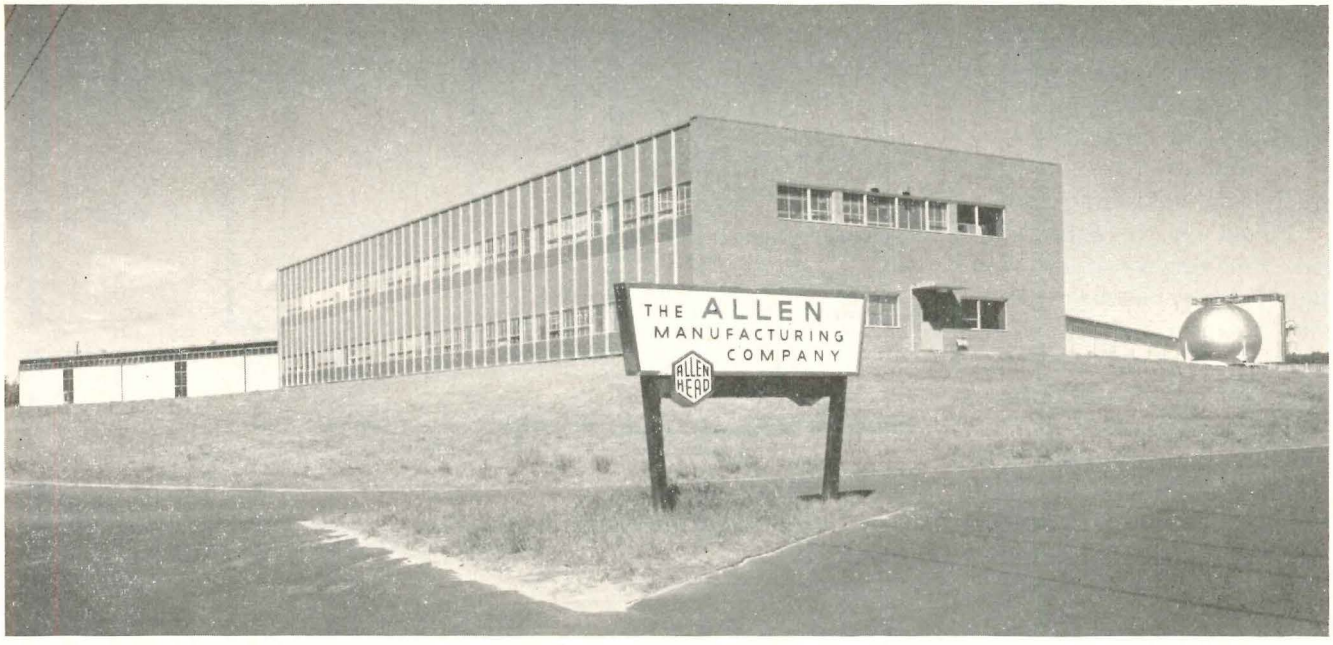
Allen Manufacturing Co.

In addition to the manufacturing area, the plant includes a separate building in which are located the executive offices. Interconnecting the two buildings is a spacious, glass-enclosed corridor which serves as the main entrance to the plant. Also included here are the lobby, telephone-reception room, and conference rooms. Service areas such as personnel office, medical facilities, cafeteria, shop offices, locker rooms, and the like are provided within the manufacturing building.

For flexibility, the main plant floor was kept free of all partitions wherever possible. The only notable exceptions are the heat-treatment area and the boiler room where the nature of the use required partitions. The somewhat large bay size (30 by 40 ft) adds to the openness of the space. The building shape approximates a square in order to reduce the travel distances between operational groupings. Like machines are placed together within these groupings near the outside walls to facilitate the adding of other machinery without disturbing the present machine layouts.

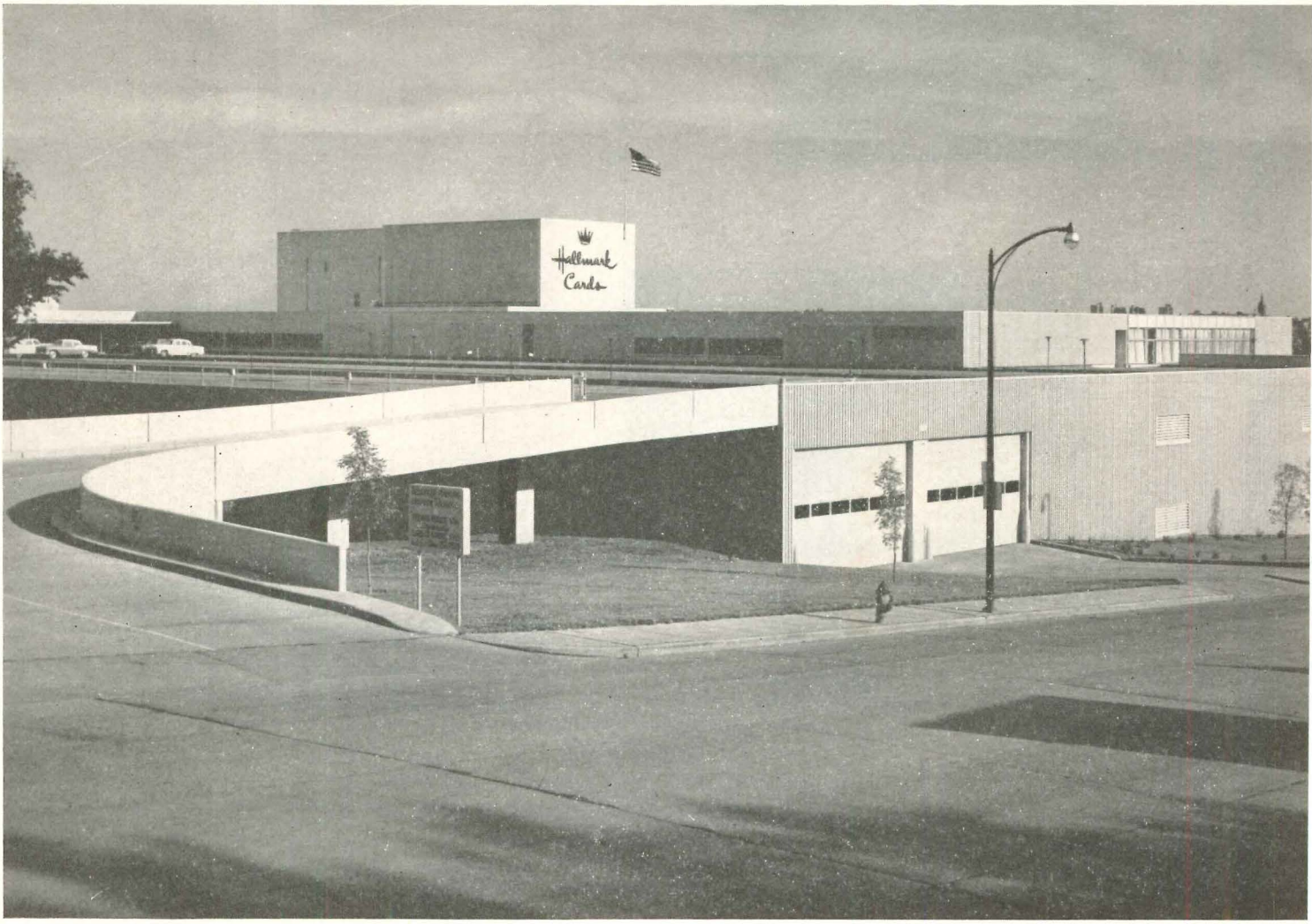
Auxiliary groupings such as maintenance, tool room, machine repair and the like are placed in the center of the buildings for ease of access from all operations. A control center was placed between the primary and secondary groupings to facilitate close controls needed over weights, inspection, machine loading, holding of work in progress and special functions.

Gottscho-Schleisner



GREETING CARD FACTORY BUILT ON A FORSAKEN SITE

The irregular and extremely steep site with a slope of almost 70 ft dictated a unique building solution. Eight stories high, the plant has gravity-flow production lines, designed for delivery of raw materials at ground level on upper floors with flow downward through succeeding floors to shipping (at ground level) on lower floors

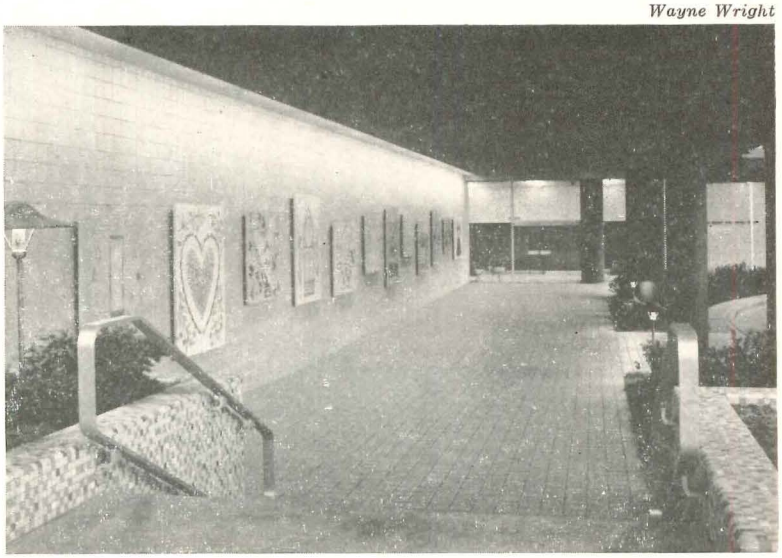


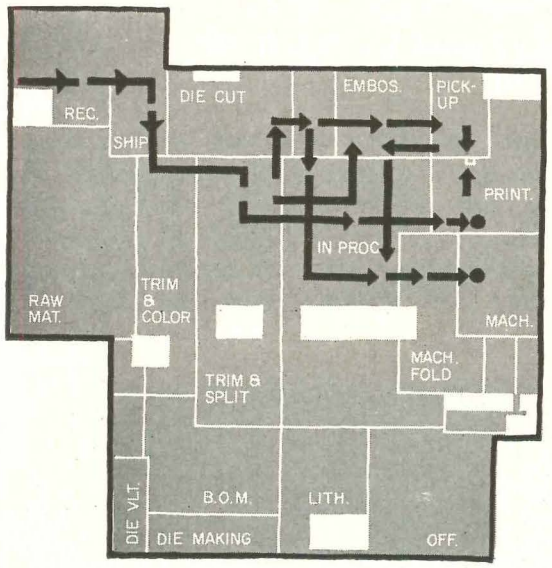
Hallmark Card Factory
Kansas City, Missouri

Welton Becket and Associates
Architects and Engineers

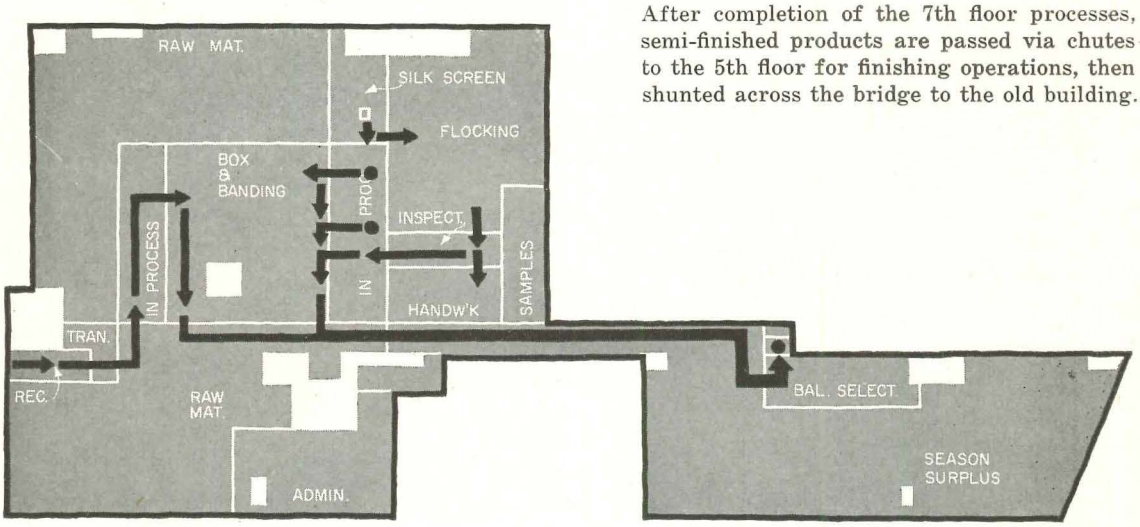
Long Construction Company
Contractors

Wayne Wright



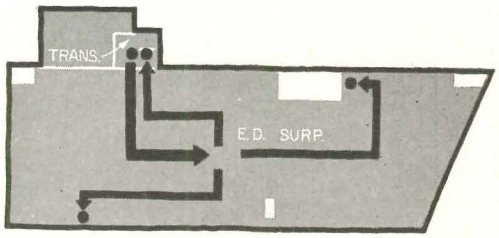


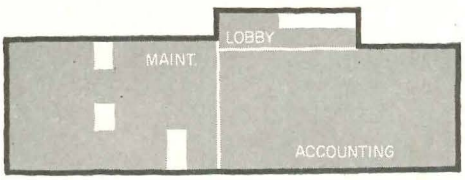
The manufacturing process for everyday (E.D.) Hallmark products begins with the delivery of raw materials from ground level outside to the 7th floor production operations

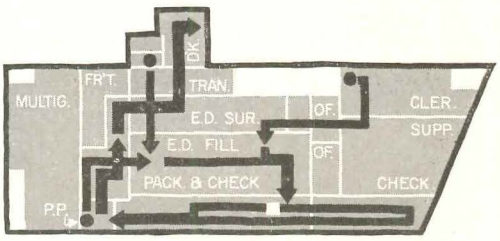


After completion of the 7th floor processes, semi-finished products are passed via chutes to the 5th floor for finishing operations, then shunted across the bridge to the old building.

A somewhat large percentage of finished everyday products are transferred down to 3rd floor of original building, where surplus for E.D. products is located, put in storage



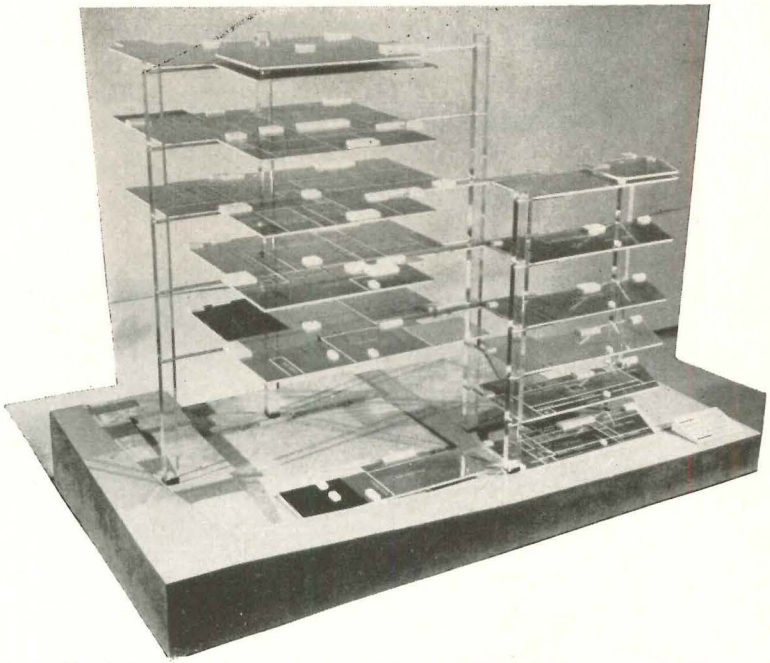




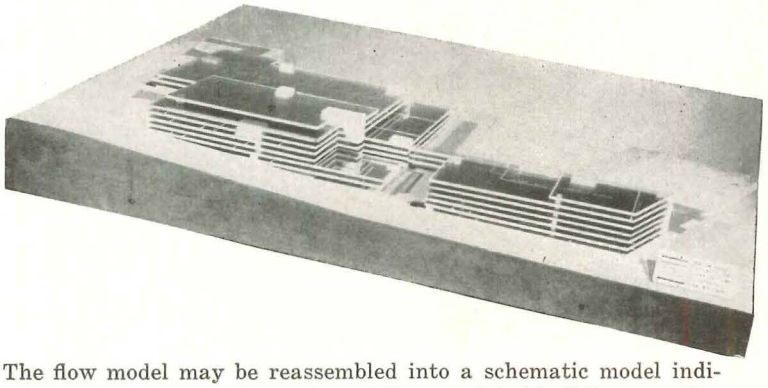
Everyday products are finally transferred from the 5th or 3rd floor to the ground level for checking, packing, and shipping by parcel post, freight, or other methods to wholesale and retail establishments

With an existing plant in operation here, the owners believed that the new facilities should be located across the street if this were feasible on the irregular topography of the site. After considerable investigation and study of the problems involved, the architects decided a building could be economically placed on the site to perform the required functions. They designed an eight-story building roughly in the shape of an inverted pyramid with floor areas varying from less than 2000 sq ft on the first floor to almost 200,000 sq ft on each of the two top floors. Because of the steep grades, all floors have direct access to ground levels outside the building. Accordingly, twenty-three loading docks are incorporated into the design at various levels to facilitate receiving and shipping. Parking for four hundred automobiles is provided on the roof and is entered from street level.

Manufacturing processes begin on the seventh floor and progress downward through the fourth floor (primarily in the new wing). Administrative offices and parking are on the eighth floor of this wing. The old building across the street—remodeled to conform in appearance to the new—is used for storage and shipping functions. Finished goods are shunted across bridges at various levels to the older structure. Conveyor belts and chutes, planned by the architect-engineers in cooperation with the client's production department, are used for efficient handling of the materials and products.

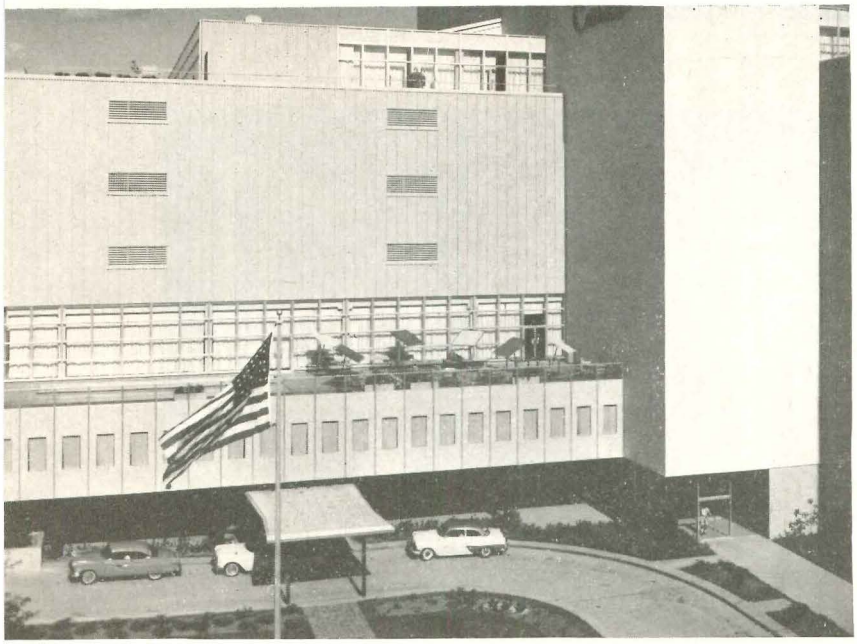


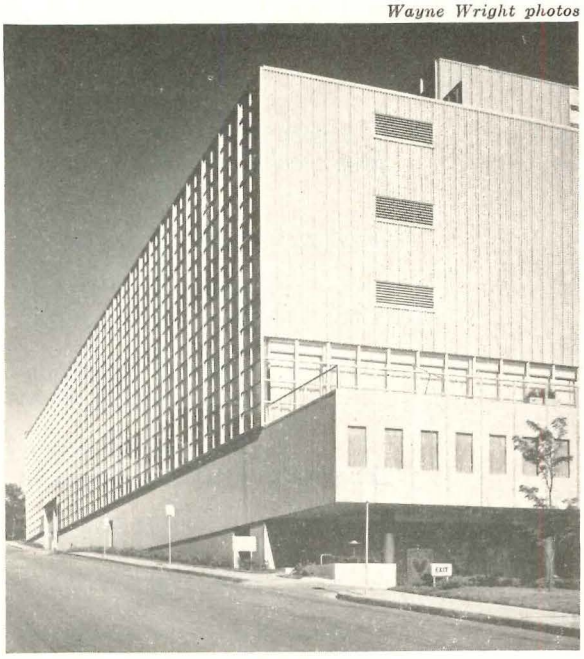
Individual flow charts are designed for assembly into an exploded, complete flow model as shown, for study of production flow lines



The flow model may be reassembled into a schematic model indicating appearance and massing of the completed building complex

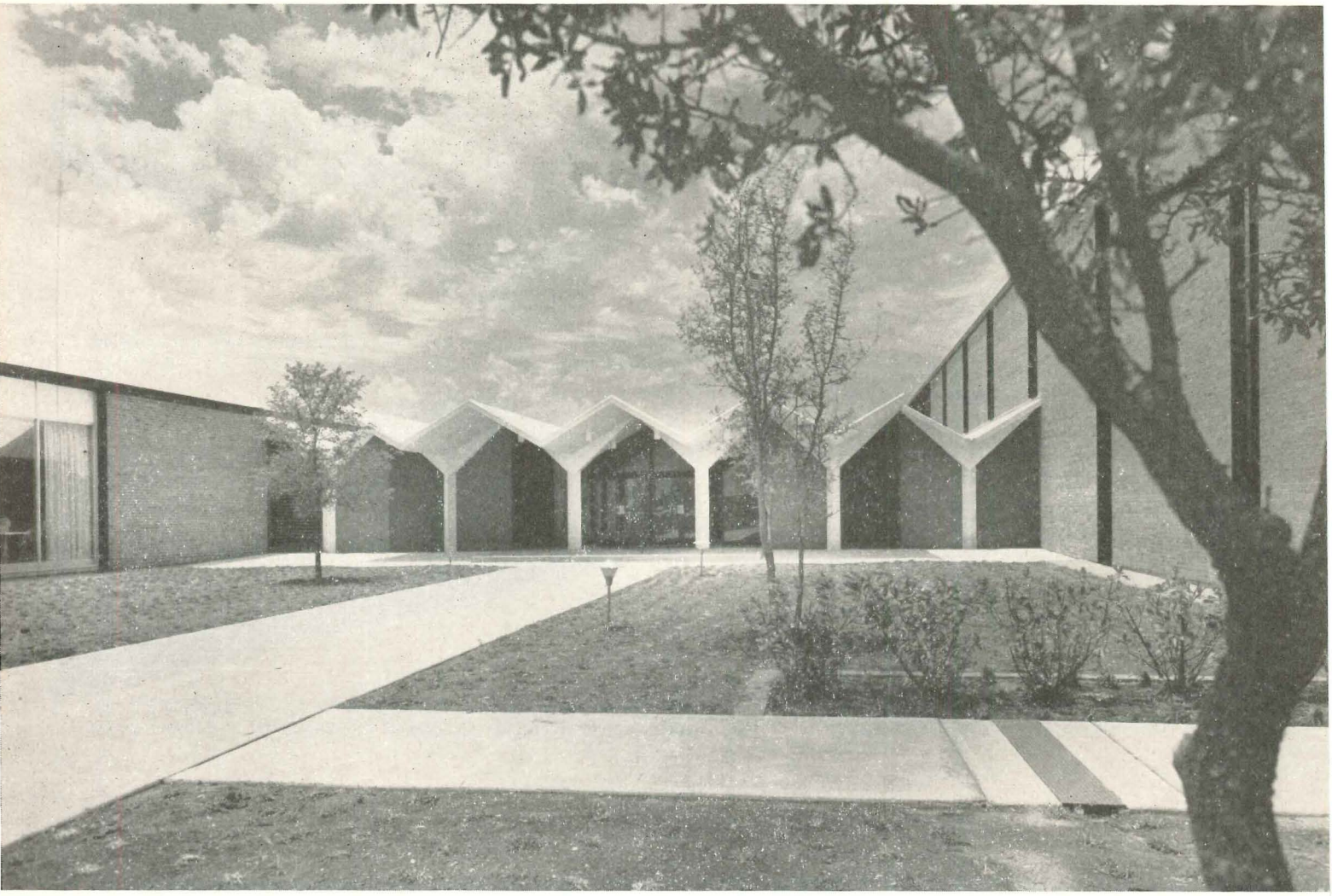
Wayne Wright photos





ENGINEERING CENTER COMBINED WITH OFFICES FOR THE AIR AGE

The program for this building complex called for facilities for administration, engineering, research and development, and testing for an aircraft company. The variety of functions, providing for large numbers of visitors, the complex problems of security, and a moderate budget were the important limiting factors of design



Temco Aircraft Corporation
Engineering Center and Offices
Garland, Texas

Harrell and Hamilton, Architects

Gregerson and Gaynor
Mechanical & Electrical Engineers

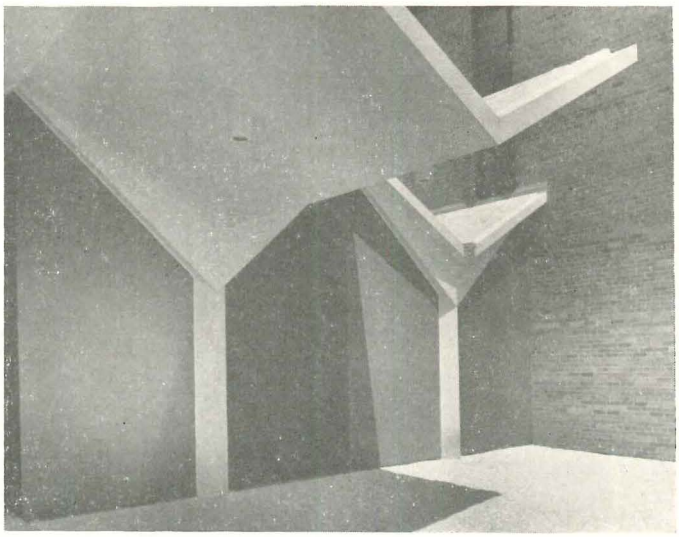
W. L. Ziegler & Associates
Structural Engineers

Mendel Glickman
Consulting Structural Engineer

Raymond L. Goodson, Jr., Civil Engineer

Arthur S. Berger, Landscape Architect

Carpenter Brothers, Contractors



Major functions of the plant are zoned into two areas—a general office building and an engineering-research center. The two are connected by a common lobby with separate entrances for employes and visitors. Security regulations are enforced at this point. The cafeteria serves both buildings and the air conditioning, located in mechanical room number six, functions for both. Otherwise, the two buildings are completely independent, yet closely related for convenience and easy supervision.

An important problem in the design was the provision for expandability and flexibility, in a complex made up of a large number of rooms of varied sizes and purposes. In solving this problem, the architects placed all fixed elements (vault, mechanical equipment rooms, toilets, kitchen and so on) along the corridors, leaving the areas near the exterior walls free of permanent obstructions. Electric ducts are placed under the floors wherever possible. Buildings are windowless except in areas where special requirements made natural light desirable. The buildings are provided with year-round air conditioning.

The engineering center has a 24- by 48-ft bay size, while the office building bays are 24 by 24 ft. All ceilings are approximately 10 ft high except for a portion of the engineering center which has a high bay section with 30-ft-clear ceilings to allow static testing of full-size mockups and fully assembled aircraft.

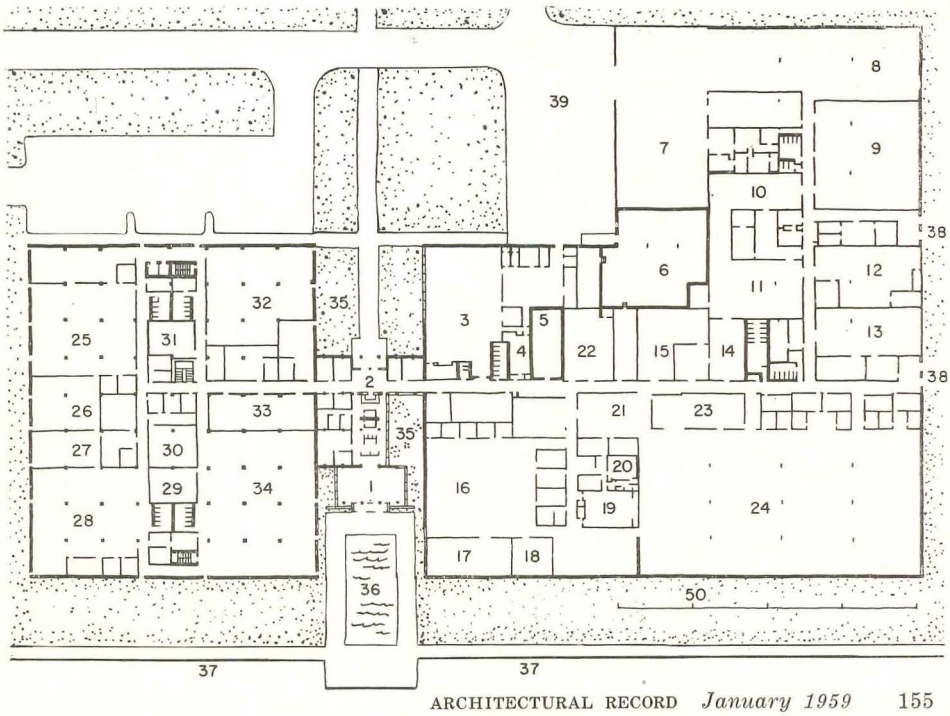
The second floor is devoted largely to large open clerical areas and executive offices.

Clarence John Laughlin photos

The engineering center building, on which construction was begun first, is a one-story structure with a high bay section. The two-story general office building is connected to the center by a glassed-in lobby with a reinforced concrete folded-plate roof

LEGEND

1. Public Lobby
2. Employe Entrance
3. Cafeteria
4. Executive Dining
5. Vault
6. Mechanical Room
7. High Bay Area
8. Model Shop
9. Electronics Area
10. Instrument Lab.
11. Elect. Servo Lab.
12. Environment Lab.
13. Matls. & Processes
14. Main Analog Lab.
15. Digital Computer
16. Research-Design
17. Prelim. Design
18. Advance Studies
19. Projection Room
20. Vice-Pres. Office
21. Administ. Pool
22. Blueprinting
23. Blue Print Room
24. Systems Design
25. Tabulation Proc.
26. Key Punch Section
27. 650 Computer
28. Materials Dept.
29. Mechanical Room
30. Telephone Equip.
31. Mechanical Room
32. Printing Shop
33. Navy Offices
34. Materials Dept.
35. Garden Areas
36. Entrance Garden
37. Visitors Parking
38. Entrance Canopies
39. Service Yard



SEASIDE PLANT FOR PRECISION ELECTRONIC COMPONENTS

The most fundamental considerations in the design of this plant were the resort character of the surroundings and the complete environmental control required for the precision products. Appearance was carefully studied and plant systems designed for high lighting levels and close control of production area humidity, temperatures and dust

Beckman-Helipot Corporation Plant
Newport Beach, California

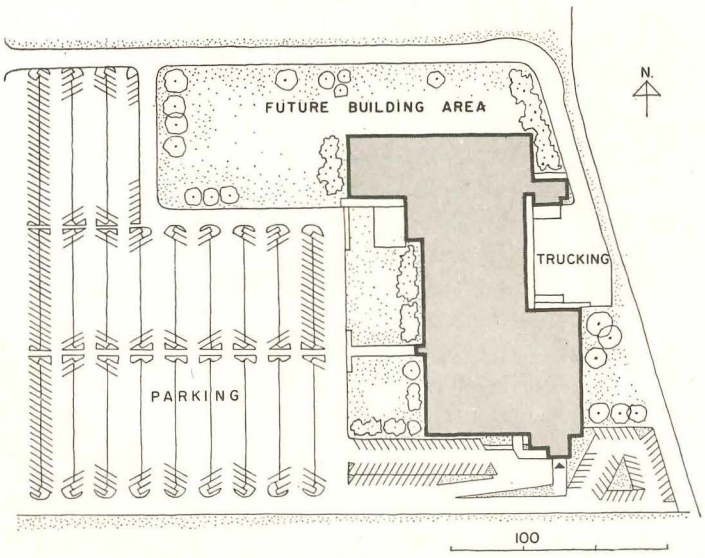
Pereira and Luckman
Architects-Engineers

Fred Lang
Landscape Architect

Joe Wyckoff & Associates
Kitchen Consultants

George Erb, Barker Brothers
Interior Designers

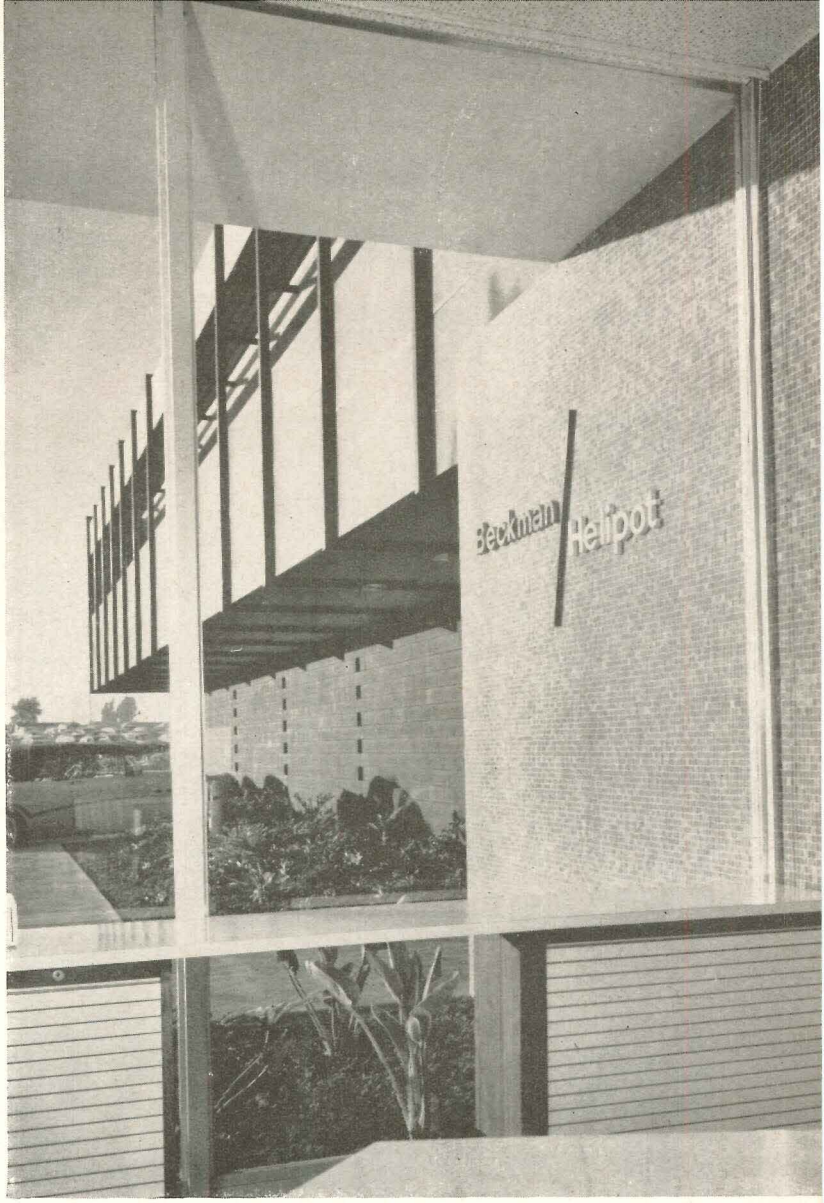
M. J. Brock & Sons
Contractors



The plant is located in close proximity to the sprawling resort areas and beaches of Newport, Balboa, and Lido Isle. It produces helical potentiometers and other types of precision electronic components. Manufacturing facilities are provided for the complete production of parts and the assembly of entire units. In addition, portions of the building are used for engineering, administrative offices, research and development and related services.

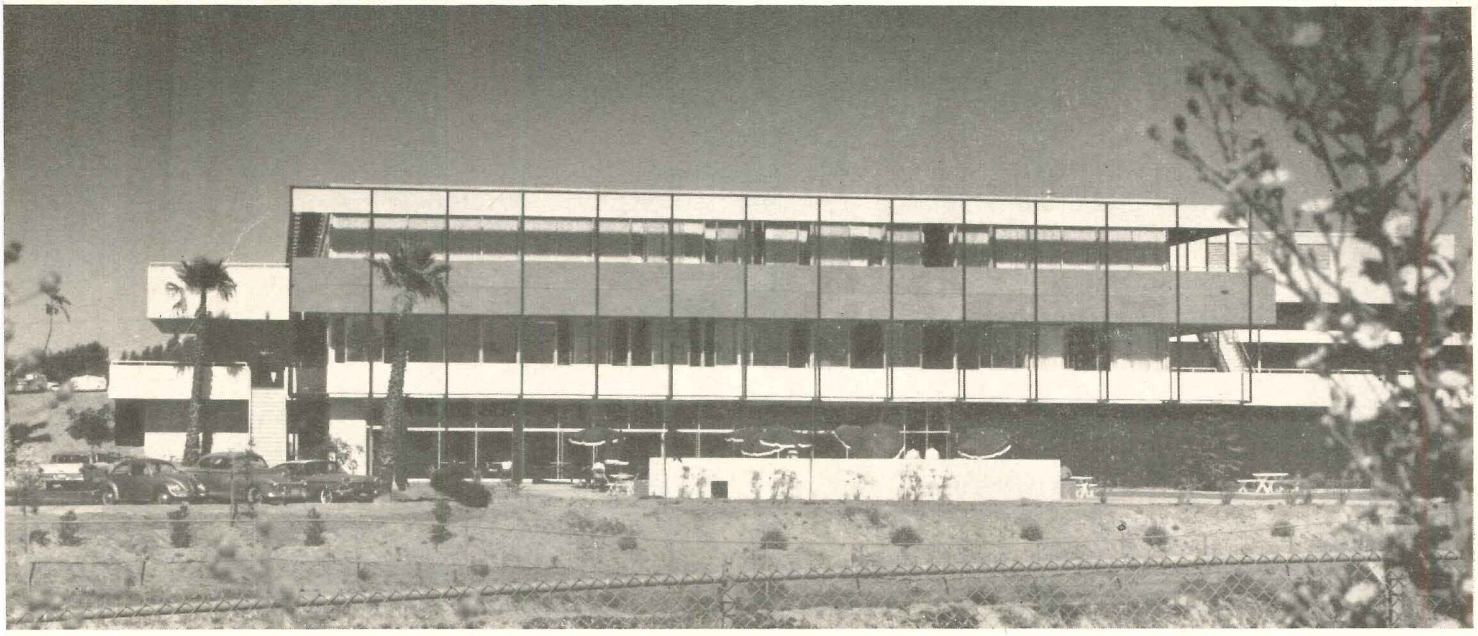
Environmental control and the desire to exploit the location for the benefit of the employes were the major elements of this design. Because of the fineness of the work, lighting levels are very high in production areas—135 to 150 foot-candles at working heights and up to 175 foot-candles in the extra-fine assembly and inspection areas. The entire production space is provided with year-round air conditioning and controls to maintain dust particle sizes below 2 microns. The owners believe the development of the scheme to harmonize with and complement the surrounding resort area and to exploit the Southern California climate to the fullest extent was of utmost importance.

Another important aspect of the design was the intention of the company to double the size of the plant in the near future. Accordingly, the plant was designed for eventual expansion and the site work done for the completed facility. Walls facing the future additions were covered with detachable metal curtain walls. Utilities were sized for the ultimate demand. It is felt that expansion can be made without stopping work.



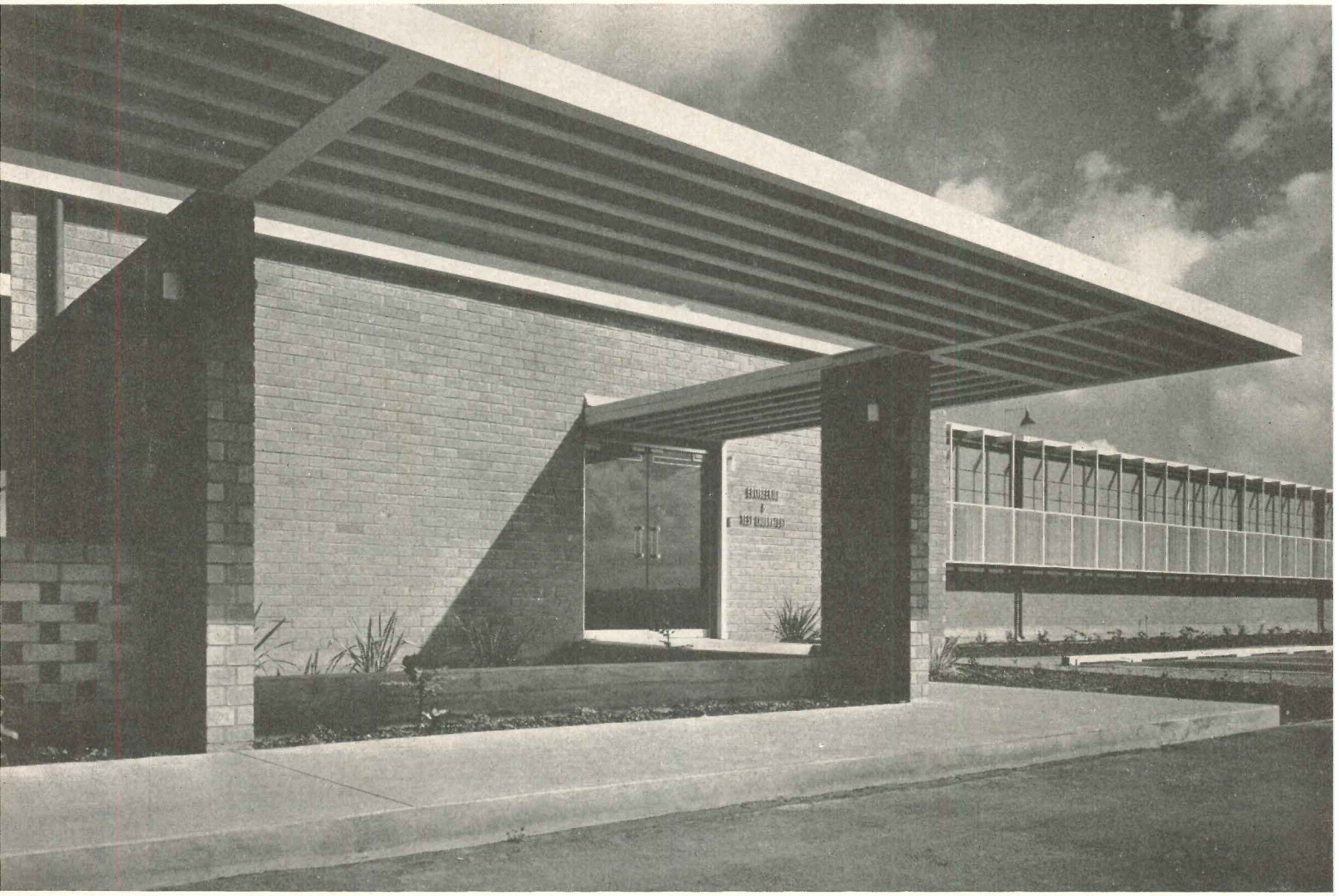
The owners and architects believe that the design of the new plant will result in better relationships with the neighbors and aid in attracting the large number of high-caliber, experienced, technical personnel required for the plant operation

Julius Shulman photos



RESEARCH AND PRODUCTION FUNCTIONS SEPARATED IN ELECTRONICS PLANT

As the newest division of the parent company, the direction and extent of the growth of this plant are relatively unknown. Because of this, the owners required a manufacturing plant and industrial laboratory at moderate cost, with flexibility provisions for expansion of all departments, maximum security, minimum maintenance

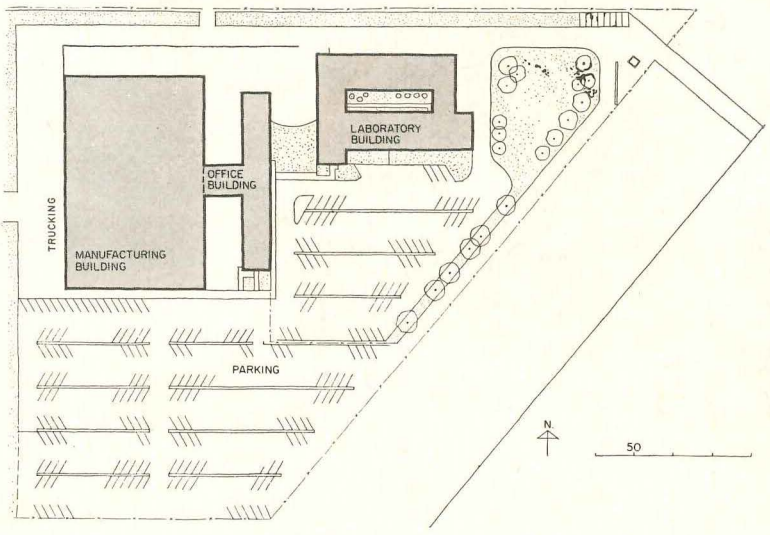


B. J. Electronics Division Plant
Borg-Warner Corporation
Santa Ana, California

John Kewell and Associates
Architects & Engineers

William Taggart
Structural Engineer

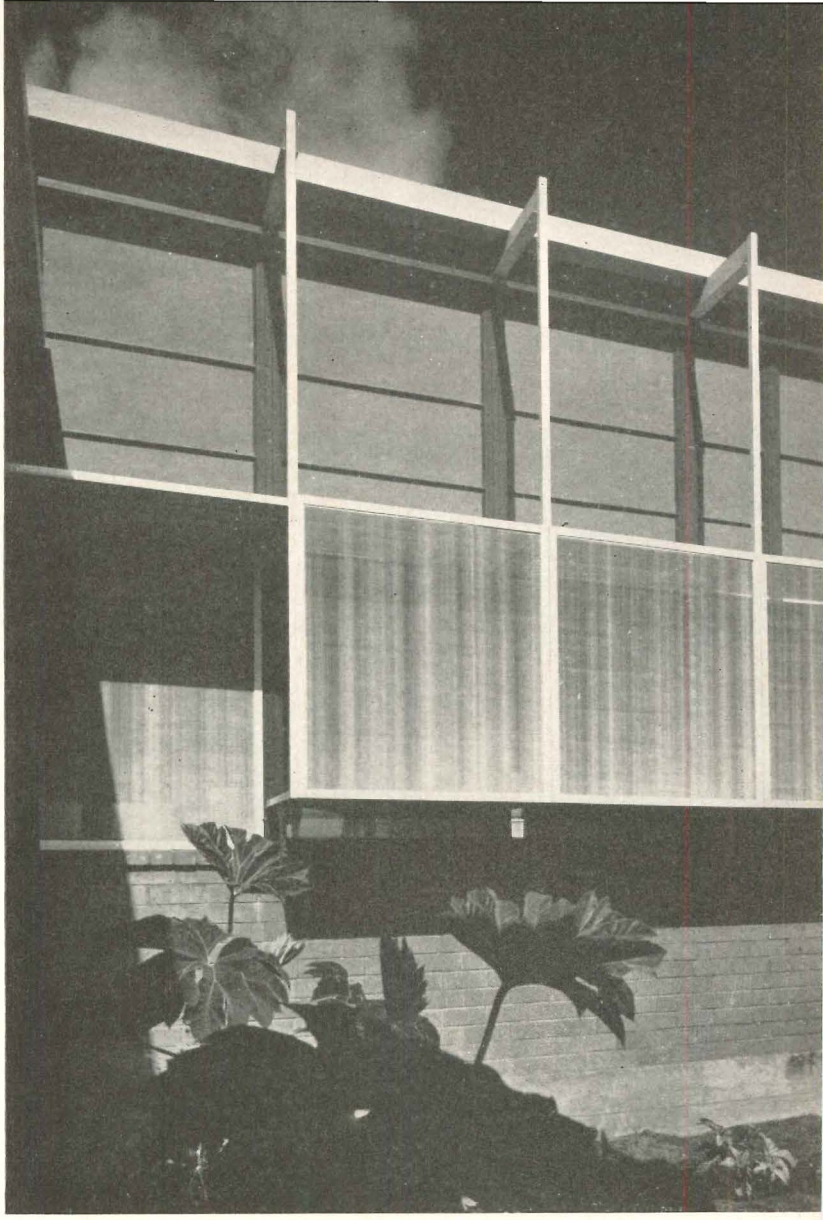
C. L. Peck Construction Co.
Contractors



Because of the more measured pace of the laboratory work, the different types of personnel employed in the manufacturing and lab areas, and the extent of security required for the two types of work, a decision was made to physically separate the functions into two buildings with an office wing between to serve both.

All traffic feeds from the highway through a main gate. Production personnel park in a non-security area and are checked at a guarded gate as they enter the manufacturing building. Laboratory and research personnel use a separate security parking lot adjacent to their building. The employment office is located so as to be easily accessible from a non-security parking area.

Flexibility of use is provided for by movable partitions, and provisions for hanging ceilings at varying heights (with changes in height possible when required). The movable walls were developed by the architects. Permanent interior walls are used only around the toilets in the production area. Services in the laboratory are laid out with outlets on 5-ft intervals. Light fixtures may be hung from supporting conduits at 5-ft intervals and can be adjusted in height according to the ceiling heights used in particular areas. Expansion is provided for by the use of temporary columns at certain exterior walls, removable aluminum wall panels, and steel sash bolted in place. By these means the laboratory can be readily expanded to the east, the manufacturing area to the west, and the offices to the north and south. All materials would be salvaged for use in the expanded plant.

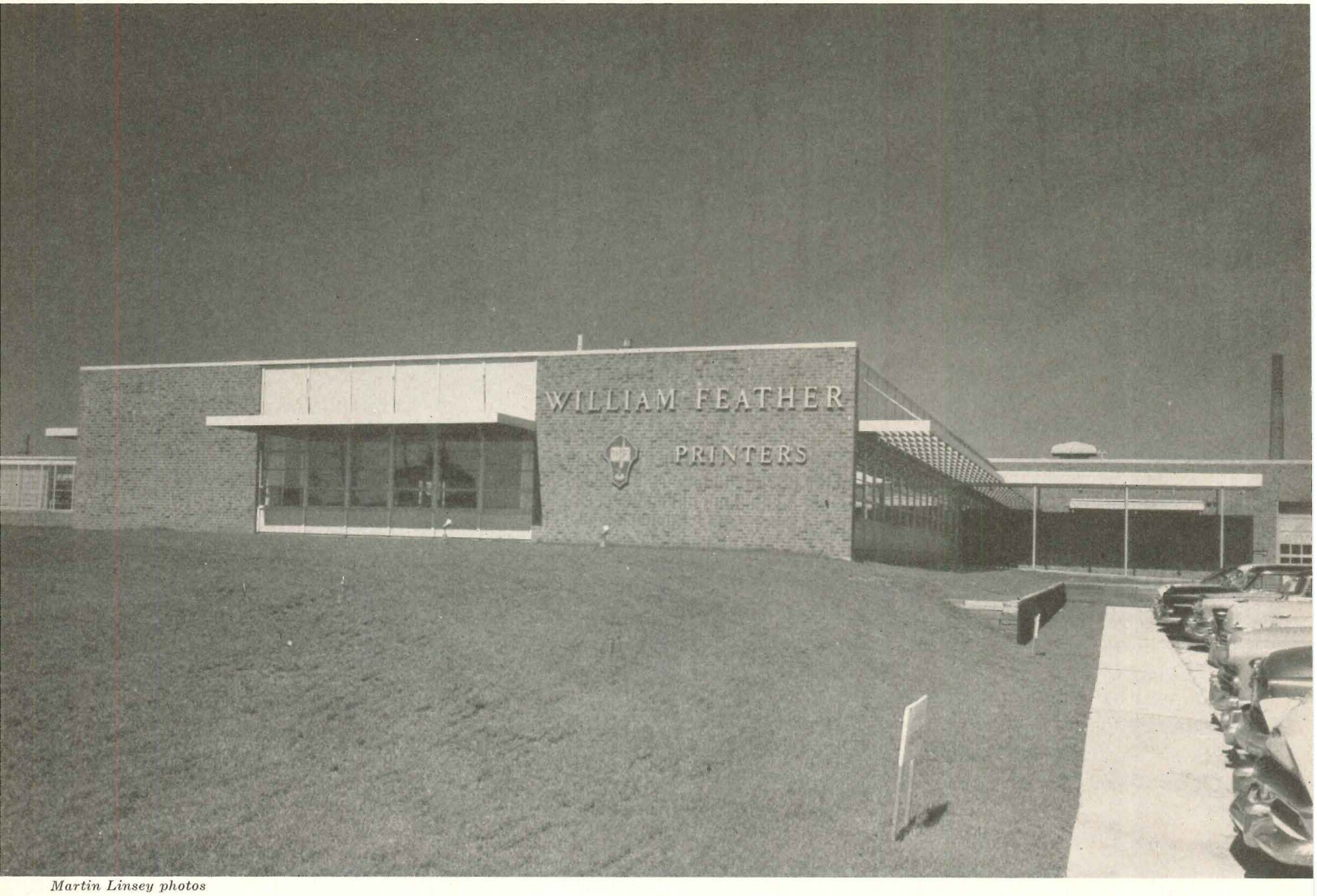


In order to create a more pleasant atmosphere for the office workers and research personnel, the administrative offices are faced toward a garden area and the laboratory was planned around a garden patio which all engineering offices face

Douglas Simmonds photos

COMPLETE FACILITIES FOR PRINTING PLANT ON OUTSKIRTS OF A CITY

Major requirements were for a single-story building to include all the operations of a complete printing plant doing black-and-white, multi-color, and full-color work of many kinds. A special effort was required to provide the personnel with cheerful, pleasant surroundings in which to work and efficient layout of all departments

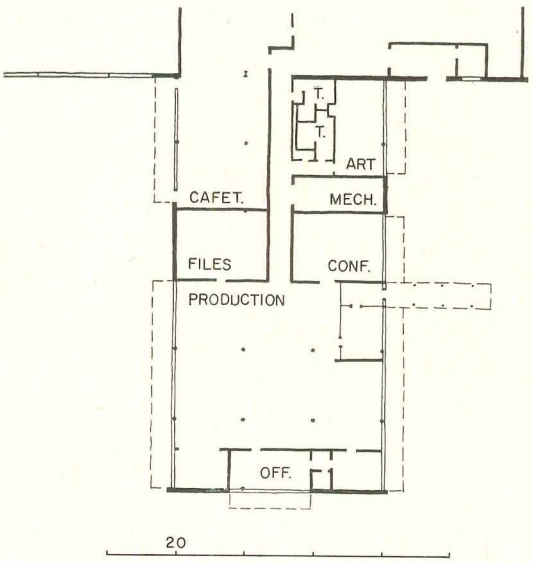


Martin Linsey photos

The William Feather Co.
Printers
Cleveland, Ohio

Dalton-Dalton Associates
Architects-Engineers

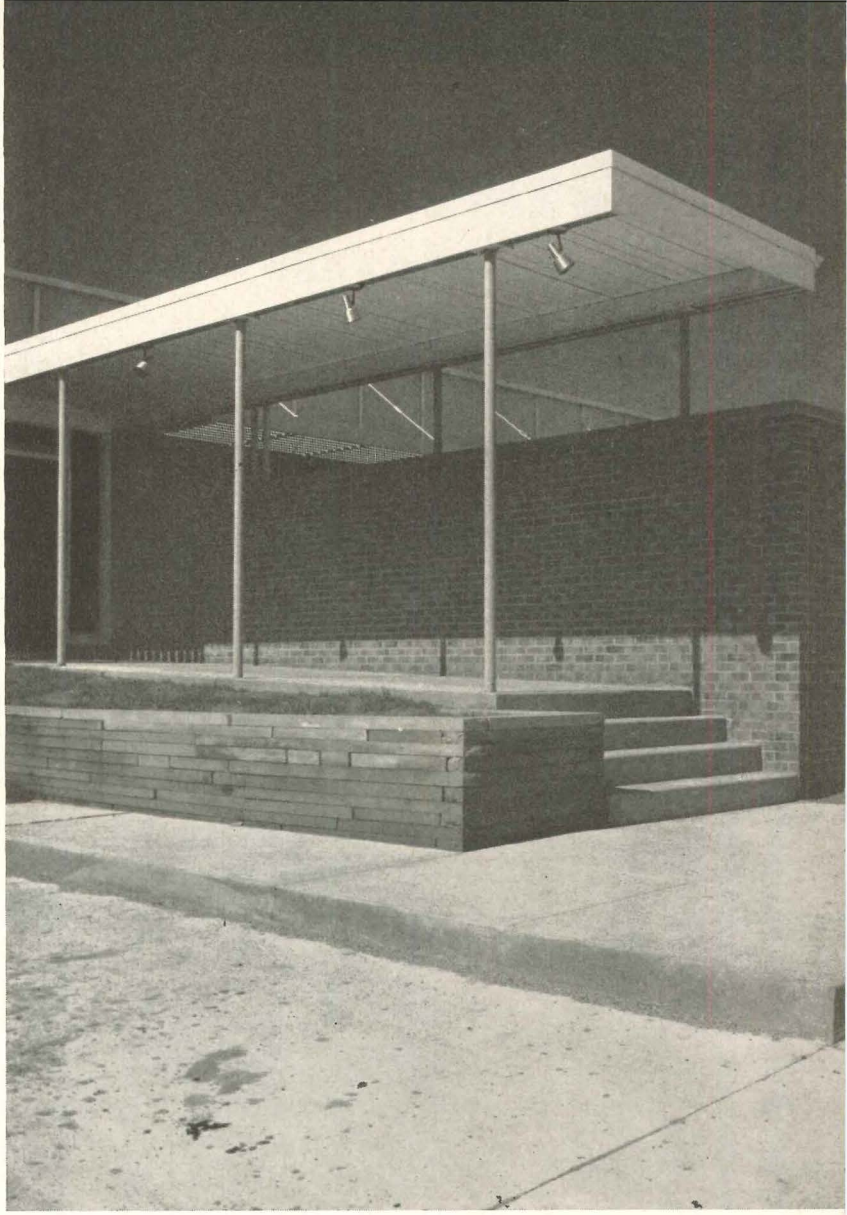
Leonard Krill Company
Contractors



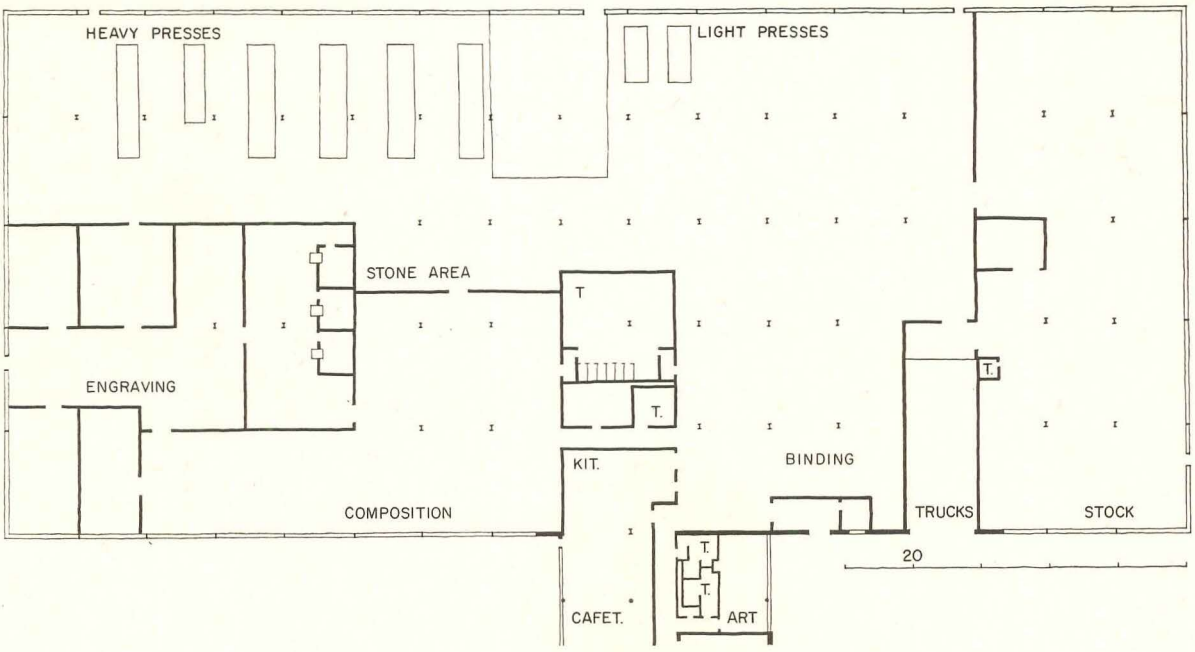
The company designs and manufactures catalogs, publications, brochures, annual reports and similar printed products. In addition, it produces advertising plates for use in national publications. This building houses all of the operations of the company, except automatic mailing and offset printing operations which are handled elsewhere. Future plans include the construction of additional space at this location for these.

The building was designed to permit efficient, economical production of the printed products. Flow through a typical production run is as follows: 1. Art Department—visualization and layout, preparation of copy and artwork for production; 2. Composition—typesetting by hand or machine (monotype or linotype), production of electrotypes for larger press runs; 3. Photoengraving—production of plates from line drawings, photographs, or other artwork; 4. Stone Area—assembly of type, plates, and so on into complete pages, assembly of pages into forms to be printed in one color at one time on the presses; 5. Presses—actual printing of sheets; 6. Bindery—printed sheets first folded, then bound and trimmed; also stitching, hole punching, or other operations; 7. Shipping—completed products shipped to another location where they are automatically addressed and mailed.

Large windows are employed on the north side to provide the diffused light considered a necessity for good printing work. Edge-maple floors are used in the press room and other production areas to absorb the vibration of the large presses and lessen fatigue.

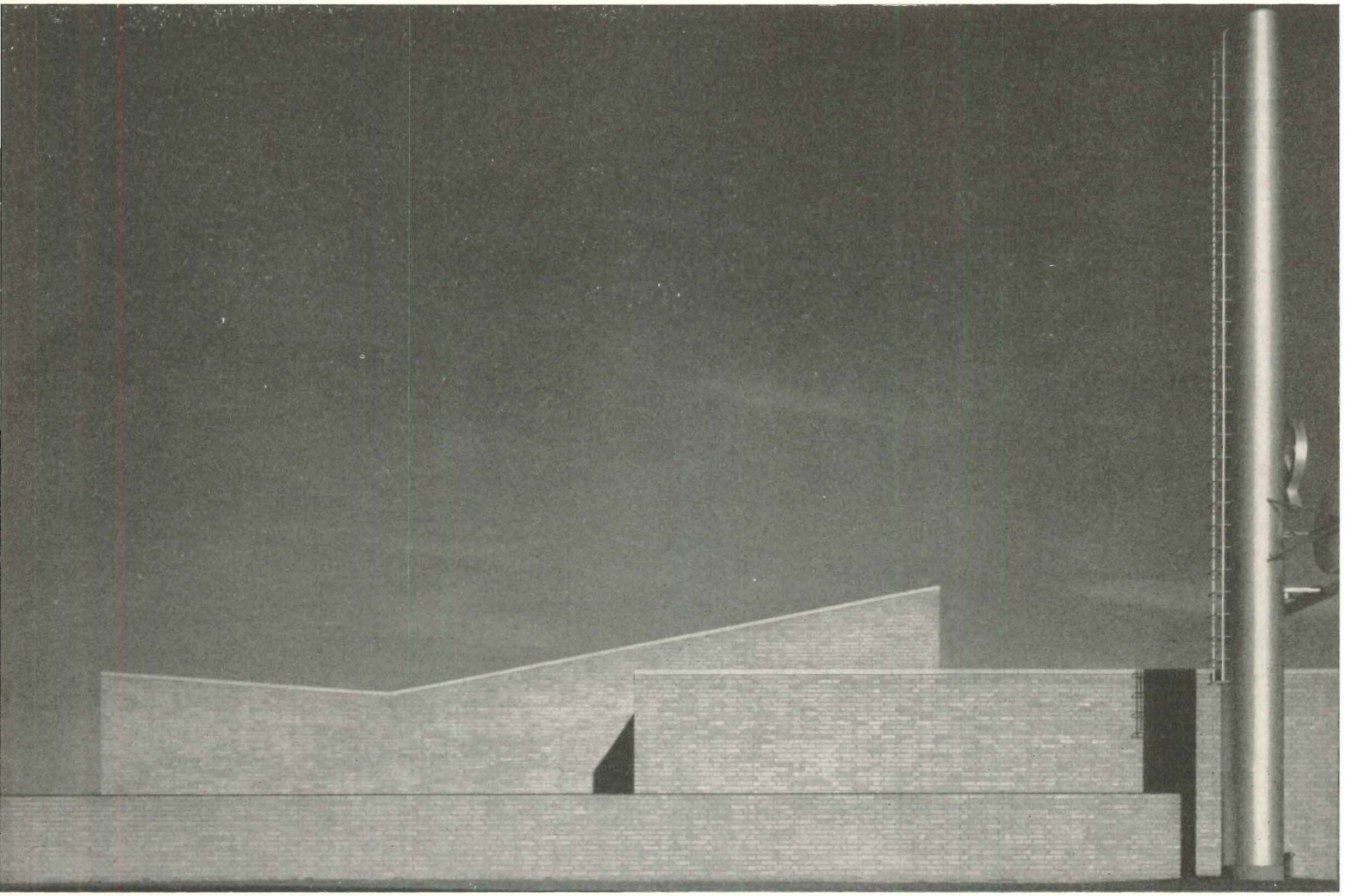


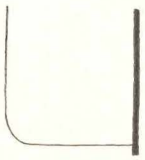
Facilities provided are zoned into a large production area located in the main building, with the reception area, lobby and other departments (administrative and sales offices, art department, and auxiliary service areas) in a smaller wing which projects forward



SIMPLE GEOMETRY FOR A DANISH CYLINDER BORING WORKS

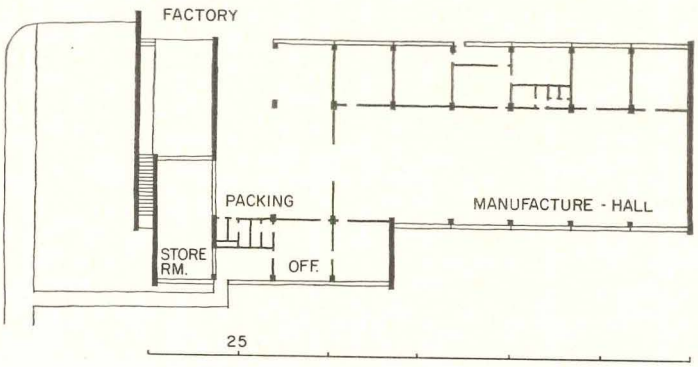
The bold forms of this building are executed in such everyday materials as concrete, brick, glass, and steel. There exists here a sense of fitness to purpose and materials not always achieved in industrial buildings. The refinement of feeling is carried into the smallest details, resulting in a dramatic architectural accomplishment





Carl Christenson Motor Works
Aalborg, Denmark

Arne Jacobsen
Architect

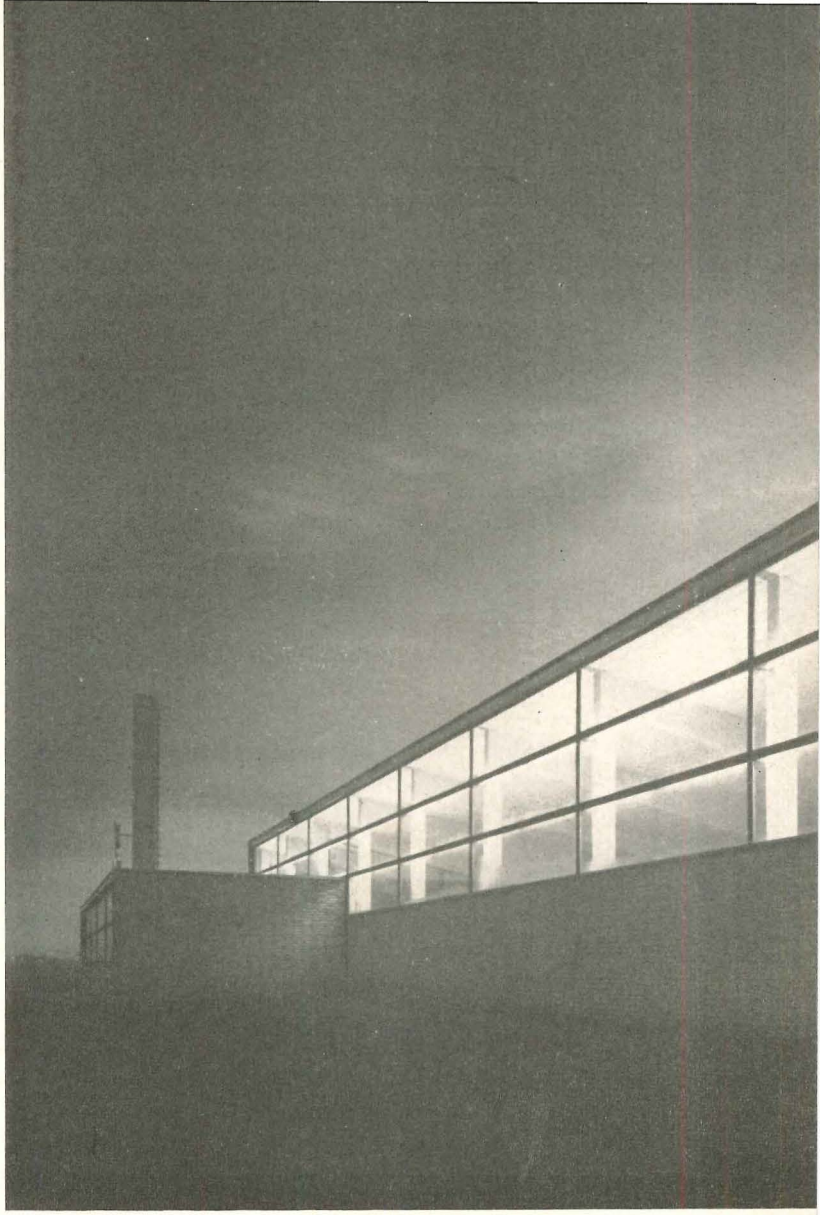


The function of this industrial building is the boring of motor cylinders and their renovation. This is the latest addition to the chain of plants of the company, which has its main works in Arhus and branches at Odense and Copenhagen.

The plant is located on the most important highway between Arhus and Aalborg. This route is heavily traveled and the owners consider the plant location has considerable advertising value. However, municipal regulations forbade direct access to the plant from this road. The entrance is located on a secondary road at the side of the site.

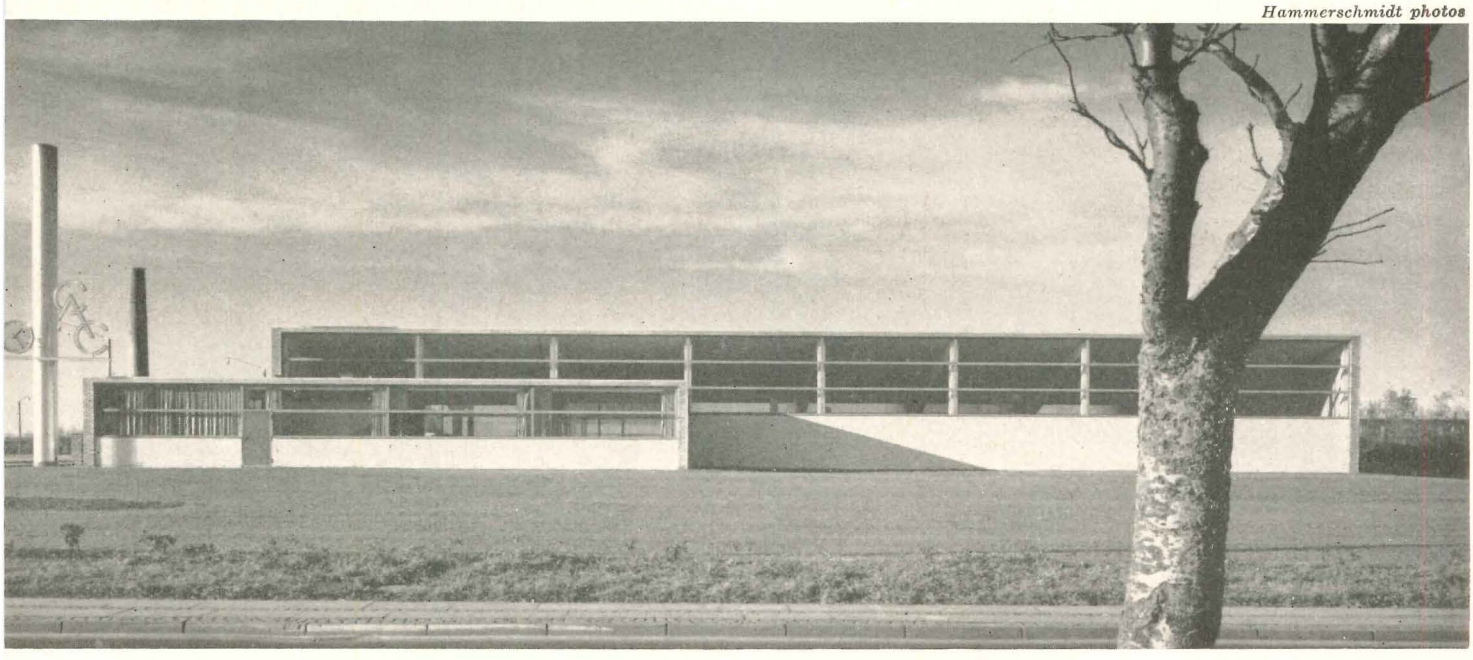
The structure is reinforced concrete with walls of non-load-bearing brick. Interior partitions are constructed of steel frames with inserts of glass. Windows are steel with operating sections above, fixed sash below, and are three meters high overall. Good lighting is extremely important to the efficient performance of the work. In order to supplement the natural lighting from the windows, skylights are employed. For artificial lighting, the plant has strip fluorescent fixtures attached to the horizontal mullions of the windows. The reason for this is the special importance of providing light from the same direction and at the same angle, day and night, in order to insure the proper setting-up of the precision machinery for work. The light strips are designed to be invisible from outside the building.

In addition to the production area, the building includes spaces for offices, a lunch room, bookkeeping department, foundry, toilets, and storage.



The simple monogram sign and clock are illuminated at night with tubular fluorescent lamps bent to shape. The owners believe this clear-cut identification of their building, night and day, is of importance and has high advertising value

Hammerschmidt photos



BOX MANUFACTURING PLANT COMBINED WITH GENERAL OFFICES

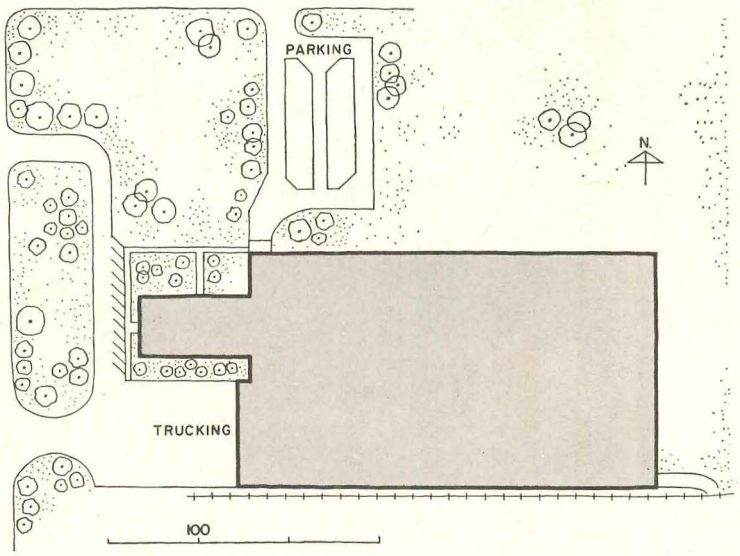
Space was required in this plant for the manufacturing of paper boxes with the auxiliary areas needed and general offices. The production of boxes of the types made here is highly mechanized. The major problem was the design of smoothly functioning, simplified flow lines for fast, efficient handling of materials and products in production

Hoerner Boxes, Inc. Plant
Little Rock, Arkansas

Ginocchio, Cromwell, & Associates
Architects

Richard B. Myrick
Landscape Architect

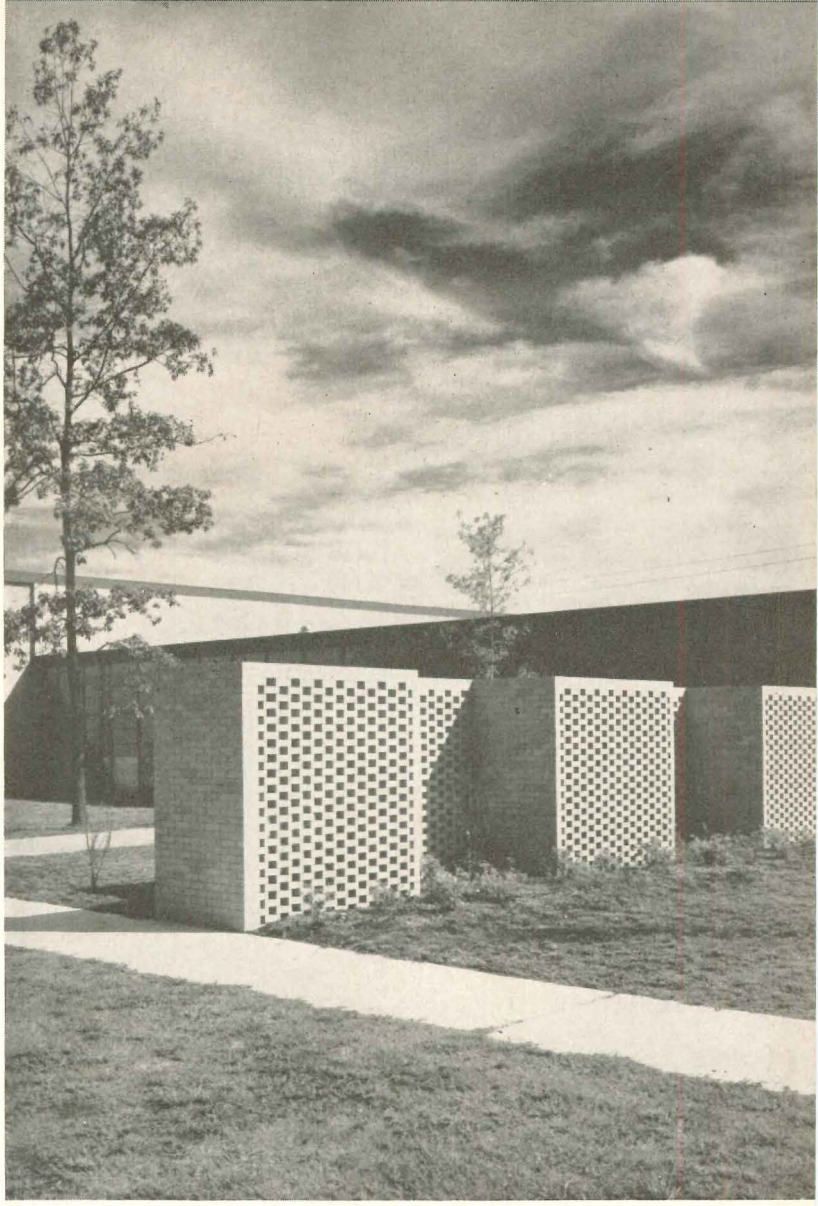
George H. Burden Company, Inc.
Contractors



The flow line within this building is generally a simple S-curve, which begins with the delivery of the raw materials (largely rolls of paper stock) from the railroad siding which runs along the south side of the building. From here, the materials are moved into storage, from which they are removed as required for production. The manufacturing process begins with the entry of the raw materials into the long line of machinery (along the north wall) used for corrugating operations. At the end of this phase, the processing continues (in the reverse direction through the center of the building) along the automatic printing and slotting machines, then through the die-cutting machines and other special operations that may be required. The direction of flow is then again reversed and the semi-finished boxes proceed along the south wall through various finishing operations, and finally go to the loading docks for shipping by rail or truck to the customers.

The structure of the building is steel frame with exterior walls of face brick and aluminum siding. The same brick is used for the free-standing screen walls. Interior partitions are constructed of frame with plywood or gypsum board.

The entire building and its machinery layout were designed for smooth, efficient, production flow, economy, and flexibility. The large, uncluttered floor of the production department and the inclusion of such features as loading docks which are adjustable in height are of aid in achieving these ends.

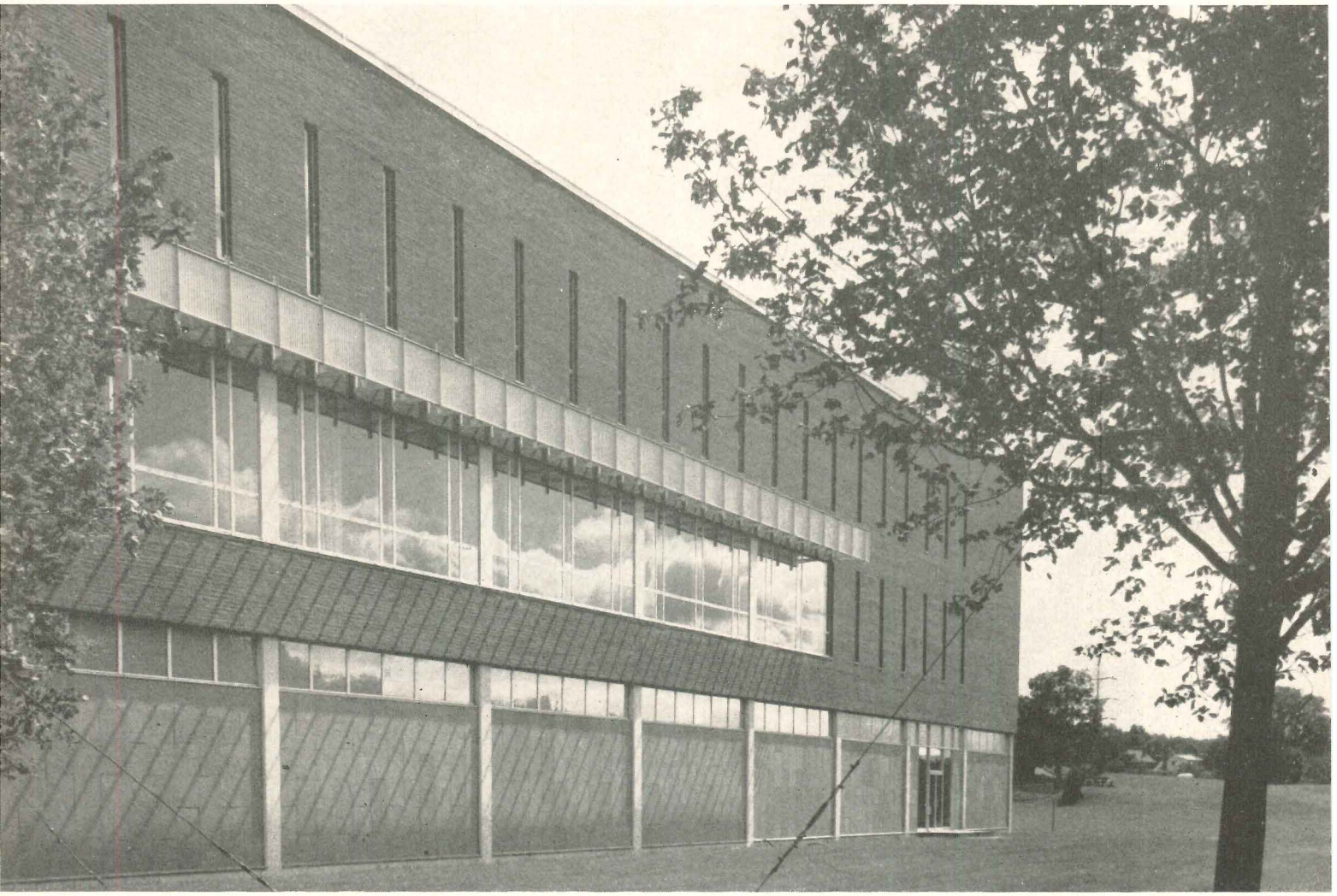


The building plan contains a large manufacturing and storage area which also includes the boiler-mechanical room and machine shop, with a much smaller wing projecting to the west containing the general offices and related service facilities

Wm. E. Davis photos

REGIONAL CHARACTER FOR NEW ENGLAND FILM ASSEMBLY PLANT

The stringent requirements for an almost completely dust-free interior working area for the production of camera film were of great importance in the programming of this building. Another primary consideration was the desire of the owners to construct pleasant, comfortable, and convenient working spaces for their personnel (three shifts)



Polaroid Corporation Plant
Waltham, Massachusetts

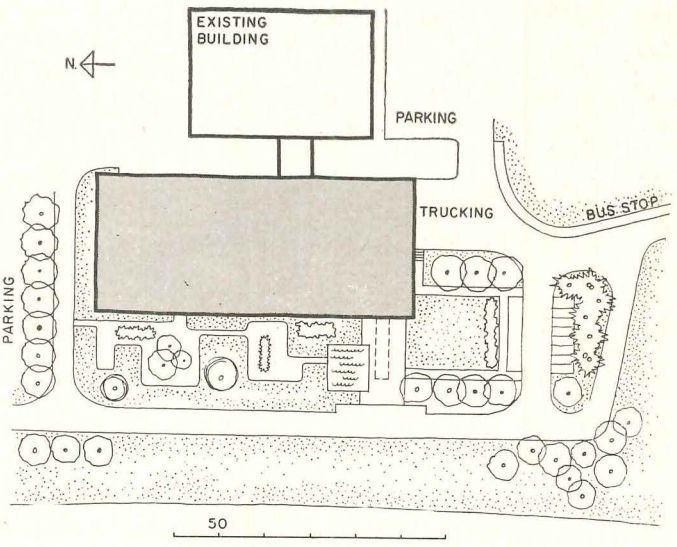
Cabot, Cabot & Forbes Co.
Engineers and Designers

Hugh A. Stubbins
Architectural Consultant

Sasaki, Walker, and Assoc., Inc.
Landscape Architects

Contract Interiors, Inc.
Interior Consultants

Aberthaw Construction Co.
Contractors



This plant is devoted exclusively to the production of camera film for the Polaroid Land Camera manufactured by the company. Production of camera film is an intricate, high quality operation. Machinery operates at high speeds and is largely mechanized. Close control of quality is necessary. The interior atmosphere must be regulated to maintain exact temperatures, humidity, and dust-free conditions.

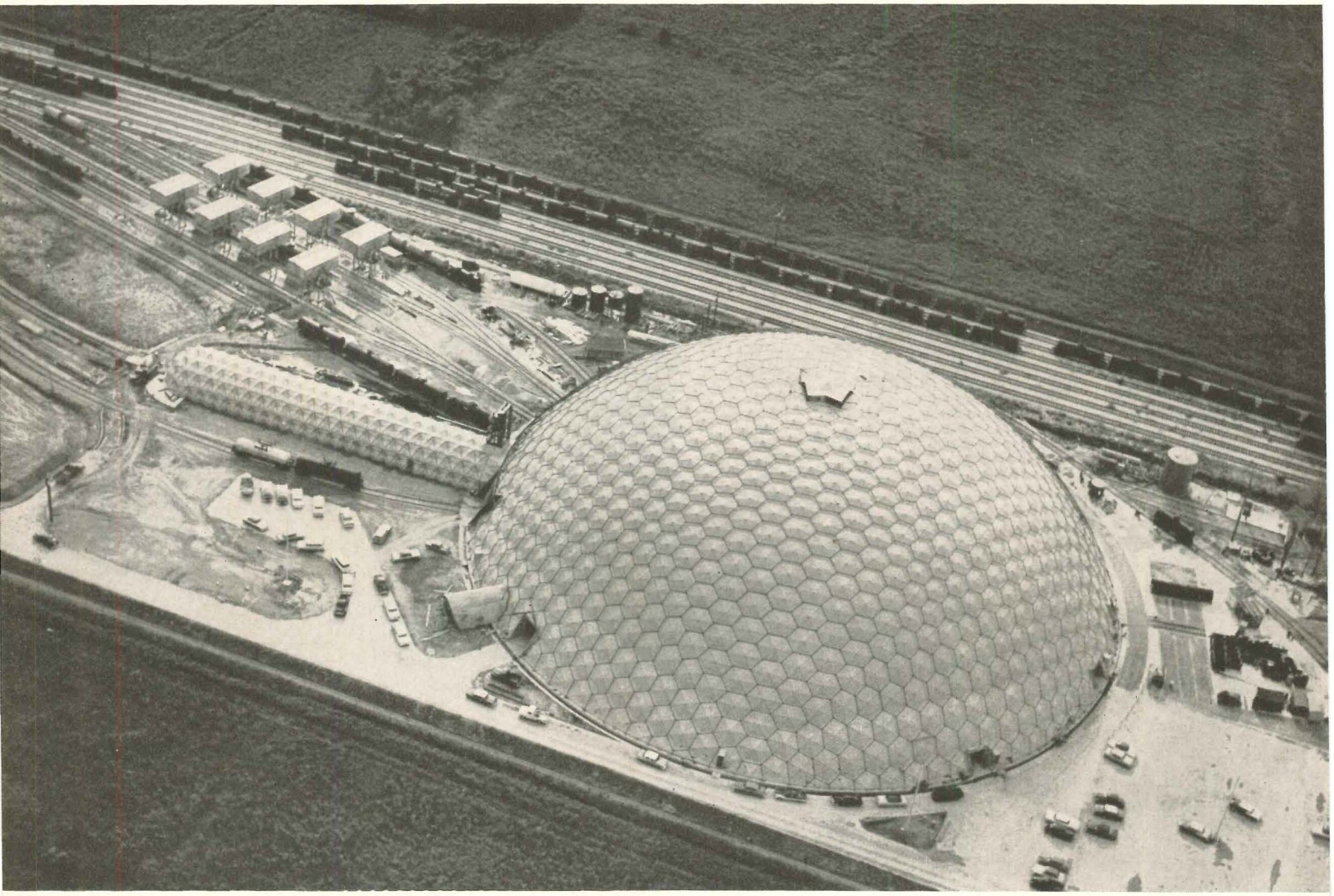
The layout includes two buildings, a small pilot plant originally constructed and a larger manufacturing plant. The main entrance lobby is located in a one-story connecting link between the two buildings. The ground floor of the main building has facilities for the shipping and receiving departments, storage, central maintenance, boiler and mechanical room, and the machine shop. The second floor is devoted to production plus a cafeteria, lounge, medical facilities, classrooms, and offices. It was determined through research that a third floor for production expansion could be built for an additional 15 per cent of the initial cost of the first two floors. To have built this space at a later date would have cost approximately 35 per cent of the initial outlay. Therefore, the building was built with a third floor, unfinished except for stairwells and elevator shafts. The cafeteria, medical facilities, and so on were sized for the ultimate number of employes at the time of expansion.

The first and second floor structure is reinforced concrete, while the third floor is steel. Movable partitions are used throughout most of the office space.

In keeping with the desire to create spaces and appearances in harmony with the surrounding woods and pleasing to the company personnel, natural materials—brick, slate, cypress—are employed in exterior and interior wherever these were feasible

LARGE GEODESIC DOME FOR RAILROAD CAR REPAIR, MAINTENANCE

In a straight-line railroad car repair and maintenance shop, all cars must be moved for one to move. All cars do not require the same amount of work and all work does not proceed at the same rate. Thus, in the conventional shop, the slowest car controls the entire operation. The major problem here was faster, more flexible handling



Union Tank Car Co. Plant
Alsen, Louisiana

Battey and Childs
Engineers & Architects

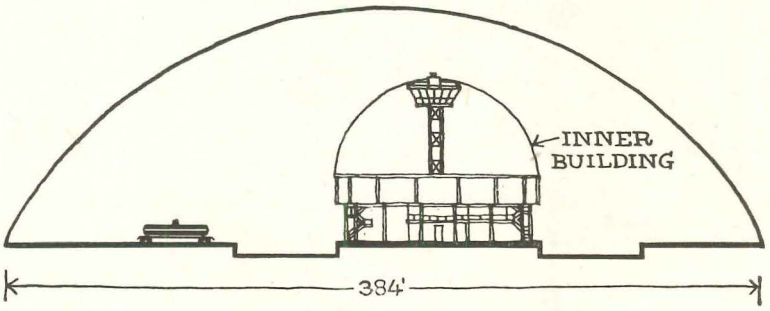
Synergetics, Inc.
Dome Engineers

M. E. Uyanik
Dome Consultant

George S. Hunt
Industrial Designer

Abe Feder
Lighting Consultant

Nichols Construction Co.
Contractors

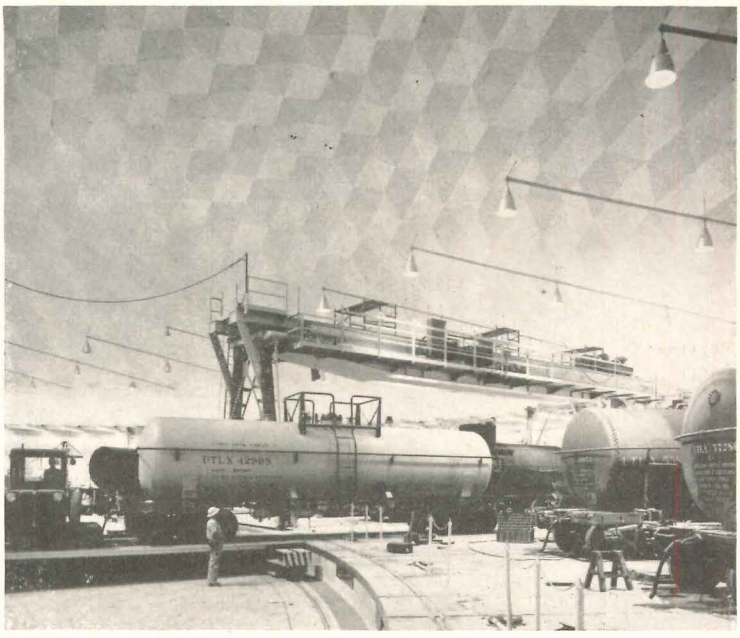


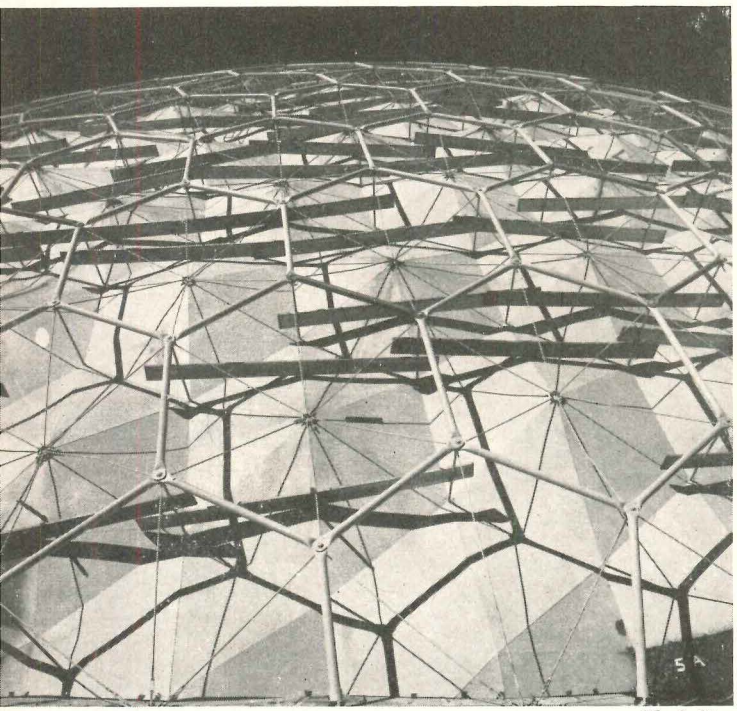
Union Tank Car Company is a leading supplier of tank cars serving the petroleum industry and also leases cars for rail shipment of chemicals, coal tar products, fertilizers, and similar liquid products. Company engineers, searching for a more efficient type of operation for the repair and maintenance of these cars, spent over a year investigating various possibilities. The use of a geodesic dome for the purpose resulted from the engineers' discovery that the major obstacle to fast, economical operations was the usual necessity for tank cars to be moved only on tracks, in only two directions, forward and back. This resulted in wasteful, slow, tedious operations.

The development of circular traffic flow patterns for the operations, fed by a rotating transfer table, led inevitably to the serious consideration of a very large dome-type building, and logically to the Buckminster Fuller geodesic dome finally employed. Investigation of this type of dome showed that in addition to the possibility for smooth flow lines, certain other advantages would accrue from its use. These include cost economy, visual control of all work areas from one central point, flexibility of working spaces, ease of cooling, heating, lighting, and ventilation, speed of erection, low upkeep and maintenance costs, longer period of time before obsolescence, suitability for virtually every type of soil condition. Union Tank officials have plans for using similar structures at their other installations and now have a second one under construction.

In the illustrations may be seen the usual stages involved in the handling of a tank car, from its arrival on a track outside the building, placement of the car on the rotating transfer table, and finally the transfer of the car to one of the maintenance areas

Black Star photos





Black Star

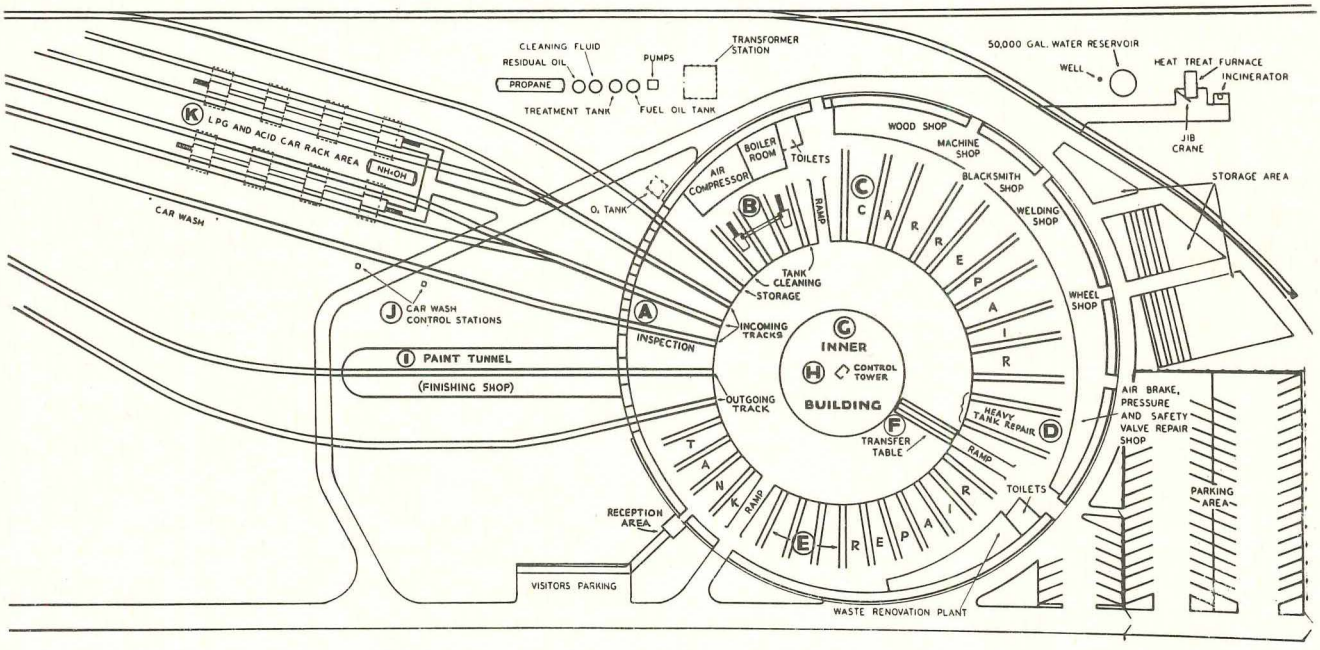
Union Tank Car Co.

Flow lines between the various operations shown in the plan below are as follows: K. Special cleaning where cars which carry gas or acid are cleaned; J. Car wash for exteriors of cars; A. Inspection of cars to determine need for repair or maintenance; B. Cleaning of car interiors; C. General repairs; D. Heavy repairs of tanks; E. General repairs of tanks; I. Car painting tunnel. The transfer table, for moving cars to various positions, is shown in F, the inner building with materials storage offices, and employe's quarters at G, and the tower for control of the operations and communications is at H

The dome allows the incorporation of a diversity of activities into an orderly, coordinated system. Although it accommodates a smaller number of cars within its physical limits than conventional installations of this type, its handling capacity is two to three times as great because of the speed and efficiency now possible. This is very significant since repair and maintenance constitutes the largest single expenditure of a tank car company. The president of Union Tank, E. A. Locke, says, "We are extremely satisfied with our first Union dome and feel strongly that such domes are equally applicable to scores of other industries." The faith of the company in the future of their construction is further demonstrated by their tentative plans to establish a division for the fabrication and erection of the domes for other companies.

Among other things, the building is impressive for its size. It is 384 ft in diameter at its base and 120 ft high. It encloses 110,000 sq ft of floor area and contains nearly half a mile (2,160 ft) of repair track. The control tower dome inside is 100 ft in diameter and rises 80 ft above the floor. Built of steel, the dome weighs 567 tons but its design transmits relatively small loads to the ground.

Lighting of the dome is entirely artificial. The main source is a "wheel of light" suspended 34 ft above the work areas. The 332 ft diameter wheel contains 106 color-corrected mercury vapor 1000 watt lamps. These provide about 50 foot-candles of illumination in the work areas.



Architectural Engineering

SCHOOL FIRE TRAGEDY—OBJECT LESSON FOR BUILDINGS OLD AND NEW. Because the 2½-story school (Our Lady of Angels) which burned Dec. 1, taking the lives of 89 pupils and four nuns, was nearly 50 years old and built of brick-veneered walls and plaster on wooden lath partitions, architects might think the fire's relevancy to today's modern structures slight. Causes of this disaster, however, point otherwise. Absence of a stairway enclosure and protective fire doors at the second floor allowed the fire to shoot up from the basement and to spread throughout the 107-ft second floor corridor. Flames were fed by combustible acoustical tile on the corridor ceiling (used also in classrooms) and by children's clothing hung along the corridor wall. Smoke and superheated, noxious gases filled the corridor, blocking attempts at escape. Fire was prevented from entering the first floor level by a closed fire door off the stairway. According to the National Fire Protection Assoc., which had engineers on the scene day after the fire, the simple fact that no such protection existed at the second floor was largely responsible for the loss of life. NFPA also reported that, "There were neither sprinklers to extinguish the basement fire, nor automatic detection equipment to give warning; and while the manual fire alarm in the building was reportedly sounded, it was too late."

Emil Szendy, who has written this month's article on "School Fire Insurance Costs," is careful to point out that, "While a building which earns a low insurance rate is also likely to be safe for the occupants, it does not necessarily follow that safety to life is assured by conformity with insurance requirements. Insurance premiums are calculated in terms of building loss not life loss. Frequently, conformity with life-safety requirements earns little if any reduction in premium. In schools of fire-resistive construction, enclosure of the stairs will not appreciably reduce the premium charge, yet even the lightest enclosure will retard spread of fire and smoke and facilitate safe egress of occupants. The Chicago school fire demonstrated something architects have not been too willing to believe: smoke and flame race rapidly up unenclosed stairs, even in a building as low as two stories. There also is the possibility that protective closures, which earn a lower premium rate, will obstruct safe evacuation. In all buildings, especially schools, provision for escape should be paramount and should not be limited to minimum code requirements or to construction which will earn an acceptable insurance rate."

SOME MORE INTELLIGENCE ON RUSSIAN CONCRETE. Eduardo Torroja, renowned Spanish engineer in a personal interview with ARCHITECTURAL RECORD last month reported that not only is Russian precast-prestressed concrete of poor quality, but that production is not quite what it has been touted. Torroja headed an eight-man team of Western European engineers invited by the Moscow Academy of Architecture and Building Construction to discuss codes and safety factors for reinforced concrete with eight technical representatives from the East. He says that the Russians set their output of prefabricated components in one Moscow factory at 600 cu meters per day (784 yards). Their national objective is 60 million cu meters per year three years hence. Our guess is that Russian technicians are having difficulty reconciling the potential capacities of production-line concrete factories with the abilities of the Russian labor force and realities of field construction.

WHAT'S NEW ABOUT MODULAR COORDINATION? Nothing, basically, but efforts are afoot here and in Europe to promote wider acceptance. Two of the organizations involved are the Modular Building Standards Association in the U.S. and the Modular Society in England. While modular coordination—preferably called modular measure by MBSA—means many things to many people (usually a convenient module that fits a particular project, bay size, panel size, etc.) to these above groups it means use of 4 in. or any multiple of 4 in. to control the dimensioning of buildings—on the board and in the field. While formalization of this particular concept began nearly 20 years ago in the U.S., acceptance has been spotty. Those who have immersed themselves in the idea, however, and taken the trouble to battle with draftsmen, builders and laborers, seem to like it because they feel one way or another it saves money.

One result that apparently has come out of the many years of proselytizing by modular disciples is the announcement by the Veterans' Administration that it is switching to modular measure in the design of all new hospitals. All of the agencies standard details are being revised. Modular design will not be forced on private designers, but VA will recommend its use. The Veterans' Affair Committee of the House has asked the Modular Building Standards Association for material to support a possible directive requiring the use of modular design in VA hospitals.

The Modular Society in England completed an experimental modular structure in October which is a 20 ft cube purposely incorporating about as many materials and components you could think of, ranging from bricks to curtain wall panels. The October issue of *Prefabrication* (London) describes the building process and some of the difficulties encountered: "The major snag . . . is not the . . . tolerance in single units but in structural frames where cumulative errors occur and small faults in manufacture or fabrication are multiplied by the lengths of the members."

HEAT PUMPS GETTING MORE ATTENTION. Featured at the 65th annual meeting of the American Society of Heating and Air-Conditioning Engineers in Philadelphia January 26-29 is a symposium of five papers on heat pump performance. To be discussed are both central source and package type heat pumps installed in buildings ranging from office buildings to houses.

THIS MONTH'S AE SECTION

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How Choice of Construction and Design Details Determine

SCHOOL FIRE INSURANCE COSTS

By EMIL SZENDY, A.I.A.

The item of school fire insurance comes close to the top of many architects' lists of potential school economies. But while school designers may chafe at what they feel to be certain inequities in fire insurance rates, a reduction in the rates themselves, even at the most optimistic, would not seem to promise a great saving in dollars. It is not, however, insignificant considered over the lifetime of the building. What is more important, perhaps, is the wide difference in rates for fire-resistive and non-fire-resistive construction — as much as 10 times. The significance of this is two-fold: First, the savings in material costs must be carefully balanced against the increase in insurance cost. Second, conditions considered hazardous should be avoided and protective devices installed according to regulations to avoid inordinate penalties.

The author, as well as being a registered architect and authority on performance building codes, has been a school board president. He wrote the Cleveland and Harrisburg Codes and was formerly technical director of the New York State Building Code Commission. When he was school board president, he initiated correction of violations which sometimes saved as much as $1400 a year in insurance on a million dollar school; cost of correction (in this case an improper transom condition between buildings) was only $600. The intricacies of the various factors which determine fire insurance cost are spelled out here. The second article, next month, will give several specific examples to exemplify the use of fire insurance tables (as reproduced herein), methods of correcting faults which make costs higher than they need be, and the cost relation between different constructions and insurance on them.

It is unfortunate that during the construction period the emphasis is on first cost and the architect is praised or damned for his success or failure in producing a structure at a low unit cost per cubic foot or per classroom. Costs of operation and maintenance, including the cost of keeping the building insured against loss by fire, are sometimes ignored in the hectic struggle to keep within the budget. However, the architect is frequently not without blame when the building is eventually insured at a high premium. Though he cannot be expected to be familiar with rating formulas, he should be aware that, for example, fire-resistive sections should be separated from non-fire-resistive sections by standard fire doors, and that flues considered unsafe by the rating bureau should not be installed.

Of course it does not follow that construction should necessarily be limited to that which will be accorded the lowest fire rate. When, first of all, safety of the occupants is assured by the design and construction, changes to more expensive materials or construction should be evaluated against the potential savings in premium costs. Sometimes small expenditures will more than justify themselves by large savings in premium costs during the first year of operation. In other cases the additional expenditure will prove unwarranted.

A factor which also must be considered is the availability of funds for the initial construction. The need for the building constructed from available funds may be so great that potential future savings may be disregarded. However, when this is done, it should be done with the knowledge and concurrence of the school board to avoid later repercussions when the insurance bills come in.

Rates, in themselves, are not true criteria of actual insurance costs; the insurable value must be taken into account and actual premium costs calculated. A building with a short life expectancy, such as a temporary addition constructed to accommodate a peak enrollment that is expected to taper off in a few years, might be built of frame construction carrying a high insurance rate. Nevertheless, because of low first cost and low insurable value, coupled with portability and potential re-use, this building would be more economical in the long run than permanent fire-resistive construction. On the other hand, the plans for permanent buildings in any school system should be carefully scrutinized for potential savings in insurance costs. Disbursements for insurance yield no return in improved education to the school district. During the life of the building, usually from 30 to 50 years, small annual savings become large total savings, and should not be casually disregarded.

Insurable Building Values

In the rush to place insurance on the building the day it is occupied, a sum approximately the cost frequently becomes the face value of the policy, and may even be designated as 80% coinsurance.*

With building costs rising steadily, insurable values have increased, frequently without change in the face values of policies. In the event of a severe fire, the cost of replacement may not be recovered.

Insurable building values may even include amounts for architects' and engineers' fees, legal fees, administrative costs and insurance during reconstruction and, for the larger buildings, the cost of the clerk of the works.

Rating Affects Building, Contents, and Extended Coverage

In estimating insurance costs and potential savings, the calculations should not be limited to construction costs alone. The insurance rate on the contents is directly related to the insurance rate on the building. Except for frame buildings, the contents rate is the building rate increased by the fixed charge given in the rating schedule. For buildings classified as fire-resistive, the in-

*80% coinsurance is a common form of insurance coverage, and most rates are predicated on it, with the Owner carrying insurance for at least 80% of the insurable value. Under most such policies, the insurance company usually pays the net amount of the loss, sometimes subject to depreciation, up to 80% of the insurable value or the face value of the policy whichever is less. Whenever coinsurance policies are in effect, the insurable value should be accurately established and maintained so that, in the event of loss, there can be no contention that the face value of the policy was less than the specified percentage of the insurable value.

crease is 4 cents per hundred dollars of insurable value; for buildings classified as non-fire-resistive, the increase is 8 cents per hundred where the building is in part fire-resistive and the exterior walls are masonry, and 6 cents per hundred where less than one-third of the exterior walls are of frame. The seeming inconsistency in a lesser charge where frame construction is incorporated is explained when the 2 cent charge added to the building rate for the frame construction is noted; the latter compensates for the former. For frame buildings, the contents rate is the same as the building rate.

Extended coverage is a term applied to insurance covering perils of windstorm, hail, explosion (not including bursting of steam boilers, turbines, engines or pipes, or of machinery by centrifugal force), riot, riot attending a strike, civil commotion, aircraft, smoke, and vehicles. It is usually written as a rider on the fire insurance policy. When the first $50 of loss by windstorm or hailstorm is assumed by the insured ($50 deductible clause), the extended coverage rate for buildings coded as non-fire-resistive is 6 cents per hundred for both building and contents; for buildings coded as fire-resistive, with non-combustible roof construction, the rate for both buildings and contents is 5 mils per hundred when the fire insurance rate is more than 5 cents per hundred but does not exceed 7.5 cents per hundred. If the roof of the fire-resistive building is wholly or in part of combustible construction, the rate for extended coverage is 1½ cents per hundred for both building and contents. The use of combustible roof decking may involve a substantial annual premium charge.

The Rate Structure

The formulas applied in determining building rates are complex and the architect is well advised to consult an expert, the rating engineer of a reputable fire insurance company or a qualified consultant in insurance, while plans are in the development stage. The consultant's suggestions should be carefully considered and evaluated in terms of dollars and cents according to estimated premium costs. When a proposed construction deviates from a recognized standard, the consultant can secure a ruling from the rating bureau in advance of incorporation of the deviation in the structure. (Also, the consultant keeps abreast of rates that are revised frequently and of official interpretations and rulings not commonly available in publications.)

It is apparent to any student of the rating structure that some inequities result. It is also apparent that the formulas are a composite of tradition, judgment and experience, and that some of the traditional components are out-of-date and the judgment which established other components can be questioned. Flues are no longer lined with cast iron, and fire-clay flue lining is frequently used instead of fire brick. Ventilating systems are usually of sheet metal rather than of brick, tile, or concrete. (See Non-Fire-Resistive Schedule) "Stack fires, unapproved" in non-fire-resistive buildings, carry a penalty charge of 20 cents per hundred; the modern architect would not know what is meant by this phrase. On the other hand, existing fire insurance regulations have no direct application to the hazards of present-day air conditioning systems. The requirements for both fire-resistive construction and non-fire-resistive construction for the "basis" rate are in need of revision, and the penalty charges for deviations therefrom appear to bear only an arbitrary relationship to the hazard introduced and, in some instances, seem to subsidize sub-standard construction. Revision of the components of the formulas would require very involved actuarial analysis as well as the interpretation and application of available data on relative fire-resistance and fire hazard.

The great equalizer of insurance rates is the "Classified Experience Adjustment" which appears as the second-last item on each of the Schedules and is applied to determine the net building and contents rate. This adjustment is a percentage increase or decrease of the rates calculated from the formulas, and is an actuarial adjustment predicated on the loss record as related to the premiums collected. It is published periodically by the rating bureau. The present adjustment percentages on buildings and contents in areas protected by adequate water supply and fire fighting apparatus and personnel are as follows for New York state:

Frame	*+ 51%*
*Masonry (ordinary construction) ***	*+ 52½%*
Fire-resistive	*— 49½%*

The trend in rates has been up on non-fire-resistive construction and down on fire-resistive construction.

The schedules included herein are the current schedules applicable in the State of New York outside the City of New York, and to parts of Queens and Bronx Boroughs in the City of New York included in the Suburban Division. Rates, schedules and regulations will vary elsewhere and are under the control of the local insurance rating organization.

The rates are the annual charges per hundred dollars of insurable value for one-year policies in amounts not less than 80% of the insurable value (80% coinsurance). For longer term policies the annual rate decreases; for five-year policies, the annual rate is four-fifths the rate for one-year policies. When Classification Experience Adjustments downward are made during the life of a policy, the insured should receive a refund applicable to the unexpired term. That is part of the service the agent or broker should furnish. Sometimes he doesn't.

Who Establishes Rates

Rates are established by the local fire insurance rating organization subject to the approval, in the State of New York and many other states, of the state insurance department. These are nonprofit organizations supported by participating fire insurance companies. The published rates are obligatory and are applied by both capital stock and mutual companies with the exception of some companies that have other approved rates on file with the state insurance department. Discounts or reductions not authorized by the rate structure may not be applied. Mutual companies may, through dividends, refund part of the premium as a sort of profit-sharing inducement.

Key Rate and Basis Rate

Each municipality or fire district has an assigned "key rate." As will be noticed from the Schedules (pp. 176-179) the "basis rate", which is the point of departure in calculating rates for specific risks, depends upon the "key rate." The major factor affecting the key rate is the classification assigned to the municipality or fire district on periodic evaluation of the local conditions and fire-fighting potential. Availability of water under adequate pressure for fire fighting and the effectiveness of the fire department determine the fire-fighting potential. Also considered are the codes and regulations affecting construction and fire prevention and the extent to which these conform to standards established by the Under-

**Masonry (ordinary construction), also called "brick" construction, is applied to structures built with masonry exterior walls having less than 1/3 of the area of wood (such as wood windows), and with interior wood joist floor and roof construction and wood stud partitions. It used to be considered the conventional non-fireproof construction and is a specific class of construction under most building codes. When more than 1/3 of the exterior wall area is of wood, the building is classified as a frame building.

writers and are enforced. To the architect the term "protected" usually means protection—by metal lath and plaster or other accepted means—of structural steel or wood framing members to achieve a specified fire-resistance rating. In fire insurance the term "protected" sometimes means protected by available fire-fighting equipment and services. The term is, however, also used with the connotation of protection of framing members in fire insurance schedules, adding to the difficulty of interpretation of insurance regulations. As will be noted from the schedules, "basis" rates for "unprotected" structures (without adequate fire-fighting potential) are much higher than those applicable where key rates have been established.

Occupancy Codes

In all rating matters, code numbers are assigned to each type of occupancy and are important in interpreting the regulations and applying adjustments. The present code number for school occupancy is 105; under a previous coding, it was 106. All of the occupancies to which a rate schedule could be applied usually carry different code numbers. When they carry different code numbers they are subject to other Classification Experience Adjustments, and the seeming inequity of including diverse occupancies under the same rate schedule is adjusted thereby. For instance, the occupancy code for club houses is .075, and the adjustment percentage for fire-resistive structures is –25% as compared with –49½% for schools.

Construction-Protection Number

For insurance purposes, construction is classified as either fire-resistive or non-fire-resistive, and only two schedules are provided. For coding purposes, insurance risks are classified as follows:

1. *Frame Protected*
2. *Frame Unprotected*
3. *Brick Protected*
4. *Brick Unprotected*
5. *Fire-Resistive Protected*
6. *Fire-Resistive Unprotected*

The "protected" refers to the presence of satisfactory fire-fighting potential.

Risk Code Number

The risk code number is a combination of the occupancy code number and the construction-protection number. For instance, a fire-resistive school in an area with adequate fire-fighting potential would carry the code number 105-5. The risk code number is important in interpreting rate cards.

NEW YORK STATE UNIFORM SCHEDULE FOR RATING NON-FIRE RESISTIVE PUBLIC BUILDINGS

Hospitals, Sanitarias, Asylums, Jails, Public Homes, Museums of Art, Educational Institutions, Colleges,

Standard Requirements

WALLS. Of masonry, including incombustible. All other walls classed as frame.
Note—Parapets of standard thickness and height, where required.

AREA. Not to exceed 10,000 square feet ground area in buildings of ordinary construction, 25,000 square feet in buildings of non-combustible construction except roof.

HEIGHT. Not over 3 stories.

FRAME TOWERS OR CUPOLAS. None on brick buildings.

ROOF COVERING. To be metal, slate, tile, asbestos shingles, or approved composition.

CORNICES. Of incombustible material.

FLOORS. Not less than 2 inches in thickness.

FLOOR OPENINGS. Enclosed in standards shafts and have thin glass skylights in top protected with wire netting; all openings into building protected by standard swinging fire doors with panic release.

Note 1—Stairway piercing 1 floor only may have 4-inch non-combustible enclosure with standard doors (as above).

Note 2—For frame buildings, enclosures equal to floor resistance with self-closing doors.

EXPOSURE. None chargeable by application of Exposure Schedule.

COMMUNICATION. None.

HEATING. Hot water or steam systems, properly installed, or hot air systems properly installed and thermostatically controlled. Flues or chimneys of hard burned brick not less than 8 inches thick, lined with fire brick or cast-iron, and built from ground or foundation, and laid in Portland cement mortar. Throat capacity not less than 96 square inches if steam boiler other than low pressure is used, all floor timbers trimmed at least 4 inches from outside of flue (4-inch masonry chimneys with tile lining throughout, or Underwriters' Laboratories approved prefabricated chimneys, may be used for ordinary sized heating systems).

VENTILATING SYSTEMS. Flues to be of brick, tile or concrete with automatic dampers and not terminate in attic. If power driven fans or blowers, to be so arranged to be quickly stopped. Motors or engines to be located in properly enclosed rooms.

LIGHTING. To be approved installation of gas or electricity.

OCCUPANCY HAZARDS. To be located in rooms cut off by standard fire doors, floors to be of cement, ceiling if not fireproof to be protected by metal or expanded metal lath and plaster and room to be protected by an approved sprinkler system.

OCCUPANCY. Not to be occupied for reform school, almshouse or jail purposes nor for housing insane or other mental defectives. Scenery on stage limited to set wings; no additional sets nor drop scenery nor fly gallery permitted.

INTERNAL PROTECTION. In accordance with Standard Requirements.

1	**BASIS.**	
a	In cities of basis rate of less than .26	.16
b	In cities of basis rate of .26 to .36	.22
c	In cities of basis rate of over .36	.26
d	Unprotected	.42
2	**WALLS.**	
a	Less than 1/3 frame	.02
b	1/3 or over frame	.10
3	**AREA.**	
a	For frame unprotected or Class C risks grading as large in Dimension Table of the Uniform Exposure Schedule, for each 1,000 square feet or fraction thereof of the total floor and roof area, charge	.01
b	For other risks for each 1,000 square feet or fraction thereof over 10,000 square feet (ground area), ordinary construction (not to exceed .28); 25,000 square feet, non-combustible except roof (not to exceed .05), charge	.01
	Note—Deduct 10% of area charge for each 8-inch solid masonry or 12-inch hollow masonry wall dividing and strengthening risk, provided it extends to roof. Allowance not to exceed 40%.	
4	**WOOD SHINGLE ROOF**	.04
5	**HEIGHT.**	
a	Over 3 stories, each story	.04
b	Frame towers or cupolas on brick building	.02
	Note—Not cumulative with No. 4.	
6	**FLOORS.** Less than 2 inches, per floor	.015
	Note—Not to exceed .05.	
7	**FLOOR OPENINGS.** Not standard, per floor	.015
	Note—Not to exceed .05.	
8	**HEATING.**	
a	Hot air furnaces, not thermostatically controlled	.04
b	Stoves (not cumulative with a)	.04
	Note—No charge for gas or electric units safely arranged.	
c	Chimneys, bracket	.10
cc	Chimneys deficient in thickness or lining (no charge for unlined brick chimney built in masonry wall)	.05
d	Stack fires, unapproved	.20
	Note—Charges under "c" and "cc" are cumulative.	
9	**VENTILATION.**	
a	Ventilating wood flues	.05
b	Ventilating wood flues, metal lined	.03
c	Ventilating metal flues, safe	.01
d	Flues terminating in attic having combustible floor or roof or used for storage, or otherwise unsafe	.10
e	No automatic dampers where required	.015

Schools, Convents, Academies and Clubs other than Outdoor Sports Clubs

10	**LIGHTING.** Other than by approved gas or electricity	.05
11	**OCCUPANCY.**	
a	Reform School	.08
b	Insane or defectives	.08
c	Almshouse	.08
d	Jail	.08
12	**OCCUPANCY HAZARDS.**	
a	Instruction in manual training, hand work	.04
b	Instruction in manual training, power	.08
	Note 1—If more than 1 shop, make full charge for each if power used. If no power used, make full charge for 1 shop and one-half charge for each other shop. Note 2—If for other than instruction purposes, double above charges.	
c	Chemical laboratories	.04
d	Kitchen	.04
e	Dormitory	.04
f	Laundry, hand power	.04
g	Laundry, power	.08
gg	Bowling alley (except in Schools)	.08
h	Boiler house	.08
i	Outbuildings except greenhouses	.08
j	Hall with scenery	.12
k	School Bus Garage	.08
	(Double above charge if repair work is done. Charge is cumulative with charge for automobiles under Item 25a.)	
	Note 1—Charge under Item 12 not to exceed .04 in buildings classed as fire resistive or fire resistive except roof.	
	Note 2—Items 12c through 12k inclusive are not cumulative.	
	CREDITS	
14	If risk is within 500 feet (street measurement) of hydrant on approved high-pressure system for fire service only	10%
	Note—When a high-pressure system otherwise approved will deliver not less than 50% of the required quantity at standard pressure, the above credit may be pro-rated.	
15	Approved sprinkler equipment in basement	20%
16	Fire resistive grade floors, standard cut off to basement	15%
a	Without standard cut off	7½%
	Note—Not applicable where credit is given under Item 24.	
17	Approved fire stops or no concealed spaces throughout	10%
	Note—Not applicable where credit is given under Item 24.	
18	No heating apparatus in building	10%
a	If cut off in fireproof room in building	5%
19	Approved internal protection	7%
	Note—First aid equipment on fire truck shall be deemed to constitute adequate internal protection throughout premises occupied by fire department.	
a	Class C outside protection	7%
20	Watchman and Approved Clock or approved thermostat system reporting directly to public police or fire department station with warranty that the system will be regularly tested and maintained by the installing company	7%
21	Approved day and night nurse service in hospitals only	7%
	Note—Not cumulative with No. 20.	
21A	Auxiliary fire alarm in conjunction with watchman and clock or approved day and night nurse service	3%
21B	Approved thermostat system reporting to central station	15%
21BB	Approved supervisory watchman service with auxiliary fire alarm reporting to central station	10%
	Note—Item 21BB cumulative with ½ of credit under Item 21B.	
21C	Special credit	10%
21D	Masonry walls with non-combustible floors and roof (excluding metal deck) throughout except that roof supports are of bay timbers, or laminated wood beams, measuring not less than 6 inches in any dimension. (Cumulative with Items 14 through 21C inclusive)	40%
	UNEXPOSED RATE (Apply Credits Items 24 and 24A)	(.....)
22	**EXPOSURES.** As per Schedule.	
22A	80% Building and Contents rate, except as below	....
23	**80% CONTENTS RATE,** including pipe organ, add to building if credit Item 24 applies and to protected masonry building where no charge is made under Item 2a	.08
a	Where charge is made under Item 2a, add	.06
24	**CREDIT FOR PART FIRE RESISTIVE CONSTRUCTION** pro-rated as per Fire Resistive Percentage Credit Table and increased 40%.	
24A	**SPECIAL CREDITS.**	
	1—[Ed. Note: does not apply to schools; therefore omitted]	
	2—Special Credit applying to Educational Institutions, Colleges, Schools, Convents and Academies.	
	a—Brick and Frame Protected and Unprotected	15%*
	*Stop Rate—.035. No risk to rate below minimum for private dwellings or private outbuildings under a similar degree of protection, except by reason of sprinklers or equivalent exceptional protective equipment.	
25	**FAULTS OF MANAGEMENT.** Add to all rates, as per Table.	
	Note—Electrical Defects charge eligible to credit as per Item No. 24.	
26	**CLASSIFIED EXPERIENCE ADJUSTMENT**	
27	**NET BUILDING AND CONTENTS RATES**	

The Fire-Resistive Schedule

According to the Uniform Schedules, the schedule for rating fire-resistive risks may be applied to:

Buildings with masonry or concrete exterior walls and fire-resistive throughout with floors and roof of masonry or reinforced concrete or, if fire-resistive except roof (no combustible floors permitted), being at least three stories in height (basement under 50% of grade floor to be considered a story) will be rated on the appropriate schedule for rating fire-resistive risks where such a schedule is provided.

Note 1—A roof of non-combustible material, including metal deck construction, permitted.

Note 2—A one-story communicating section with a combustible roof, except a gymnasium or auditorium, will disqualify a building for such Fire-Resistive Schedule application.

In other words, to be rated under the Fire-Resistive Schedule, the building must be fire-resistive throughout with the following permissible exceptions:

1. In buildings three stories or more in height the roof may be combustible construction (with penalty charges applied as scheduled).
2. Regardless of height, the roof may be of non-combustible material not necessarily fire-resistive (with penalty charges applied as scheduled).
3. A communicating one-story gymnasium or auditorium may have a combustible roof (with penalty charges applied as scheduled.)

Communication with any other combustible construction will disqualify the building for rating under the fire-resistive schedule. It is important to keep this in mind when fire-resistive additions are attached to existing non-fire-resistive buildings, or vice versa. To retain the right to be rated under the Fire-Resistive Schedule the line of joining must be a *standard fire wall* and any communication must be through *approved fire doors*.

Buildings which are partly of fire-resistive construction but are not eligible for rating under the Fire-Resistive Schedule are rated under the Non-Fire-Resistive Schedule with credit from a "Fire-Resistive Percentage Credit Table." The percentage of credit is calculated by multiplying the actual percentage of fire-resistive construction by a factor which varies with the class of the fire-resistive construction. Four classes are defined, ranging from fully fire-resistive with floor openings protected in the standard manner, to light non-combustible construction without fire-resistance rating.

However, in applying the Classification Experience Adjustments, if at least 66⅔% of the horizontal levels are of fire-resistive construction (non-combustible or metal deck construction permitted) and the building is enclosed in masonry walls, the ad-

justment applicable to fire-resistive buildings may be applied. Under present Classification Experience Adjustment modifications, this may be the difference between +52½% applicable to buildings coded as "brick" and −49½% applicable to buildings coded as "fire-resistive", a total difference of 102%.

Curtain Walls

Technically, only buildings with masonry or concrete exterior walls may be rated under the fire-resistive schedule. In fact, under "Definitions and Standards," a separate chapter of the Uniform Schedules, it is stated that

Buildings of non-combustible construction (other than masonry) with combustible contents will be rated from the Fire-Resistive Percentage Credit Table as indicated under the Non-Fire-Resistive Schedule.

Also, technically, only buildings with floors of masonry or reinforced concrete may be rated under the fire-resistive schedule. However, by interpretive ruling, buildings with incombustible exterior walls other than masonry are being rated under the Fire-Resistive Schedule, and unprotected steel may be used subject to a penalty charge.

The Non-Fire-Resistive Schedule

Both Brick (Ordinary) Construction and Frame Construction are rated under this Schedule. Also, as already noted, fire-resistive construction which does not qualify for rating under the Fire-Resistive Schedule is rated under this schedule, with credit for the percentage which is fire-resistive.

The "Standard Requirements" define the construction which will be accorded the basis rate; deviations therefrom are subject to the penalties listed, and credits may be deducted for construction superior thereto or provided with fire-fighting or fire-warning equipment, all as scheduled. Whenever one-third or more of the exterior wall area is of frame construction, a penalty charge of 10 cents per hundred is applied and the building is coded as of frame construction. If the Occupancy Hazards listed are not

located in rooms cut off by standard fire doors, floors to be of cement, ceiling if not fireproof to be protected by metal or expanded metal lath and plaster and room to be protected by an approved sprinkler system

the penalty charges indicated are applied. Except for manual training rooms, only one penalty charge is made for each of the occupancy hazards listed. Manual training rooms have a penalty charge for each such room in the building (see Items 12a and 12b, Note 1 and Note 2, of the Non-Fire-Resistive Schedule).

NEW YORK STATE UNIFORM SCHEDULE FOR RATING FIRE RESISTIVE PUBLIC BUILDINGS

Hospitals, Sanitaria, Asylums, Jails, Public Homes, Museums of Art, Educational Institutions, Colleges,

1	**BASIS (except Schools, Museums and Libraries):**	
a	In cities with key rate of less than .26	.04
b	In cities with key rate of .26 to .36	.06
c	In cities with key rate of over .36	.08
d	Unprotected	.16
1A	**BASIS—SCHOOLS, MUSEUMS AND LIBRARIES:**	
a	In cities with key rate of less than .26	.03
b	In cities with key rate of .26 to .36	.045
c	In cities with key rate of over .36	.06
d	Unprotected	.12
2	**ROOF (Combustible, including metal deck as noted).**	
a	Combustible roof on 3-story building or on 1- or 2-story communicating gymnasium or auditorium section	.04
b	Combustible roof on 4-story building	.035
c	Combustible roof on 5-story building	.03
d	Combustible roof on 6-10 story building	.025
e	Combustible roof on 11-15-story building	.02
f	Combustible roof on 16-20-story building	.015
g	Combustible roof on over 20-story building	.01
	Basement under 50% or more of grade floor to be considered as a story. Pro rate charge if part of roof is of fire resistive construction.	
	Note—Metal deck roof having combustible roof covering—Make ½ charge under Item 2 above.	
h	Wood shingle roof	.01
3	**AREA.** No charge if fully fire resistive. Fire resistive except roof, for each 5,000 square feet or fraction thereof in excess of 25,000 (not to exceed .05)	.005
	Allow 10% credit for each 8-inch solid masonry or 12-inch hollow masonry wall dividing and strengthening risk, provided it extends to the roof and the section so cut off is 5,000 square feet in area. Allowance not to exceed 40%.	
4	**STRUCTURAL STEEL.**	
a	Unprotected metal lumber type of floor and/or roof support	.03
b	Unprotected horizontal structural steel (cumulative with "4a")	.005
	Note—When not more than 40% of total floor and roof area is of inferior fire resistive construction (including any combustible roof area) above charges may be prorated and are then cumulative with "c."	
c	If only lower flanges or unimportant members are unprotected	.001
	Note 1—"c" not cumulative with "a" or "b" unless those charges are subject to a pro-rata reduction.	
d	Metal deck roof construction having combustible roof covering (one or two story building only)	.07
	Note 1—"d" not cumulative with "a," "b" or "c" above.	
	Note 2—The net amount of charge under Item Nos. 4a through 4d, inclusive, may be pro rated between the charges applying to two or more sections of the building of different classes of fire resistive construction, as provided for therein, on the basis of the total floor and roof areas, each such section being separated from any other section by masonry division walls.	
	Note 3—Underwriters' Laboratories listed four hour suspended ceiling to be considered as affording adequate protection to steelwork (excepting metal deck construction).	
	Note 4—Combustible ceiling suspended under unprotected steel floor and/or roof supports not permitted.	
e	Unprotected, vertical metal floor and/or roof supports (cumulative with Item Nos. 4a through 4d, inclusive):	
	a. With non-cumbustible contents	No charge
	b. All other buildings not provided for under (a) above	.03
5	**FLOOR OPENINGS.**	
a	Not standard protection, per floor	.002
b	Ventilating flues terminating in attic having combustible floor or roof or used for storage, or otherwise unsafe	.025
6	**OCCUPANCY HAZARDS.**	
a	Manual training	.002

No Credit for Protected (Fire-Rated) Combustible Construction

The date when the "Standard Requirements" were drafted can be deduced from acceptance of metal ceilings (the old-fashioned kind) as protection for combustible construction, and the absence of any mention of protected (fire-rated) combustible construction. Stud bearing walls and wood joisted floors may be protected so as to qualify for 1½ hour fire resistance ratings (see NBFU Resistance Ratings dated Jan. 1957 and issued with NBFU Building Code). As the estimated fire duration in school buildings with no effort at extinguishment is one hour, some credit should be accorded when the combustible members are protected so as to have fire resistance for one hour and one-and-one-half hours.

Sprinklered Risks

Generally speaking, the permanent schools in New York State today are seldom built of brick (ordinary) or frame construction, and existing buildings of such construction are likely to be outmoded and scheduled for elimination as soon as the present peak enrollment period has passed. The upward trend in applicable fire insurance rates may reflect the decreased number of such buildings and the increased fire susceptibility of the existing old buildings. When economy dictates the use of brick (ordinary) or frame construction or when combustible old buildings must be used, the installation of

Schools, Convents, Academies and Clubs other than Outdoor Sports Clubs

b	Chemical laboratory	.002
c	Cafeteria, diet kitchen, domestic science or other kitchen	.002
d	Hall with scenery	.002
e	Dormitory	.002
f	Laundry, power (no charge for domestic type washing machines or ironers)	.002
ff	Bowling Alley (Except in Schools)	.01
g	Boiler house or other outbuilding	.01
h	Auxiliary building occupied for kitchen, hand or power laundry, manual training, chemical laboratory or hall with scenery	.01
i	School Bus Garage	.01
	(Double above charge if repair work is done. Charge is cumulative with charge for automobiles under Item 20.)	
	Note—Charges are cumulative except when charge is made under "h," no charges are made under "a," "b," "c," "d" or "f."	
7	**OCCUPANCY.**	
	All classes except hospitals, schools, museums and libraries	.02
CREDITS		
8	If risk is within 500 feet (street measurement) of hydrant on approved high-pressure system for fire service only	5%
	Note—When a high-pressure system otherwise approved will deliver not less than 50% of required quantity at standard pressure, the above credit may be pro rated.	
9	Approved sprinkler equipment in basement	10%
10	No heating apparatus in building	5%
11	Heating apparatus cut off in fireproof room	2%
12	Watchman and approved clock or approved thermostat system reporting directly to a public police or fire department station and with warranty that the system will be regularly tested and maintained by the installing company or, in hospitals only, approved day and night nurse service	3%
13	Auxiliary fire alarm connection to fire department in conjunction with watchman and clock or approved day and night nurse service	2%
14	Approved thermostat fire alarm system reporting to central station	8%
14a	Approved supervisory watchman service with auxiliary fire alarm reporting to central station..	5%
	Note—Item 14a cumulative with ½ of credit under Item 14.	
15	Approved internal protection	3%
	Note—First aid equipment on fire truck shall be deemed to constitute adequate internal protection throughout premises occupied by fire department.	
16	Class C outside protection	7%
17	**EXPOSURE.** As per Schedule, reduced 50%.	
17A	**SPECIAL CREDITS.**	
	1—Special Credit applying to Public Buildings, Hospitals, Sanitaria, Asylums, Jails, Public Homes, Museums of Art	50%*
	2—Special Credit applying to Educational Institutions, Colleges, Schools, Convents and Academies	25%*
	*Stop Rate—.035.	
	Note—Occupancy Classes 085 and 105 are subject to a Stop Rate of .030.	
18	**FAULTS OF MANAGEMENT.** As per Table, reduced 50%.	
19	**MOTION PICTURES.** As per Schedule.	
20	**AUTOMOBILES.** As per Schedule, reduced 50%.	
21	**CONTENTS,** including pipe organ.	
	Add to net building rate:	
	Schools	.04
	All other classes	.06
22	**CLASSIFIED EXPERIENCE ADJUSTMENT**	
23	**NET BUILDING AND CONTENTS RATES**	

automatic sprinklers should be considered. For the maximum reduction in rates the installation must be a standard two-supply sprinkler system conforming to Underwriters' requirements, supplemented with standard first-aid protection and watchman (or central station supervisory) service and standard outside protection, and with no exposure from adjoining buildings. The floor openings must be protected. Deviations from the standard requirements are, as usual, subject to penalty.

Cost of installing standard sprinkler installations and the cost of periodic inspections, supervisory service, and maintenance should be taken into account when evaluating the effect upon the insurance premium. One inherent advantage is the possibility of utilizing this system to sound an automatic alarm for evacuation of the building and to transmit such an alarm, day or night, to fire headquarters. Fires are likely to be extinguished at their inception and before the arrival of the fire department, which can shut off the water before extensive water damage occurs.

Minimum rates for sprinklered risks are: for brick (ordinary) construction, 2.8 cents per hundred; for frame construction, 3.5 cents per hundred; and for contents, 3.5 cents per hundred. These compare very favorably with rates applicable to first-rate fire-resistive construction. While the minimum rates will rarely be assigned, they are indicative of what can be achieved by the installation of sprinklers.

Large Undivided Areas

There are no area limitations for buildings of fire-resistive construction. For buildings three stories and more in height where the ground area exceeds 25,000 sq ft, a penalty charge is made for combustible roof construction, as given in the Schedule. (Buildings less than three stories in height with combustible roof construction are not rated on the Fire-Resistive Schedule.)

For brick (ordinary) construction and for frame construction a penalty charge is made whenever the ground floor area exceeds 10,000 sq ft. A percentage credit applies whenever areas which exceed the specified limits are divided by masonry walls.

Height Limits

For brick (ordinary) construction and for frame construction a penalty charge applies whenever the building height exceeds three stories. A basement under 50% of the grade floor is considered a story. Some old buildings may be affected by this limitation.

Unprotected Steel

In establishing rates for fire-resistive buildings and fire-resistive percentage credits for buildings rated under the Non-Fire-Resistive Schedule, unprotected steel is subject to penalty. As can be noted from the Fire-Resistive Schedule, the charges for unprotected metal lumber (steel joists) used for floor or roof support and for unprotected vertical supports are appreciable, and should be taken into account when considering the omission of fire protective encasements or ceilings. The small penalty charge for unprotected horizontal structural steel will seldom justify the additional cost of protection.

The requirement of a 4-hour ceiling for adequate protection of structural steel appears excessive. However, it can be provided easily by use of special plaster aggregates.

It should be noted especially that

Combustible ceiling suspended under unprotected steel floor and/or roof supports [is] not permitted.

The not uncommon violation is the suspension of a combustible acoustical ceiling under unprotected steel. Where combustible acoustical materials are installed, a minimum 5/8-in.-thick approved gypsum wallboard on incombustible supports should be interposed between the acoustical material and the unprotected steel.

Also, it should be noted that when applying the fire-resistive percentage credit table, no credit is allowed for all-metal construction with combustible finish, and that the credit factors decrease rapidly with the grade

of fire-resistive construction. For first-class construction, the credit factor for buildings is 65 and for contents, 55. It decreases ten points for each lower class. For fourth-class fire-resistive construction the credit factor for buildings is 35 and for contents, 25. (Credit factor × percentage of fire-resistive construction = percentage of fire-resistive credit.)

Floor Openings

Protection of floor openings is usually provided by enclosure of stair openings and shaft openings. The applicable requirement is:

Masonry enclosures not less than 6 in. thick, with thin glass skylight in top protected with wire netting, and all openings to building protected by standard fire doors labeled for opening in vertical shaft.

In school buildings the skylight is not mandatory to avoid the penalty charge. In the Fire-Resistive Percentage Credit Table

Satisfactory self-closing hollow metal, kalamein or similar type doors in an otherwise standard shaft may be considered as the equivalent of standard floor opening protection.

Fire doors "labeled for opening in vertical shaft" are Underwriters' labeled Class B doors having maximum glass area of 100 sq in. with maximum dimension of 12 in., and are obviously unsuitable for stair doors in school buildings where the onrushing student should be aware of a student on the other side.

In school buildings where enclosures are provided for stairs, it is frequently necessary for the doors to stand open when pupils are dismissed or, in secondary schools, when classes change. If hold-open devices with fusible releases are not provided, the doors will be blocked open with wood wedges or hooked back. After inspection, a penalty charge may apear on the next rate card, and it is a dangerous practice in any case.

The penalty charges, where acceptable enclosures are not provided, are 2 mils per hundred for each floor level in fire-resistive buildings. Premium savings alone seldom justify enclosures in fire-resistive buildings, desirable as they may be for life safety and to prevent spread of fire and smoke from story to story.

It should be noted that the number of floor openings is not a factor in determining the penalty charge.

Heating Apparatus in "Fireproof" Room

The regulations provide:

Wherever credit for boiler room cut off is allowed in these schedules, unless otherwise provided, the boiler room shall have a horizontal cut off of solid masonry not less than 4 in. thick and a vertical cut off of solid masonry not less than 8 in. thick or, if of hollow masonry (vertical cut off only), not less than 8 in. thick to have ½ in. of cement plaster on each side of wall or 1 in. cement plaster on boiler room side. All communications to risk to be protected by a single Class A fire door mounted on boiler room side of the wall.

While "fireproof" rooms are usually provided to meet requirements of the state education department, they seldom conform fully to the requirements set forth above. The credits of 2% in fire-resistive buildings and 5% in non-fire-resistive buildings do not justify the additional expense. And the potential fire severity in the modern heater room does not warrant a required 3-hour fire-resistive enclosure.

Internal Protection

No school should be without portable fire extinguishers. When these are provided in adequate number and of the type, size and location specified in the regulations, requirements for internal protection are met and a 3% credit in fire-resistive buildings and 7% credit in non-fire-resistive buildings accrues. Standpipes and hoses are acceptable alternates to portable fire extinguishers.

Exposure Charges

Whenever an adjoining building may communicate fire to the risk being rated, an exposure charge is added to the rate for the exposed building. The exposing building may be on the same or adjoining property, or may be an attached structure separated from the exposed building by a fire wall with openings protected by standard fire doors.

No exposure charge is made when the exposure is from:

Private dwellings and outbuildings not subject to specific rating
Farm Buildings
Minimum rated risks
A building across a public thoroughfare over 25 ft in width
An exposing building with an unexposed rate not in excess of .255
A building with an approved blank masonry wall; or connected to such building
One-story buildings not over 500 sq ft in ground area

In calculating the exposure charge, the following factors are taken into account:

The unexposed building rate of the exposing building.

The size of the exposing building in ground floor area and height. The risk from the exposing building may be classed as small, ordinary or large, in accordance with tabulated dimensions applicable to brick construction and frame construction.

Reduction factors which take into account the character of the exposing walls, whether brick or frame; the size classification of the exposing building, whether small, ordinary or large; the distance between the exposing building and the exposed building and the key rate of the community.

Where an exposing building of large size is relatively close to the exposed building, and carries a high rate, the exposure charge can be quite large, as it is a percentage of the rate of the exposing building. Where there are several exposing buildings or several sides of exposure, the most severe exposure determines the exposure charge. The unexposed building rate is the rate calculated before Classified Experience Adjustments are applied.

The exposure charge is reduced one-half when exposed openings are protected by standard metal-frame wire-glass windows or approved glass blocks or an approved system of outside sprinklers, or when the exposing building, not greater in height, has such protection.

Whenever a proposed building is liable to an exposure charge, the amount of the charge should be calculated to determine whether changes in plan or location or protective measures are justified. What is somewhat inequitable is that the exposure charge applies as an increase in rate for the exposed building irrespective of its size or type of construction. Total involvement of an exposed fire-resistive building of large area by fire communicated from an exposing building would be extremely unlikely as the internal partitions would serve as fire stops.

Communications, and Joint and Separate Rating

Whenever sections of a building are of different types of construction they will be rated as a joint risk unless standard fire walls separate them and communication is through approved fire doors. Lack of such separation and protected means of communication may eliminate application of the fire-resistive schedule.

The "standard" fire wall is of brick or reinforced concrete not less than 8 in. thick for one-story buildings and not less than 12 in. thick for higher buildings. Hollow tile or concrete block walls shall be 4 in. thicker, except when separating buildings which are both rated for "masonry construction (ordinary)."

The "standard" protection for an opening in a fire wall is two fire doors, each bearing the Underwriters' Class A label, one on each side of the opening, both arranged for automatic operation or one arranged for automatic operation and one self-closing. The minimum acceptable opening protection for separate rating of the two communicating sections is one Class A door and one Class B door arranged for operation

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PREFAB REINFORCING CUTS SHELL COSTS

The thin shell-roofed, glass-enclosed library going up on the Bronx (N. Y.) campus of Hunter College will mark the first major use of the hyperbolic paraboloid in the eastern United States, and the first major use anywhere of welded wire fabric instead of individually placed reinforcing bars.

The structural system devised by architect Marcel Breuer, F.A.I.A., consultant Eduardo Catalano, and structural engineers Farkas and Barron consists of six 60-ft-square inverted concrete umbrellas supported on central columns and joined at the edges to form a roof 120 ft wide by 180 ft long. Each umbrella is divided into four hyperbolic-paraboloidal quadrants whose thin concrete membranes transmit stresses to heavy ribs which in turn carry them to the supporting columns.

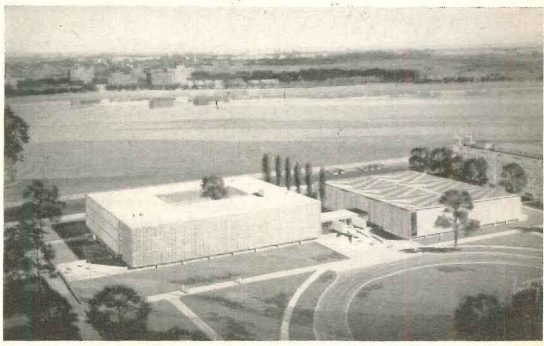
The hyperbolic paraboloid shape used has several inherent economic advantages: it requires less concrete for a given area than is needed for conventional roof construction, and, since its compound curves actually consist of straight lines, it can be formed relatively easily of stock lumber. However, in the case of the Hunter College library, the savings in manpower and money—and particularly in time—were greatly increased by the contractor's choice of an alternate which called for heavy wire mesh reinforcement (½-in. wires on 6-in. centers) to replace the usual shaped, detailed bars. When the concrete work had been completed, it was found that, while the higher per ton cost of the prefabricated steel fabric kept actual savings in labor and materials down to about $600, construction time had been cut by about six days.

The four tons plus of reinforcing steel required for each of the umbrellas was supplied in the form of 31 by 10½ ft mats, which were placed three to a quadrant. A crane was used to hoist them from the stock-pile one at a time and ease them into position, guided by a four man lather crew. They were then overlapped at least two wire spacings (one foot), and nested so that there were only three thicknesses of wire at the lap. Thus, with one inch chairs under the mats, the 3½ in. depth of the shell provided at least a one inch cover of concrete at top and bottom of the steel.

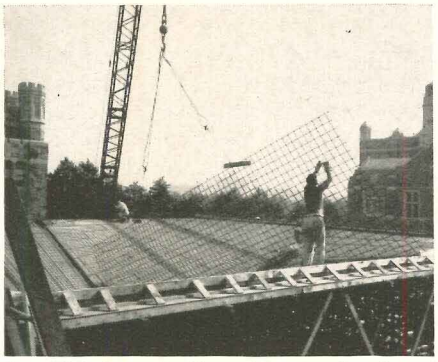
All the mats were made the length required at the center of the umbrellas (the point of deepest drape), and, in order to permit nesting at the overlaps, were placed as nearly parallel to one another as possible. For continuity of reinforcement, they were tied securely at regular intervals, beginning at the center of the umbrella and working out to the edges, where the excess fabric was trimmed.

According to the general contractor, Leon D. de Matteis & Sons, Inc., and Dic Concrete Corp., the subcontractor for the concrete work, the steel fabric adjusted readily to the compound curves of the hyperbolic paraboloids, fitting "like a glove," in spite of the thickness of the wires and a difference in elevation of as much as 4 ft between opposite corners of the mats. This confirmed the results of experiments that engineer Maurice Barron had conducted previously to determine the "drape-ability" of the wire mesh.

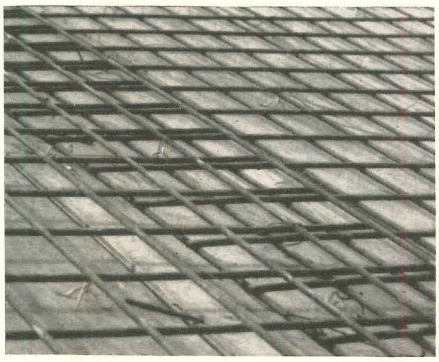
The reinforcing work was completed by placing standard bars for the stiffener ribs that divide the shells into quadrants and for the tension edges or perimeters of the membranes. The concrete was then poured at the outer edge, worked down to the center, vibrated and rough screeded.



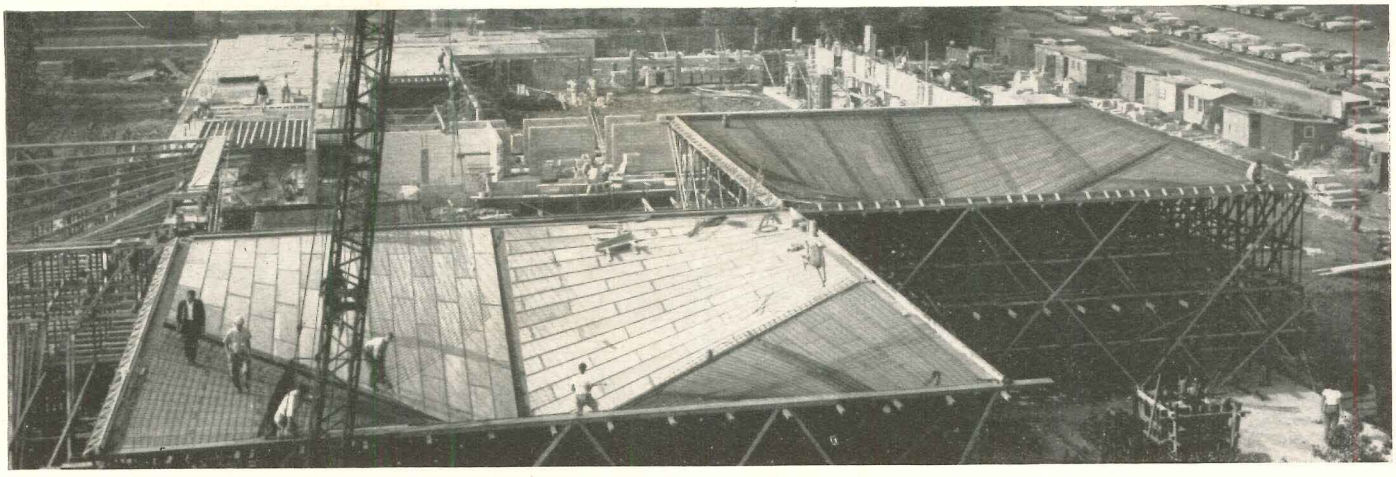
Architect's rendering shows completed library with accompanying classroom structure

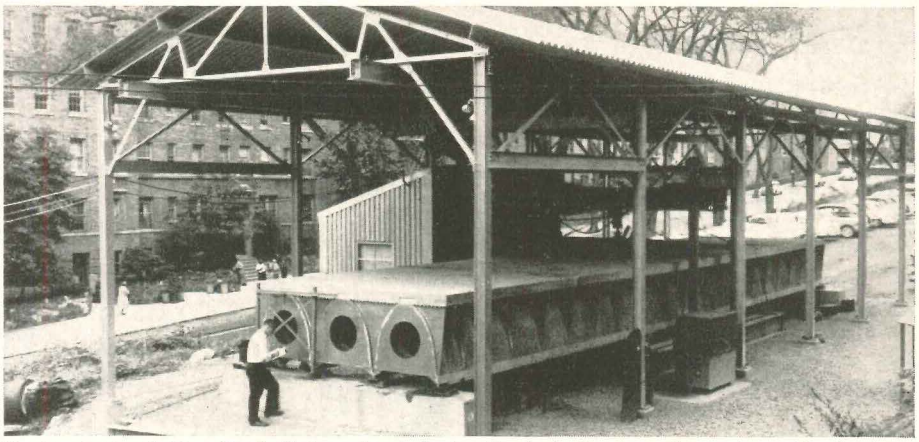


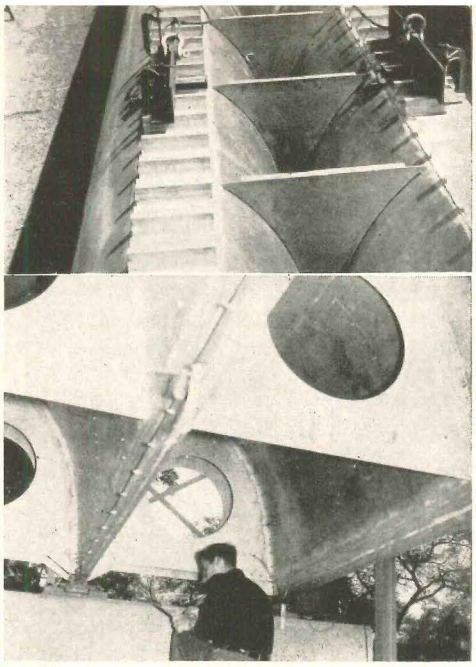
Steel fabric mats, three to a quadrant, are hoisted in place on mushroom-shaped forms



Parallel reinforcing mats are nested to assure adequate concrete cover for steel







During tests at New York University, a hydraulic jack (center of span) applies load up to 35 tons on single-lane prototype of Reynolds-Baroni bridge. Views at right show upper and under surfaces of parabolic arches, as well as diaphragms and shear connectors

ALUMINUM SHEET FORMS THIN-SKINNED BRIDGES

With a watchful eye on the Federal highway program, the aluminum industry is invading a realm in which structural steel has thus far reigned unchallenged: during the last months of 1958, it announced the design, erection and testing of no less than three aluminum highway bridges. All are production items and two were built at a cost competitive with that of steel. Structural designers may take a cue from the fact that both of the less expensive bridges are of a stressed-skin type of construction for which aluminum is uniquely suited; the other uses welded aluminum girders.

The Reynolds-Baroni bridge, which was designed by Dr. Giorgio Baroni and engineered and fabricated by the Reynolds Metals Company, is made up of 4-ft-wide parabolic arches fabricated of aluminum sheet and stiffened by aluminum diaphragms. These modular sections can be made in lengths up to more than 100 ft and joined side by side to form a bridge of almost any width (in multiples of 4 ft). The single-lane prototype (above) is 12 ft wide by 60 ft long.

The bridge can be installed with any standard type of abutment and pier; and, in lieu of formwork, the conventional concrete deck is simply poured over corrugated sheets which are laid between shear connectors welded to the crests of the arches. Main structural joints are welded.

Under the direction of Dr. James Michalos, chairman of the Department of Civil Engineering at New York University, the demonstration bridge has been subjected to dynamic loadings equal to upwards of forty years of normal service. Tests will continue until the equivalent of 100 years' service is reached.

The second stressed-skin bridge (below) was designed and built by Fairchild Engine and Airplane Corporation. Like the Reynolds bridge, it is made up of modular sections fabricated of sheet aluminum. However, in this case, the sections are hollow triangular "beams" bolted edge to edge at the top to form the roadway base and tied at the bottom by a plate of heavier aluminum sheet. Extruded aluminum stiffeners are riveted to the canted webs and bottom plate to prevent buckling, while a standard concrete roadway, poured directly onto the aluminum deck and joined to it by shear ties, assists the upper and lower plates in carrying bending loads.

The assembly has been tested by Professor William J. Eney, director of Fritz Engineering Laboratory at Lehigh University, under loads representing more than one hundred years of normal service. The test model is 24 ft (two lanes) wide and 50 ft long, but the design is expected to be most economical when used for spans of 80 ft and up.

The low cost of both the Fairchild and the Reynolds-Baroni bridges can be attributed to their effective use of aluminum's high strength-to-weight ratio; to the ease of prefabricating their components on a mass-production basis; to the savings in transporting and assembling the lightweight "beams"; and to the elimination of the need for forms for the concrete deck. And the reduction in original cost will surely lend weight to such added virtues of structural aluminum as ready availability and maintenance-free service.

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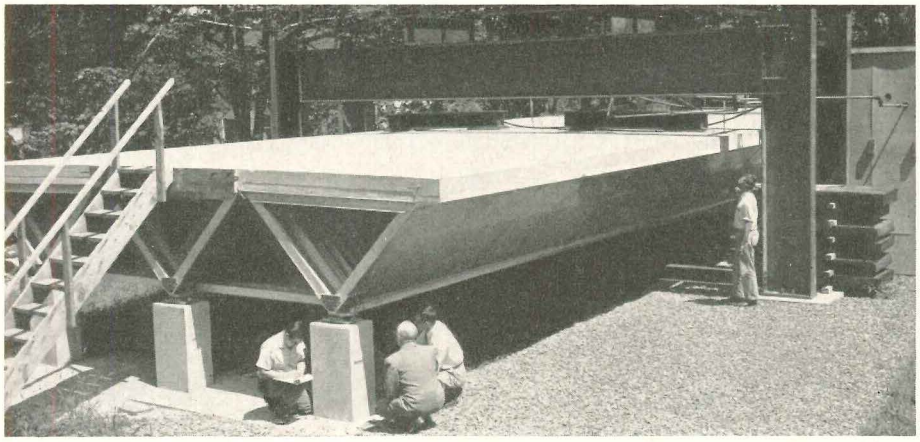
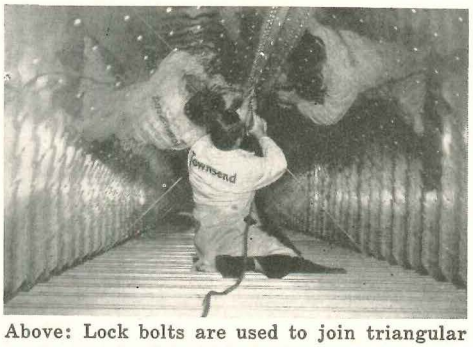
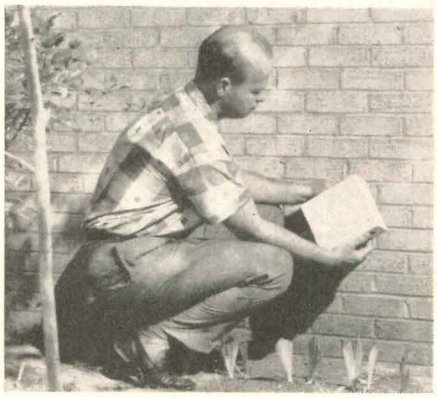




Above: Lock bolts are used to join triangular sections of Fairchild bridge at test site
Left: Lehigh University tests combine static and dynamic loadings well above design limits, simulating more than 100 years normal service

Silicone-Treated Bricks Offer Cure for Efflorescence



A new treatment for the control of efflorescence consists of coating bricks with a silicone-based compound called *Silaneal 772* immediately after they leave the kiln. Since the unsightly green or white stains are actually surface deposits of soluble salts leeched from the masonry, they can be eliminated only by preventing the movement of water through the brick. The *Silaneal 772* treatment does this by bonding to the surfaces of the brick an invisible silicone deposit that causes the brick to shed water in liquid form instead of absorbing it as untreated bricks do. It does not, however, interfere with the "breathing" of the masonry. Masons report that the treated bricks can be laid up without pre-soaking, and that their low absorption rate retards the setting of the mortar, making it possible to lay up more courses before striking the joints. Finished walls can be cleaned by washing them with a garden hose—or by a heavy rain. *Dow Corning Corp., Midland, Mich.*

Spray-on Coating Has Permanence of Tile

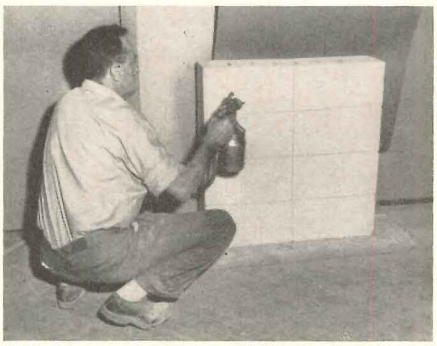
A multi-purpose coating that can be applied to virtually any surface, indoors or out, promises to be a strong contender in the protective-decorative coatings field, particularly for applications where durability and ease of maintenance are of prime importance.

Its base is a quartz powder which, when mixed with a catalyst and other additives, is "self-fired" by an undisclosed chemical process. Sprayed on in liquid form, the *Mozel* coating cures to a tough, tile-like finish in about thirty minutes. Still too new to have undergone extensive in-service testing, it has nevertheless passed unscathed through a rigorous series of laboratory tests conducted by the manufacturer and others. Results indicate that the finish is fire resistant, fadeproof, frostproof, moistureproof, shock-resistant and non-chalking. As might be expected, the maintenance required is nil, except for an occasional washing.

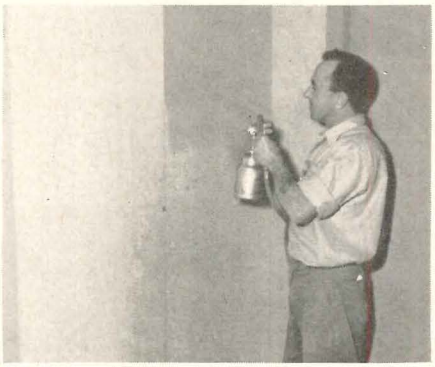
The coating is said to adhere firmly to all commonly-used building materials, including metal, asbestos products, asphalt, kiln-dried wood (plywood), brick, concrete block and dry concrete. In fact, according to company spokesmen, the adhesion is so strong that the *Mozel* finish will chip off only if the material to which it is applied fails.

When sprayed at the recommended pressure (fifty pounds), the coating will cover 200 to 250 sq ft per coat per gallon. And the material itself is relatively inexpensive: installed cost for the two paper-thin coats that are normally required is estimated at about fifty cents a square foot.

The *Mozel* coatings come in three finishes—flat, satin and gloss—each suitable for either interior or exterior use. The first two resemble similarly-classified paints, while the gloss finish is closely akin to glazed ceramic tile in appearance. The wide range of standard colors can be augmented on special order. *Quartz Mosaic, Inc., Yorklyn, Del.*



When sprayed on concrete block, thin *Mozel* coating retains rough texture of base

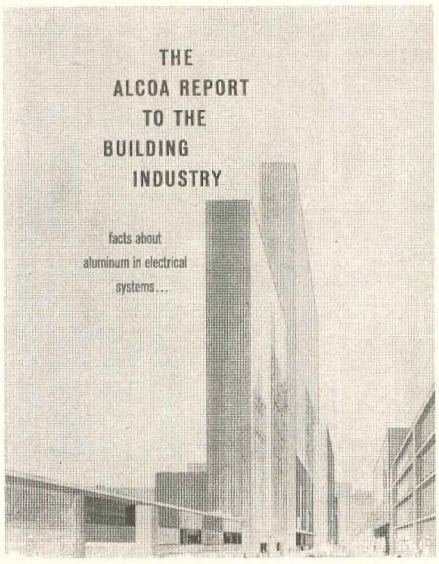


On dry wall materials like plywood, finish forms smooth protective-decorative skin

Saran Fibers Produce Durable, Fire-Resistant Fabric

Saranspun, a new decorative fabric with exceptional strength and durability and low maintenance costs, is expected to prove particularly useful for drapery installations in institutional and public buildings. The saran fibers of which it is woven are self-extinguishing and require no flameproofing treatment. In addition, the material has good dimensional stability and, since it absorbs very little water, is virtually unaffected by high humidity or weather changes, resists staining, and is impervious to rot and mildew. The smooth surface of the fibers tends to shed ordinary dust and dirt, but the fabrics can easily be washed or dry cleaned without dulling the colors. They also have the soft, sturdy "hand" necessary for ease of sewing and draping. Made from fibers supplied by the Saran Yarns Company of Odenton, Md. *Saranspun* is now being marketed by the *Georgia Co., Inc., 276 Fifth Ave., New York, N. Y.,* and by *Mead & Montague, Inc., 245 Fifth Ave., New York, N. Y.*

more products on page 214



THE ALCOA REPORT TO THE BUILDING INDUSTRY, *Facts About Aluminum in Electrical Systems,* presents information based on a survey made for Alcoa by the firm of Edward E. Ashley, consulting engineers. Specific topics covered include conduit, wire and cable, bus conductor, busway, armored cables, enclosures and switchgear, lighting fixtures and accessories, and such other components as reactors and transformers. Illustrations and examples refer to existing installations, and several sections cover accepted working and handling practices with such aluminum electrical products as conduit and wire and cable. 32 pp. *The Aluminum Company of America, 754 Alcoa Building, Pittsburgh 19, Pa.*

The Design and Specification
. . . of Watertight Concrete discusses basic requirements for watertight concrete, and the benefits of *Pozzolith* in producing it. 6 pp. *Master Builders Co., 7016 Euclid Ave., Cleveland 3, Ohio**

Packaged Boiler-Burner Units
(A.I.A. 30-C-1) Catalog sheets describe and give selection data for complete line of packaged forced-draft boiler-burner units. *Fitzgibbons Boiler Co., Inc., 101 Park Ave., New York 17, N. Y.*

Harvey Probber Office Furniture
Catalogs 'Inner Office' series of desks, tables, executive cabinets and seating pieces. *Harvey Probber, Inc., 1082 Davol St., Fall River, Mass.*

Silvray Lighting Catalog
Features illustrations, accompanied by photometric and dimensional data, of each product in the Silvray line of fluorescent and incandescent fixtures. *Silvray Lighting, Inc., 100 W. Main St., Bound Brook, N. J.**

Cutler Mail Handling Equipment
(A.I.A. 35-H-1) Illustrates and gives installation details and suggested specifications for Cutler line of mail chutes and institutional letter box equipment. 8 pp. *Cutler Mail Chute Co., Rochester 7, N. Y.**

Thiokol Concrete Adhesives
Discusses results of laboratory and field tests which verify suitability of *Thiokol* liquid polymer epoxy resin concrete adhesives for bonding new-to-old and old-to-old concrete. Application methods are described for a number of typical uses. *Thiokol Chemical Corp., 780 N. Clinton Ave., Trenton 7, N. J.*

Insulation Adhesives and Sealers
Covers properties, uses, application methods and coverage of *3M* insulating sealers and adhesives for insulation. 4 pp. *Adhesives, Coatings and Sealers Div., Minnesota Mining & Mfg. Co., 423 Piquette Ave., Detroit 2, Mich.**

Coil-Type Spray Dehumidifier
(A.I.A. 30-F-2) Includes engineering data, dimensional data, coil performance charts and psychrometric charts. 16 pp. *Marlo Coil Co., 7100 S. Grand Blvd., St. Louis 11, Mo.**

Remote Roomaire Conditioner
Catalog 7758 supplements illustrations and descriptions of the various *Roomaire* remote type room air conditioning units with capacity data, physical data and dimensions. *Young Radiator Co., Racine, Wis.**

The BTC Chair (A.I.A. 28-A-7)
Contains specifications, dimensional drawings and color photographs of models in the BTC line of folding chairs. 16 pp. *Brewer-Tichener Corp., Courtland, N. Y.*

Sheet Flashing (A.I.A. 7-A-1)
Discusses characteristics and specific properties of *Nervastral Rigid* sheet flashing, and gives installation and specification data. Bulletin 133, 8 pp. *Rubber & Plastics Compound Co., Inc., 10 Rockefeller Plaza, New York 20, N. Y.**

Hydrocide Colorcoat
Outlines the properties and advantages of *Hydrocide Colorcoat,* a decorative and protective coating for masonry walls. Color chips, and detailed application, specification and coverage data are included. 4 pp. *L. Sonneborn Sons, Inc., Building Products Div., Dept. H, 404 Fourth Ave., New York 16, N. Y.**

Marcolite Skylights (A.I.A. 12-J)
Contains detailed information, including specifications, on all available models and designs in the *Marcolite* line of aluminum and fiberglass skylight products. 12 pp. *The Marco Co., 45 Greenwood Ave., East Orange, N. J.**

Durcon Laboratory Sinks
Bulletin PF/5 contains a corrosion resistance chart, a dimension table, procedures for installation, and complete information on *Durcon* corrosion-resistant laboratory sinks. 8 pp. *The Duriron Co., Inc., Dayton, Ohio**

Aluminum Grating by Kerrigan
(A.I.A. 14-R) Describes, illustrates and gives details and safe load tables for several types of aluminum grating. 8 pp. *Weldforged Grating Div., Kerrigan Iron Works, Inc., Nashville, Tenn.**

Spotlighting Data
Specification sheets and descriptive brochures on complete line of arc and incandescent spotlights for indoor and outdoor use include foot candle readings and diameters for flood to small spot sizes at various lengths of throws. *Strong Electric Corp., 253 City Park Ave., Toledo 1, Ohio*

**Additional product information in Sweet's Architectural File, 1958*

more literature on page 228

USEFUL CURVES AND CURVED SURFACES: 34-Ellipsoid

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

The ellipsoid, shown here in isometric projection, is one of the quadric surfaces and is generated by rotating a variable ellipse about an axis. It has three principal sections, shown here as the sections by the xy, xz and yz planes.

Its equation:

$$\frac{x^2}{a^2}+\frac{y^2}{b^2}+\frac{z^2}{c^2}=1$$

where $a = OA$ in the diagram,
$b = OB$
$c = OC$

Every section is an ellipse (or a circle; for the circular sections, see construction right). When $b = a$, the ellipsoid becomes the surface of revolution called an oblate spheroid (Dutch cheese shape); when $b = c$, it is a prolate spheroid (watermelon shape), also a surface of revolution. When $a = b = c$, it is, of course, a sphere. The volume is $\frac{4}{3}\pi a b c$. There is no simple formula for the area.

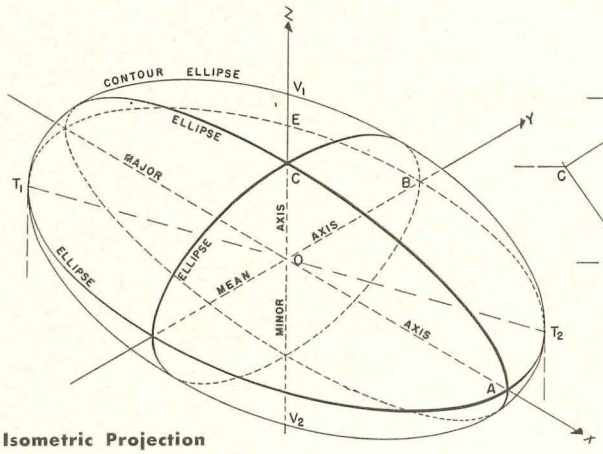
To draw in projection, first draw the projections of the ellipses on the three principal planes. The axes will be conjugate diameters (see Sheet 20) and the ellipses can be constructed from them. Then, second, draw the ellipse which is the projected or contour edge of the ellipsoid; (a) find its points of tangency T_1 and T_2 with the ellipse on the xy plane (see separate diagram below giving general method of finding points of tangency); (b) construct the auxiliary ellipse (one quarter of which is shown) which is the section of the ellipsoid by the vertical plane through the z axis normal to the plane of projection; draw a chord DD normal to the plane of projection, find M the midpoint, draw OM extended to V_1; this is the point on the contour ellipse corresponding to the vertical plane through the z axis; (c) project V_1 back onto the isometric projection and mark V_2 at the same distance on the opposite side of O; (d) V_1V_2 and T_1T_2 are conjugate diameters of the contour ellipse; use method of Sheet 20 or parallelogram method to complete ellipse; (e) check points of tangency between contour ellipse and ellipse of xz plane by drawing a chord parallel to the y axis, finding its midpoint and extending to cut the ellipse at the point of tangency; repeat procedure for ellipse of yz plane, using a chord parallel to x axis.

Parallelogram method of drawing ellipse. This is often easier than other methods, particularly in projections. Given two diameters D_1D_2 and D_3D_4, draw the surrounding parallelogram. Divide one of the sides into any number of equal spaces; divide the intersecting diameter into the same number of equal spaces. From D_2 draw rays through the points on the diameter; from D_1 draw rays through the points on the side. The points of intersection of the rays lie on the ellipse. The same construction can be used with any two conjugate diameters. (This is basically the same construction as shown on Sheet 3 for the parabola; in the case of the parabola, D_2 is at infinity and the rays from it through the points on the chord D_3D_4 are all parallel).

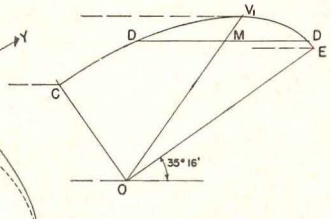
To find the points of tangency between an ellipse and the tangents to it drawn from any external point: From P draw any two lines cutting the ellipse at A B C D. Draw CB and DA extended to meet at Q. Draw the diagonals of the quadrilateral ABCD, intersecting at R. Draw QR, cutting the ellipse at T_1 and T_2, which are the required points of tangency. When P is at infinity, AB and CD become parallel chords and the line QR bisects both of them.

Construction of Ellipsoid: Lamellas. Ellipsoids have been built as domes on the lamella principle, using a radial distribution of points of intersection of the lamellas along latitude lines, similar to the lamella construction of a spherical dome. This means that every lamella in a half ellipse is different; there is no repetition along a given latitude line such as there is on a sphere.

Circular Sections. Another method, which might simplify construction, is based on the fact that on every ellipsoid there are two families of parallel circles which are sections of the ellipsoid. Looking at the isometric drawing of the ellipsoid, imagine the plane yz rotated about the mean axis. The minor semi-axis of the ellipse which is OC in the vertical position will increase continuously until the plane is coincident with the xy plane, when this semi-axis will become equal to OA. Somewhere between these two values, this semi-axis will have the value equal to OB and the section would therefore be a circle.

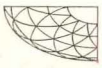


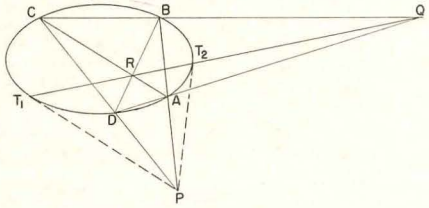
Isometric Projection



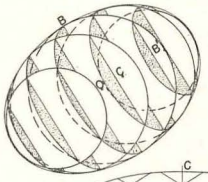
Auxiliary Ellipse

Lamellas



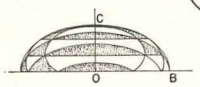


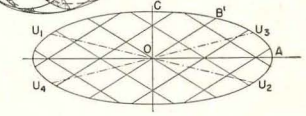
Points of Tangency



Auxiliary Projection

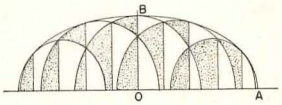
Half End Elevation





Side Elevation

Circular Sections



Half Plan

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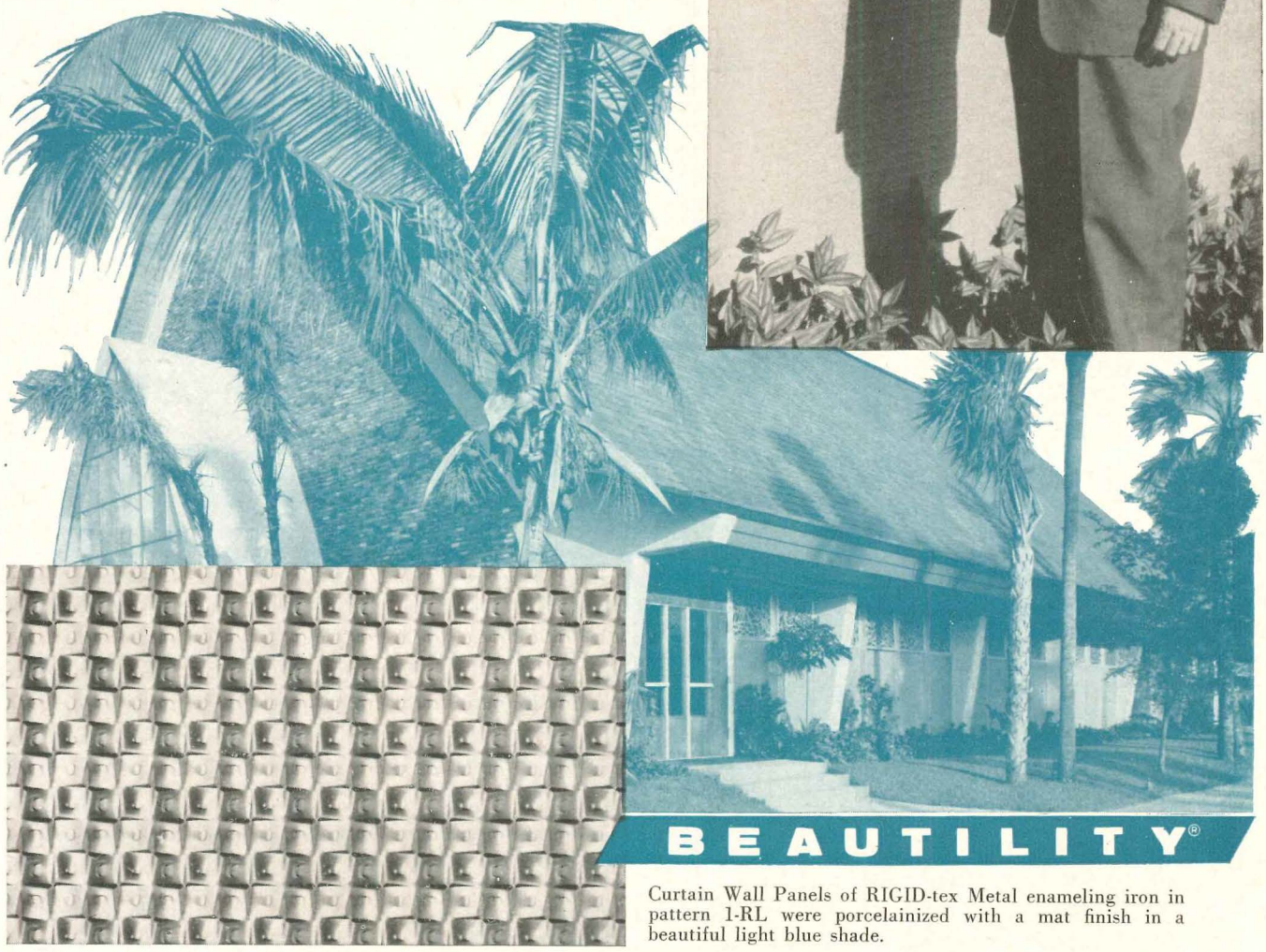

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See Sweets Architectural File 6 C/Ri

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USEFUL CURVES AND CURVED SURFACES: 35-Ellipsoid and Elliptic Paraboloid

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

Given an ellipsoid, to find the two families of circles which are its sections.

Draw the side elevation of the ellipsoid, showing an ellipse with semi-axes OA and OC. Swing an arc OB of length equal to half the mean axis to intersect the ellipse at B'. All the circular sections of one family will be parallel to this radius vector; the other family will be symmetrical, making the same angle with the base on the opposite side of the minor axis.

On the side elevation the lines U_1OU_2 and U_3OU_4 are the conjugate diameters of the two principal circular sections (shown here as straight lines passing through O). Each bisects every chord of the family. The four points U are the umbilical points of the ellipsoid.

Lines of curvature on the ellipsoid are the traces of the intersection of the ellipsoid with the hyperboloids of one and two sheets which are confocal with the ellipsoid. At the umbilical points the curvature is the same for all normal sections. A drawing can be found in Hilbert "Geometry and The Imagination," p. 189.

The principal sections of the ellipsoid are lines of curvature and are also the only closed geodesic curves on the ellipsoid. All other geodesics are not closed curves and are very difficult to work out in detail. Every geodesic passing through one umbilical point passes through the umbilical point diametrically opposite, but not symmetrically. One set of geodesic curves is shown in Hilbert on p. 223.

Elliptic Paraboloid

The elliptic paraboloid, shown here in isometric projection, is one of the quadric surfaces and is generated by rotating a variable parabola about an axis.

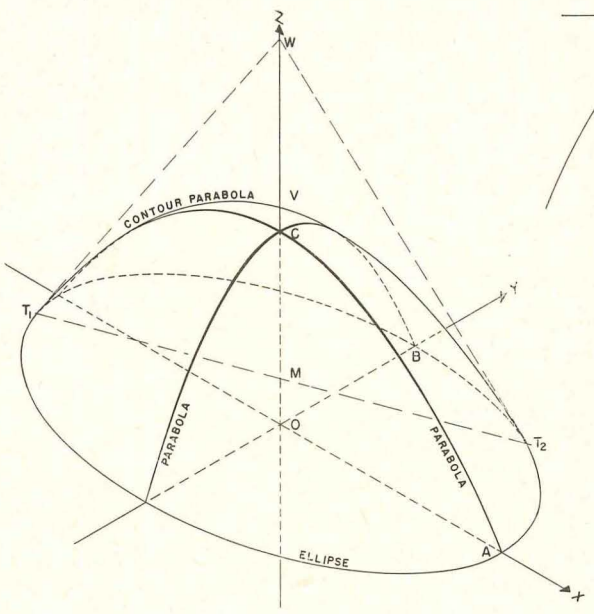
Its equation (with the axis as shown)

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = \frac{c-z}{c}$$

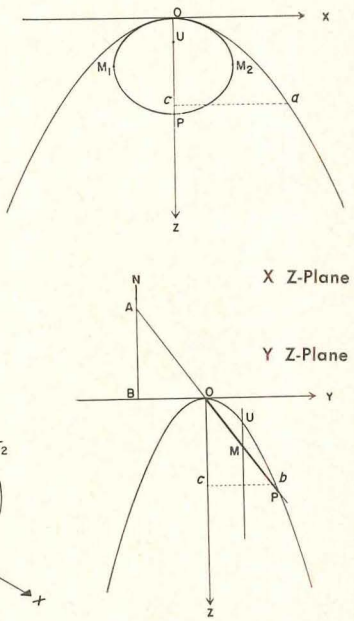
The sections of the surface by any plane parallel to the z axis is a parabola. The two principal sections are the xz and yz planes. All other sections are ellipses. The section by the xy plane is an ellipse with semi-major axis equal to the constant a (OA in the diagram) and semi-minor axis equal to constant b (OB in the diagram). This ellipse is drawn here as the bottom of the paraboloid, although the surface actually continues to infinity. When a equals b, it is a paraboloid of revolution, and its equation may also be written in cylindrical coordinates as:

$$\frac{r^2}{a^2} = \frac{c-z}{c}$$

Volume = ½ (area of base) (altitude)



Isometric Projection



Circular Sections

To draw in projection, first draw the projections of the paraboloids on the xz and yz planes. These will also be parabolas in projection. Second, draw the projection of the ellipse on the xy plane. Third, on z axis, measure CW equal to OC. W is the vertex of an elliptic cone which is tangent to the paraboloid at every point around the ellipse in the xy plane. Fourth, draw tangents WT_1 and WT_2 to the ellipse (see method of finding exact points of tangency above), and draw T_1T_2. Fifth, find M the midpoint of T_1T_2, which will be on the vertical line OW, and find V the midpoint of MW. Sixth, with MV as vertical axis and T_1MT_2 as base, draw a parabola. This is the parabola which is the contour or visible edge of the paraboloid in projection. To check the point of tangency between the contour parabola and the parabola in the xz plane, draw a chord of the xz parabola parallel to the y axis; find the midpoint of the chord and draw a line parallel to the z axis through it; the point where this line cuts the parabola is the required point of tangency. The point of tangency between the contour parabola and the parabola in the yz plane is found in the same way, using a chord parallel to the x axis.

All sections parallel to a plane containing the z axis are identical parabolas; i.e. they are all the same size. All sections normal to a plane containing the z axis are ellipses of the same proportions; i.e. the major axis is always equal to $\frac{a}{b}$ times the minor axis.

To find the circular sections: On every elliptic paraboloid there are two families of parallel circles which are sections of the surface (this is similar to the general ellipsoid, see sheet 34. Given the elliptic paraboloid $\frac{x^2}{a^2} + \frac{y^2}{b^2} = \frac{z}{c}$, draw the projections on the yz and xz planes as shown. Draw OB of length b along the y axis and draw BN at right angles at B. Swing an arc OA of length a to intersect BN at A. Draw AO extended to cut the parabola at P. OP is the trace of one of the circular sections. It is shown in projection, as an ellipse, on the xz plane.

The planes of all the other circular sections of this family will be parallel to OP. The other family is symmetrical on the opposite side of the z axis.

To find the umbilical point U, find M the midpoint of OP. Draw a line through M parallel to the z axis. This line is the conjugate diameter (i.e. passes through the mid-points) of all the chords parallel to OP. It cuts the parabola at U. Every elliptic paraboloid has only two umbilical points. In the case of the paraboloid of revolution, the two families of circular sections coincide (as parallels of "latitude") and the two umbilici coincide at the vertex O.

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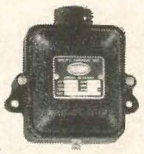

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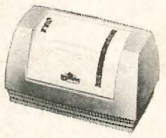

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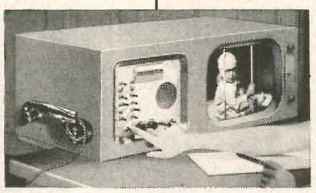

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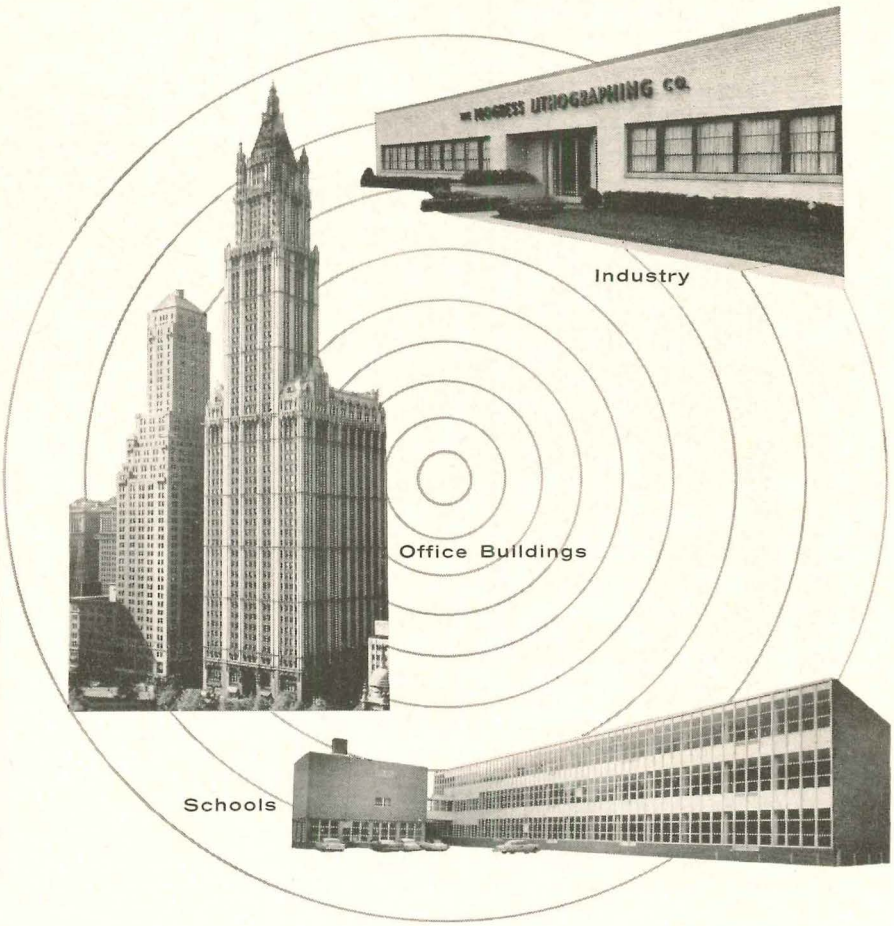

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USEFUL CURVES AND CURVED SURFACES: 36-Hyperboloids

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

Another quadric surface, the hyperboloid of one sheet (or of one nappe) is shown here in isometric and orthogonal projections. It is one of the only two possible doubly ruled curved surfaces; the other is the hyperbolic paraboloid. It is easily constructed from straight members. It can be generated in several ways:

1. As a ruled surface: A straight line (such as 3'12) is moved so that it touches at all times three given, non-intersecting straight lines (such as 3'18, 4'19 and 5'20), no two of which are in the same plane and which are not all parallel to any one plane. The three given straight lines are all members of one family or regulus; the successive position of the line 3' 12 generate the other family (such as 4' 13, 5' 14, 6' 15, etc.).

2. By the rotation of a variable hyperbola about its conjugate axis (here the z axis), with its apex always in contact with an ellipse (the throat ellipse) which is in a plane normal to this axis. When the throat ellipse is a circle, the hyperbola does not vary and the surface is a hyperboloid of revolution of one sheet.

3. By the translation of a variable (but always similar) ellipse with its plane always normal to a straight line through its center (here the z axis) and with the extremities of its axes on two fixed hyperbolas (here the sections of the xz and yz planes) whose planes are perpendicular and whose conjugate axis is this straight line.

The equation (axes as shown): $\frac{x^2}{a^2} + \frac{y^2}{b^2} - \frac{z^2}{c^2} = 1$

(The equation of the asymptotic cone, shown here in section as a dotted line, is $\frac{x^2}{a^2} + \frac{y^2}{b^2} - \frac{z^2}{c^2} = 0$)

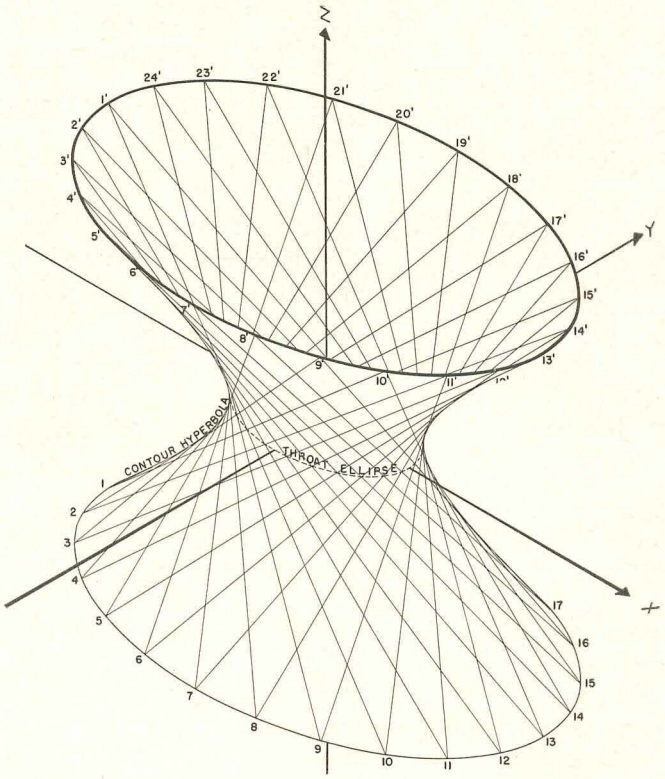
All sections containing the z axis are hyperbolas. The xz and yz hyperbolas are principal sections. All sections parallel to any given plane containing the z axis are hyperbolas whose asymptotes are the projections on this section plane of the parallel section of the asymptotic cone containing the z axis. Such vertical sections which cut the throat ellipse will have the axes of the hyperbolas in the xy plane; sections which do not, will have their axes parallel to the z axis. The vertical section which is tangent to the throat ellipse will consist of the pair of straight lines passing through the point of tangency. (The dotted lines shown on the xz and yz planes are projections of these.) Portions of the hyperboloid as cut off by two parallel planes, both parallel to the z axis, have been used for shell roofs, such as the Hippodrome at Madrid by Torroja.

All sections parallel to the xy plane are similar ellipses.

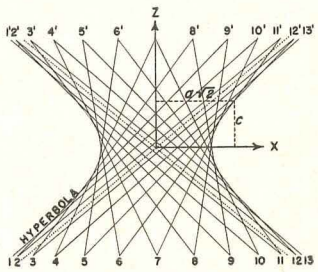
All other sections are conics, including circles, ellipses, parabolas and hyperbolas. Circular sections will be shown in a later sheet. The contour edge of the "inside" will be an ellipse, of the "outside" a hyperbola.

The nature of such curves can be determined for each case by a simple test (see diagram). Given a curve such as ACB. Draw the chord AB and the tangents AO and BO. Find the midpoint M of AB. Draw OM, cutting the curve at C. If C lies at the midpoint of OM (such as C_2) the curve is a parabola; if C is closer to M (such as C_1) it is an elipse; if closer to O (such as C_3) a hyperbola.

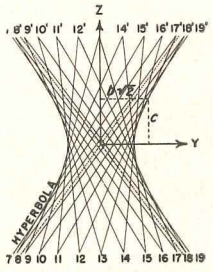
continued next month



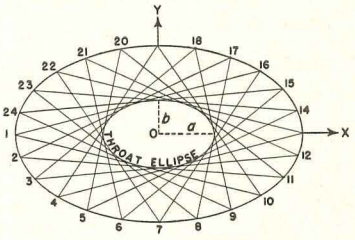
Isometric Projection



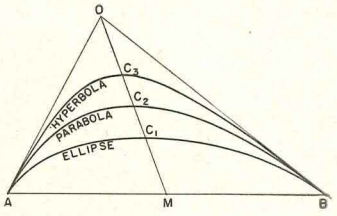
X Z-Plane



Y Z-Plane



X Y-Plane



Test Diagram

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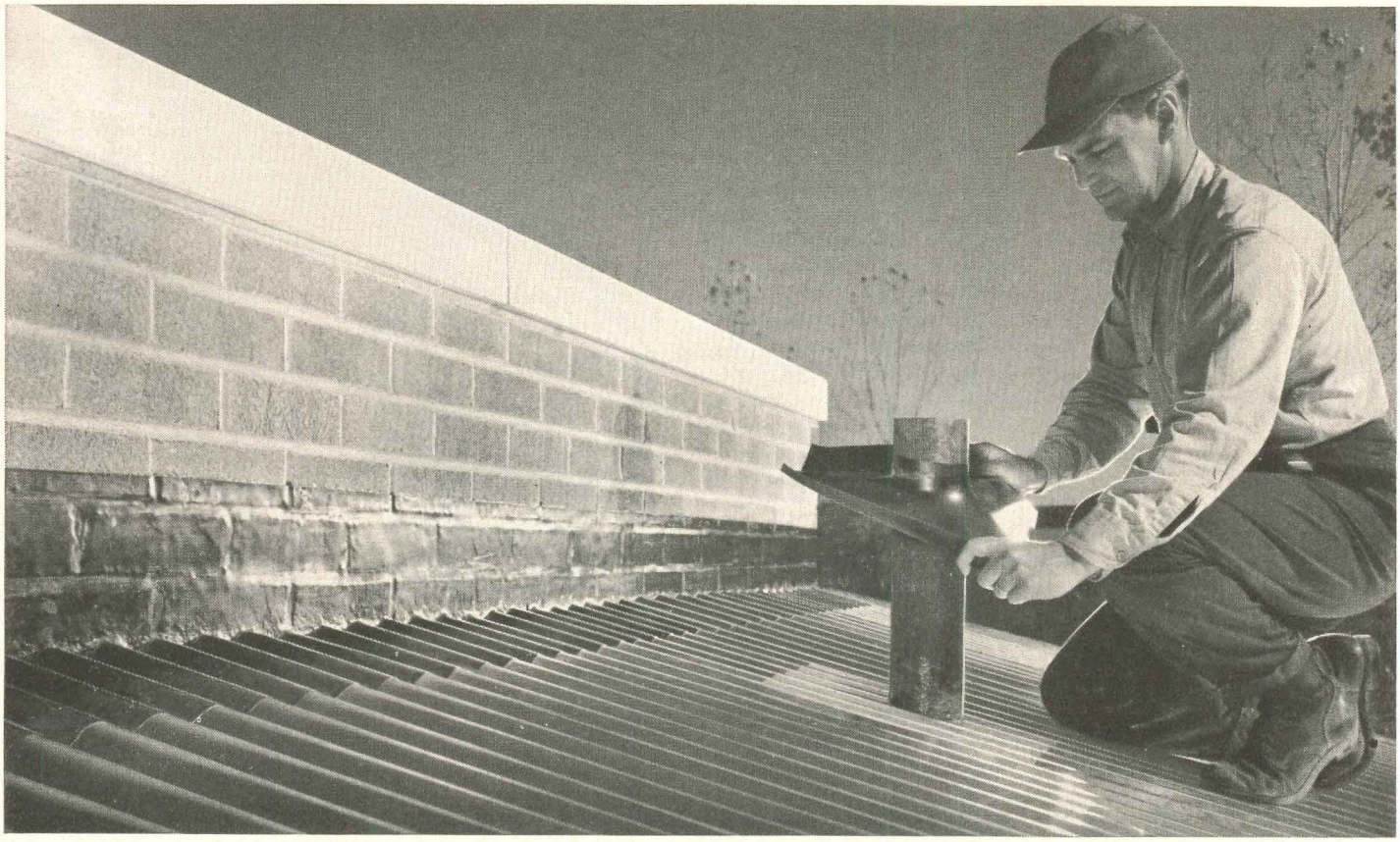

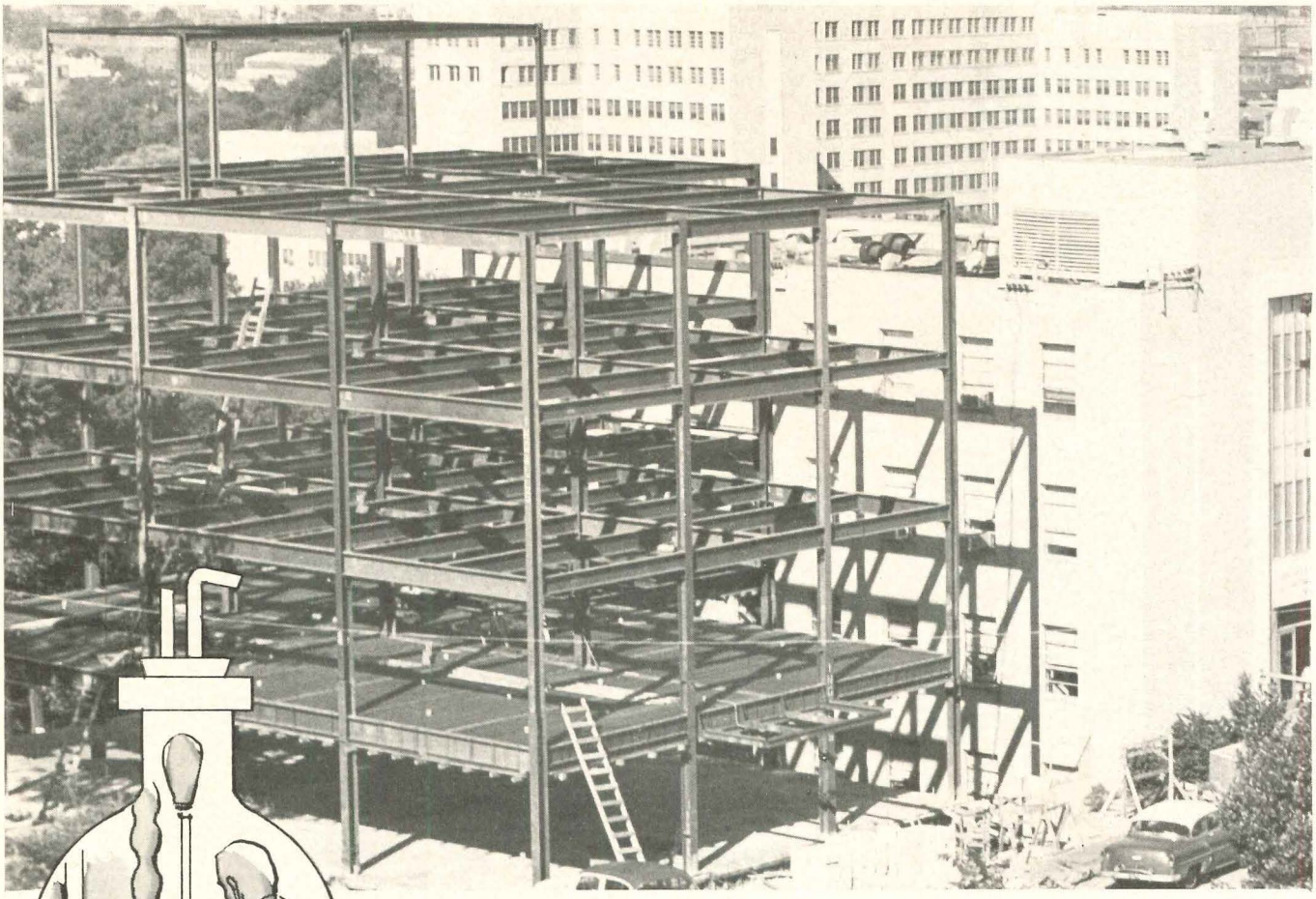

Kettering-Meyer Laboratory No. 2 at Southern Research Institute, Birmingham, Alabama
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Architect: Lawrence S. Whitten
Engineers: Wilmore, Hudson and Luke
General Contractor: Daniel Construction Company

STEEL PLATE FABRICATORS ASSOCIATION FOUNDED 1933

AISC AMERICAN INSTITUTE OF STEEL CONSTRUCTION INC. FOUNDED 1921

THE INGALLS IRON WORKS COMPANY
Executive Offices
BIRMINGHAM, ALABAMA

INGALLS INDUSTRIES ARE:

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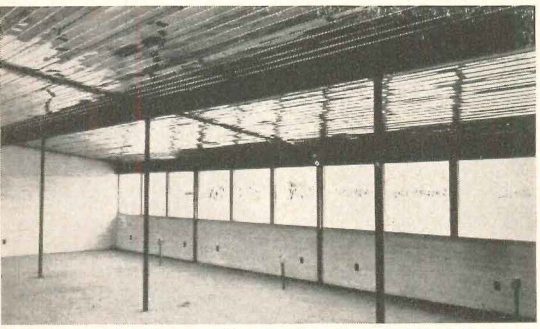
The Ingalls Shipbuilding Corporation, Shipyards: Pascagoula, Mississippi; Decatur, Alabama Sales Offices: New York, Chicago, Washington, Houston, New Orleans, Atlanta

continued from page 180

Solar Research House to Test Practicality of Radiant Cooling



Heating-cooling water is circulated through integral tubes in copper ceiling panels

Similar panels (tubes 5 in. o.c.) are used for bare-roof type solar collector/rejector

The latest "solar house," a research facility recently completed at the University of Arizona's Institute of Atmospheric Physics in Tucson, will test the feasibility of using the same collector that gathers heat during the winter to dissipate it during the summer. As a result, the house—which will actually be used as a laboratory and office for the researchers studying it—differs from similar structures in several respects. The most obvious departure is the design of the roof collector whose low pitch is a compromise between the sharp slope that is optimum for collecting heat from the sun and the flat surface that would be optimum for throwing off heat at night during the cooling season. For the same reason, the collector lacks a glass cover and the other devices that might add to its ability to retain radiant heat but would interfere with the radiant cooling process.

Otherwise, the system closely resembles others that have been built to date. Its essential elements are a copper roof collector with integral tubes, radiant heating-cooling ceiling panels of similar construction, a large insulated water storage tank, a circulating system—and a supplementary heat pump.

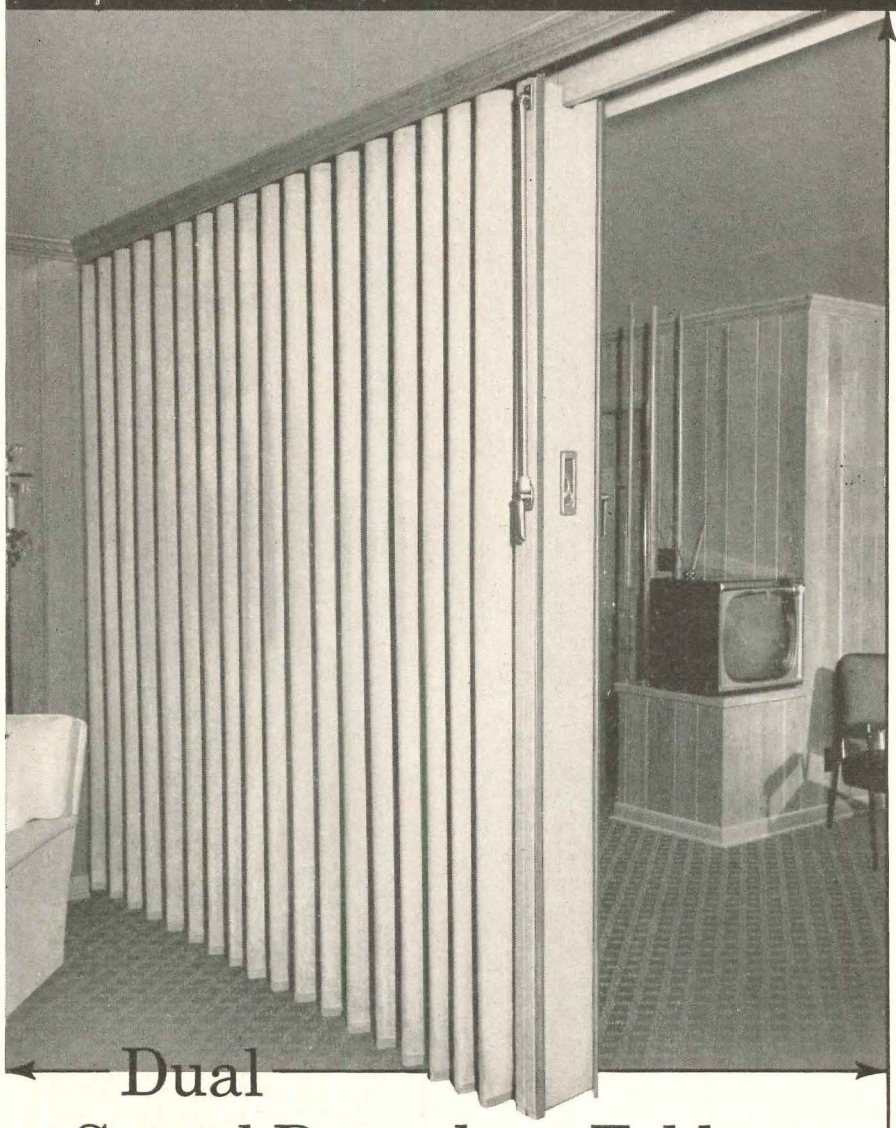
During normal winter operation, water from the bottom of the storage tank is pumped through the collector, heated, and returned to the tank. Heated water from the top of the tank is circulated through the interior ceiling panels. When, during a protracted cloudy spell, the collector is unable to raise the temperature of the water in the tank to the level required for heating, the heat pump is used to add heat to the water at the top of the tank, thus lowering the temperature of the water at the bottom of the tank, from which the collector circulates, and increasing the efficiency of the collector.

During the summer, the tank inlet and outlet feeds are reversed. The roof collector is operated nightly to dissipate heat from the top of the tank by radiation and convection to the atmosphere, and the interior panels draw cooled water from the bottom of the tank. If the collector is unable to reject enough heat, the heat pump operates just as in winter, raising the temperature of the water at the top of the tank and lowering the temperature at the bottom.

According to Raymond W. Bliss, Jr., associate physicist at the Institute of Atmospheric Physics and director of the solar house project, the

continued on page 202

Sound Solution FOR SPACE SEPARATION . . .



Dual Sound-Retardant Foldoor Partition

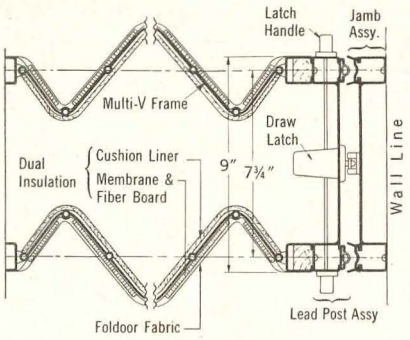
In many situations, it's just as important to be able to separate sound as it is space. That's why the new Dual Sound-Retardant FOLDOOR Partition is such a sensible choice for all double-use facilities. It marks the first time that the convenience and beauty of the fabric-covered folding door are available in a general purpose, maximum sound-retardant partition that operates from overhead tracks only.

In Canada: FOLDOOR of CANADA, Montreal 26, Quebec

Photo above from Biltmore Hotel Courts Nashville, Tennessee

HOLCOMB & HOKE
FOLDOOR
FOLDING PARTITIONS AND DOORS
®

NEW FABRIC-COVERED FOLDING PARTITION RETARDS SOUND AS WELL AS A 3" GYPSUM WALL!



This new structural design plus special insulation minimizes sound transmission.

Look at the advantages that only the new sound-retardant FOLDOOR offers:

Equivalent in sound reduction to a three-inch solid Gypsum tile wall • Minimum space requirements • Easy to operate • No floor guides • Will not bind from slight ceiling sag • Beautiful decorator fabrics • All meeting points tightly sealed • Installed weight is approximately 5.25 pounds per square foot, about half of which is represented by the four dense layers of complementary insulation.

OTHER FOLDOOR PRODUCTS

Look to FOLDOOR for folding doors and partitions to meet every commercial and residential application. Both Multi-V and Multi-X models are offered in a wide variety of fabrics and colors. Full line of tracks, switches and other accessories.

SEND FOR INFORMATION

. . . or phone your nearest FOLDOOR distributor now. No obligation, of course.

HOLCOMB & HOKE MFG. CO., INC.
1545 Van Buren Street
Indianapolis 7, Indiana

Please send me full information on: the new Dual Sound-Retardant FOLDOOR Partition.

NAME_____

FIRM_____

ADDRESS_____

CITY_____ STATE_____

Technical Roundup

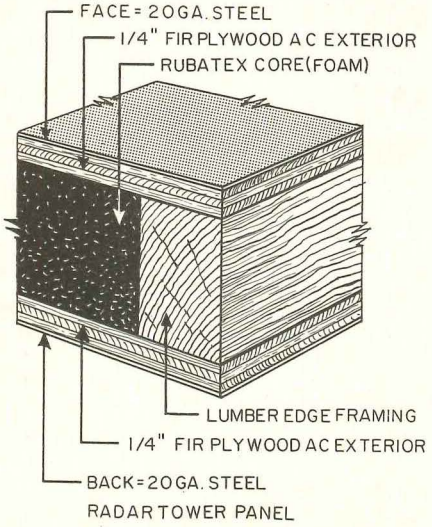
continued from page 194

system is far from being economical. (Although operating costs are expected to run about half those of conventional year-round systems, the initial cost was about double.) Its purpose, as Bliss puts it, is not to make "a dramatic break-through" in the field of applied solar energy, but to provide a means for studying, over a long period of time, the small details whose refinement may eventually make such a system economically sound. The radiant cooling technique will be given particular attention, since in many areas, Arizona among them, the heating season is so short that cooling is the more critical aspect of a successful year-round system.

Building Panels Buck Heavy Loads, Arctic Climate at DEW Line Posts

The $600,000,000, three thousand mile DEW (Distant Early Warning) line that now stretches across the Arctic includes some fifty radar stations designed and fabricated by Dresser-Ideco Company of Columbus, Ohio. Though many of the details on their construction remain classified, enough information has been released to indicate the complex problems involved—for example, the need for modifying or even developing building materials to withstand the fierce Arctic climate.

One such material is a laminated insulating panel developed for the project by the Haskelite Manufacturing Company of Grand Rapids, Mich. At the DEW stations, the panels are



RADAR TOWER PANEL

used in radar towers, where they form a platform on which revolving radar gear is mounted between a protective "radome" and the steel superstructure below. Dresser-Ideco speci-

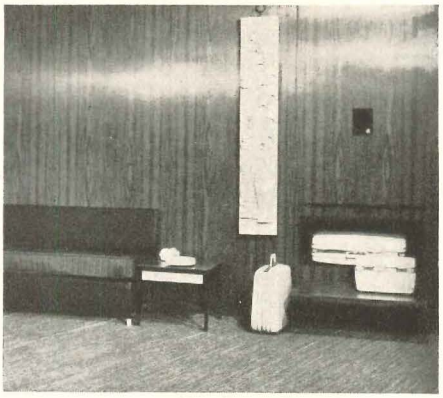
continued on page 206

A. Bernard Olson uses Keycorner because it's part of "A better job at a lower price."

Technical Roundup

continued from page 202

fied that the panels have a U-factor of less than .20, and support working loads of 100 psf across a 4-ft span. As shown, the product developed to meet these requirements consists of a central core of expanded rigid rubber insulation sandwiched between outer skins of 22 ga. galvanized steel over ¼ in. exterior grade marine plywood. According to Haskelite, they could eventually find commercial use in floor applications where insulation, moisture-proofing or exceptional strength is desired.



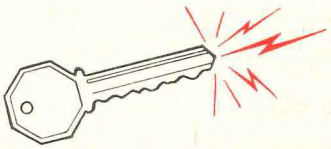
Tomorrow's "Room for a Night"

The "Room of Tomorrow," a hotel or motel studio room with terrace and bath, gave visitors to the National Hotel Exposition held last fall a preview of what they might expect in the way of overnight lodgings in the future.

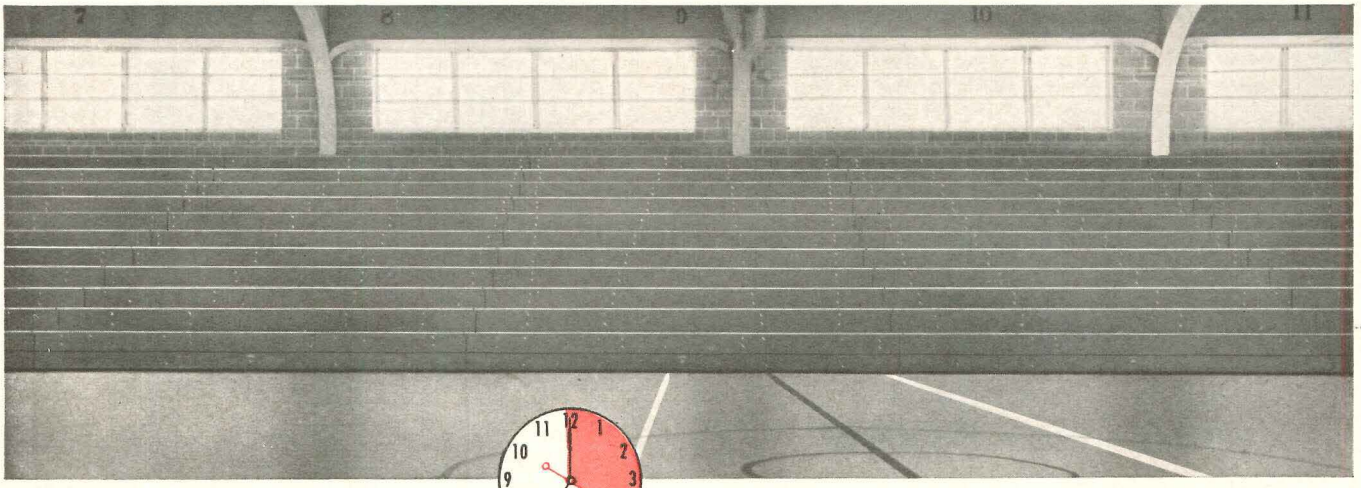
Designed for the hotel industry by Henry End, A.I.D., I.D.I., of Miami, Fla., the room features the most advanced products and products-to-be of several cooperating manufacturers. Its more unique aspects include a private dumb-waiter for luggage and room service; a control panel that allows the guest to manipulate communications, heating, radio and television, air conditioning and lighting from a central point; and simulated electro-luminescent paneling.

The more traditional elements are designed and arranged to extend the functions of a typical hotel room so that it can serve satisfactorily as both a bedroom and a sitting room. To this end, desk, dressing table and storage are combined in a single cantilevered unit that stretches the length of one wall; and couches narrow enough for comfortable sitting slide out from under bolsters mounted over a slight recess in the wall to form full size beds for equally comfortable sleeping. All furniture is of steel and plastic laminate, chosen, as were floor and wall surfaces, for durability and ease of maintenance.

more roundup on page 208

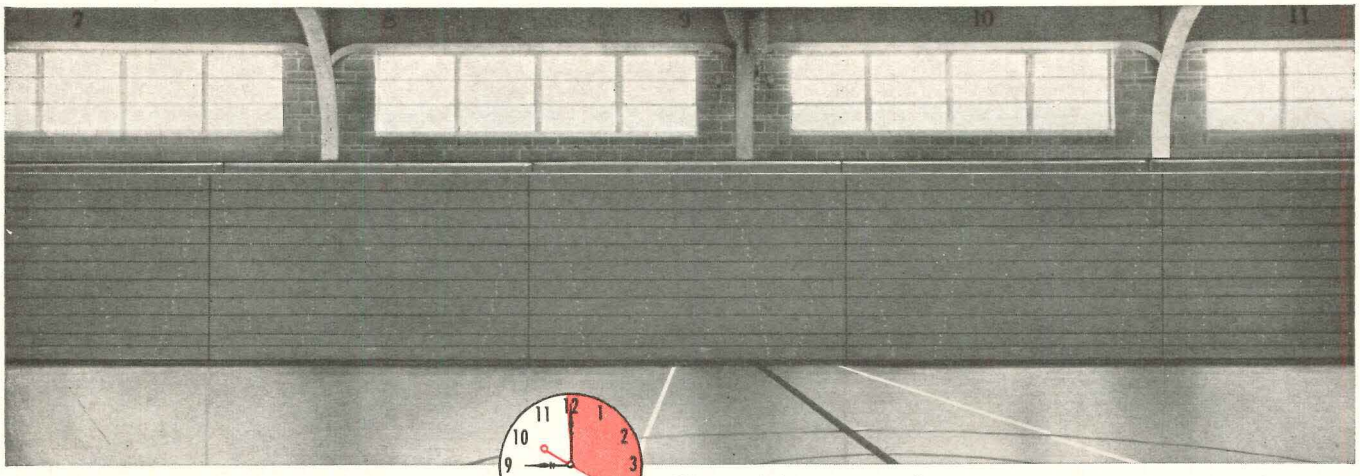


POWER OPERATION
makes sense in gym seats!



Crystal City High School
Crystal City, Missouri

Opens in seconds—at the turn of a key! No muscle power, no binding, no noise, no damage to seats, walls, floors. When all seat rows are not required, movement stops instantly by release of control key, with seats locked immovably in position. Movement stops automatically when seats are fully open or closed.



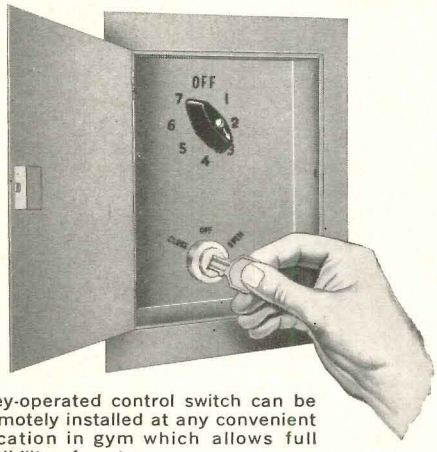
Medart Power Operation can be inexpensively installed on Medart Seats already in service.

Closed in seconds—just as smoothly, quietly, safely as opening operation.

Medart Seats need no floor tracks, no extra wall reinforcements, no special construction provisions. Only regular 110-v. or 220-v. power source is required.

Cost? Just a fraction more than manually operated seats—and this is soon recovered through lower maintenance and service expense.

Write for catalog



Key-operated control switch can be remotely installed at any convenient location in gym which allows full visibility of seats.

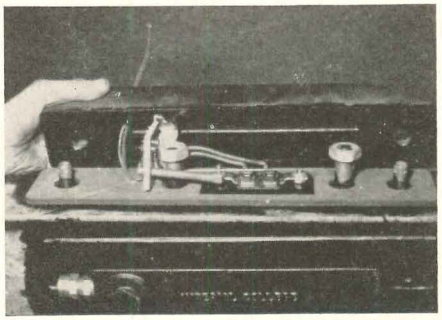
MEDART
TELESCOPIC GYM SEATS

SPECIFY the best, then INSIST on it!

SEE OUR CATALOG IN SWEET'S

FRED MEDART PRODUCTS INC. • 3540 DE KALB STREET • ST. LOUIS 18, MISSOURI

Technical Roundup



Stud-Welded Strain Gauge Speeds Frame Analysis

"The year's most outstanding contribution in the field of semi-automatic electric arc stud welding" was made by Dr. J. C. Chapman of the Imperial College of Science and Technology, London, England, in the opinion of the judges of an annual competition sponsored jointly by the American Society for Metals and Gregory Industries, Inc.

The $1500 Gregory Award was presented to Dr. Chapman for his ingenious use of stud welding to increase the reliability of the vibrating wire strain gauges used to measure stresses in steel building members. The end-welded studs serve two purposes in the new strain gauge assembly: they transmit information to the gauges, and they secure the gauges to the structure being analyzed. According to Chapman, the resulting apparatus can be assembled more rapidly; drilling and tapping, which are always tedious and often structurally undesirable, are eliminated; and the accuracy of the gauge is increased.

Super-Adhesive May Hold Promise for Building

A unique bonding material introduced by Eastman Chemical Products, Inc., as a laboratory curiosity only a year ago is now solving a wide variety of difficult assembly problems involving the joining of almost every kind of material, from minerals to wood to rubber. According to company officials, the new Eastman 910 Adhesive, chemically known as methyl 2-cyano acrylate, is the first that will produce high strength bonds between virtually any combination of materials without excessive pressure, heat, solvent evaporation or long curing time. In most cases, the materials are bound in less than a minute.

The glue has proved itself in many conventional adhesive applications, and has even made possible certain product design innovations that have heretofore been considered impractical. One possibility that may be of particular interest to the construction industry is that of gluing metals, rather than joining them by nuts, bolts or welds: in a test made on office desks, the adhesive eliminated thirty spot welds. And since a single drop can bind pieces of metal weighing several hundred pounds each, similar feats may be possible in other types of metal fabrication. The primary drawback of the new adhesive —a cost of $75 a pound—may be offset by the extremely small quantities needed. One drop is all that's required for most gluing tasks, and there are about 750 drops in an ounce. Although Eastman feels that the new material comes nearer to answering the description of a "perfect" industrial adhesive than anything developed thus far, the company will continue to explore the principle by which it works, as a possible basis for a whole new series of industrial adhesives. The 910 Adhesive is now being marketed by the Armstrong Cork Company, as well as by Eastman.

WHAT ARE ITS QUALITIES?

Tectum insulates, is structural, noncombustible and acoustical. It is lightweight yet tough and strong supporting roof loads up to 200 psf on economical spans. Its natural, textured surface is the result of compressing thick blankets of tough wood fibers into a rigid board. It is dimensionally stable, may be worked with ordinary wood working tools, resists insects, fungus and rot.

Tectum is supplied in thicknesses from 1″ to 3″ and the exposed side is protected by a ply of roofing felt, ready for the application of roofing materials as soon as it is erected. This backing also protects the material in handling and shipping and makes an excellent mopping surface for built-up roofing or shingles.

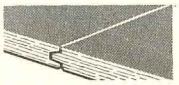
IS IT ECONOMICAL?

As a roof deck material Tectum serves as insulation, structural deck and acoustical board. It has a rich-toned, textured appearance that is both decorative and complementary to other materials within the building. Its light weight reduces the weight and cost of the framing system. Tectum is rated noncombustible by Underwriters Laboratories, assuring favorable insurance rates in most communities. Tectum goes down dry, down quickly, ready for roofing immediately. Add the extra qualities of Tectum to the savings its use makes possible and you'll agree that Tectum is definitely an economical material.

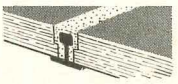
EXPERIENCED DISTRIBUTORS

There is a Tectum distributor or representative in your area — a capable building product specialist who can help with your roof deck, sidewall or acoustical problems. Give him a call before your next project or write Tectum Corporation, Newark, Ohio. Tectum has plants in Newark, Ohio, and Arkadelphia, Arkansas. Regional offices in Philadelphia, Atlanta, Columbus, Chicago, Dallas, Beverly Hills, Seattle and Toronto, Canada.

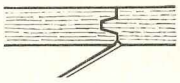
FIVE EXCLUSIVE ADVANTAGES



1. Tectum planks, used for roof deck construction, have tongue and groove edges on the long dimension. Nine and ten foot lengths are not unusual. Tongue and groove edges are driven together for strong, tight joints. Tectum makes an effective roof diaphragm for a lifetime of service.

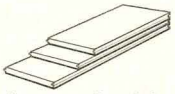


2. Tectum tiles, also used for roof decks, have rabbeted edges on the long dimension and are designed to be erected over bulb-tee framing systems. The rabbeted edge allows plenty of room for grout to seal around the bulb-tee, assuring a firm bond with the framing and adding rigidity to the deck.



3. The exposed edges of Tectum on the "ceiling" side of the board are beveled making each joint neat and attractive with a paneled appearance. Fits better, looks better than square-edge materials.

4. Factory applied felt backing is another Tectum plus factor. Tectum is ready for roofing as it's erected.



5. Tectum is custom cut to your specifications in special lengths engineered to fit any building module. Saves cutting on the job, saves time and labor, provides flexibility for the designer.

QUALITY · INTEGRITY · SERVICE

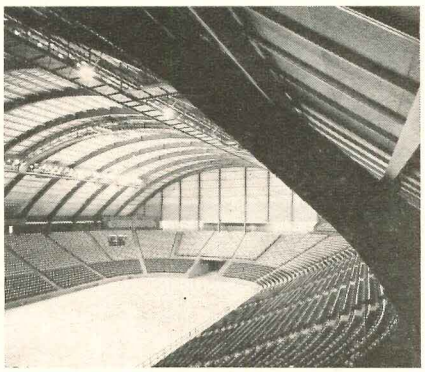
9-1

Homes

Studio ceilings for residential construction are gaining in popularity. Wood textured Tectum, with its decorative as well as functional advantages, is enjoying a growing acceptance. Sound conditioning has sales appeal, too.

Stover Residence, Houston, Texas.

Auditoriums



The roar of the crowd can be effectively controlled in buildings like this huge auditorium. Tectum roof decks offer many qualities of incomparable value for structures of this size. This is tongue and groove Tectum plank.

Univ. of Maryland Student Activities Building. Architect: Hall, Border and Donaldson

Commercial Buildings

Large commercial buildings are covered rapidly with minimum cost, minimum labor investment. Tectum is a real contribution to the success of commercial buildings for the investor, the designer, the contractor and the user.

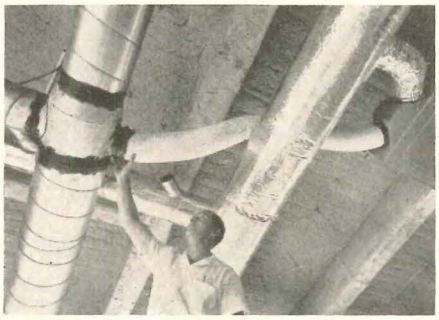
U.S. National Bank, Hillsboro, Ore. Architect: Williams & Martin

Product Reports

continued from page 181

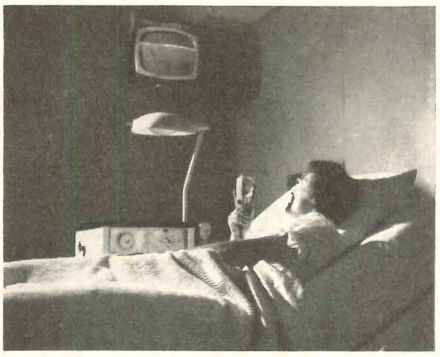
Fireproof Schoolroom Curtain

Cordoglas, a glass fabric coated with vinyl plastic, is described as needing no lining or flameproofing. Completely opaque, the curtains are designed for use in school auditorium and classroom windows. *Cordo Chemical Corporation, 34 Smith Street, Norwalk, Conn.*



Flame-Resistant Flexible Airduct

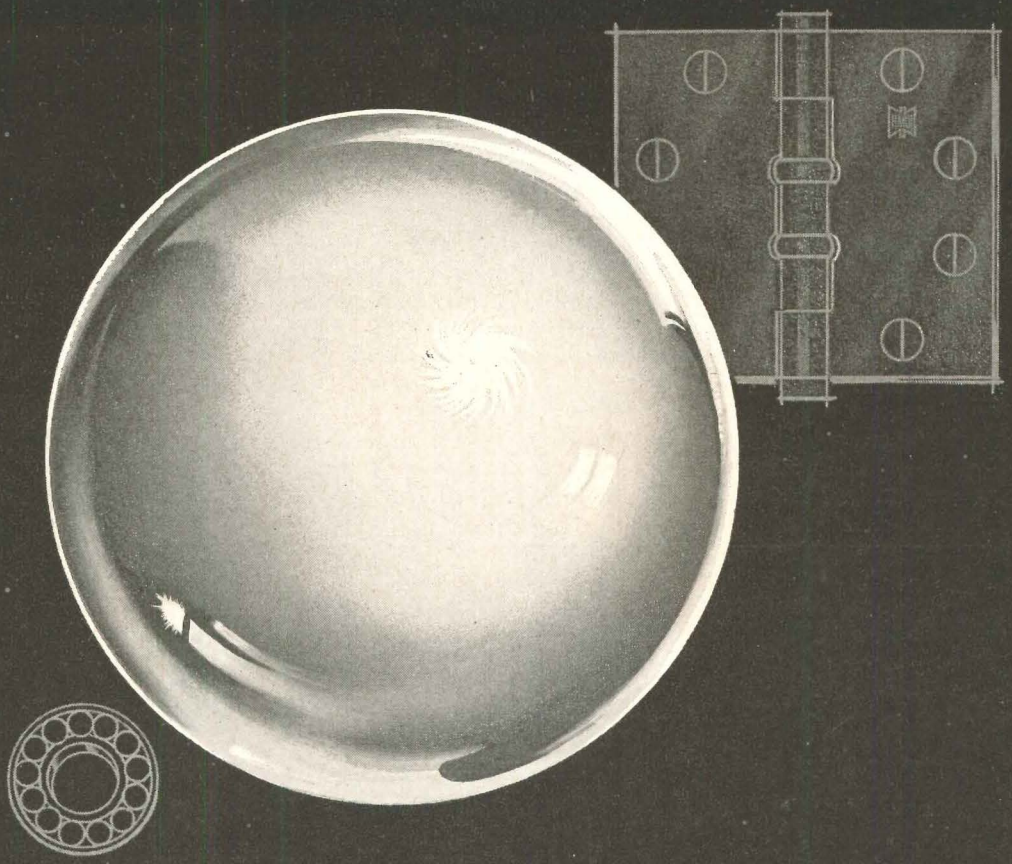
Useful for hot and cold, high- and low-velocity applications, this flexible pipe, made of flame-resistant Underwriter's grade asbestos cloth and steel spiral, is said to be the first of its kind to meet the specifications of the Chicago building code. This duct material is available in lengths of up to 20 ft and with inside diameters ranging from three to 12 in., and is said to be acid and oil resistant and to need no painting. The duct bends without kinking and should prove useful in office installations with movable partitions and for close-quarters connections between mixer boxes and ducts in dual-duct systems. *The Wiremold Co., Hartford 10, Conn.*



Hospital Bedside Control Panel

A hospital bedside control panel is said to permit a patient to adjust his bed, open and close drapes, turn lights on and off, operate a closed-circuit TV system and radio, and call a nurse or communicate with her. *Minneapolis-Honeywell Regulator Company, Minneapolis, Minn.*

more products on page 216



26*-Jeweled movement

All 26 *Keep Rolling Forever*—not Part of the Time—in a Hager *"Life-Time Bearing"* Butt Hinge!

The bearings *stay there* for *life!* Upper and lower raceways ride *forever*—on the *full count* of ball *bearings*—in a Hager *Life-Time Bearing* Butt Hinge!

Tough case-hardened steel ball bearing raceways are press-fitted into direct contact with knuckle on Hager ball bearing butt hinges.

No soft brass retaining jacket (or crimped shell) lies between the knuckle and the raceway . . . nothing to eventually wear away and allow the bearings to slip out.

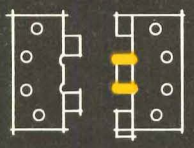
Both raceways and *all* 26 ball bearings are hard at work in Hager Ball Bearing Butt Hinges—in fine jeweled movement—forever providing life-time trouble-free silent door operation.

You'd expect finer performance from *Hager* Ball Bearing Butt Hinges, naturally—and naturally, you have a right to!

If it's expected to *stay* for *life*, then, of course

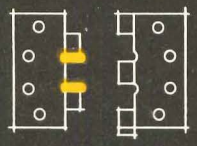
EVERYTHING HINGES ON HAGER!

*26 Balls in 4½" x 4½" 2-bearing Butt Hinges



NOT THIS . . .

One-knuckle-bored construction. Bearings anchored with wear-away brass bushings. (Bearings eventually fall out, when pin is removed.)



BUT THIS . . .

Hager **TWO**-knuckle-bored construction. Bearings anchored with case-hardened steel raceways.

Hager®

EVERYTHING HINGES ON *Hager!* • C. HAGER & SONS HINGE MFG. CO., ST. LOUIS 4, MO., U.S.A.
HAGER HINGE CANADA LIMITED, KITCHENER, ONTARIO

Reinforced Epoxy Pipe

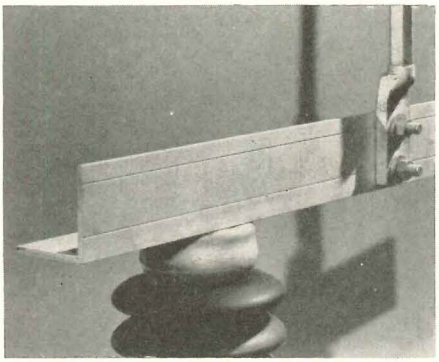
Corrosion-resistant reinforced plastic pipe, strong as steel but only one-eighth its weight, is now being manufactured in 2 to 12 in. diameters to meet piping, tubing and ducting needs in the building field. Known as *Bondstrand,* the new pipe comes in rigid 20 ft lengths with ends plain, bell-and-spigot or flanged. Other lengths, as well as diameters up to 40 inches, are available on special order. Two standard series, one with a nominal working pressure of 250 psi and the other rated at 500 psi, are in production, with greater pressure ratings obtainable by "beefing up" the wall thickness as required. Nontoxic, nonflammable and collapse-resistant, the plastic pipe may be cut and joined in the field without special tools. *Amercoat Corp., 4809 Firestone Blvd., South Gate, Calif.*

Gas Fired Water Boiler

A new line of small hot water boilers has been announced with three models with jacket dimensions of 13 by 22 in. at the base and heights ranging from 25¾ to 36¾ in. Net water sq ft is given as 175 to 320 for LP gas and 200 to 360 for all others. AGA inputs are 44,000 to 80,000 Btuh for the former and 50 to 90,000 Btuh for the latter case. Models 58, 78 and 98 in the "Wee Scot" line are from *Dunkirk Radiator Corp., Dunkirk, N. Y.*

Multi-purpose Concealed Flashing

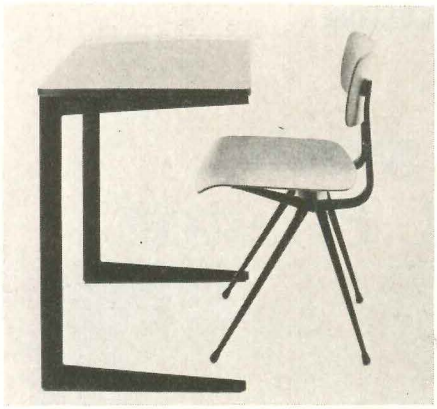
Alum-O-Top, a new low-cost concealed flashing material, is said to combine the virtues of aluminum and glass fiber with those of asphalt-impregnated creped paper. Suitable for water-proofing, damp-proofing and vermin-proofing, it consists of aluminum sheet, asphalt-bonded to heavy kraft paper on one or both sides, and reinforced with glass fibers spaced ¼ in. apart and running in both directions. Two and four mil grades are available in 4 to 48 in. widths. *Chase Brass & Copper Co., Waterbury 20, Conn.*



Angle for Bus Conductor

An aluminum angle is said to be a lower-cost substitute for small tubular bus conductors. Adaptable to normal cable lug connectors, it is available in the 3¼ by 3¼ by ¼ in. size, in 25 ft lengths, and is rated at 1300 amperes. *Aluminum Company of America, 1501 Alcoa Building, Pittsburgh 19, Penna.*

more products on page 224

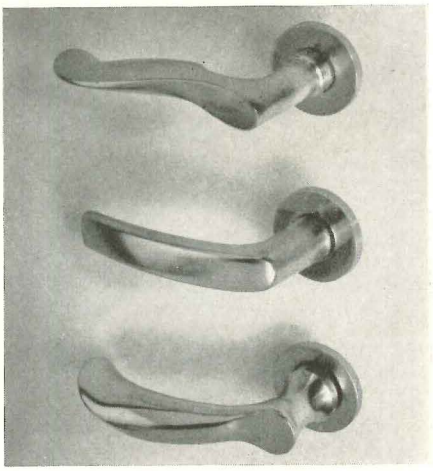


School Furniture from Holland

As might be expected from its family name, the new "Revolt" group of steel furniture for schools is a far cry from the usual institutional fare. The group includes desks (one-pupil, two-pupil and teachers'), chairs (side chairs, arm chairs, study chairs with writing arm, and ingenious folding-stacking-coupling chairs), and tables, all of which were designed by Friso Kramer and manufactured by a group of factories in Holland, and several of which have won awards in the annual Brussels International Design Competition. Construction is primarily of steel, with chair backs and seats, and table and desk tops of plastic. Both the steel and plastic come in 10 colors, making possible 100 different combinations. The series is being imported and distributed through *Stendig, Inc., 600 Madison Ave., New York 22, N. Y.*

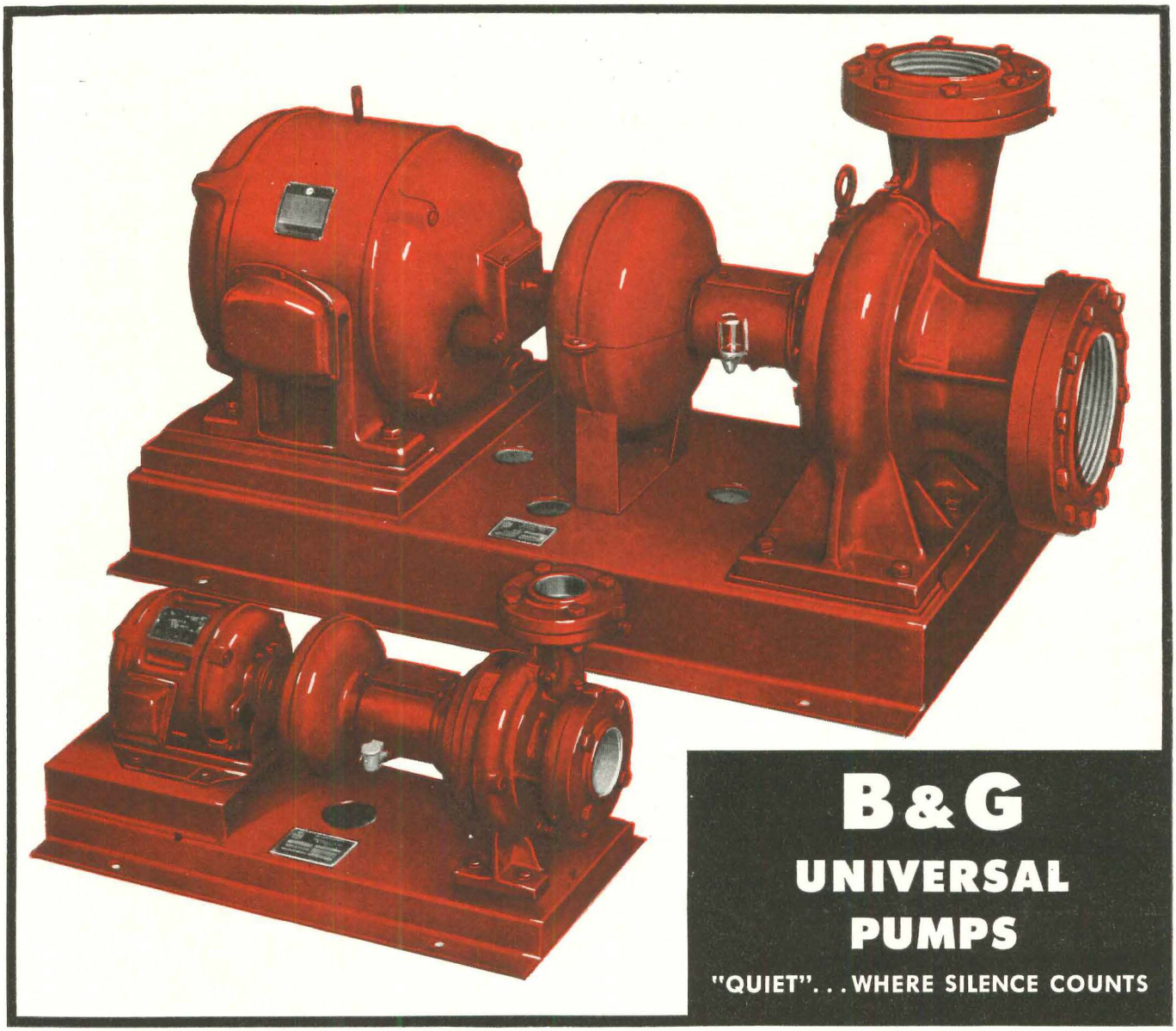
Mail Chute of Clean Design

Presenting a completely plain and neat appearance, this latest model in a well-known line is also designed for package installation with all pieces precut and packaged for each floor, making for one-stop installation. The design elements of glass front, metal sides, mailing pocket, lock and penalty card have been reduced and refined with excellent results. The company has also cleaned up the design of their letter-box door and offers it with either a combination lock or five-pin tumbler lock. The door and frame are built to federal specifications and are offered in three sizes. *Cutler Mail Chute Co., 78 Anderson Ave., Rochester, N. Y.*



Hardware by a Camera Maker

Imported Hardware, a new firm in the midwest, has announced several new hardware lines. Notable among these are a selection of leverhandles by Wehag, and lock mechanisms by Zeiss Ikon, both West German firms. The leverhandles are of refined, clean design, available in several anodized finishes and in several sizes in order to adapt them to the scale of the building. Handles and rosettes are available for backsets as narrow as ¾ in. and prices for the handles start at about $5.00. The mortise locks come in a complete line ranging from entrance to show case units in backsets from ¾ in. to 4 in. and prices starting at about $15.00. *Imported Hardware, Box 322, Bloomfield Hills, Michigan*



B&G UNIVERSAL PUMPS

"QUIET"... WHERE SILENCE COUNTS

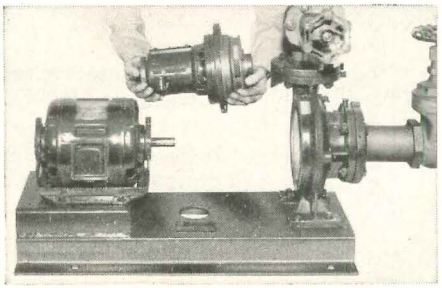
QUIET... FROM 1 TO 40 H.P.

With the line of B&G Universal Pumps now covering a range of from one to forty horsepower, every conceivable circulation requirement of systems using water for heating and cooling can be satisfied.

The B&G Universal Pump is an outstanding example of a product designed to meet a specific need. It is engineered and built to satisfy in every detail the exacting demands of circulated water systems, *Silent, vibrationless operation* is the keynote of the Universal's performance.

Motors are specially constructed and selected for *extra-quietness!* Long *sleeve* bearings are used in both motor and pump and the oversized shaft is made of special alloy steel with an integral, heat treated thrust collar. Water leakage is prevented by the exclusive diamond-hard "Remite" mechanical seal. Flanges, bolts, nuts and gaskets for both suction and discharge sides and pet cocks for venting and gauge tappings are furnished without extra charge.

Send for descriptive literature and engineering data.



Easy to service...vertical split case construction permits removal of entire bearing frame without disconnecting pipes.

Reg. U.S. Pat. Off.

BELL & GOSSETT

COMPANY

Dept. FO-32, Morton Grove, Illinois

Canadian Licensee: S.A. Armstrong, Ltd., 1400 O'Connor Drive, Toronto 16, Ontario

Office Literature

continued from page 182

Forms in Light (A.I.A. 31-F-2)
File folder contains illustrations of, and data on, a special group of decorative incandescent fixtures designed for lighting public spaces. *Habitat, 336 Third Ave., New York 10, N. Y.*

21 Industrial Lighting Problems
. . . *Solved With Power Groove* gives case histories, each with lighting layout and technical and cost data, of industrial lighting installations using G-E *Power Groove* fluorescent lamps. *General Electric, Nela Park, Cleveland 12, Ohio* *

Drafting Room Equipment Catalog
Presents complete line of drafting tables and files, with concise specifications and a discussion of drawing and filing techniques. *Hamilton Mfg. Co., Two Rivers, Wis.*

Factory-Built Sewage Plant
Bulletin 101 gives engineering and selection data and specifications on prefabricated *Cavitator* sewage treatment systems for small installations. 4 pp. *Yeomans Brothers Co., 1999 North Ruby St., Melrose Park, Ill.**

The Balanced Door (A.I.A. 16-A-1)
Catalogs Ellison line of balanced entrance doors, with details, installation photographs and specifications. 12 pp. *Ellison Bronze Co., Inc., Jamestown, N. Y.* *

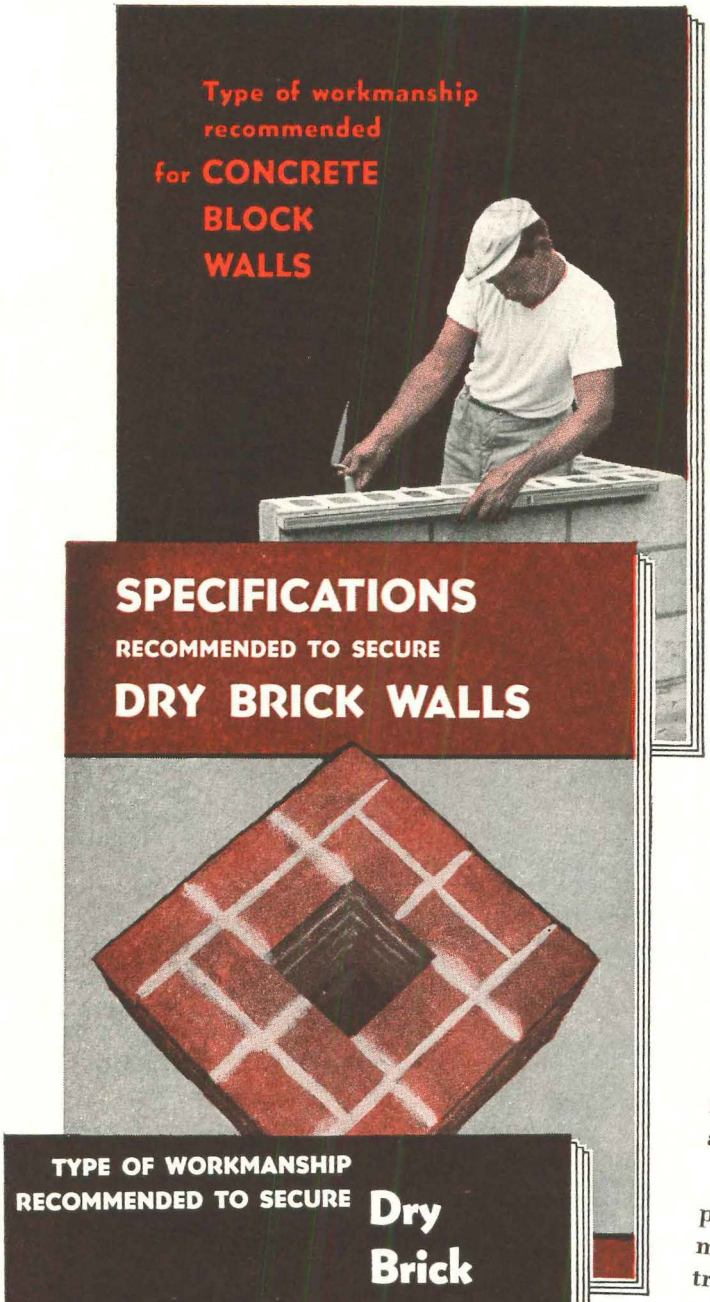
Poly-Ep Data Bulletin
Bulletin 82-A discusses the dielectric strength; resistance to moisture, abrasion and chemicals; adhesion to synthetic materials and metal; and other properties of *Poly-Ep* polyamide-epoxy resin finish. 4 pp. *D. J. Peterson Co., Sheboygan, Wis.*

Underfloor Distribution Systems
(A.I.A. 31-C-62) Depicts three types of *Spang* duct systems for underfloor distribution of power, telephone and intercom wiring. 8 pp. *Spang-Chalfant Div., National Supply Co., Two Gateway Center, Pittsburgh, Pa.*

Insulation for Low Temperatures
Booklet FL-104 contains photos and brief descriptions of several types of cold storage enclosures made with *Foamglas* cellular glass insulation. 12 pp. *Pittsburgh Corning Corp., One Gateway Center, Pittsburgh 22, Pa.**

**Additional product information in Sweet's Architectural File, 1958*

more literature on page 232



GET THESE IMPORTANT BOOKS!

THE three books at the left are a "must" for anyone who is interested in good masonry construction. One describes the type of *workmanship* recommended to secure dry brick walls. The second describes the *specifications* recommended to secure dry brick walls. The third describes the type of workmanship recommended for *good concrete-block walls.*

Each of these books has been endorsed by foremost authorities. Each has received a citation of merit from the Producers' Council and the American Institute of Architects. Each is fully illustrated, clearly written. Each contains a wealth of really valuable information.

These books are *not* advertisements for our product, Brixment. They are published and made available to members of the building trades solely as an industry service. Mail the coupon, *today*, for your free copies.

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Manufacturers of
BRIXMENT FOR MORTAR

Louisville Cement Company—Dept. AR-3
Second and Walnut Streets, Louisville 2, Kentucky

Gentlemen:

Without cost or obligation, please send me a copy of each of your three books on masonry construction.

Name_____

Firm_____

Street_____

City_____ State_____

Office Literature

Wood-Metal Homemaking Brochure
(A.I.A. 35-B) Includes illustrations, drawings, descriptions and specifications of Wood-Metal equipment for homemaking rooms. 8 pp. *Dept. A, Wood-Metal Industries, Inc., Kreamer, Snyder County, Pa.*

Poured-in-Place Gypsum Roof Decks
Gives design data, weight and thermal properties and working drawings for typical poured-in-place gypsum roof deck construction. 8 pp. *The Celotex Corp., 120 S. LaSalle St., Chicago 3, Ill.**

Heating Controls
Bulletin GEA-6774 describes and gives application information on each device in the G-E line of domestic heating controls. *General Electric Co., Schenectady 5, N. Y.**

Modular Lighting (A.I.A. 31-F-2)
Gives complete information on special features and mounting methods for Moe Light recessed and surface-mounted modular fixtures. 12 pp. *Moe Light Div., Thomas Industries, Inc., 410 S. Third St., Louisville 2, Ky.**

Luminous Ceilings
(A.I.A. 31-F-290, 31-F-21, 39-B-1) Describes, illustrates and gives specifications for luminous ceiling systems and lighting equipment. 8 pp. *Luminous Ceilings Inc., 2500 W. North Ave., Chicago 47, Ill.**

Haws Folding Partitions
Includes product information, details, and specifications for electric-hydraulic folding partitions. 8 pp. *Robert Haws Co., 15722 Telegraph Rd., Detroit 39, Mich.*

Make Your Home Distinctive
. . . *With Decorative Glass* offers ideas, illustrated by installation photographs, for use of translucent, light-diffusing glass in residences. 20 pp. *Mississippi Glass Co., 88 Angelica St., St. Louis 7, Mo.**

Gas-Fired Unit Heaters
Catalog gf-58 covers sound ratings, unit location, mounting heights, length of throw, performance specifications, weights and dimensions, etc. on new line of compact, propellor fan type gas-fired unit heaters. 8 pp. *Grinnell Corp., 260 W. Exchange St., Providence 1, R. I.**

**Additional product information in Sweet's Architectural File, 1958*

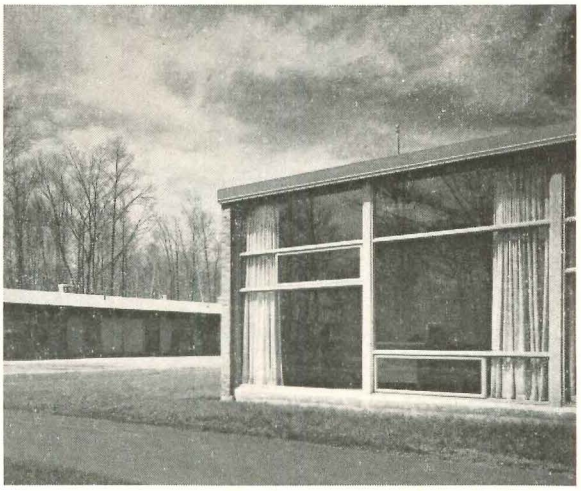
more literature on page 236

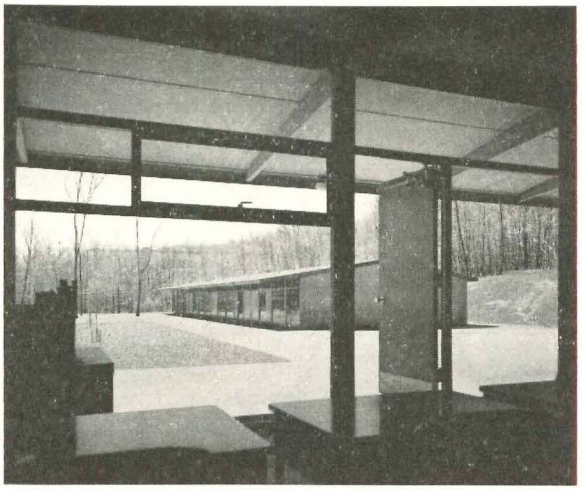
It's hard to tell where the inside ends and the outside begins in the new Fletcher Judson Elementary School, Watertown, Connecticut. Here, nature seems to be part of the classroom—keeping the children company outside the window and boosting their morale as they work.

The feeling of freedom and openness that dominates this school is caught and held by expansive areas of *glass* which let in the daylight but keep harsh weather outside. No less than five Pittsburgh Glass products contribute to the school's spaciousness and beauty: PENNVERNON Window Glass, HERCULITE Heat-Tempered Glass, *Pittsburgh* Polished Plate Glass, Mirrors, and Heavy Plate Glass.

A school designed with many Pittsburgh Glass products is rich in light, life and beauty. And it's no more than our children deserve.

Architect: Warren H. Ashley, West Hartford, Connecticut





CONSULT YOUR ARCHITECT

for information about the use of these famous Pittsburgh Glasses in school construction:

Solex®	green tint, heat-absorbing and glare-reducing plate glass
Solargray®	neutral tint, heat-absorbing and glare-reducing plate glass
Herculite®	shock-resisting tempered plate glass
Twindow®	the world's finest insulating window
Polished Plate Glass	for clear, undistorted vision
Pennvernon®	window glass at its best
Spandrelite®	glass in color
Pittco®	glass-holding and decorative metal members

GLASS

PAINTS · GLASS · CHEMICALS · BRUSHES · PLASTICS · FIBER GLASS

PITTSBURGH PLATE GLASS COMPANY

IN CANADA: CANADIAN PITTSBURGH INDUSTRIES LIMITED

Office Literature

Azrock Flooring Products
Includes product descriptions, illustrations, installation data and brief architectural specifications on *Azrock* line of flooring products. 12 pp. *Azrock Floor Products Div., Uvalde Rock Asphalt Co., Box 531, San Antonio, Texas* *

Paint Specification Manual
Includes complete information for selecting and specifying *P&L* line of paints, varnishes and enamels. 24 pp. *Pratt & Lambert, Inc., 75 Tonawanda St., Buffalo 7, N. Y.**

Year Round Concreting
(A.I.A. 3-B-2) Summarizes new ACI standard recommendations for cold weather concreting, with sections on accelerators, preparation before concreting, winter concreting objectives, and protection required. Guide specifications are included. 8 pp. *Calcium Chloride Institute, 909 Ring Bldg., Washington 6, D. C.*

Unistrut Parts Catalog
An Expanded General Engineering Parts Catalog offers a complete listing of all fittings, channel members and other parts that comprise the *Unistrut* bolted metal framing system. Channel width specifications, illustrations and explanatory notes are also included. 180 pp. *Unistrut Products Co., 933 W. Washington Blvd., Chicago 7, Ill.*

Laboratory Working Surface
(A.I.A. 35-E) Describes and gives chemical and physical test data and specifications for *Kemrock,* a resin-impregnated natural stone surfacing for laboratory worktops. 8 pp. *Kewaunee Mfg. Co., 5046 S. Center St., Adrian, Mich.*

The Superior "Compact"
Describes features, and gives complete data, dimensions and recommended boiler room layouts for Superior *Compact* boilers. *Superior Combustion Industries, Inc., 1475 Broadway, New York 36, N. Y.*

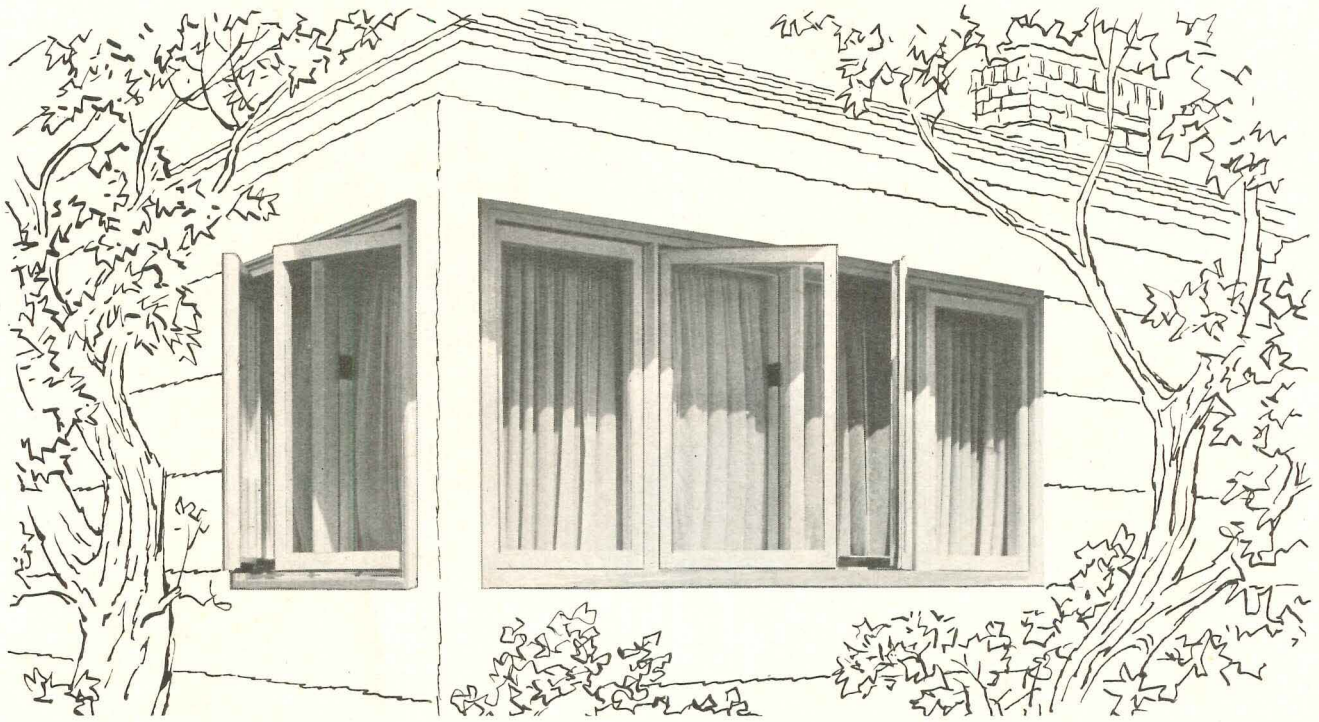
Literature Requested
Malcolm F. Scott, Architect, 24221 Locust Dr., Farmington, Mich.

H. H. Harper, Supervisory Engineer, Engineering Section, Office of the Post Engineer, Building T-6205, Fort Lee, Va.

Morris C. Jones and Lewis E. Lyman, Architects, Walters Bldg., 317 North Main St., Garden City, Kansas

**Additional product information in Sweet's Architectural File, 1958*

BILT-WELL Casements

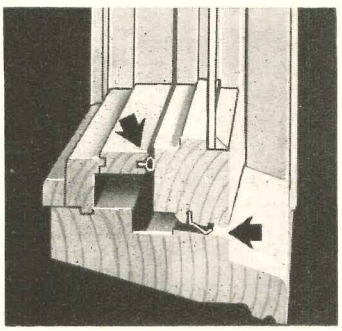


Use BILT-WELL Casements singly, in pairs, in multiple units with matching BILT-WELL picture sash.

BILT-WELL Casements are available in three widths, 16", 20" and 24" and in five heights, 24", 32", 36", 48" and 60".

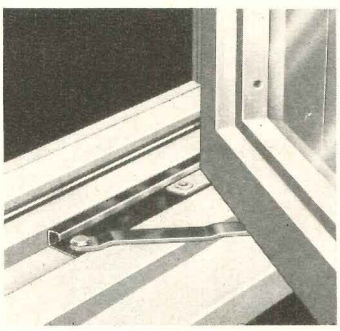
Matching picture sash available in 15 different sizes.

The BILT-WELL Casement, when tested for weathertightness, consistently recorded a high efficiency. Infiltration tests showed an exceptionally good seal between weatherstripped sash and frame. This results in important savings to the home owner in heating costs, and assures greater year around comfort.*



Weather Stripping

Twin-system BILT-WELL weather stripping (two independent arrangements, one of vinyl tubing, one of stainless steel) plus snap-on storm panels are lifetime money savers, reducing heating costs as much as 4 cents per window per day.



Concealed Hinges

Sturdy BILT-WELL hardware is concealed for trim, uncluttered appearance. Prowler-proof... dependable...guaranteed. Provides 90° sash opening for easy cleaning.

Specify BILT-WELL WOODWORK

Manufactured since 1866 by

CARADCO, Inc., Dubuque, Iowa

(formerly Carr, Adams & Collier Company)

SCHOOL FIRE INSURANCE COSTS *continued from page 178*

in the same manner. Penalty charges apply to all communicating openings through fire walls, even to double standard fire doors, and are percentages of the exposure factor for the communicating building. Charges for additional openings are one-half the charge for the first opening.

For separate rating of communicating sections, they may be connected through a ventilated light well, or by bridges or passageways either open on one side or glazed with thin glass and constructed as specified in the regulations. Fire walls must extend at least 2 ft above abutting combustible roof construction.

Hanging Fire Doors

A frequent bone of contention with the rating bureau is the manner in which fire doors are installed in hollow masonry walls and partitions. The regulations provide:

Whenever openings through walls of hollow masonry are protected by fire doors, the doors must be supported directly on sections of solid masonry. This requirement will apply alike to all types of fire doors including swinging doors mounted on steel framing which, in turn, is dependent on the wall for support. In this latter case, the door frame must be secured to a section of solid masonry.

Usually, the frame must be built in with strap anchors embedded in solid masonry. Setting a frame within the prepared opening and fastening it with expansion bolts is not acceptable.

When frames are built into hollow masonry walls or partitions, the inspector of the rating bureau is likely to be "from Missouri" and demand proof that the cells at the jambs have been filled with concrete. The jambs should either be built of brickwork well bonded to the hollow masonry or the inspector should be present when the jambs are being erected.

Architects should keep in mind that acceptable opening protectives must be labeled doors in labeled frames equipped with approved hardware and installed in accordance with the applicable Underwriters' requirements.

Roof Covering

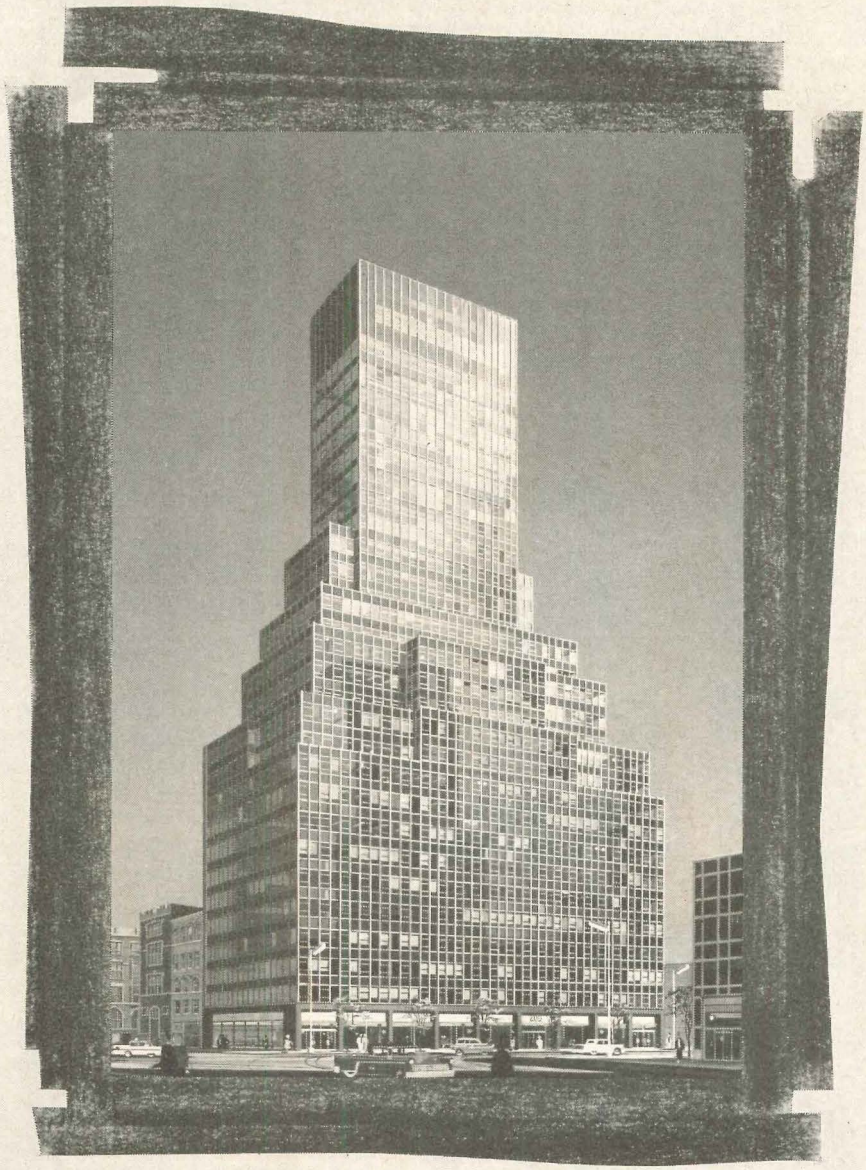
The regulations state:

All roof coverings listed by the Underwriters' Laboratories as Meeting Class A, B, or C Specifications shall be considered as approved.

Most customary roof coverings, including the usual built-up gravel or slag or smooth asphalt-surfaced roof coverings, and some prepared roof coverings including asphalt shingles, meet one of these specifications. In case of doubt, the Fire Protection List of the Underwriters' Laboratories should be consulted.

Insurance Requirements vs Code Requirements

The architect must plan his building in conformity with the requirements of the state education department. In some cases, he must also conform to local building and fire prevention codes. He should never assume that conformity with these will earn a satisfactory insurance rate. Building and fire prevention codes are minimum requirements for safety to life and property, or should be. State education requirements are primarily concerned with building planning. Insurance regulations, and the formulas for determining building and contents rates and charges for extended coverage, attempt to establish a balance, with a margin for profit, between premiums collected and losses and overhead paid out. State education department and usual building code requirements for stair enclosures or fire doors do not meet insurance requirements.



200 East 42nd Street, New York
Owner: Joseph Durst & Sons
Windows: L·O·F Parallel-O-Grey Glass
Architects: Emery Roth & Sons, New York

"BEST" is glass that minimizes wiggles in reflections, glass that makes your façade as handsome as your rendering.

"BEST" glass, therefore, is *plate* glass. Best plate glass is *twin-ground*. And you always get twin-ground plate glass when you specify L·O·F ¼" *Parallel-O-Plate®* or *Parallel-O-Grey®*.

L·O·F GLASS

PARALLEL·O·PLATE GLASS

LIBBEY·OWENS·FORD GLASS CO. *a Great Name in Glass*

TOLEDO 3, OHIO

Washington Topics *by Ernest Mickel*

continued from page 40

for the elderly, and changes in the secondary mortgage operations of the Federal National Mortgage Association.

For '59: $52 Billion in Buildings, Government Forecasts Indicate

The Departments of Labor and Commerce issued an optimistic construction forecast for calendar 1959, asserting that new construction spending is expected to rise seven per cent. This would bring the current year's outlay for new work up to $52.3 billion, pushing the total over the magical $50 billion level for the first time in history. Last month Commerce and Labor said it appeared 1958 would wind up with expenditures of $48.8 billion in new work.

This highest record for 1959 would represent a new record in physical volume of work as well, topping the previous peak, established in 1955, by an estimated three per cent.

Public expenditures should provide the major part of the 1959 expansion, the government statement said, going up some $2.1 billion to $17.1 billion. The $35.2 billion total predicted for private work would be a gain of $1.4 billion over 1958.

Construction costs will rise moderately this year, the two agencies said.

As for housing, they expect an 11 per cent advance in expenditures for new residential construction. This would jump the $18.5 billion 1958 total to $20.6 billion. The gains in residential construction will come principally from a 13 per cent increase in outlays for new private nonfarm dwellings. The government placed its anticipated unit volume for both public and private nonfarm dwellings at 1.2 million; this compares with around 1,170,000 started in 1958.

The private home outlook was covered as follows:

"The increase in new private housing outlays also reflects an expected rise in the average construction cost of the units built. The apartment boom of the past two years appears to be lessening, so that the proportion of such units (which are smaller and cost less, on the average, than single-family houses) is likely to decline in 1959. Moreover, under the less favorable mortgage terms anticipated for 1959, and as builders use up the relatively large volume of 1958 commitments for moderate-cost houses with government backed mortgages, the proportion of higher-priced single-family houses may be expected to rise."

Here is a brief rundown on prospects as seen by Labor and Commerce for 1959:

Outlays for new manufacturing plants will be down 15 per cent from 1958; this is due to sharp reduction in numbers started in 1958.

Aggregate spending for commercial buildings will expand to match the record total of $3.6 billion of 1956. Office buildings and warehouses, setting a new peak of almost $2 billion in 1958, are expected to fall back to $1.9 billion, the 1957 level. This reflects completion of a large number of major office buildings started in New York City during the past few years.

Expenditures for new stores, restaurants, and garages, are expected to increase this year by 10 per cent—to $1.7 billion. This figure would still be 10 per cent under the 1956 high of nearly $2 billion.

Shopping facilities—expansion is expected.

Other types of nonresidential building will be at or near records this year.

Churches and related facilities—up 10 per cent toward $1 billion.

Private education construction—

COMPETITION

"It is our hope that this competition will encourage the architectural profession to direct its great skill and experience to the solution of a recognized national problem. This problem, better housing for the middle income family, vitally affects all strata of our society. Its solution is properly the concern and responsibility of everyone connected with the housing industry."

SEYMOUR MILSTEIN, PRESIDENT

METHOD OF SUBMISSION

Each submission shall consist of not more than three 30 x 40 illustration boards, used vertically, of sufficient weight to permit handling and display. Drawings shall be in black and white suitable for reproduction. Typewritten information, schedules, etc. may be applied to front of illustration boards. There shall be no projecting lettering or other materials. Each board shall have a thin card mounted face inward on the back with gummed tape, bearing the Contestant's name (or names, if a joint submission), address, and school or office affiliation; a statement signed by the Contestant (s) that this particular submission has not been previously submitted in any other competition; the name of the individual or individuals to whom award check is to be made payable and address of the individual to whom it is to be mailed if award is made for the submission. If the contestant is an undergraduate student he will so indicate on the back of the submission.

Submissions shall be addressed to Mastic Tile Corporation of America and delivered to The Architectural League of New York, 115 East 40th Street, New York 16, New York, postmarked or express receipt stamped not later than 12 Midnight on June 30, 1959, and must be received not later than 12 Midnight on July 10, 1959. Submissions will be returned by prepaid registered mail wherever possible. However the sponsor cannot assume responsibility for loss or damage to entries. Exhibit, reproduction and publication rights are reserved by the sponsor for a period of one year after award.

Submissions will be numbered in order of receipt and each will be anonymous until the Jury has judged the entries which are identified by number only. The Jury shall have full and final power in the selection of all entries for award. By taking part in this program the Contestant(s) agree (s) that he shall have and make no claim against the Jury, any member thereof, the sponsor, the endorsing institutions, on account of anything that may be done or omitted to be done, except for awards made to him. The mailing of the check payable in the amount awarded to the name or names given on the original entry shall constitute full payment of the award.

Notification of awards to entrants will be made by the sponsor as soon as practicable after judging is completed, and payment of award as above shall also be made as soon as practicable.

The Major Award winner will be required to submit an explanatory model of the typical dwelling unit for public display adequately demonstrating his solution within a period of 45 days after date of award. This model shall be made available for display as arranged by the sponsor.

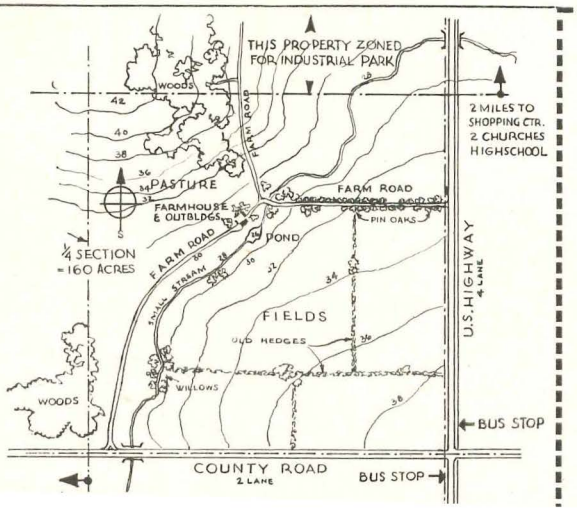
The submission shall indicate in tabular form the proportionate assessment of general development, cost of roads, utilities, etc. together with a schedule of construction cost in sufficient detail to indicate reality of approach. The scope and validity with which the economic problem is faced will be one of the criteria of judgment.

The sponsor has not set any restrictive conditions as to materials, methods of construction, or design classification, and no restriction is placed nor implied in the development of the tract save that the suitability for individual ownership is mandatory either for individual houses or group arrangements suitable for cooperative ownership.

It is hoped that through the medium of this competition an awakened professional and student interest will be directed to this problem and that the results will augment the efforts of the large scale operative builder.

To this end judgment will be made on the basis of creative approach, best economic development of the site and greatest aesthetic contribution.

NOTE: It is felt that the program has been so defined to permit of the Contestant's judgment. Therefore no questions will be answered.



ENTRANTS ARE REQUESTED TO REGISTER PRIOR TO MAY 15, 1959

Mastic Tile Corp. of America, Dept. 8-1, P.O. Box 128, Vails Gate, N. Y.

I intend to enter the Mastic Tile Corporation Design Competition.

Please send me ____ additional copies of the program for the design competition and an 8" x 10" reproduction of the tract plot plan.

Name_____

Firm or School_____

Address_____ City_____ Zone____ State_____

ADDITIONAL ENTRY FORMS ARE AVAILABLE FROM MASTIC TILE CORPORATION, THEIR REPRESENTATIVES AND DISTRIBUTORS.

APPROVED BY THE COMMITTEE ON COMPETITIONS OF THE AMERICAN INSTITUTE OF ARCHITECTS

Washington Topics

process by authorizing appropriations for Census to carry the additional work. It has been said that approximately $1 million would be needed for the new Census effort.

The Budget officials pointed out that under the new arrangements, agreed to by Labor and Commerce Secretaries, all collection and dissemination of construction statistics would be centered in the Commerce Department, thereby improving the quality of the program. BDSA has been doing the labor force analysis, and with this going over to BLS, a significant improvement there also is anticipated, Budget said.

Mr. Stans said that fixing responsibility in single agencies will provide better coordination and improve the operation of each of the programs.

Details remained to be worked out on the methods Census would employ.

Survey Finds 20% of Architects Using Modular Drawings

A new spark of enthusiasm has hit the Modular Building Standards Association. After visiting most of the major architectural schools in the country and working on plans for a better inventory of building plans prepared by the modular dimension principle, Byron C. Bloomfield, M.B.S.A.'s executive director, said he was very much encouraged to find a high level of interest in the system.

A survey conducted by the American Institute of Architects has indicated that the percentage of firms now producing modular dimensioned working drawings has passed the 20 per cent mark. Nearly one out of 10 jobs was found to be constructed from modular blue prints, Mr. Bloomfield said.

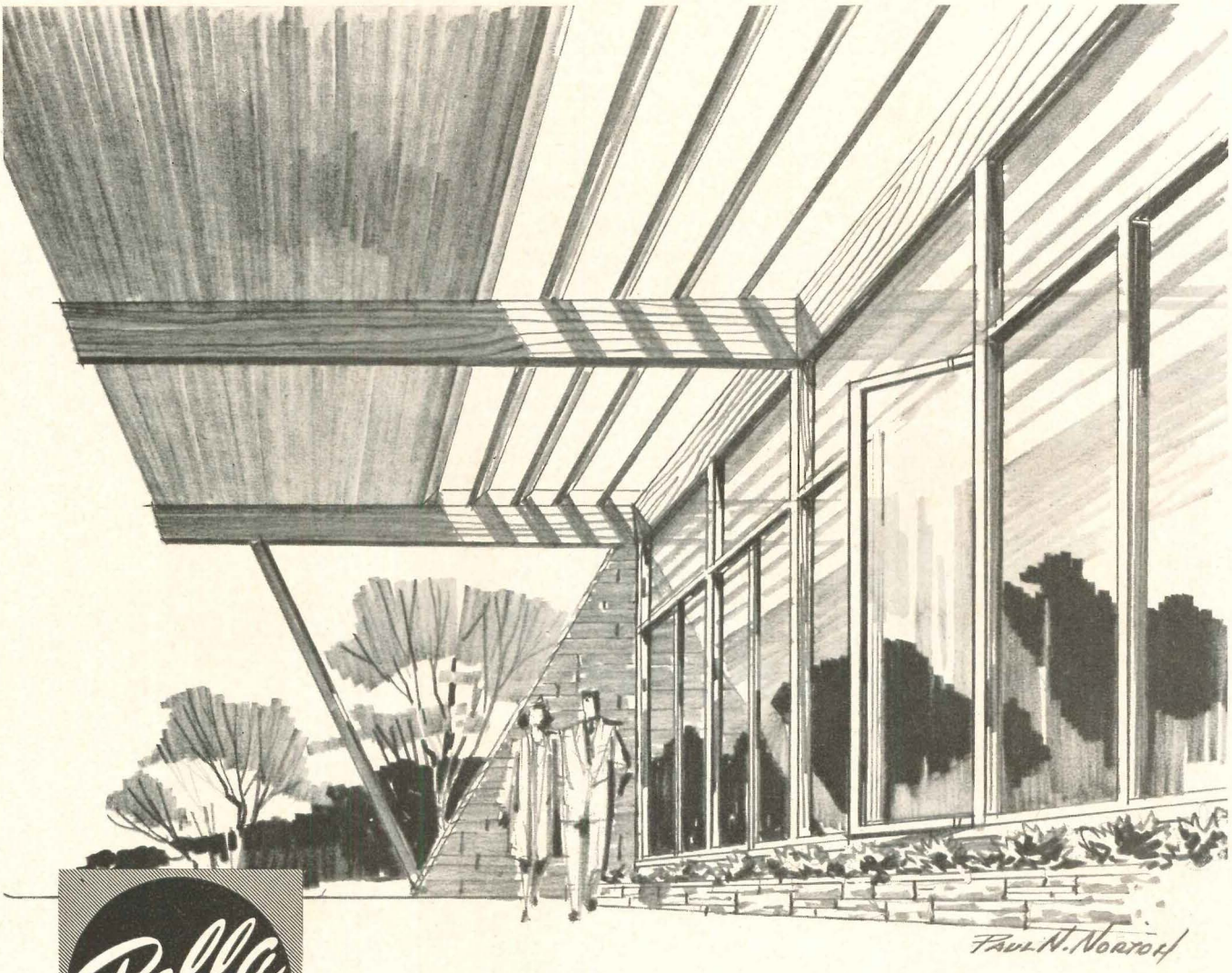
He is stressing the premise that architects, contractors, and producers of such jobs are experiencing greater profits than they would have received from non-modular projects. More and more of them, and owners as well, will find additional profits in their 1959 balance sheets because of modular methods, he predicted.

One important reason for the rising interest in modular measure, Mr. Bloomfield suggests, lies in the fact that more and more architects are specifying modular products. This prompts manufacturers to make and market modular materials. These segments of the industry no longer are "waiting for each other" to move in the modular dimension field.

He said that 1959 will see the first modular bath tub on the market, with modular wall tile available in increasing quantity. Well over half the window producers in the country now are making their products available in modular sizes. Many stock no non-modular sizes.

Director Bloomfield said that almost every architect will state freely that when he is specifying a stock material, he would like it to be in multiples of four ins., including one-half the joint on either side plus tolerance or, in other words, modular.

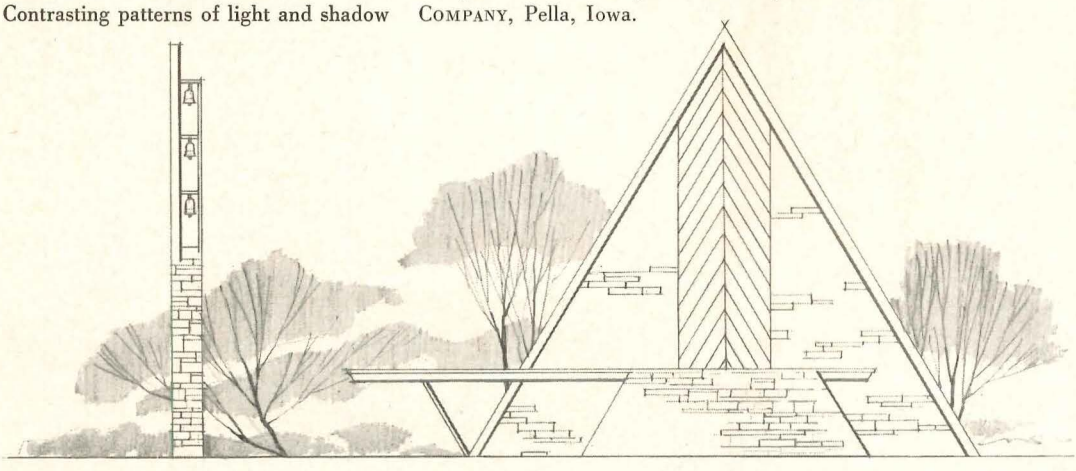
In looking forward to prospects for the movement this year, he stated: "On 10 per cent of all buildings modular materials are specified, and on over half of the jobs they are wanted. This, plus statements from individual architects and from officials in one government agency requiring all architects retained by them during the last three years to use modular drafting, leads us to only one conclusion: the increasing number of architectural firms using modular measure for working drawings and the increasing number of manufacturers introducing new lines of modular products in 1959 will provide the entire construction industry with unexpected additional income."



Pella®

windows add dignity to contemporary worship center

PROBLEM: How to distribute natural daylighting deep in the sanctuary of this chapel while preserving privacy. Here the architect selected PELLA WOOD CASEMENT WINDOWS in their new 24″ x 68″ glass size, with PELLA fixed units in combination overhead. Contrasting patterns of light and shadow created by the louvered marquee break the view of the interior as seen from outside. See the PELLA catalog in Sweet's or write for copy. For nearest United States or Canadian PELLA distributor, consult your classified telephone directory. ROLSCREEN COMPANY, Pella, Iowa.



Results are Inconclusive in Tests Of Runway Pavements for Jets

The long-awaited U. S. Corps of Engineers report on the airfield paving test run at Vicksburg, Miss., left a good many unanswered questions. It is not likely to still the continuing argument between producers of cement and asphalt as to the relative merits of their products for airport paving use.

Appearing before a House subcommittee after the report was issued, representatives of the Corps and the Air Force stated that they were in substantial agreement that the interior portion of a runway built for B-52 use can be constructed of flexible pavement if it is to be subjected to "normal operations."

It was agreed that with more than so-called "normal use," flexible-type pavements tend to rut, causing the huge planes to rock or "porpoise" while taking off. This can lead to damage of instruments and endanger take-offs, it was explained.

As a safety factor, the Air Force favored a 75-ft-wide concrete strip placed in the center of the runway to accommodate the landing gear of the B-52's. There was general agreement, too, that warm-up pads and taxiways should continue to be built of concrete.

Testifying before the subcommittee, Maj. Gen. Walter K. Wilson, deputy chief of engineers for construction, said: "The Corps of Engineers has concluded that it is possible to construct heavy-load flexible runway interior pavement that will provide adequate service for normal B-52 operation. However, B-52 operational conditions may occur that could cause objectionable roughness in flexible pavement because of differential settlement.

"Therefore, as a general policy we are in agreement with the Air Force that a center strip of rigid pavement in runway interiors is good insurance."

New Chief of Hospital Facilities Named as Dr. Hoge Resigns

Dr. Jack C. Haldeman has succeeded Dr. Vane Hoge as Chief of the Division of Hospital and Medical Facilities in the U. S. Public Health Service, Health, Education and Welfare Department.

Dr. Haldeman had served as assistant chief of the division for approximately a year before he took over the top duties on July 1 this year.

Dr. Hoge has gone with the new Hospital Planning Council of Chicago, an independent voluntary group which deals with overall planning of hospitals and health facilities. It has no government connections.

Dr. Hoge served as assistant surgeon general in PHS for the 18 months prior to his acceptance of the Chicago position. He was instrumental in organization of the Hospital Facilities Section of USPHS in 1940 and contributed much to the establishment of the Hill-Burton hospital construction program which was first authorized in August of 1946. At that time the USPHS section was made a division and Dr. Hoge was named to head it. Some three years later he was made assistant surgeon general.

Dr. Haldeman was involved early in the H-B program operations. Two years after its initiation he left to head the Alaska Health Program and was in what is now the 49th state for several years. Returning to Washington, D. C., he was designated to head the USPHS Division of State Services. As assistant surgeon general he took over the Hospital and Medical Facilities Division when Dr. Hoge left July 1, having served for a year as its assistant chief.

PANEL-WALLS

an exciting new use for the most Beautiful of all Building Materials

The VERMARCO PANEL-WALL® unit is a low-cost, preassembled wall section, encased in extruded anodized aluminum. Units lock together for large panel-walls, or adapt easily to a wide range of curtain wall systems.

Exterior Face—available in a variety of ½ inch thick marbles with improved exterior finishes to enhance color and withstand weathering.

Core—a rigid insulating material, bonded to both faces.

Interior Face—standard finished in ⅛ inch asbestos-cement board, which can either be painted or receive a variety of other materials or treatments to produce attractive interiors.

Metal Frame—precision built of extruded anodized aluminum.

Size—recommended sizes 15 to 20 sq. ft. per panel.

Performance—panels, when joined, are automatically weather and moisture sealed by means of a tongue and groove system with built-in vinyl weatherstop and expansion seal that eliminates the need for additional framing or caulking.

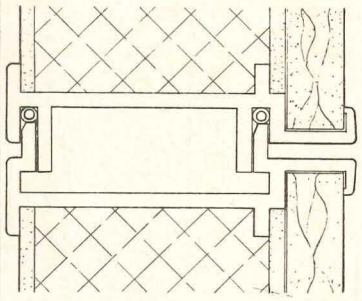
Curtain Wall Systems—VERMARCO PANEL-WALL is available in three series:

Series 100—Flush-Mount Panel. Maximum thickness 3 inches, approximate weight of panel 10.4 lbs. per sq. ft. "U" factor .11.

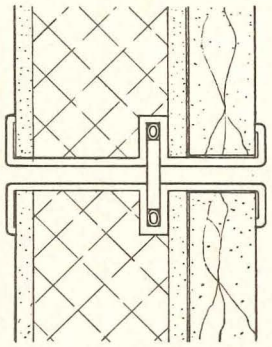
Series 200—Grid-Wall Panel.

Series 300—Window-Wall Panel

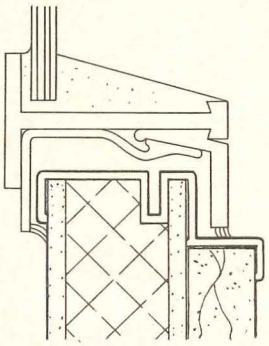
Write now *for complete specifications, detail drawings, marble varieties and cost.*



Flush-Mount Panel



Grid-Wall Panel



Window-Wall Panel

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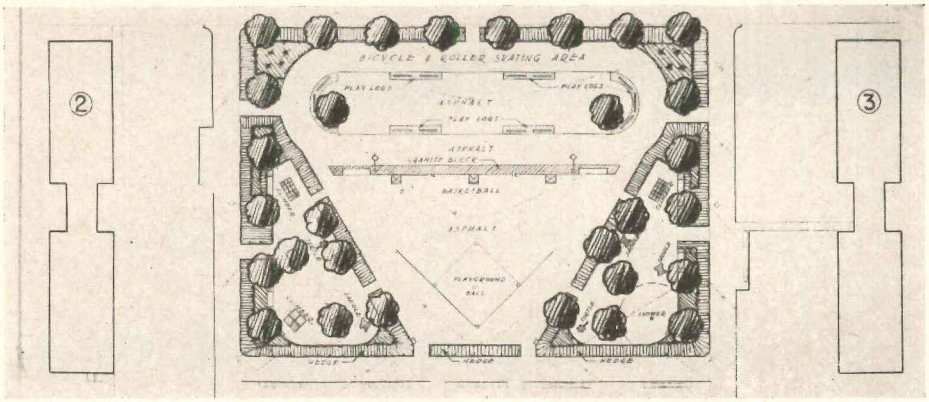
New York Public Housing Gets New Play Areas, Formerly Lawns

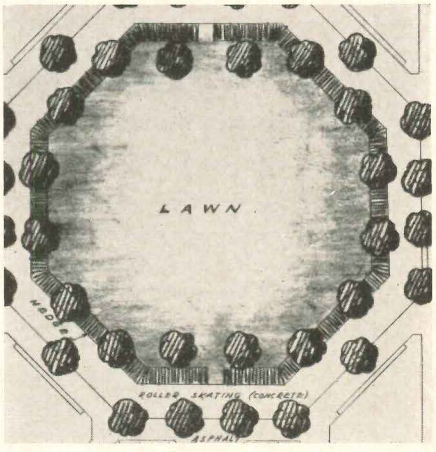
The New York City Housing Authority is gradually increasing play areas in public housing from about 25 sq ft per development apartment to 35 sq ft. The extra space is being achieved by converting malls and lawns.

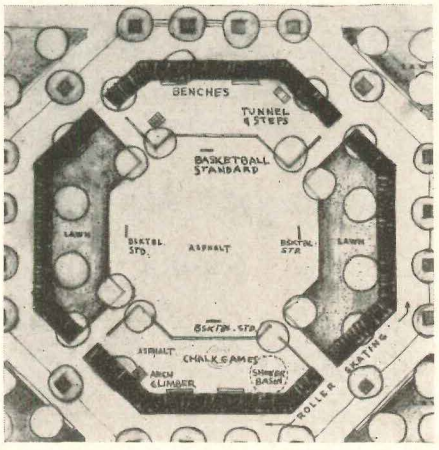
William Reid, chairman of the Authority, points out that the post-war child-population boom has made facilities inadequate. About 55 per cent of the lower-rent housing population comprises children under 21.



A two-part program has been undertaken to meet the need for more playgrounds: 1) More play areas are being inserted in developments in the planning or construction stage; 2) lawn areas of completed developments are being converted when possible. The Authority expects the cost of the playgrounds to be saved many times because children who have enough space to play use their energies that way instead of damaging buildings and grounds.

The plans shown were prepared under the supervision of Wolcott E. Andrews, senior landscape architect in the Authority's Construction Division. Above is a new play area for Linden Houses. Below are "before" and "after" views of one at Stephen Foster Houses.





Nowadays, architects can choose from a wide variety of resilient floors. Armstrong is in the unique position of making all types. So, an Armstrong Architectural-Builder Consultant has no bias toward any one type of flooring and can make impartial recommendations for any interior. He can also get you special assistance from the Armstrong Research Center and Bureau of Interior Decoration. Call him at your Armstrong District Office or write to Armstrong Cork Company, 1501 Rock St., Lancaster, Pa.

the flooring spec: Armstrong CUSTOM VINYL CORK TILE

EASY CARE By using Custom Vinyl Cork Tile in this smart men's store (one of the firm's ten), the owners are assured of a spotlessly good-looking floor every minute. The durable vinyl coating makes maintenance easy and economical, eliminates the special care cork tile often needs. And in bad weather during business hours, tracked-in dirt and water can be quickly mopped up. **Broadstreet's, Fifth Avenue, New York City.**

LONG WEAR In this handsome permanent showroom, a home prefabricator displays many different building components side-by-side. Armstrong Custom Vinyl Cork Tile—with its natural luxury—provides an appealing and versatile background. It's highly resistant to indentation from stationary and moving loads and will give many years of excellent service. **Pease Display Center, Pease Woodwork Company, Hamilton, Ohio.**

design features

As its name implies, Armstrong Custom Vinyl Cork Tile combines the natural beauty of cork and the functional advantages of vinyl. An exclusive Armstrong process fuses a thick layer of clear vinyl to the top of a cork mat. This permits the use of much larger pieces of cork than are used in other types of cork tile. The distinctive appearance of this new cork tile creates a feeling of unusual luxury in any interior, commercial or residential. Two stylings are available: the gentle "Natural Design," and the emphatic "Driftwood Design." The latter won an AID First Design Award for 1957.

technical data:

composition: transparent vinyl resins fused with cork

surface resistance: excellent for grease and alkalis

ease of maintenance: superior

underfoot comfort and quiet: very good

static load limits: 125 lbs. per sq. in.

recommended uses: over suspended subfloors and on grade when Armstrong specs are followed

gauge: ⅛"

size: 9" x 9"

design effects: Natural Design 1005 (see floors in accompanying illustrations) and Random Driftwood Design 1006 (see wall in office picture on facing page)

ARMSTRONG FLOORS

APPROXIMATE INSTALLED PRICES PER SQ. FT.

(Over concrete, minimum area 1000 sq. ft.)

20¢ - 35¢	35¢ - 45¢	45¢ - 60¢
Linoleum Tile	Linoleum Tile	Vinyl Corlon .070"
Asphalt Tile 1/8" (A,B,C,D)	Asphalt Tile 3/16" (C,D)	Linoleum .125"
Asphalt Tile 3/16" (A,B)	Asphalt Tile 1/8", 3/16" (greaseproof)	Cork Tile 1/8"
Linoleum .0625"	Linoleum .125" Battleship	Excelon Tile 1/8" (Vinyl Asbestos)
	Cork Tile 3/32"	
	Excelon Tile .0625" (Vinyl Asbestos)	

60¢ - 70¢	70¢ - 90¢	90¢ and over
Vinyl Corlon .070" (Hydrocord Back)	Vinyl Corlon .090" (Hydrocord Back)	Custom Corlon Tile 3/32", (Homogeneous Vinyl) 1/8"
Rubber Tile 1/8"	Rubber Tile 3/16"	Custom Vinyl Cork 1/8"
Cork Tile 3/16"	Custom Corlon Tile 3/32", 1/8" (Homogeneous Vinyl)	Opalesq Vinyl Tile 1/8" (Homogeneous Vinyl)
Linotile 1/8"	Cork Tile 5/16"	

Women in Washington Once Again Discuss Their Housing Wants

What the women of the nation want in their houses, according to evidence gathered at the Women's Conference on Housing, is not only more space, but, most particularly, better defined space. Among the suggestions offered by the 70-odd delegates to the conference, held October 14-16 in Washington: separation of entry and living rooms; separation, if only by a screen, of living and dining room; access to dining area through door only, *not* by a pass-through; better use of kitchen space, especially for storage.

Many of the delegates declared themselves willing to do without some labor-saving equipment, if this could be exchanged for additional space. One questionnaire given to the delegates bestowed on each a hypothetical $2500 to spend on extras; leading the list of preferences by a good margin (though returns were incomplete) was an additional bathroom. Second —what can only be classed an "amenity"—the housewives wanted fireplaces. Also high on the list: garbage disposers, washers, undefined additional space, and one-car garages (suggestions for multiple use of garage space came from some).

Sidelight on the conference: if modern architecture has not, as they say, won the battle, it is at least, among housewives, running neck-and-neck now with "Colonial or Traditional" and "Ranch" styles. And a rather grimmer note: some of the delegates, particularly those from the southwest, expressed an interest in bomb shelters as part of the house.

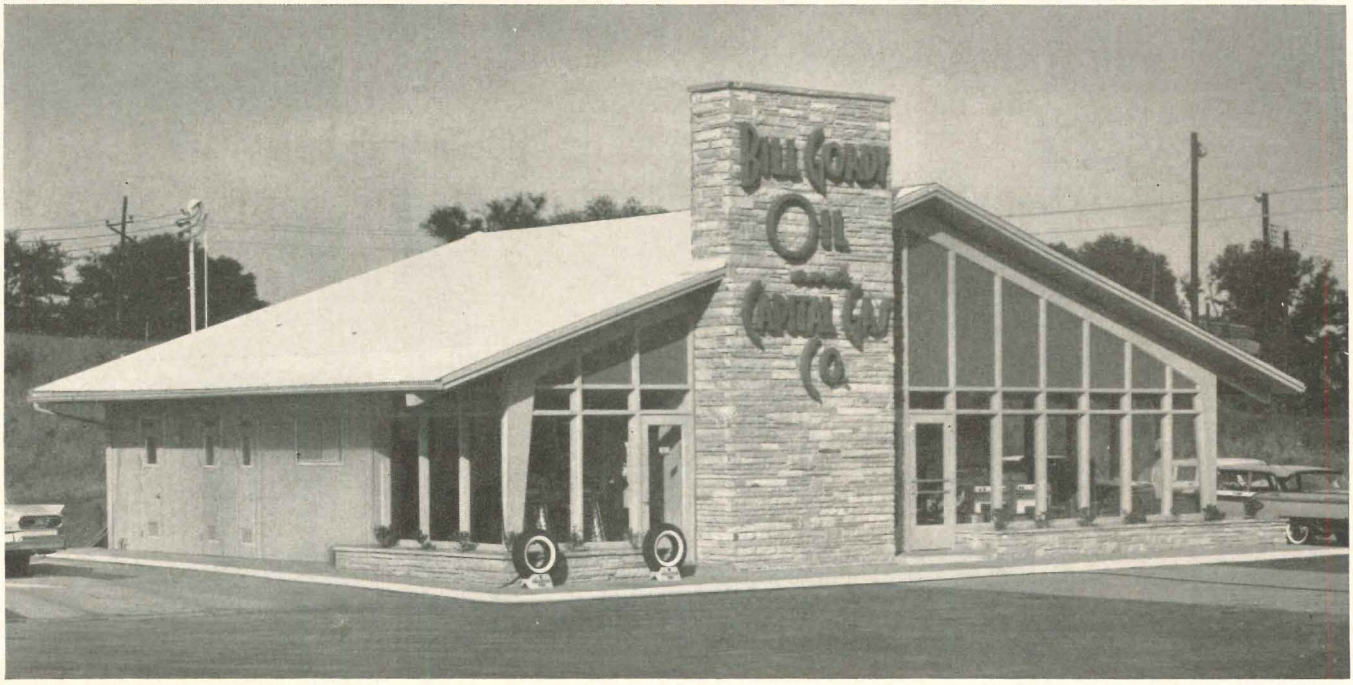
The conference, which was an outgrowth of the 1956 Women's Housing Congress held by the Housing and Home Finance Agency, was sponsored by The National Association of Home Builders and the United Industry Committee on Housing; members of this committee include the Air Conditioning and Refrigeration Institute, Better Heating-Cooling Council, Copper & Brass Research Association, National Lumber Manufacturers Association, National Association of Plumbing Contractors, National Bureau for Lathing and Plastering, Oil Heat Institute, Plumbing Fixture Manufacturers Association, Portland Cement Association and the Structural Clay Products Institute.

At Another Housing Conference: Predictions of Things to Come

Also at Washington in October, another group of women attended the second annual Congress for Better Living, sponsored by *McCall's Magazine*. The conclusions they drew were identical with those of the housing conference—more space, even at the expense of some built-ins and appliances.

One of the more adventurous sessions of the conference revolved around industrial designer Henry Dreyfuss's look at a "dream house of the future"—a house which included such sanitary features as electronic removal of outdoor dirt at the entry, disposable bed "linen" and closets equipped to clean and press clothes (synthetic fiber) over-night; such conveniences as self-washing kitchen and bathroom floors (push a button, soap and water carry dirt down a hidden drain); and such "fun" items as lighting to change color with moods and capsules in the air conditioning system to give the scent of "hay in Manhattan and Christmas trees in December." Less "blue sky" possibilities: movable walls to change room sizes as family needs change, and Oriental "go-downs" to store furniture and art not in use.

IDEAS...



Architects: Pearson, Humphries and Jones, A.I.A., Montgomery, Alabama

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Variety of Building Designs, Plus Modular Panel Wall Construction Make Armco Buildings The Practical Vehicle For Your Imagination

Your ideas and Armco Steel Buildings *are* compatible. You get the flexibility you need to best serve your client, plus the economy and convenience of mass-produced components. Unique wall construction features 16-inch-wide, flat-surface STEELOX® interlocking panels. Even the structural parts are standardized, providing a wide range of sizes and building types—all designed to meet wind and snow load requirements of your area. Clear widths range from 5′-4″ to 100′. Total width and length are practically unlimited. You'll find complete freedom of exterior and interior treatment, including insulation if it's desired.

Write us for details. Get facts about special features available, like durable, heat-reflective Armco ALUMINIZED STEEL for roof and wall parts. Armco Drainage & Metal Products, Inc., 4189 Curtis Street, Middletown, Ohio. In Canada: write Guelph, Ontario.

See Our Color Catalog in Sweet's Architectural File

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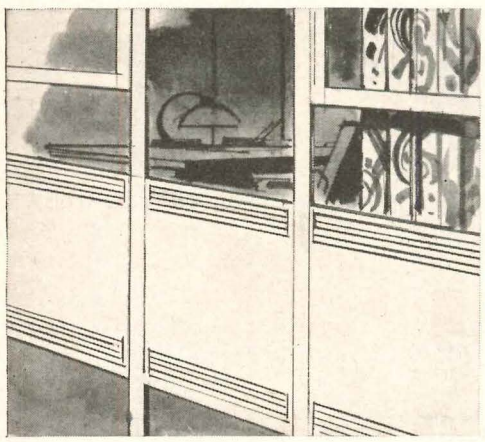
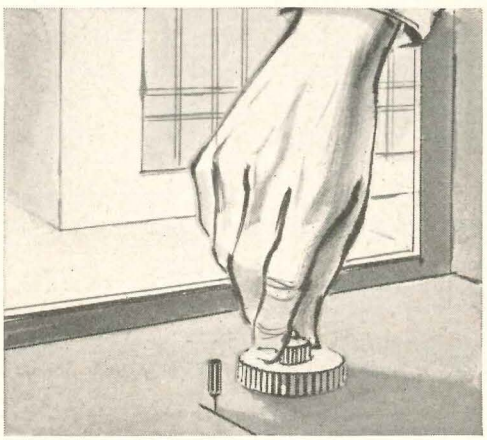
NEW... AND ALL LUPTON

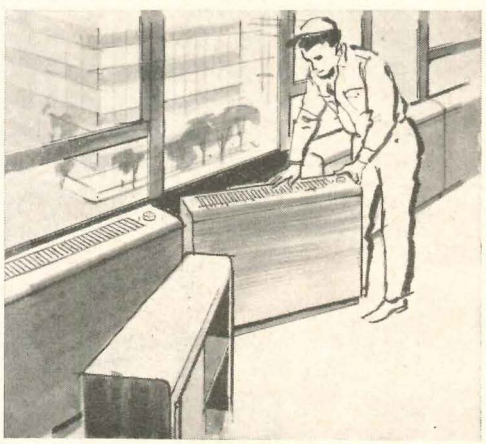
New LUPTON Curtain Wall combines comfort conditioning with your choice of matching cabinets and bookcases.



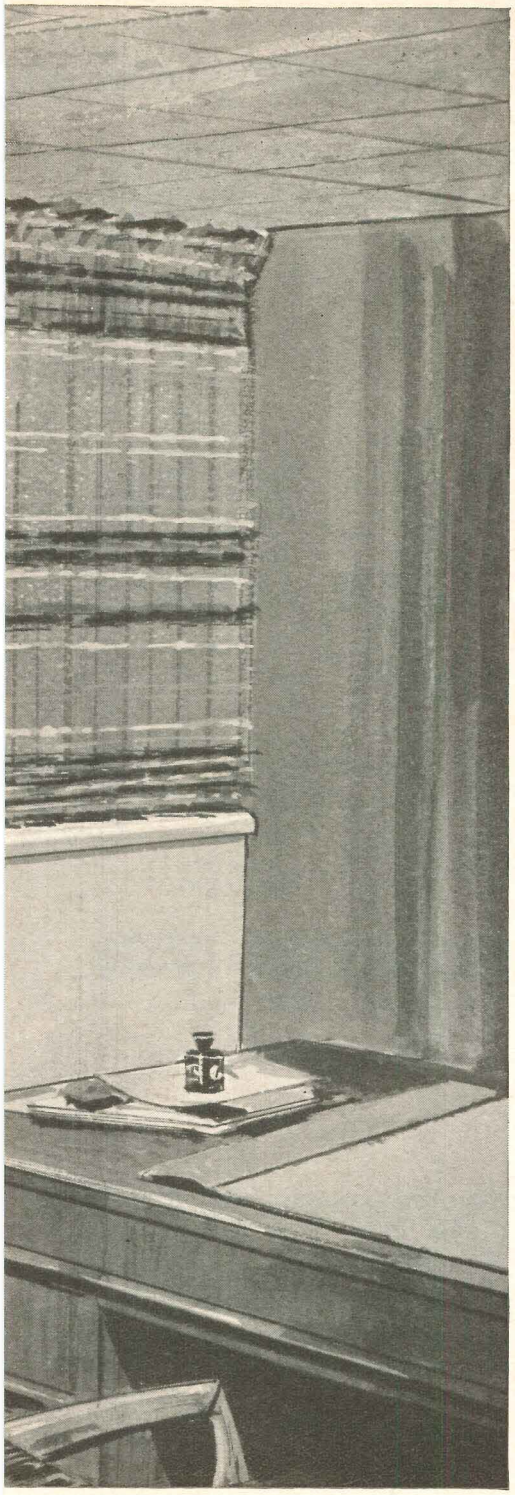
Outside—wide separation between air intake and discharge! This gives faster, more efficient heat dissipation on outside by preventing recirculation of heated air. Nothing protrudes outside.



Comfort at the twist of a dial! Each occupant regulates the exact amount of comfort conditioning he wants . . . regardless of conditions in other parts of the building. This lowers air-conditioning costs.



Costs 40-60% less to install! There's no bulky, space-consuming ductwork, plumbing connections, water towers, or condenser units needed. Trained LUPTON crews install the units.



New concept integrates personalized comfort conditioning with LUPTON Curtain Walls!

Offers you many advantages over usual air-conditioning methods for buildings of true "perimeter" type.

Now, LUPTON Curtain Walls and LUPTON Comfort Conditioning are unified. They're installed together to form a complete exterior-interior wall. You get one-source responsibility for detailing and coordinating outside wall and inside cabinets, shelves, and air-conditioning equipment. A simple electrical connection puts the LUPTON Comfort Conditioner in operation.

System Easily Expandable

Wide flexibility is another advantage of LUPTON Comfort Conditioning. Advance planning makes your system easily expandable. Just treat all exterior panels in a uniform manner to provide for comfort conditioning. Then, you can make changes in the number and location of comfort-conditioning units with ease and speed . . . at relatively small cost.

You can install as many LUPTON Comfort-Conditioning Curtain-Wall Units as you need at first. In each office, you can combine the unit with shelving, bookcases, or storage cabinets. You can replace these latter units with additional LUPTON Comfort Conditioners if required.

You have endless opportunities for variations in spandrel proportions and surface treatment.

Building-Owner Advantages

The building owner gets more income-producing space.

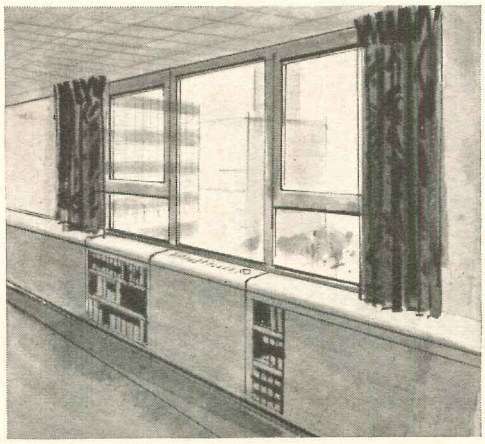
He gets a major rental feature, because his clients enjoy healthful ventilation as well as odor and smoke removal through the LUPTON Comfort Conditioner's exhaust system.

Air-conditioning costs go down, too. Like ventilation and exhaust, temperature is regulated from each unit by the occupant of each room. This prevents costly over-air-conditioning. Allows full room-by-room variation.

Two Interchangeable Units

LUPTON offers two comfort-conditioning units: heavy-duty for areas with a particularly heavy cooling load, and lighter-duty for average loads. Both units have the same dimensions, and can be interchanged as loads decrease or increase. LUPTON's durably-made, precision-balanced components assure you efficient, low-maintenance operation.

Write today for more information about Comfort Conditioning—LUPTON's far-reaching advance in aluminum curtain-wall design and function.



Compact, attractive appearance! On the inside, a sill of normal depth—on the outside, air circulating function may be concealed or revealed as desired. There are no projecting parts.

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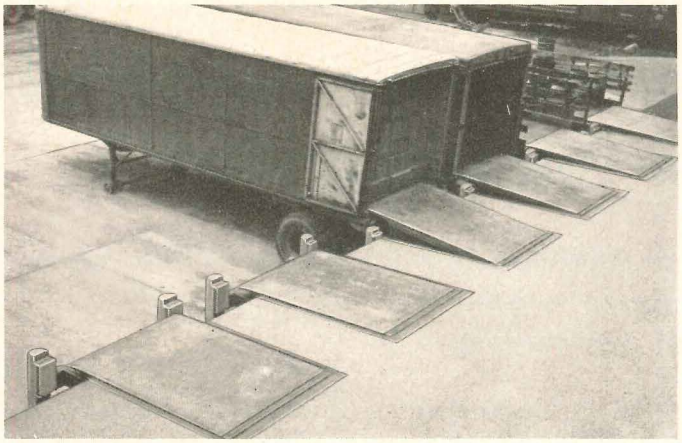
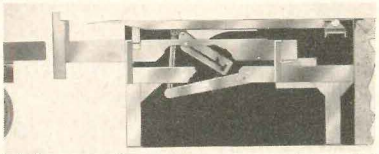
Newest design in automatic Loading ramps!



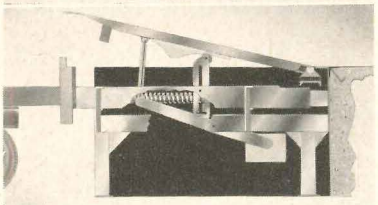
RITE•HITE *FULL AUTOMATIC*

LOADING RAMP

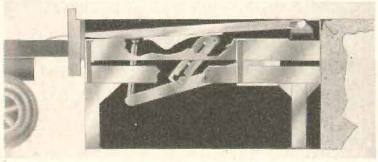
completely truck actuated . . . no manpower needed!



Truck approaches dock . . .



raises ramp platform . . .



platform lowers to rest on truck bed.

Rite-Hite **pioneered precision counterbalanced** mechanical ramps, designed, built and installed the **first** full automatic truck ramp to incorporate this simple, trouble-free design. **You can specify Rite-Hite with confidence** because Rite-Hite precision counterbalancing does away with starters, motors, pumps, cylinders, gears and wiring — always potential sources of trouble and expense. Rite-Hites stay on the job year after year, unaffected by heat, cold, water, snow, ice or hard use. Rite-Hites are simplest to install — shipped completely assembled, no "extras" to buy. Rite-Hites are available in full 10-ton capacity full-automatic and manual models to meet every loading dock requirement. Before you specify, get complete details about Rite-Hite — Dept. AR-59

Scores of "blue chip" companies like Hoerner Boxes, Inc., Hallmark Cards, Inc., General Electric, General Motors and Parke-Davis have put their stamp of approval on Rite-Hite Mechanical Loading Ramps.

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No, Boss — the boys are going strong — I'm talking from a —

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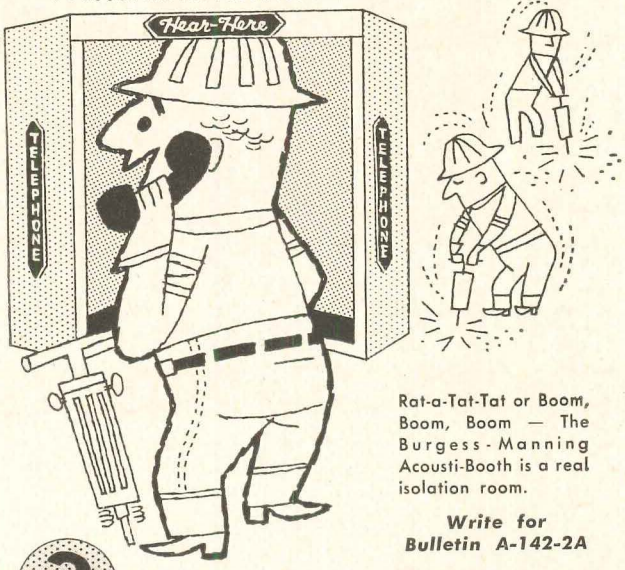

Rat-a-Tat-Tat or Boom, Boom, Boom — The Burgess-Manning Acousti-Booth is a real isolation room.

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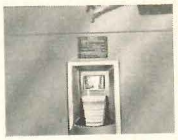
. . . the nation's first and leading bulk liquid food dispensers for fully automatic fingertip portion control delivery.



Just "touch" the button for automatic delivery, portion controlled!

Also available for coin operation . . . around the clock!

Also available 1-3 flavor fully automatic cup vendor.

- 20 Gallon capacity
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- Counter, under counter or floor models
- All models use standard 5 or 10-gallon dairy cans
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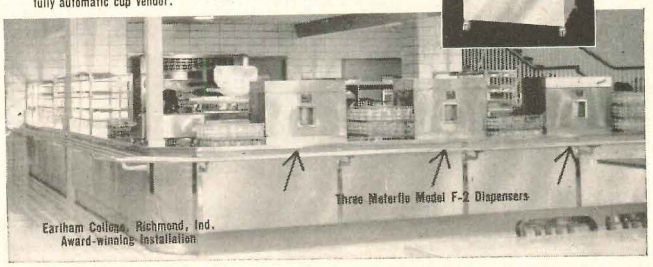
Floor Model F-2 with or without leg or casters



Three Meterflo Model F-2 Dispensers

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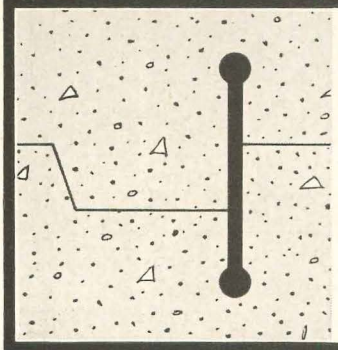
FOR MASONRY JOINTS

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

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

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

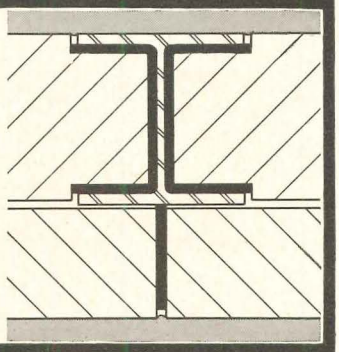
RUBBER or VINYL WATERSTOPS



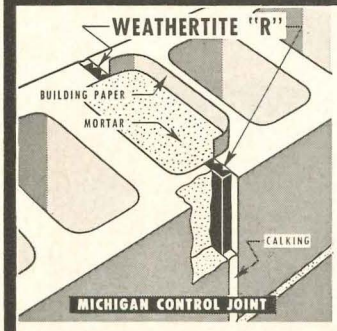
Williams Waterstops are made from Natural Rubber Stock and designed for maximum effectiveness in any type of cast-in-place construction joint. They will bend around corners, and will not crack or tear from shear action. Tensile Test: 3990 lbs., Elongation Test: 650%. Available in rolls up to 80 feet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

EVERLASTIC MASONRY GASKETS

Everlastic Masonry Gaskets are a readily compressible, nonabsorbent Elastomer impervious to water and inert to heat, cold and acids. In masonry joints they permit linear expansion in summer heat, and seal joints against moisture which causes frost damage in winter. Everlastic Gaskets are furnished die-cut to specifications and coated with pressure sensitive adhesive . . . they should be used between sill and coping stones, brick or stone wall panels, and masonry and structural steel members.



WEATHERTITE for CONTROL JOINTS



Weathertite is a specially shaped, nonporous, expanded Polyvinyl Chloride strip which provides multiple, continuous contact surfaces when compressed, and thereby produces the positive pressure contact essential for an effective watertight seal in standard control joints in block constructed walls. Weathertite is available in two types to meet all requirements. Type "R" is made especially for use in Michigan Control Joints; Type "RB" is made especially for use in Besser Control Joints.

See Sweet's Files, or Write for Information.

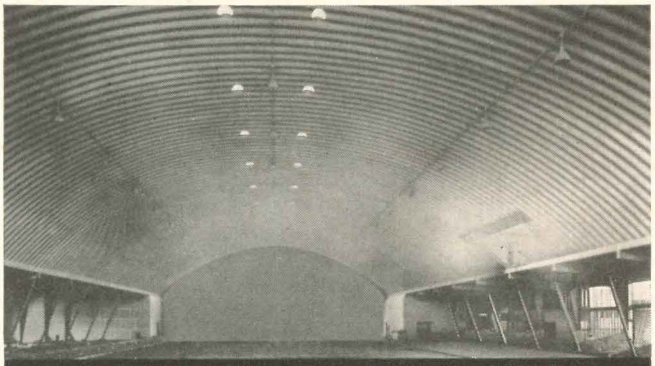
WILLIAMS
EQUIPMENT and SUPPLY CO.
456 W. Eight Mile Rd., Hazel Park, Michigan

Gone! Forever

PILLARS
POSTS
BRACES
TRUSSES

WITH **WONDER BUILDING®**

TRUSS-SKIN ROOF SYSTEM!



Phoenix-Colosseum, Phoenix, Arizona — Truss-Skin roof of 100 foot clear span width. 10 ft. cantilever extension on both sides.

Clear span design from wall to wall and floor to roof, gives more useable area for your client's dollar. Double-curved and corrugated patented Wonder Building panels of heavy gauge zinc-coated steel, form self-supporting rigid arches. No concentration of load stresses — every square inch is a structural member. Adaptable to almost any design requirement from modern 'component' architectural styling, to storage type. Meets local code requirements. Wonder Building distributors stand ready to help architects, engineers, or contractors in all phases of planning or construction.

SYMBOL OF SIMPLICITY
Arch panels are quickly bolted together. Weather sealed with neoprene washers. High percentage of construction done on the ground for easier, less costly erection.

Truss-Skin roof sizes: 20′ to 184′ width — length unlimited.

"ENGINEERED TO THE MARKETS"
TRADEMARK
TRUSSLESS PATENTED Wonder Building®

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Wonder Building Corporation of America
Dept. T-159, 30 N. LaSalle St., Chicago 2, Illinois
I'd like more information *for the following use:*
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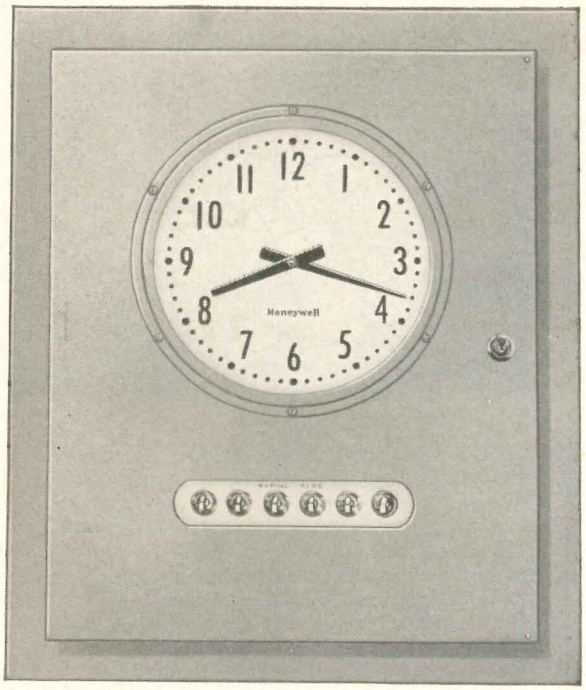
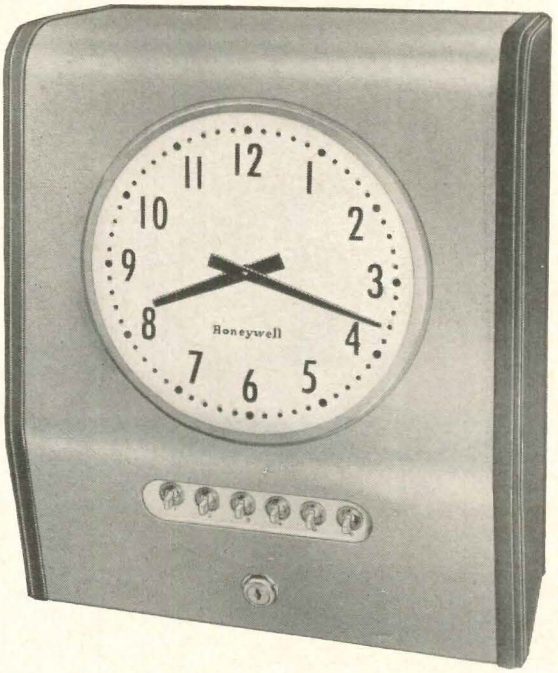
Name .....
Street .....
Phone .....
City .....State .....

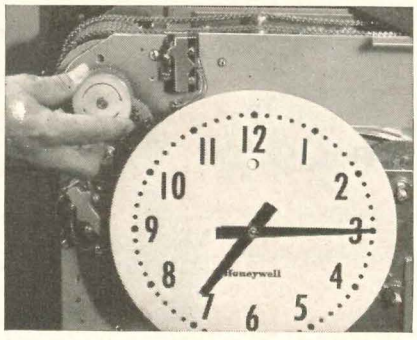
DOUBLE CORRUGATION
Panels of patented Coro-Crimp design. Wide range of widths and lengths.

The most dependable
ever offered now backs

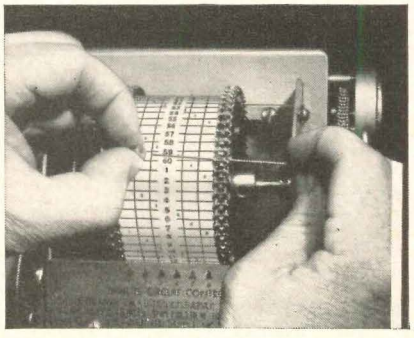




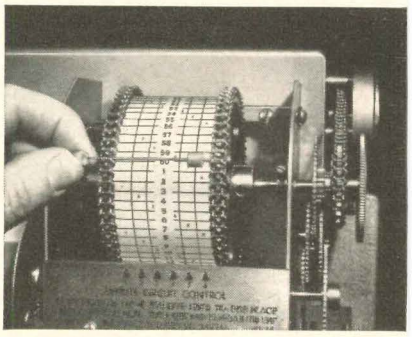
AS AN ADDED BENEFIT TO YOUR CLIENTS—CLOCKMASTER PROGRAMMING IS THE EASIEST TO SET:



1 The same setting wheel used for setting master clock to the correct time is used to set the programmer. Time and program bells are always in step with one another.



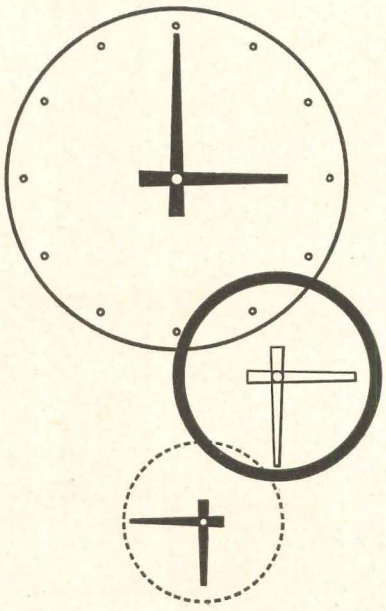
2 Then, simple, reusable steel pin is inserted in chain link opposite minute mark indicating time signal is to sound. Light section is day, dark section is night.



3 Reusable plastic roller slides onto pin, without special tools, to sound program-signal. Any signal can be changed without affecting any other part of program.

nationwide service up HONEYWELL'S CLOCKMASTER* SYSTEM

A Honeywell expert is always on hand, beginning with initial clock and programming planning . . . continuing through years of efficient, convenient service.



Honeywell sales engineers work closely with architects and engineers in planning a master time and programming system.

During installation, experienced Honeywell installation supervisors are present to answer any questions and check the finished job. Once the system is in operation, Honeywell's factory-trained men provide free service for one year. Then Honeywell offers a low-cost maintenance plan that includes regular inspections and prompt, efficient service by skilled men who are available immediately when needed from 112 Honeywell offices throughout the country. There is one in your area.

Handsomely-designed Honeywell clocks come in dial sizes of 9, 12, 15 or 18 inches. They may be flush or surface mounted. They're easy to install and have standard plug-and-socket connections.

For more information about Honeywell's Master Time and Programming Systems, call your nearest Honeywell office. Or write Minneapolis-Honeywell, Dept. AR 1-04, Minneapolis 8, Minnesota.

*Trademark

Honeywell

H HONEYWELL *First in Control*

or specification details see Sweet's
rchitectural File 33b/Mi.

The Record Reports

On the Calendar

January

5-16 International Home Furnishings Market—Merchandise Mart, Chicago

14-15 Building Research Institute Conference on Noise Control in Buildings—Hotel New Yorker, New York

14-15 14th Annual Short Course in Residential Construction, conducted by Small Homes Council of University of Illinois—University of Illinois, Urbana

18-22 15th Annual Convention and Exposition, National Association of Home Builders—Chicago

26-29 10th Plant Maintenance and Engineering Show and Conference—Public Auditorium, Cleveland

26-30 65th Annual Meeting, American Society of Heating and Air-Conditioning Engineers, and 14th International Heating and Air-Conditioning Exposition, sponsored by A.S.H.-A.E—Bellevue-Stratford Hotel and Convention Hall, Philadelphia

29-31 Annual Meeting, Society of Architectural Historians—Cleveland

February

4-6 Home Improvement Products Show—The Coliseum, New York

8-13 National Convention (first of three in 1959), American Society of Civil Engineers—Los Angeles

9ff "The New Architecture" exhibition; through Apr. 19—Museum of Modern Art, New York

15-18 Ninth Annual Convention and 1959 Show, Mason Contractors Association of America—Chase-Park Plaza Hotels, St. Louis

17-20 Annual Conference on Church Architecture, sponsored by Church Architectural Guild of America and Dept. of Church Building of National Council of Churches of Christ—Statler Hilton Hotel, Los Angeles

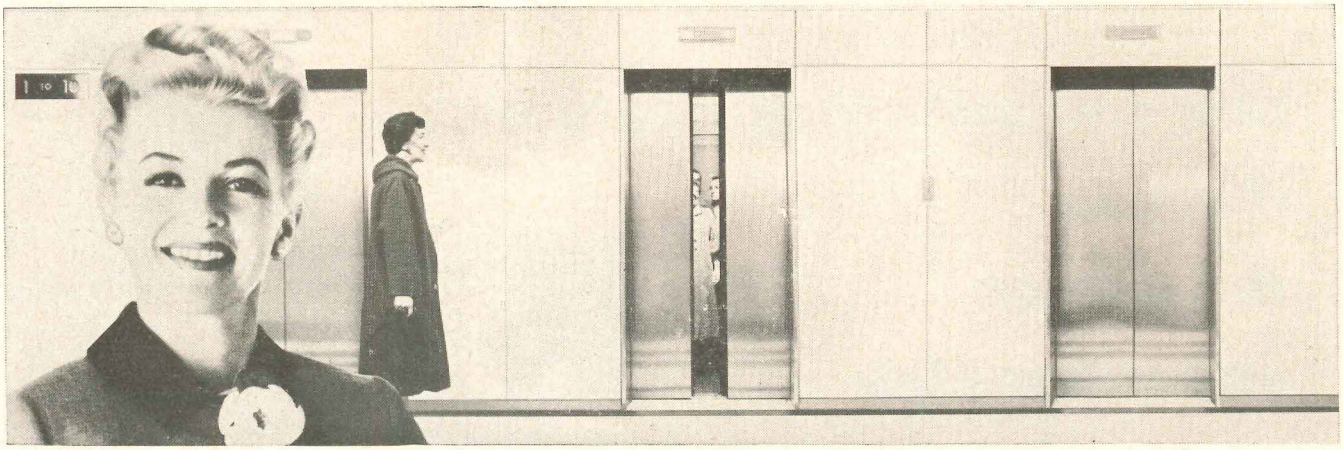
23-26 Annual Convention, American Concrete Institute—Statler Hilton Hotel, Los Angeles

March

1-4 Second National Lighting Exposition, sponsored by Light-

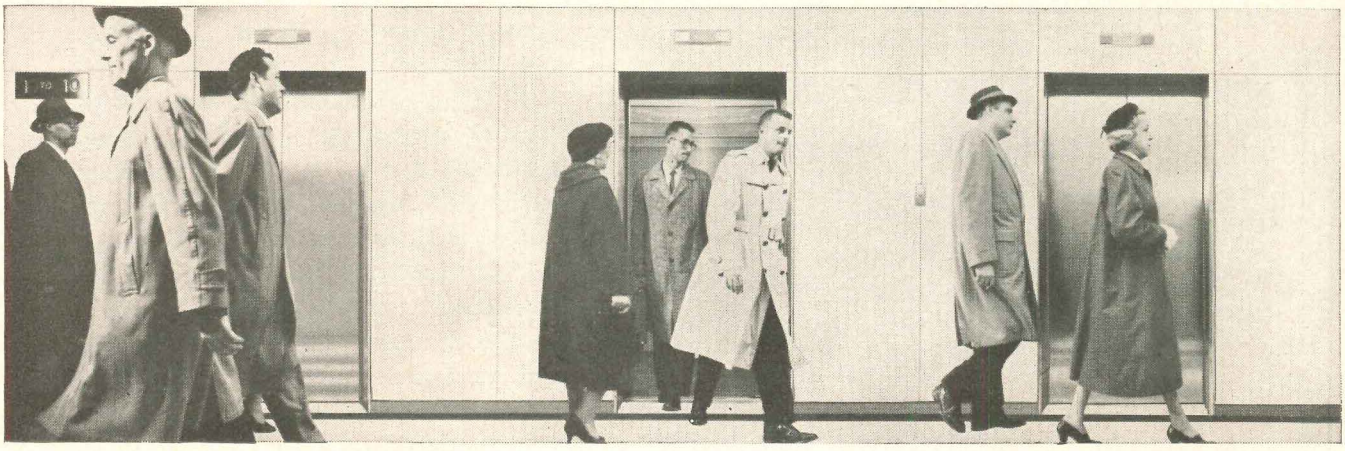
"SEEING EYES" CONTROL WESTINGHOUSE

YOU DON'T HAVE TO "WATCH THE DOORS!"



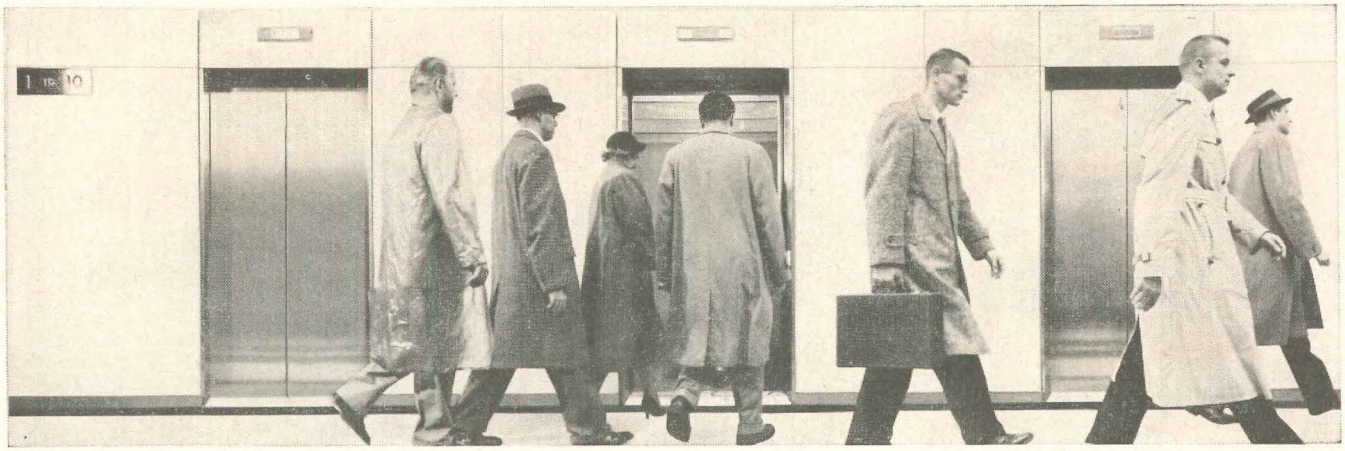
1 "Wonderful comments about Westinghouse operatorless elevators with Traffic Sentinel doors keep coming in from all parts of the country," reports Betty Furness. "There's magic built into these doors that 'see' electronically. Just follow this demonstration on door courtesy and see what we mean. Here, elevator arrives at floor with a smooth, level landing.

2 "Passengers leave elevator. Doors remain fully open and completely motionless. There is no door action whatever . . . no door feints . . . no threatening 'coming at you' door movement. Traffic Sentinel electronically sees and senses passenger traffic and controls the doors.

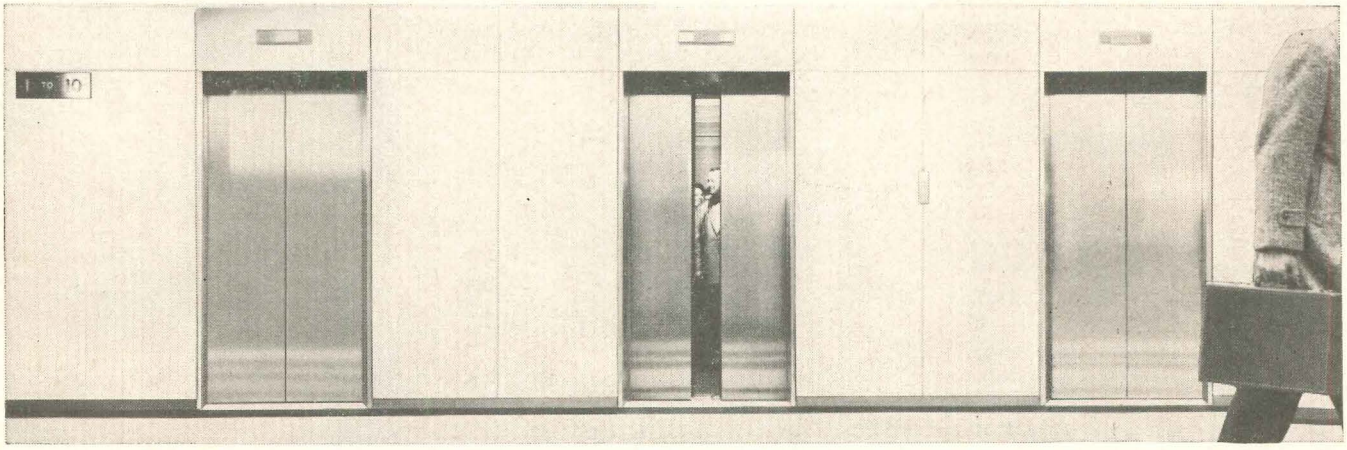


3 "While passengers continue to leave the comparatively full elevator, doors continue to remain wide open. Door movement is governed entirely by passenger traffic and not by fixed time intervals. Traffic Sentinel recognizes and compensates for all variations in passenger movement—automatically—so that passengers are unaware of the doors.

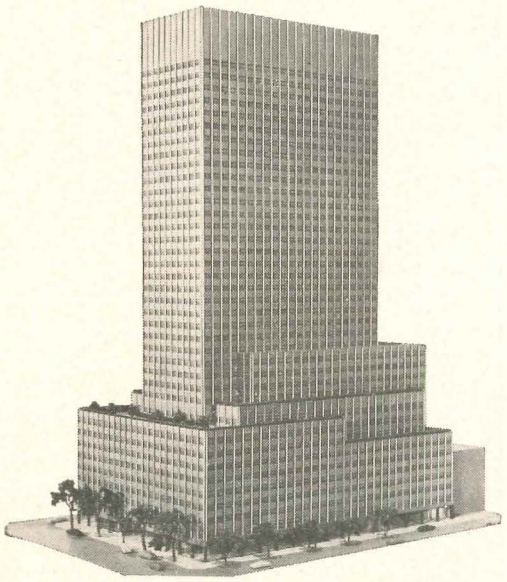
TRAFFIC SENTINEL® DOORS
—THEY WATCH YOU



4 "Waiting passengers now enter with complete confidence. Our polite Traffic Sentinel doors never close prematurely—never budge an inch to scare or annoy them. This is door control at peak perfection—Traffic Sentinel—an original Westinghouse development.



5 "Only after the last passenger has safely boarded the elevator will the doors close. Westinghouse modern elevator systems take their proud place in new buildings across the nation and in existing buildings anxious to modernize with the finest vertical transportation available."



TISHMAN BUILDING, 666 Fifth Avenue, New York

To facilitate speedy movement to and from offices, 666 Fifth Avenue has a Westinghouse Selectomatic® Automatic elevator system which all but eliminates unnecessary waiting time. Twenty operatorless elevators, equipped with Traffic Sentinel controlled doors, carry an estimated 6,000,000 passengers to and from the building's 38 stories in a single year. When you're in New York City, plan to visit the Tishman Building and test ride these Westinghouse operatorless elevators. If you want to make a detailed study, we will be proud to arrange a behind-the-scene demonstration.

Owner-Management:
Tishman Realty and Construction Co., Inc.
Architects: Carson & Lundin

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

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DESI ARNAZ SHOWS CBS-TV MONDAYS

WESTINGHOUSE ELEVATORS AND ELECTRIC STAIRWAYS

The Record Reports

ing, Lamps and Electrical Manufacturers' Salesmen's Association, Inc.—The Coliseum, New York

1ff University of Illinois Biennial Festival of Contemporary Arts; through Apr. 5—University of Illinois, Urbana

Office Notes

Offices Opened

Coston-Frankfurt-Short, Architects-Engineers, announce the opening of an office at 912 First National Bank Bldg., Tulsa.

Hugh Newell Jacobsen, Architect, has opened an office at 1802 Corcoran St., N. W., Washington. Mr. Jacobsen formerly was with Keyes & Lethbridge.

W. Maurice Johnson, A.I.A., announces the opening of an office at 563 N. Church St., Spartanburg, S.C.

Morris C. Jones and Lewis E. Lyman have formed a partnership for the practice of architecture at 317 N. Main St., Garden City, Kan.

Daniel Koffler and Associates, Consulting Engineers, have opened an office at Dupont Blvd. and Washington Ave., New Castle, Del.

Carl B. Troedsson, architect and planner, announces the opening of an office at 501 S. Boylston St., Los Angeles 17. Mr. Troedsson formerly was with Victor Gruen Associates.

Firm Changes

Harland Bartholomew and Associates, 317 N. 11th St., St. Louis 1, announces that Jack Wood has joined the firm as an associate.

De Leuw, Cather & Brill, architects and engineers, 202 E. 44th St., New York 17, announces that Benjamin Gray has joined the firm as a general partner.

Schwab and Jewell, Architects, 2506 N. Charles St., Baltimore 18, announces that Stanley L. English, A.I.A., has been made an associate.

Frederic P. Wiedersum Associates, architects and engineers, 10 Columbus Circle, New York 19, announces that Guy G. Rothenstein has been appointed to head its housing and hospital division.

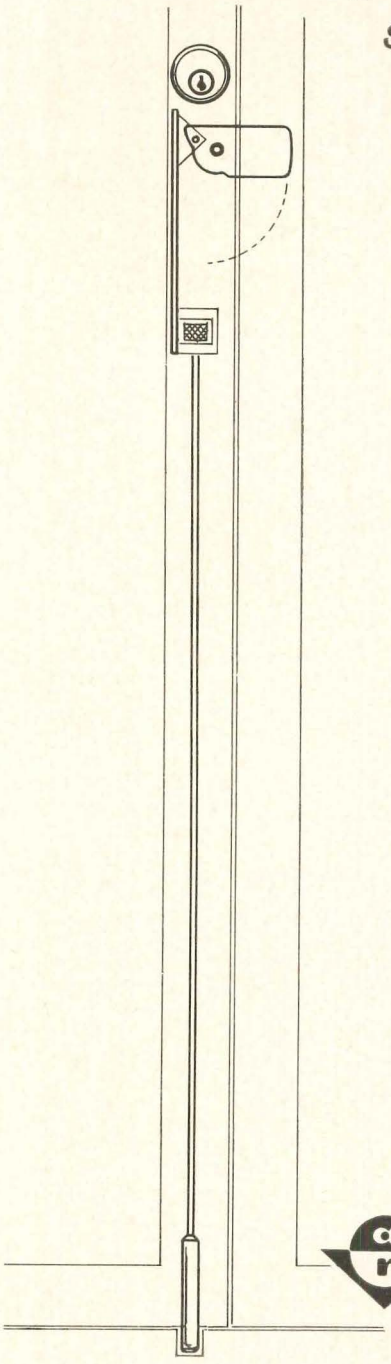
New Addresses

Boyer, Biskup & Widstrom, A.I.A., 4802A Dodge St., Omaha.

Kelly & Deteau, Architects-Engineers, 913 Judson Rd., Longview, Texas.

Fred H. Prather, A.I.A., 200 S. Michigan Ave., Chicago.

Now! the greatest advancement in locking protection since the bolt replaced the boulder

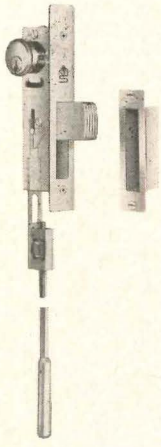


The new *MS® 1851-II TWO-WAY LOCK for pairs of SWINGING GLASS DOORS ...gives double protection and exit safety!

The MS® 1851-II Two-Way Lock is specifically designed for the control of *Main and Obvious* entrance pairs of doors for places of public assemblage. One 360° turn of the key throws or retracts both a *lock* and *threshold bolt*, simultaneously locking or unlocking both doors. This insures that the *entire opening* is usable during business hours and places the responsibility of traffic control on management. The key can be removed only in the locked or unlocked position. Holding special interest for insurance companies and organizations whose professional concern is public safety, this purposefully designed deadlock adds strength to the narrow stile installation and assures exit freedom.

More than a slogan, **MAXIMUM SECURITY.** is the exclusive basic principle that governs the design and manufacture of Adams-Rite locking devices that are, in fact, stronger than the doors and windows in which they are installed, providing the ultimate in security and safety.

An outstanding example of this principle in action is the new MS® 1851-II. Unique in deadlock design and construction, the MS® 1851-II operates unlike standard bolts that vacate the lock when projected. The MS® counter-balanced bolt retains as much bolt within the lock stile as projected. Actually bridges the opening with a solid bar of steel (from as short a backset as ⅞"), making it impossible to force entry without destroying the door channel itself. This, coupled with the joint action of the 4015 two-way converter threshold bolt, and the lifetime strength of dichromate zinc plated steel construction, maintains Maximum Security. The MS® 1851-II which eliminates locking hardware in the inactive door is a combination of the basic MS® 1851 Lock and No. 4015 Two-Way Converter. The 4015 may be stocked separately to convert any MS® 1851 series lock into an MS® 1851-II.



Quality Hardware for Over Half a Century

For additional detailed information and specifications, write

ADAMS-RITE
Manufacturing Company
Dept. GD-128, 540 West Chevy Chase Drive, Glendale 4, California

Adams-Rite also produces over 90% of all door hardware for the airframe industry.

Required Reading

Modulor . . . *cont. from page 60*

ing the reactions of dozens of readers and users. The expressions set forth range from unabashed adulation to suggestions for improvements or revision (mostly along mathematical lines), with a few samples of outright disapproval thrown in. The most stringent criticism is contained in charges of arbitrariness and contrivance.

Le Corbusier's most powerful reply to his detractors lies, of course, in his own work, and it is good that this book documents the application of the Modulor in such notable projects as Chandigarh, the *Unité d'Habitation* at Nantes, and the chapel at Ronchamp, among others.

What with the bedazzlement of red series, blue series, golden sections, and the like, it is easy to lose sight of the essential importance of the Modulor. Perhaps the best summation, and the one closest to Le Corbusier's intentions, was that of Albert Einstein: "It is a scale of proportions that makes the bad difficult and the good easy."

—ARTHUR FISHER

Technical References

INTRODUCTORY GRAPHICS. *By J. Norman Arnold. McGraw-Hill Book Co., 330 W. 42nd St., New York 36. 543 pp., illus. $7.75.*

REINFORCED CONCRETE FUNDAMENTALS: WITH EMPHASIS ON ULTIMATE STRENGTH. *By Phil M. Ferguson. John Wiley & Sons, 440 Fourth Ave., New York 16. 604 pp., illus. $9.50.*

TECHNICAL DRAWING. *By Frederick E. Giesecke, Alva Mitchell, and Henry Cecil Spencer. Macmillan Co., 60 Fifth Ave., New York 11. 844 pp., illus. (4th ed., revised). $10.*

SUMMER AIR CONDITIONING. *By Seichi Konzo, J. Raymond Carroll, and Harlan D. Bareither. Popular Mechanics Press, 200 E. Ontario St., Chicago 11. 554 pp., illus. $7.50.*

PLASTICS IN BUILDING ILLUMINATION. *Building Research Institute, 2101 Constitution Ave., Washington 25. 99 pp., illus. $3.*

REFRIGERATION AND AIR CONDITIONING. *By W. F. Stoecker. McGraw-Hill (address above). 397 pp., illus. $8.*

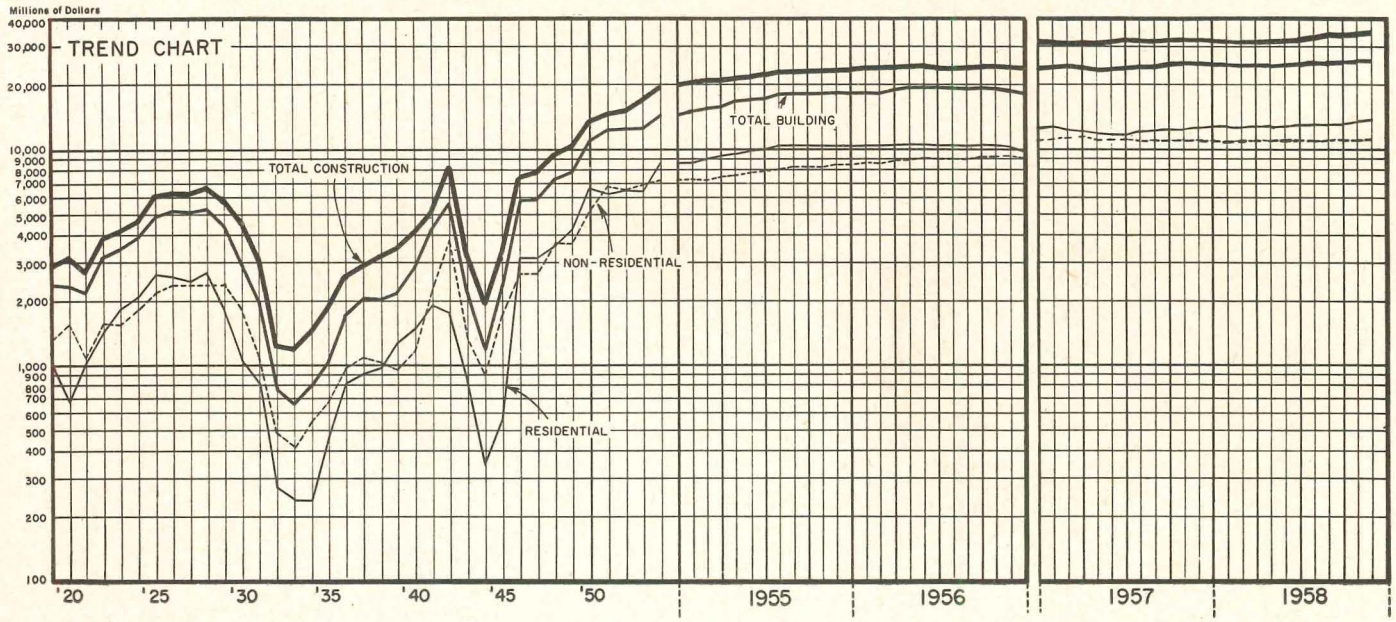
FUNDAMENTALS OF PIPE DRAFTING. *By Charles H. Thompson. Wiley (address above). 66 pp., illus. $3.50.*

CONSTRUCTION MANAGEMENT AND SUPERINTENDENCE. *By Walter C. Voss. D. Van Nostrand Co., 120 Alexander St., Princeton, N. J. 238 pp., illus. $6.95.*

ENGINEERING DRAWING. *By Frank Zozzora. McGraw-Hill (address above). 440 pp., illus. (2nd ed.). $6.50.*

Current Trends in Construction

As Reflected in Contracts for Future Construction in the U.S. Reported and Tabulated by F. W. Dodge Corporation.



ELEVEN MONTHS SHOW 1958 CLIMBED TO RECORD

The year 1958 has definitely set a new all-time annual record in construction contracts, even without the final month's figures, F. W. Dodge Corporation reported. November contracts pushed the cumulative total for the first 11 months of the year to $32,838,551,000, up nine per cent over the same 1957 period.

According to Dr. George Cline Smith, Dodge vice president and economist, "The first 11 months of 1958 have substantially exceeded the full year of 1957. This means that despite the recession, 1958 is the 11th consecutive record year, and the 14th straight year of increase in total contracts."

The figure for November 1958 was $2,593,855,000, or nine per cent more than November 1957. Residential buildings and public works accounted for most of the month's gain.

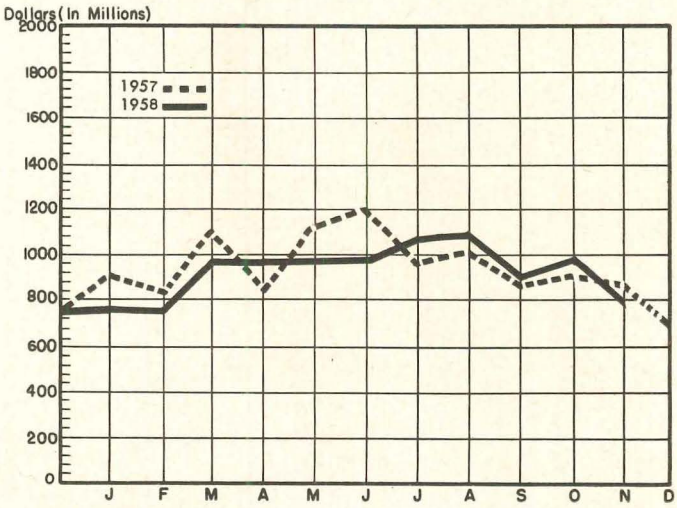
Residential contracts totaled $1,205,712,000 in November (30 per cent over the same 1957 month). The number of dwelling units put under contract in the month was 94,574, up 31 per cent from a year ago. Single-family houses rose 29 per cent; apartments were up 39 per cent.

Heavy engineering contracts in November came to $613,087,000—a gain of nine per cent over November 1957. Increases in public works—principally streets and highways—offset decreases in utility contracts.

Nonresidential building's November 1958 total of $775,056,000 represented a drop of 12 per cent from the 1957 month. Manufacturing, educational, and science buildings showed steep decreases; commercial, hospital, and social and recreational buildings were also down.

Cumulative totals for the first 11 months, by categories, were: nonresidential, $10,218,954,000 (down four per cent from the same 1957 period); residential, $13,725,415,000 (up 12 per cent); heavy engineering, $8,894,182,000 (up 22 per cent).

NONRESIDENTIAL BUILDING



RESIDENTIAL BUILDING