PROGRESSIVE ARCHITECTURE *May 1961*

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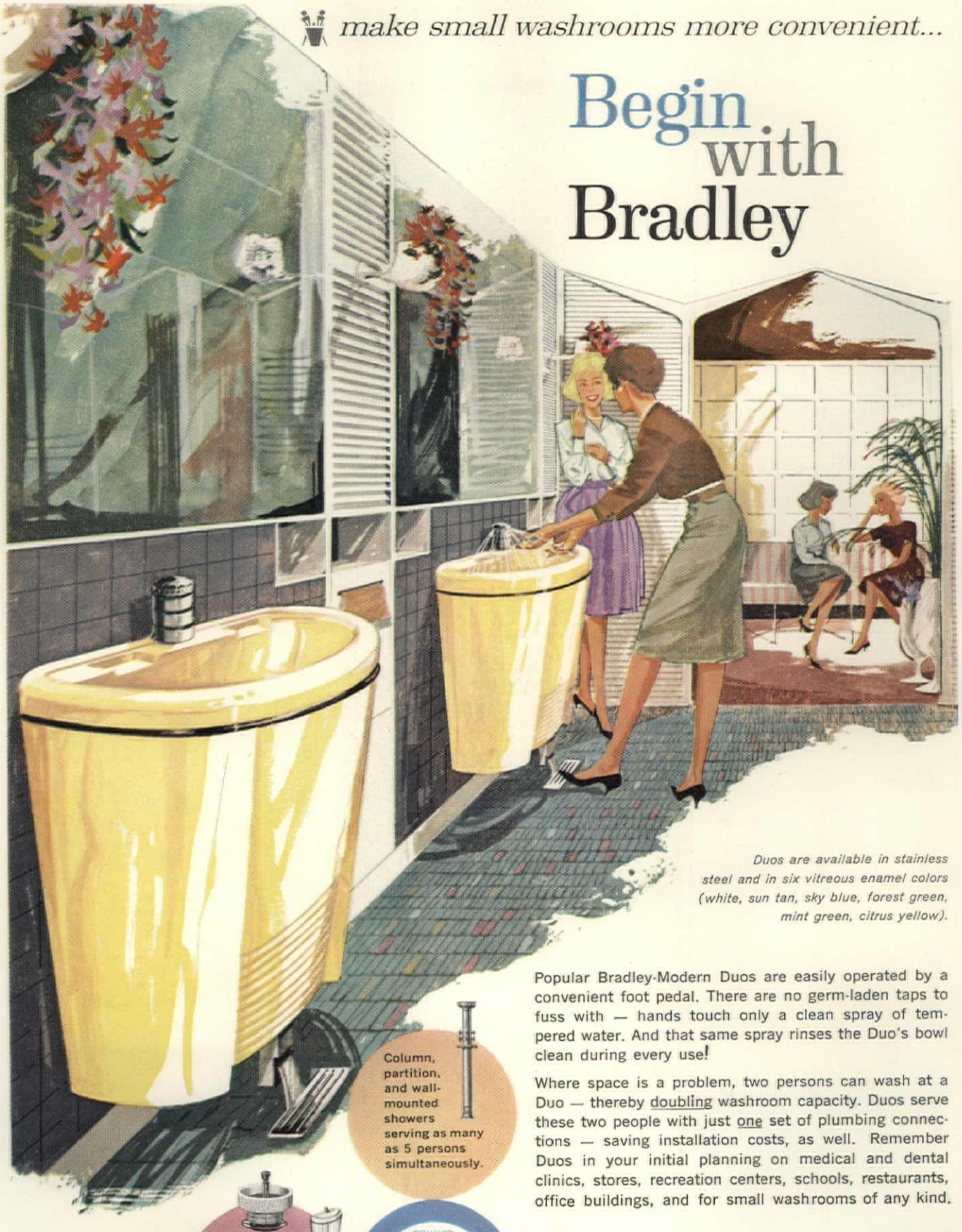

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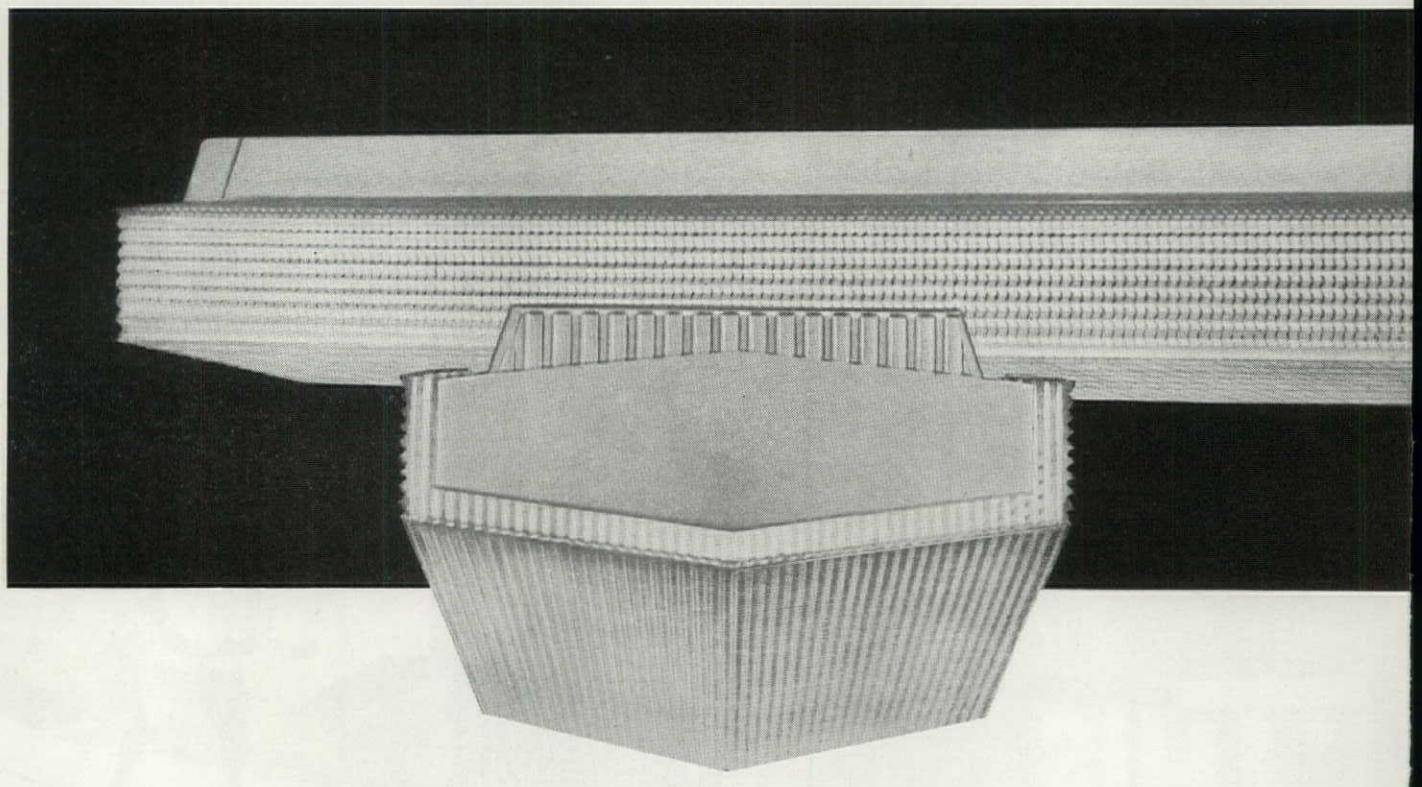

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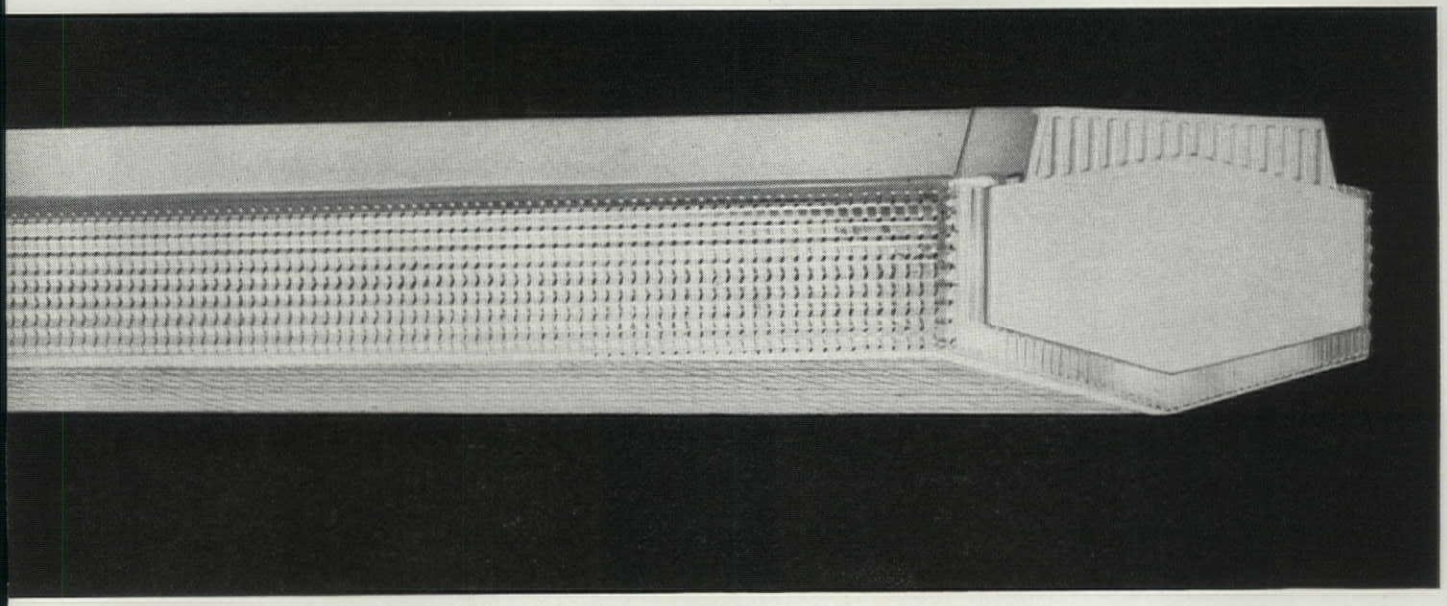

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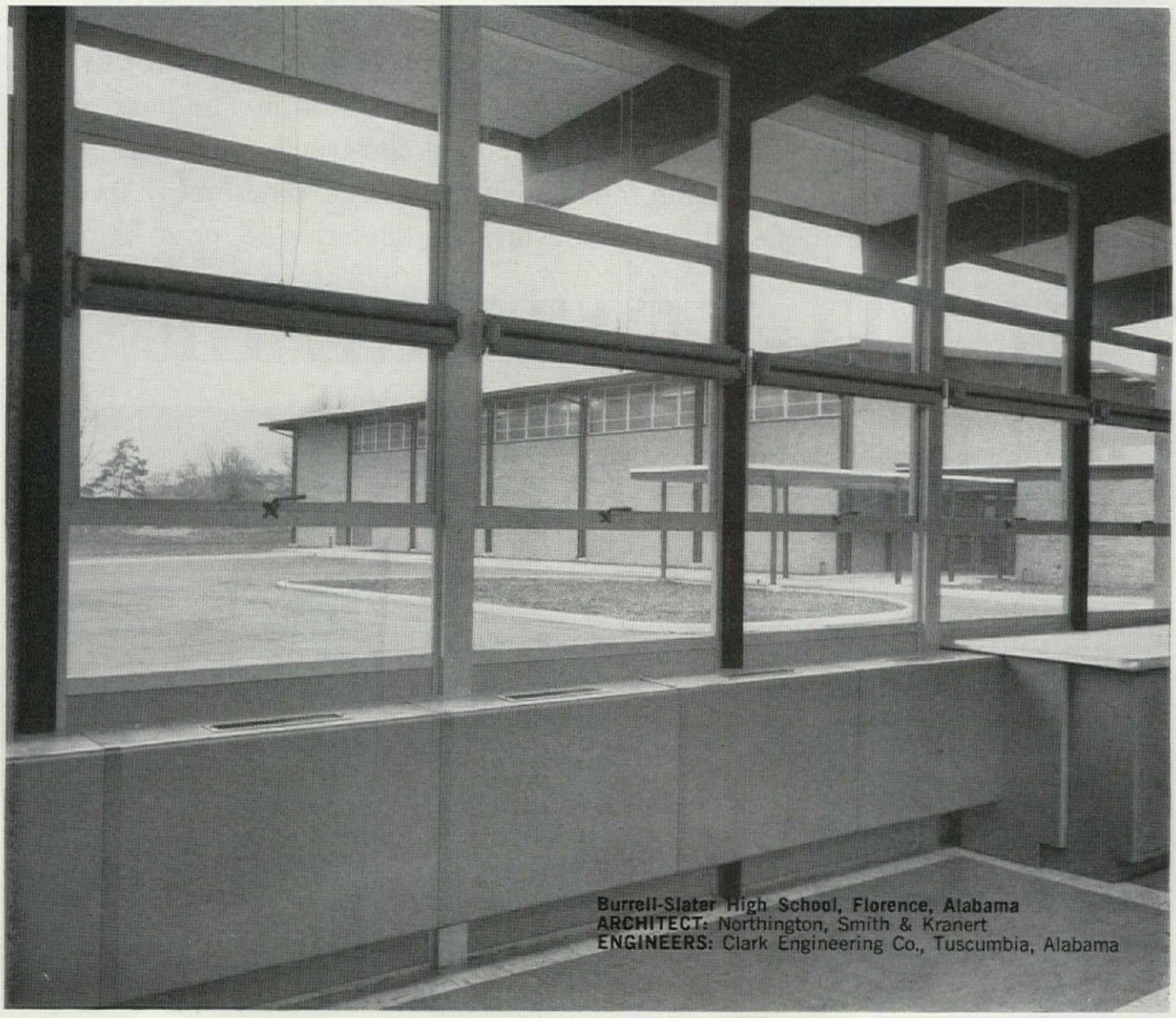

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ARCHITECT: Northington, Smith & Kranert
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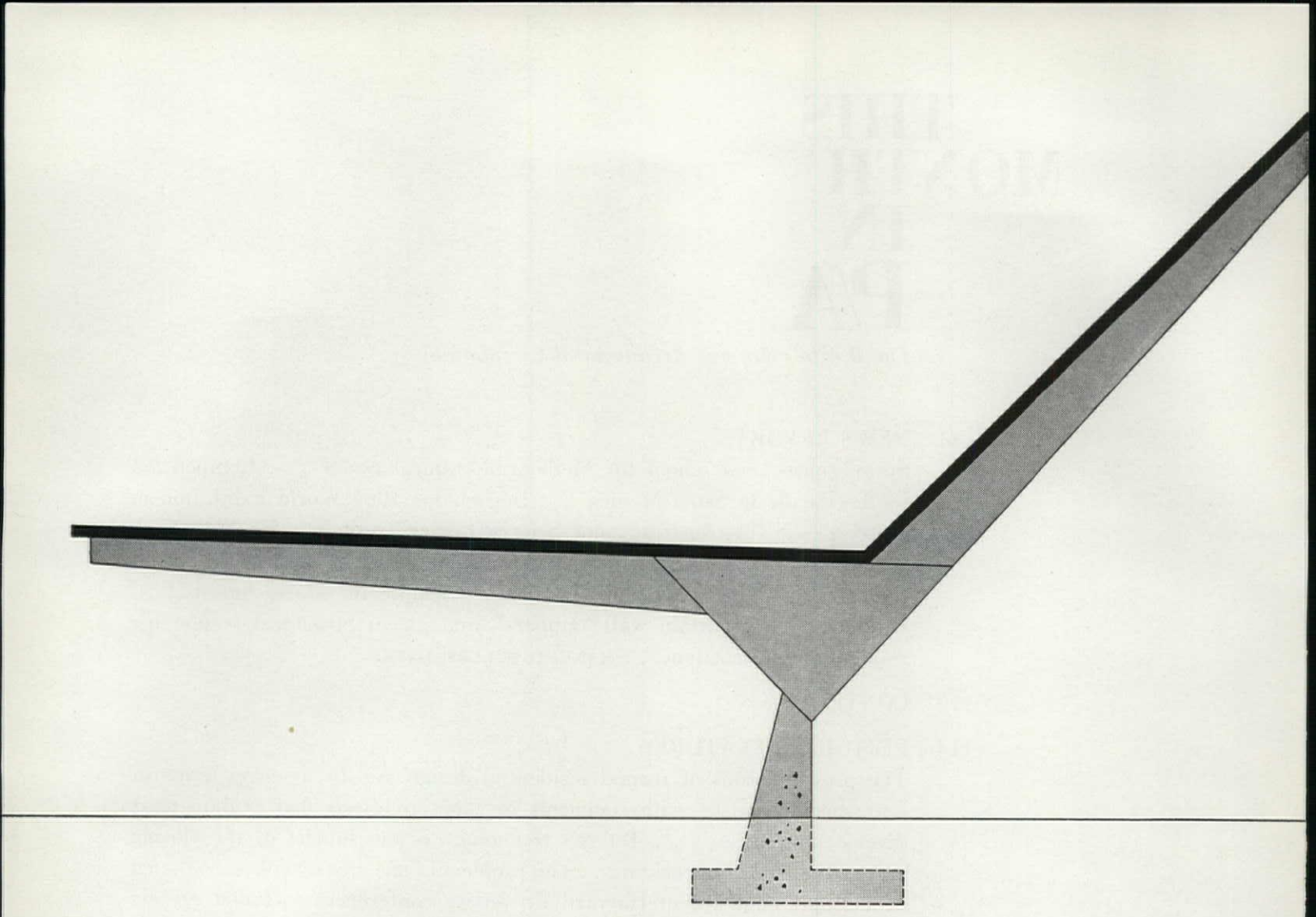
Indexed in Art Index, Architectural Index. Second-class postage paid at New York, N. Y. Volume XLII, No. 5



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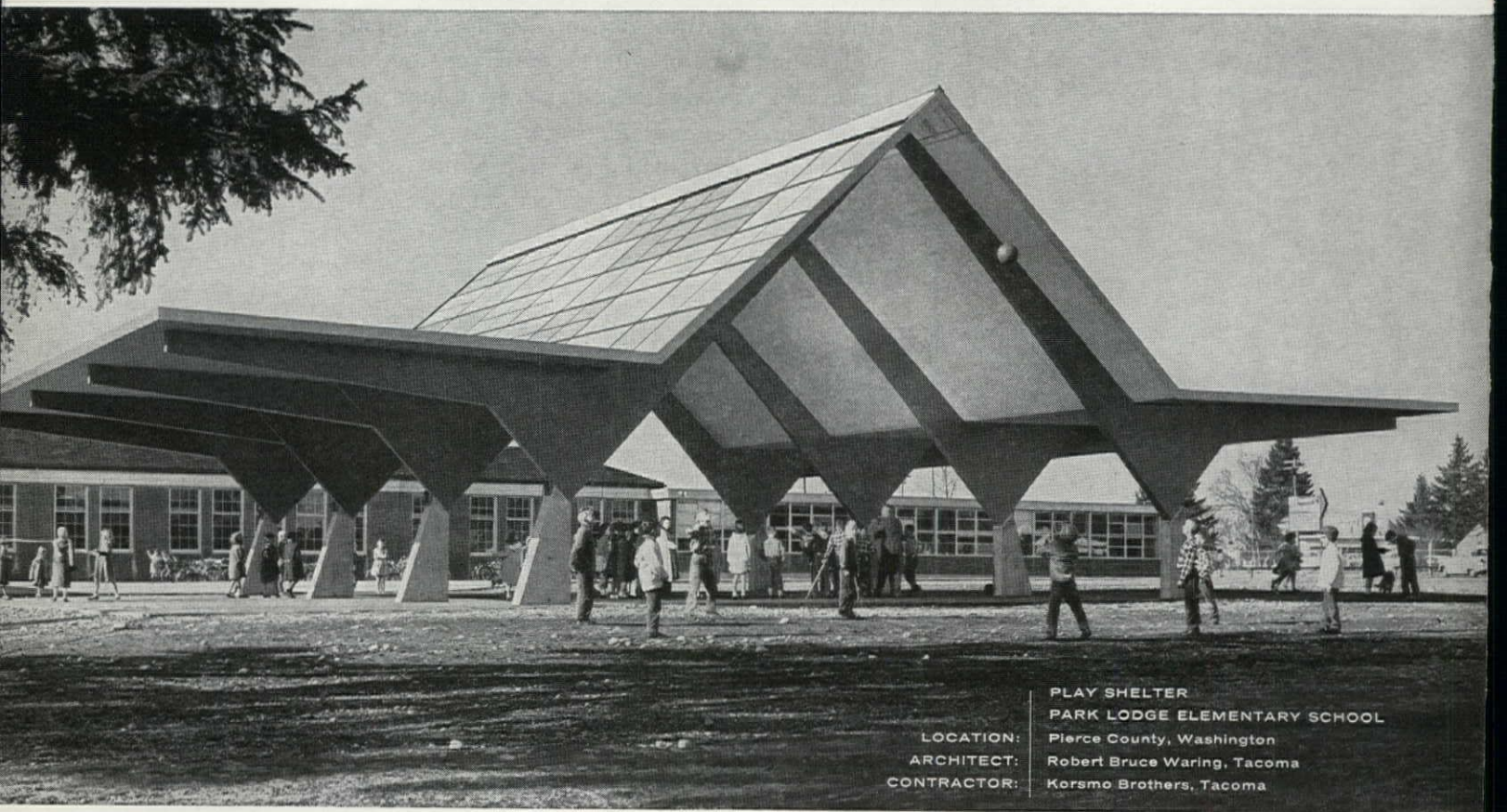

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ARCHITECT: Robert Bruce Waring, Tacoma
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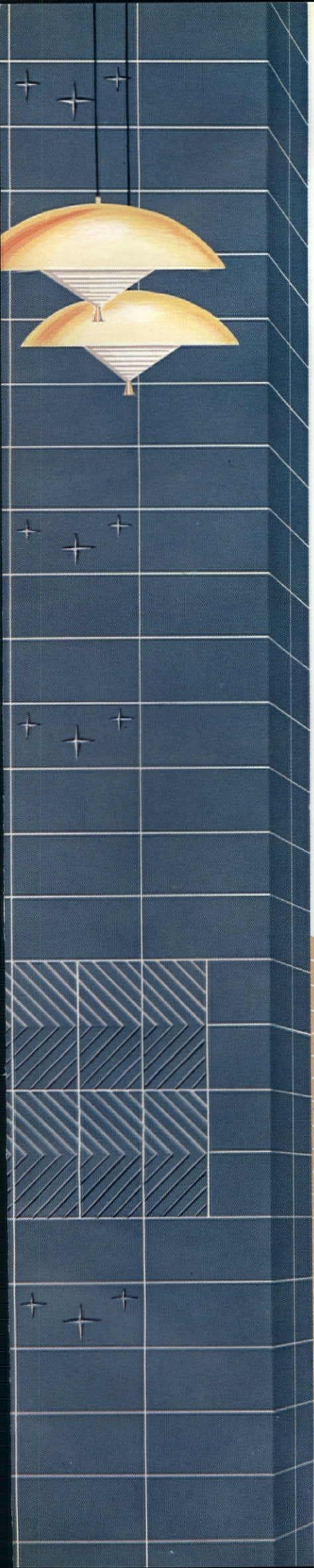

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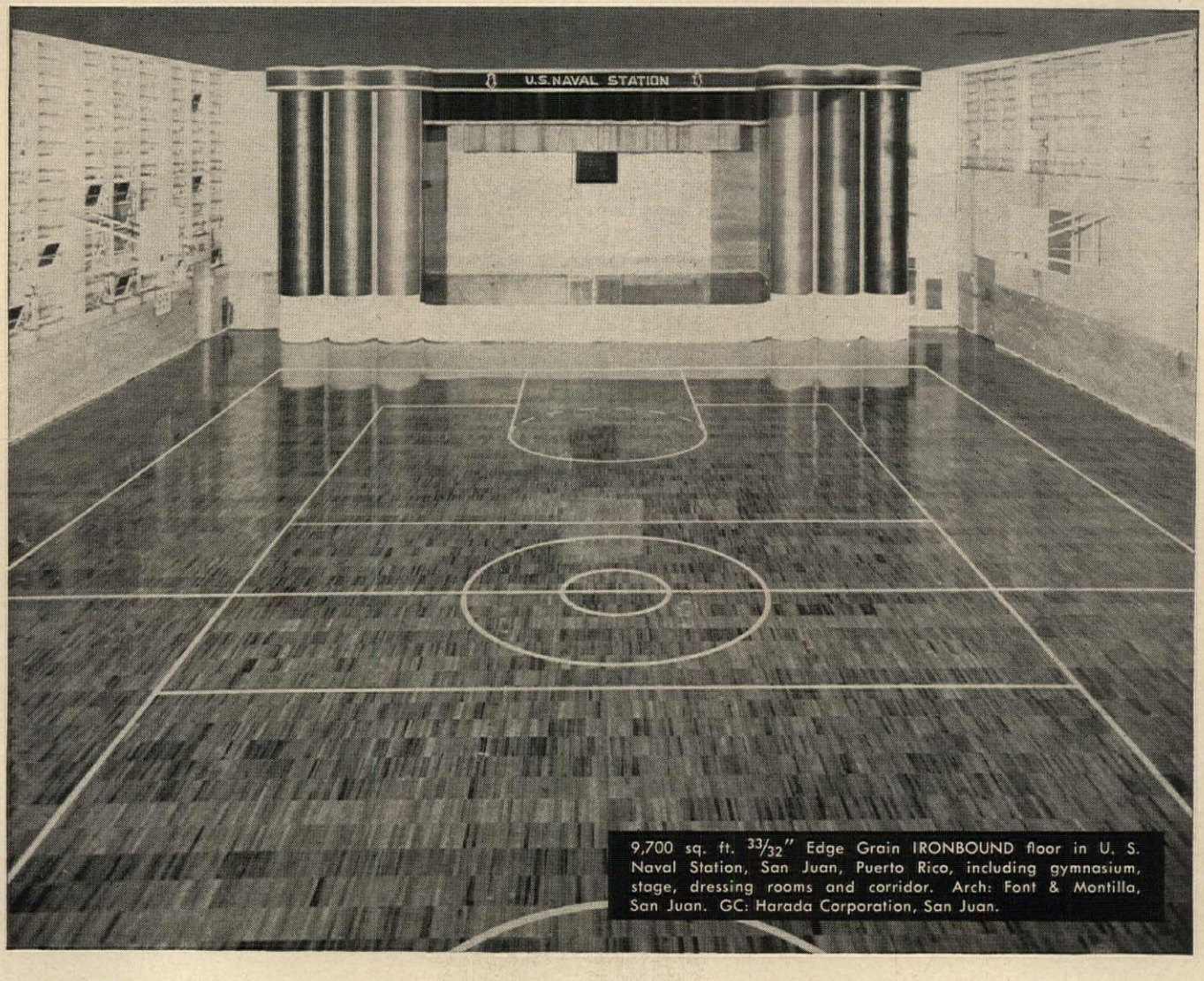
PROGRESSIVE ARCHITECTURE MAY 1961

NEWS REPORT

Architecture's Monthly News Digest of Buildings and Projects, Personalities, New Products

Towering spire will be landmark of new National Art Gallery and Cultural Center in Melbourne, Australia.



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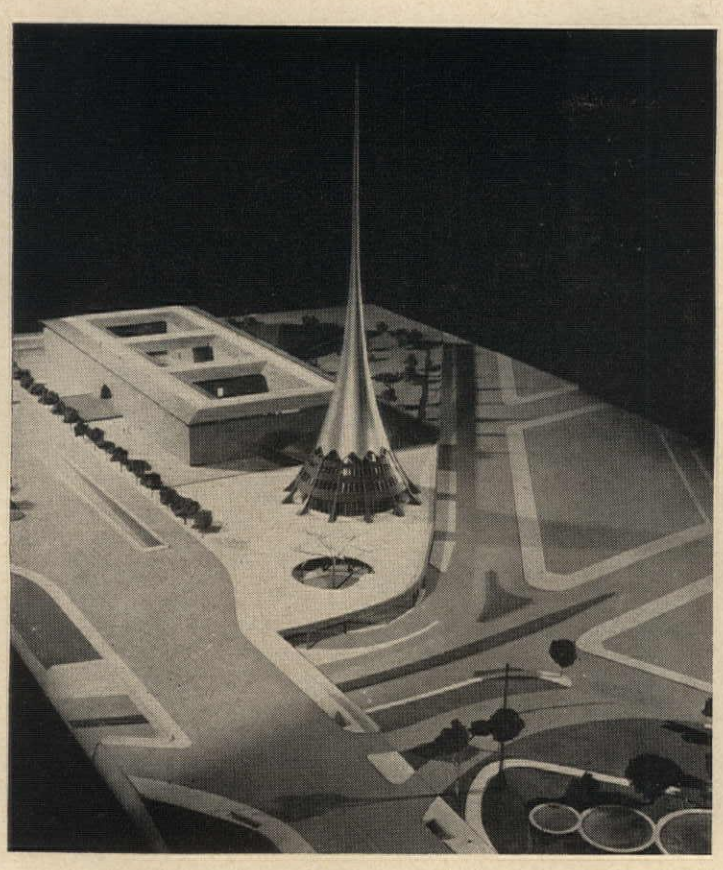
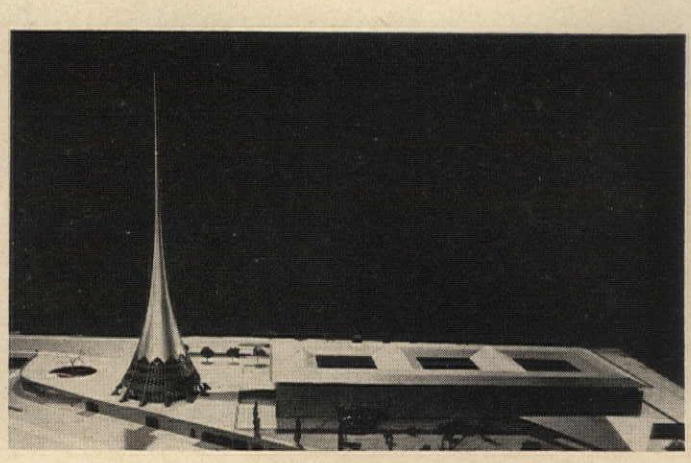




Rectangle, Triangle, and Spire for Australia

MELBOURNE, AUSTRALIA Excavations begin next month for the new National Art Gallery and Cultural Center of Victoria in Melbourne. The center will have three buildings on a 7½-acre site: the gallery, an art school, and, in one structure, auditoriums, restaurants, and offices.

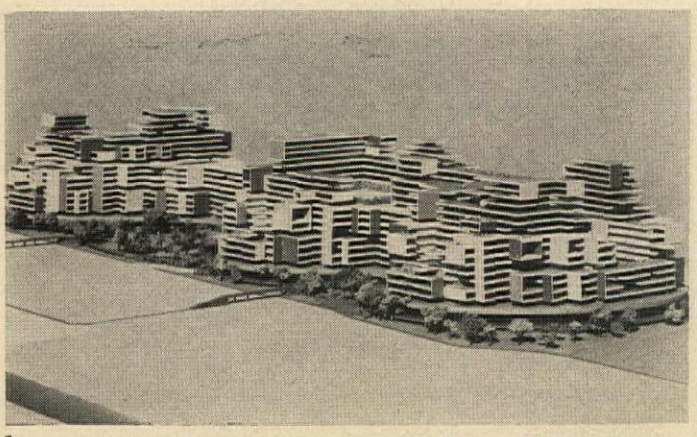
The moated gallery will be a four-story rectangle sheathed in local basalt and penetrated by three courtyards, one for sculpture, one for oriental exhibits, and one Australian in character. It will be entered over a forecourt through an archway. Floors in the gallery will "float" independently of the exterior walls, on which most of the paintings will be hung. A building-height hall will be provided.

The art school will be in the form of a triangular pyramid, reflecting the shape of its site. It will sit behind the gallery in landscaped gardens. The gallery, art school, and spire will be on a podium over multilevel parking for 2000 cars.

The third element will have two auditoriums and an experimental theater reached on the level below the main podium. Rising above the podium will be a restaurant and meeting rooms and offices for cultural organizations. This unit will be topped by a 415-ft, tapered spire.

Architect is Roy Grounds of Grounds, Romberg & Boyd.

Center will be raised on a landscaped podium to afford river views from terraces, gardens, and the spired restaurant.



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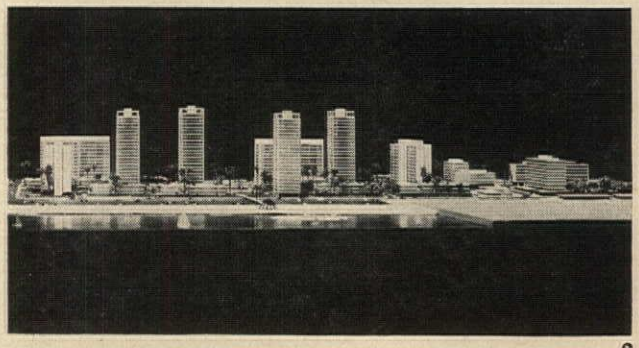

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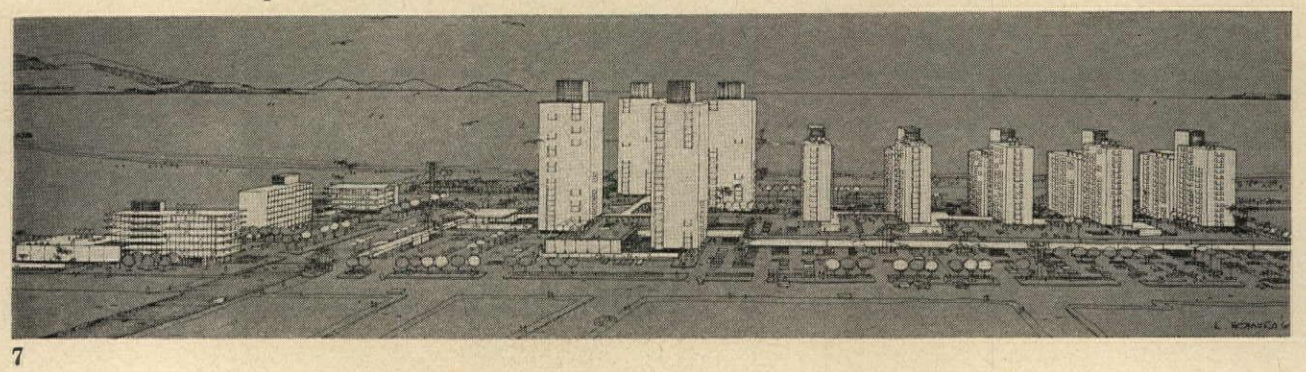

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Renewal Between Mountain and Sea in Santa Monica

SANTA MONICA, CALIF. All through March and April, municipal and citizens' groups met in Santa Monica's public places to see, hear about, and discuss 11 proposals for a major beachfront development project here. (Eight are shown on these pages.) Although all presentations were open to the public, final say in the awarding of the project will devolve upon the city's Redevelopment Agency and the Citizens' Progress Committee, a group of 100 civic-minded Santa Monicans.

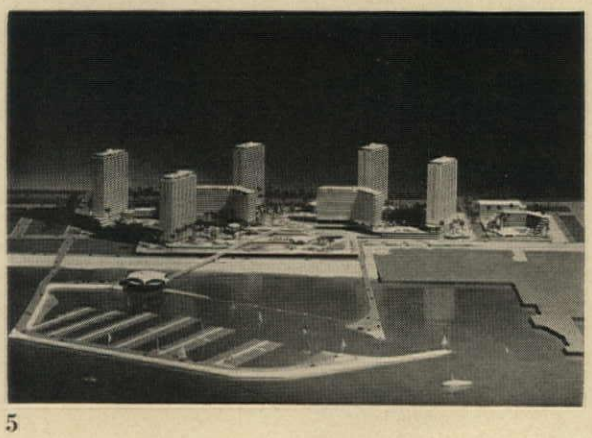
Site of the project is a 36-acre section called Ocean Park. Unhappy site defects are the presence of a huge public parking lot and a highway between the redevelopment and the ocean. All proposals attempted to void these nuisances through the use of high-rise buildings and/or terraced complexes.

Proposal by William L. Pereira & Associates for Western Urban Renewal Corporation (James H. Scheuer) 1 places apartments on three man-made earth mounds atop seven-level parking garages. Top of garages form roof gardens; most tenants would be able to walk almost directly from cars to apartments. Shops and stores are at ground level of the proposal.

An arrangement of high-rise apartments and garden apartments is the proposal of Kern County Land Company and Del E. Webb Corporation, designed by Welton Becket & Associates 2. Proposal separates the area into four neighborhoods containing two high-rise apartments and a number of two- and three-story garden apartments. A central park area features a 200-seat restaurant. Commercial area of this plan contains an apartment house for the elderly, an office building, a motel, and a parking building.

Another hill-over-parking garage design is by DeMars & Reay Associated (Pietro Belluschi and Charles Eames, Consultants) for Perini-Santa Monica Associates 3. The architects have arranged four hills surmounted by terrace and high-rise apartments. In addition to freeing land for parks and recreational facilities, this plan permits triple use of "used" land—for garages, terrace apartments, and as base for the towers.

3



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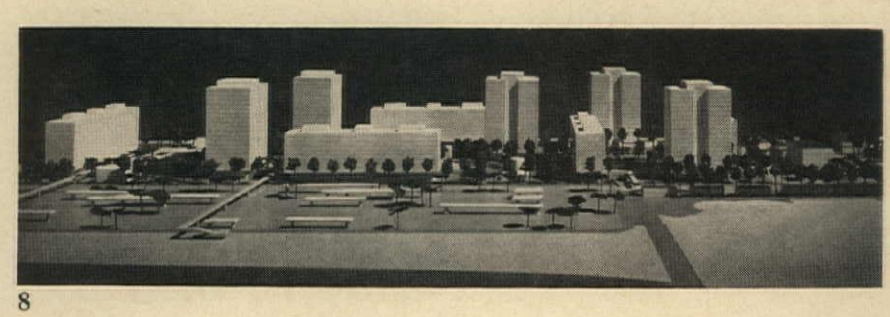


8

Ladd & Kelsey's design for Braemar Associates 4 proposes three 31-story high-rise apartments, a nine-story apartment for the elderly, 10 three- and four-story low-rise, co-operative apartment buildings, and such common-use amenities as a restaurant, library-gallery-lounge building, and a beach club. Commercial facilities include two inns, bank, office, and hotel.

A hexagonal site plan was designed by Daniel, Mann, Johnson & Mendenhall for the Deane Associates proposal 5. There are seven major structures of 13 and 27 stories, plus a number of five-story units and two-story town houses. This proposal has an alternate plan whereby the existing beach front and the public parking lot would be covered over and another high-rise apartment building erected thereon.

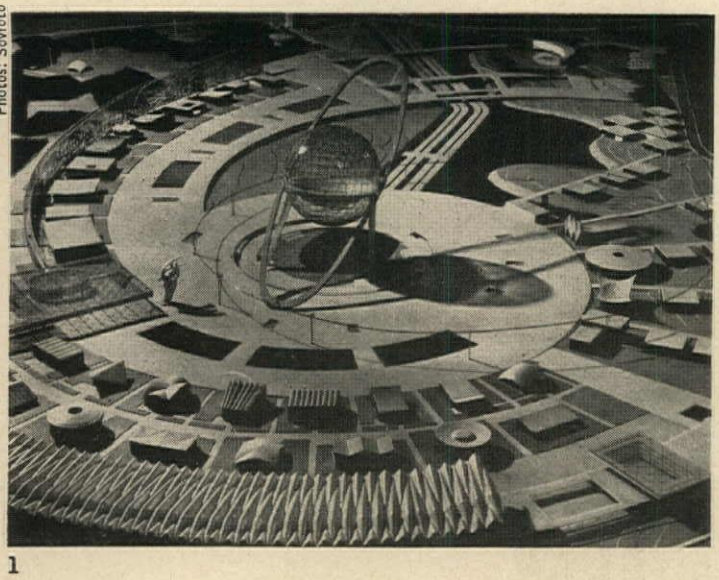
Four slab buildings atop a curved parking and shopping building is the design by Kelly & Gruzen and Robert E. Alexander & Associates for Dworman Associates 6. The slabs utilize an ingenious system of "split-level" floor-through apartments, giving cross-ventilation and exposure to two views. These buildings include 1760 apartments, with another 218 in town houses.

Maynard Lyndon and A. Quincy Jones & Frederick E. Emmons associated to prepare the proposal for Heftler Construction Company, Wallace Properties, and Centex Construction Company 7. This proposal includes, in addition to the commercial areas, five slab towers and four point towers. The slabs are turned perpendicular to the beach to provide maximum views of the ocean and the mountains. Decks and plazas relate the buildings on the mountain side of the site, and the ocean side is devoted to gardens.

The proposal by Victor Gruen Associates for Reynolds Aluminum Service Corporation of Virginia 8 is an example of the increasing interest of some building manufacturers in urban renewal. This proposal emphasizes high-rise buildings to capitalize on both views.

Other proposals were by Adrian Wilson & Associates for Santa Monica Developers; Vernon Duckett for Samuel Firks; and Milton Schwartz & Associates for Diller-Kalsman, Osias Construction Corporation.

Photos: Sovfoto



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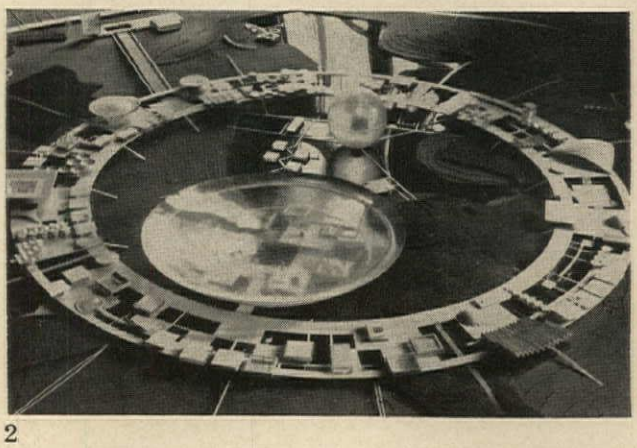

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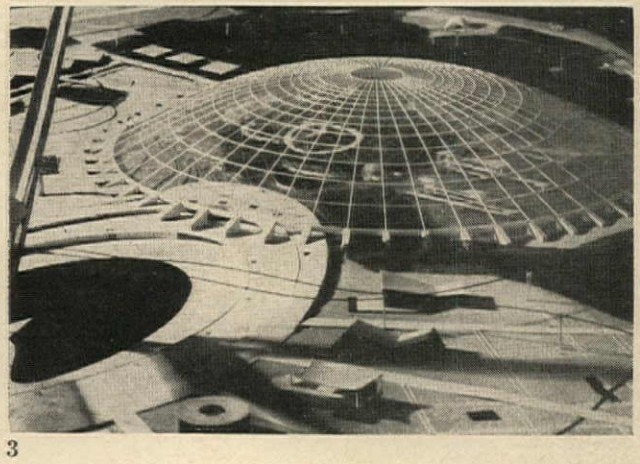

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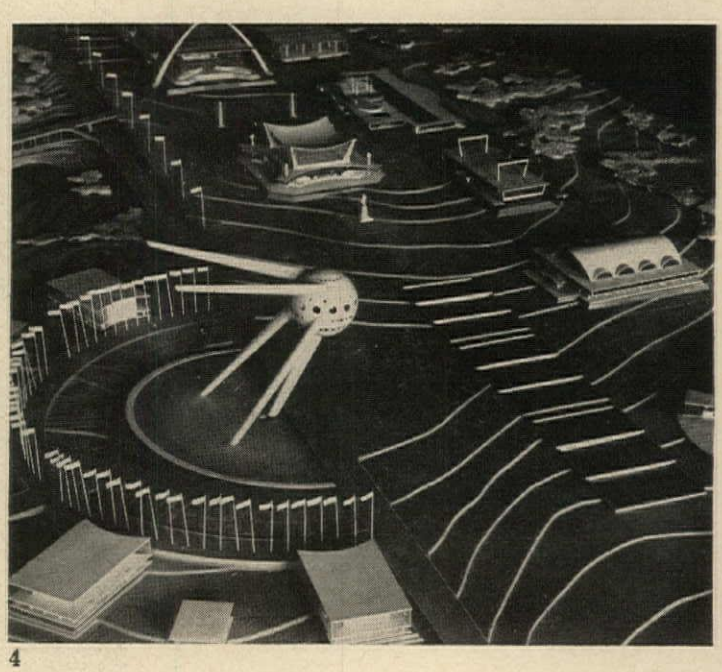

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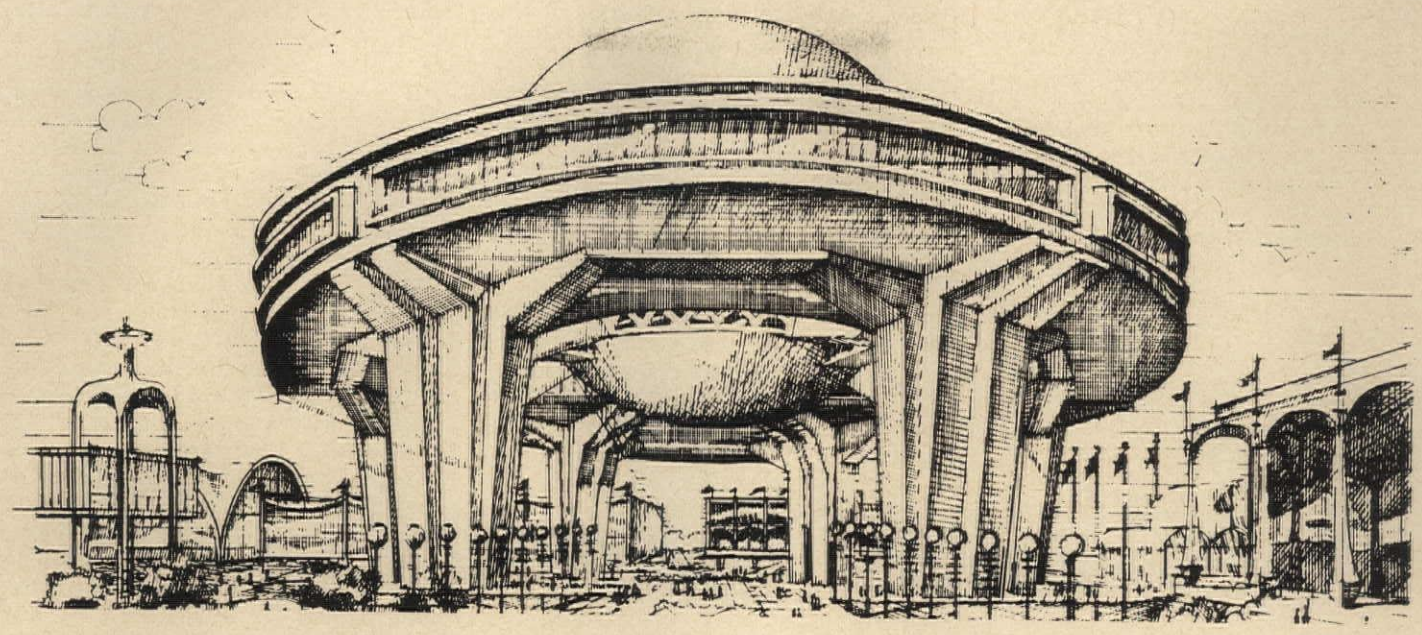
Design Competition for 1967 Moscow World's Fair

MOSCOW, U.S.S.R. Doing what the management of the New York World's Fair should have done a year or so ago, those responsible for the design of the proposed 1967 World's Fair in Moscow have held a competition for the "best general layout" for the fair. Shown above are several of the more than 30 schemes that were submitted by design teams from the U.S.S.R. Academy of Civil Engineering and Architecture, the Moscow City Planning Institute, the Structural Steel Design Institute, the Moscow Institute of Architecture, and other design and research groups.

The fair will take place on a 1235-acre site, almost 500 acres of which will be devoted to a large recreational area. Theme of the fair will be "Progress and Peace," and there will be a central structure symbolizing this motto.

Proposals shown here are 1 a radial scheme with variously roofed pavilions around the theme structure; 2 a completely circular arrangement with the symbolic building in a central park and again with an astonishing variety of roofs; 3 an immense, transparent dome covering various activities, sharing the spotlight with the "Progress and Peace" symbol; and 4 a mall plan, with exhibit buildings arranged in rows and the theme building highlighted in a pool; latter would have restaurant and windows at top.

D. N. Chechulin, Chief Architect for the Moscow World's Fair, states that these "are the first suggestions and preliminary ideas of architects and engineers" but that "the materials of the contest will be used for further work in drawing up the general plan of the World Fair."

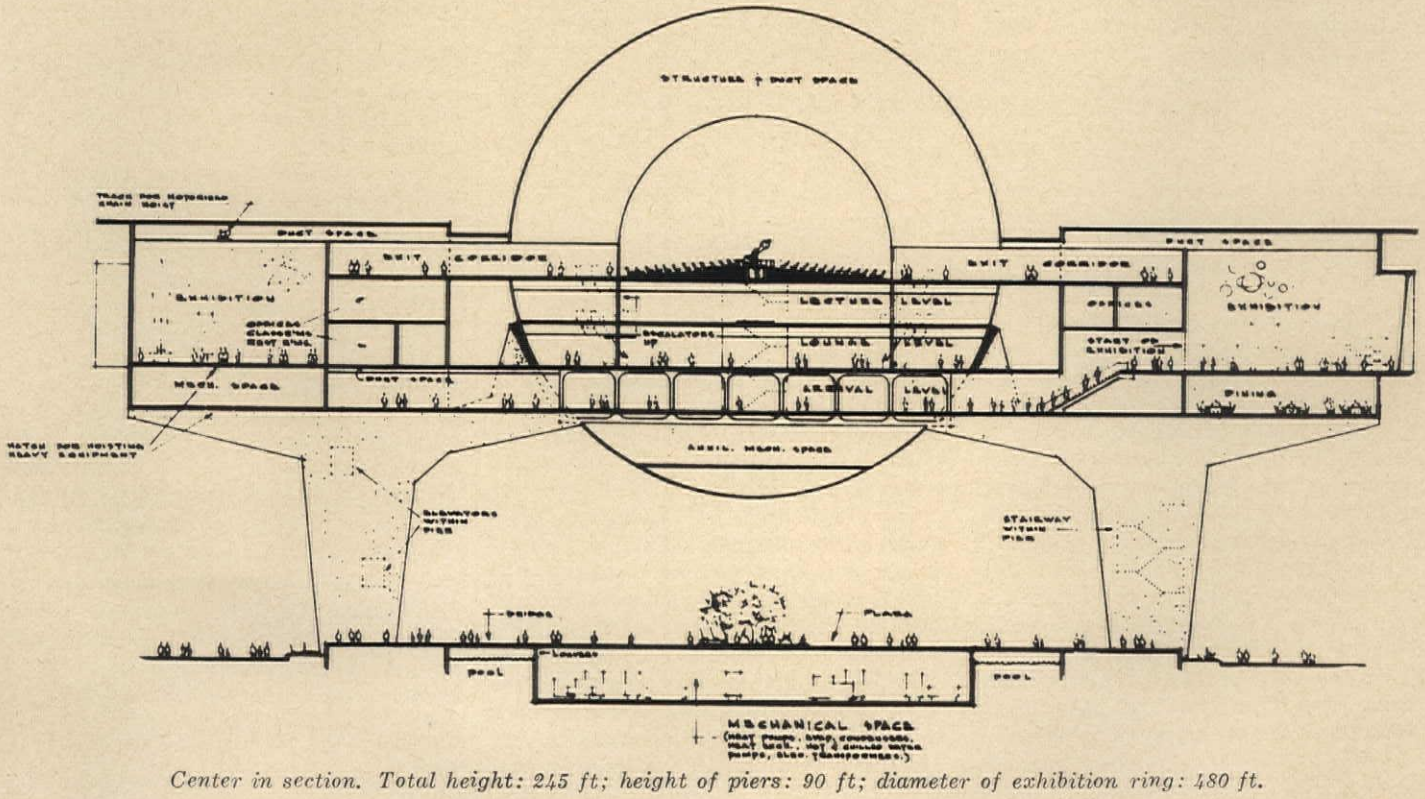


ASTRONARIUM-SCIENCE CENTER PROPOSED FOR WORLD'S FAIR

NEW YORK, N. Y. Lively interest in Washington and the support of such scientific celebrities as Drs. Edward Teller and Gerard P. Kuiper have greeted the proposal of an astronarium and science center as the U.S. exhibit at the 1964–65 New York World's Fair. Designed by Architect La Pierre, Litchfield & Partners and Consulting Engineer Theodore J. Kauffeld, the proposal would remain after the fair as a permanent science education center.

The center would be supported on six concrete piers containing elevators by which visitors would ascend and descend in a one-way traffic pattern without crossing each other. The structure would have three levels, plus the astronarium itself: the arrivals level, containing lobby, lounge, restaurant, kitchen, and mechanical and electrical space; the exhibition level, containing 112,000 sq ft of exhibit space, room for displays of technical literature, classrooms in an inner circle, and a lounge; and the lecture level, containing a 1000-seat lecture room that would be used for briefing lectures before witnessing the show in the astronarium (this level would also contain a ring of offices). The domed astronarium itself would seat 1000 spectators in specially designed chairs. Many advanced presentation techniques would be used to show and explain space travel, rocketry and missilry, and the stellar and solar systems.

Dr. Teller has said that he approves of the concept and "would like to support it to the fullest extent."



Center in section. Total height: 245 ft; height of piers: 90 ft; diameter of exhibition ring: 480 ft.

PERSONALITIES

Sponge divers and cigar rollers in Tampa, Florida, are now subject to the penetrating scrutiny and exactitude of observation that for more than 20 years guided PROGRESSIVE ARCHITECTURE past the Scylla of the looming deadline and the Charybdis of the

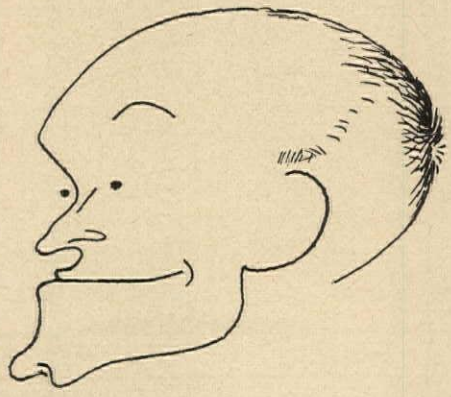
printer. Taking a prolonged and well-earned rest there is **Charles Magruder,** P/A Managing Editor from 1940 to 1960. An adept wielder of the verbal poniard, Charles was never loathe to pierce the self-inflated balloon of the egoist or the phoney. At the same time, he was, during his long association with P/A, a sympathetic and helpful colleague, always quick to come to the defense of "my editors" in the event of outside intrusion.

Charles came to the magazine in 1938, when it was still *Pencil Points.* He had already grounded himself thoroughly in architecture and publishing by obtaining a B.S. in architecture from the University of Florida, working for several Florida offices, and then, turning to newspaper work, going on to become City Editor and AP Wire Editor of the *Tampa Times.* He was made Managing Editor of P/A in 1940, and, with the exception of several war years when he served as professional consultant to the publications department of The Engineer School in Fort Belvoir, Charles watered the editorial and production plant with his inimitable concoction of acid generously laced with the milk of human kindness. When illness forced his departure recently for a deck chair down among the sheltering palms, the magazine's staff and the professional organizations to which he devoted much of his time felt a sincere sense of loss.

The P/A staff, and his friends throughout the country, lift a glass to Charles Magruder, who is undoubtedly lifting one back.

LE CORBUSIER added an honorary Doctor of Humane Letters degree from Columbia University to the Gold Medal he got from AIA on his U.S. trip (p. 63, MARCH 1961 P/A). The degree was presented at a convocation in his honor sponsored by the School of Architecture as part of its "Four Great Makers" series. Previously, WALTER GROPIUS was awarded an honorary degree of Doctor of Humane Letters in the same series. . . . The "International Grand Prize of Architecture" of the magazine *L'Architecture d'Aujourd'hui* went to the Danish architect ARNE JACOBSEN. . . . Brigadier-General WILLIAM WHIPPLE, JR., former director of the Southwestern Division for the Army Engineers, is now Chief Engineer of the New York World's Fair 1964–65 Corporation. . . . 1961 president of Associated General Contractors is M. CLARE MILLER of McPherson, Kansas.

It has been well-nigh impossible in New York of late, when attending an architectural lecture at Columbia University or a panel sponsored by the Architectural League, to miss hearing from **Philip Johnson.** In the space of ten days recently, Johnson chair-



manned a panel on architectural education for the notable Columbia series on the "Four Great Makers," debated with Reyner Banham on the past, present, and future of the "International Style" in the League's 1961 series, and appeared again at Columbia in the convocation honoring his great, long-time influence, Mies van der Rohe. That these meetings were enlivened by Johnson's formidable knowledge of architecture and its history, and his unerring choice of the *mot juste,* will go without saying for those fortunate enough to have seen—and heard—him in action.

Johnson's entree into architecture is widely known—how, after receiving a B.A. in Philosophy from Harvard in 1927, he became interested in the emerging modern architecture during a post-graduation European trip; how he served as Chairman of the Department of Architecture of the Museum of Modern Art from 1932 until 1954 (taking the field of industrial design under his aegis during that time), mounting many now historical architectural and design exhibits and coining (with Henry-Russell Hitchcock) the term "International Style"; how at the age of 33 he re-entered Harvard to take his B.A. in Architecture. What followed has become design history: his own famous "Glass House" in New Canaan; the Museum of Modern Art's annex and garden; the Seagram Building with Mies; and most recently, two AIA-award winning buildings —the shrine at New Harmony, Indiana, and the nuclear reactor in Israel.

Still the greatest living master of the outrageous—and meaningful—statement (at Columbia: "I believe Charles Colbert asked me to moderate this panel on architectural education tonight because he knows I do not believe in it"), Johnson has shown infinitesimal signs of mellowing recently (at P/A Design Awards judging: "I wouldn't build a building like any one of these, but I hope I can take a liberal attitude"). Architects may be sure, however, that for many years to come they will find their severest critic and most dedicated colleague in Philip Cortelyou Johnson.

KENNETH M. NISHIMOTO's seventh annual architectural tour of Japan will depart from Los Angeles October 6; those interested should write him at 263 S. Los Robles Ave., Pasadena, California. . . . 1961 Fitzpatrick Award of the Building Research Institute went to EDMUND R. PURVES. . . . LUDWIG MIES VAN DER ROHE was elected to the National Institute of Arts & Letters. . . . THOMAS DE GIATANI, director of the Stage Department of Juilliard School of Music, was elected president of U.S. Institute for Theater Technology. . . . New president of Cooper Union in New York is Dr. RICHARD FRANKLIN HUMPHREYS. . . . Dean CHARLES R. COLBERT announces degree of Master of Science in Architecture, concentrating on medical facility planning, from School of Architecture and School of Public Health and Administrative Medicine of Columbia University.

Sketches by Romeo Cobbelli

Urban Renewal Commissioner on Urban Renewal

WASHINGTON, D.C. *"I believe that urban renewal constitutes the most important domestic program of our time." Thus, writing to P/A, did* ***William L. Slayton,*** *recently appointed Commissioner of the Urban Renewal Administration, characterize his new position. "There is no job I would rather have the privilege of holding," he said.*

Slayton comes to his post with an impressive background of experience, including positions as Associate in Charge of Urban Renewal for I. M. Pei & Associates and Vice President for Planning and Redevelopment for Webb & Knapp, Inc. Graduated from the University of Chicago with an A.B. in municipal government and an A.M. in public administration, 44-year-old Slayton was planning analyst for the Milwaukee Planning Commission and special assistant to the Mayor and City Council of Milwaukee. After war service in the Navy, he became associate director of the "Urban Redevelopment Study" under Professor Coleman Woodbury, and in 1949 became Redevelopment Director of the National Association of Housing and Redevelopment Officials.

Asked by P/A for his attitudes on urban renewal, Slayton sent the following "random thoughts."

The two key words of the urban renewal program should be *experimentation* and *design.* One assumes that cities will be concerned with enhancing their economic status and that they will direct their programs toward that end. One assumes also that, since slum clearance and blight elimination are the basic purposes of the programs, these will automatically be achieved in the process of carrying out the programs. There is no similar drive, however, for design and experimentation; yet these are essential ingredients if the renewal program is to rebuild our cities in new urban patterns. Public officials, unfortunately, are not design-oriented, and the executives (both local and Federal) of the urban renewal program are not prepared to take the risks of experimentation.

Experimentation. Too frequently, we react to urban design as though our population were almost completely homogeneous: we assume that the living needs and desires of all can be met through a limited number of types of living accommodations—the free-standing, single-family house on a suburban lot, the garden apartment, the attached house, and the elevator apartment. We also assume a rather limited arrangement of these housing accommodations. But the public cannot judge what it cannot observe, and there is much we do not know about housing needs and desires. Thus we should experiment with new types and new arrangements, determining how well such experiments meet the needs and wants of particular groups within the population. We should try some double maisonettes, some town houses around a common court, some mixture of town houses and elevator apartments, some different types of apartment units, some town houses in elevator buildings. Some may not be successful, but we will learn a great deal more about the complexity of the public's wants and needs.

Where other types of buildings are concerned, as with commercial developments, we seem to hit upon a single scheme that works and then build only that. The shopping center has been a successful grouping of stores, but perhaps we should try other arrangements. There are many different ways of achieving stated objectives, but there is not much enthusiasm among cities and builders and mortgage lenders to try them out. Urban renewal provides a vehicle for this experimentation; it should be encouraged.

William L. Slayton . . . "Urban renewal constitutes the most important domestic program of our time."

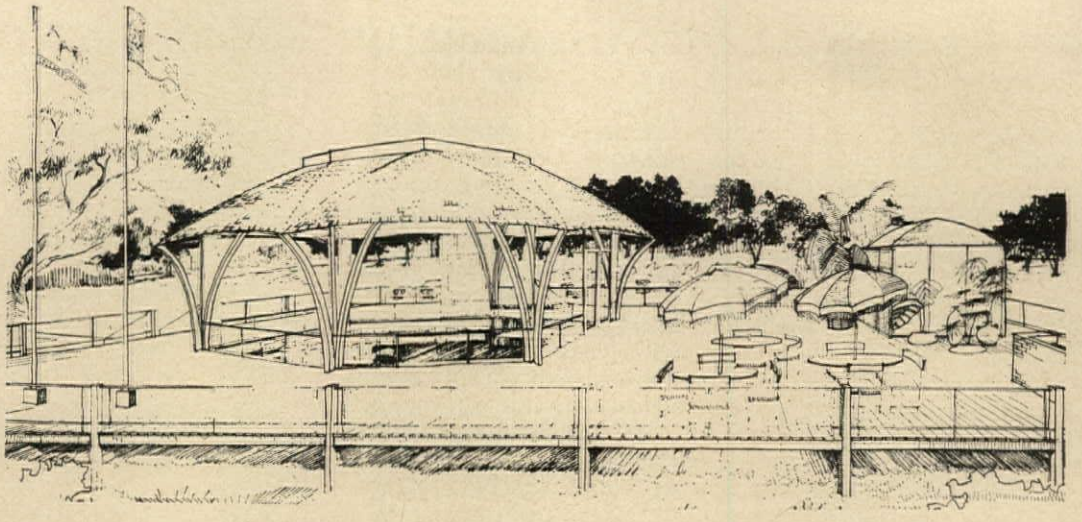
As far as *design* is concerned, we are limited also, although there is recent evidence of more emphasis upon design and the selection of developers with design as a criterion. But our laws and planning practice are geared to the developer, who, when he has a lot on which he wishes to erect a building, is controlled by zoning laws. Few have recognized the absurdity of using zoning-type development controls to guide or control urban renewal. There is a failure to recognize that zoning necessarily must be negative in character and must be designed for the individual lot. To transfer such a type of control to urban renewal is unrealistic. Urban renewal is a development whose objective is to achieve a positive goal, rather than to prevent what is rated bad on the basis of some mathematical formulas.

Only recently has an approach been made toward establishing something like a design guide. Similarly, the concept of an over-all architectural control, with the designer serving as advisor to the public body that is responsible for selecting redevelopers and influencing their decision, is also a recent development. Here we need a whole new set of controls—different in kind rather than degree from the controls common to zoning.

This means we have to think of land disposition—and land price—in different terms. The developer must appraise the amenities he may have to install, as well as the maximum number of units he can erect. Instead of giving the builder a bonus for a plaza, the location of plazas should be specified. They probably should be public rather than private. We should try out new means of disposition and new ways of bringing in the architect to create the design concept. We should throw away the land use plans and prepare design plans ("design guide plans" would perhaps be a better phrase).

The design approach for the private developer must be applied also to the public developer. Location, orientation, height, façade, etc.—all these items cannot be left to the public client acting in isolation from the urban renewal program. And not just the public building, but *all* public improvements. Let us have some specially designed light standards. And let us have some specially designed sidewalks. Let's put a bit of art and architecture into our public appurtenances. Let us try to bring art back into the city in many ways—in fountains, pools, carefully designed squares, etc. Philadelphia requires each developer to spend one per cent of construction cost on art. This is one way of bringing art into renewal areas; let's try others as well.

In short, let's break out of the standard approach, and discover if some nonstandard approaches might better meet our needs. Let's also think in terms of urban *design* and emphasize it as being as important as economics.



TWO-CHUKKER PLAN FOR DALLAS POLO CLUB

DALLAS, TEXAS A recently formed group of polo aficionados here will have a clubhouse designed by Bolton & Barnstone of Houston. The club will be built in two stages: first, the main meeting room and bar, dressing rooms, and pro's room, to be followed by dining room and kitchen.

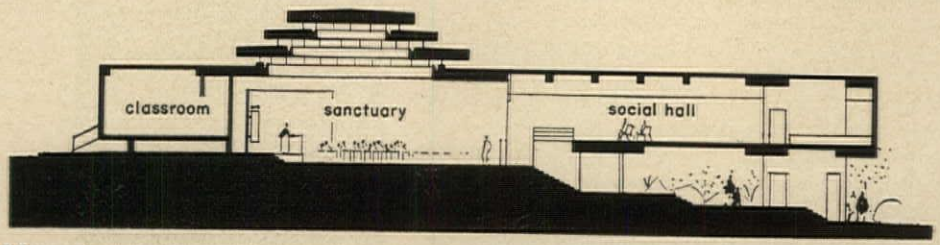
The large, communal room will be an octagon with a tangential diameter of 30 ft. It will have a vaulted roof of laminated fir columns and beams exposed on the interior. The roof will be covered with cedar shakes following the undulating curves that will result from the meeting of the arched column-beams. Banquettes will line three sides of the octagon, with a bar and fireplace as focal points in the room. A separate structure will house dressing facilities for players and the pro's bedroom. Both units will sit on a 100′ × 65′ redwood platform from which the game will be observed, and which will be used for outdoor dining.

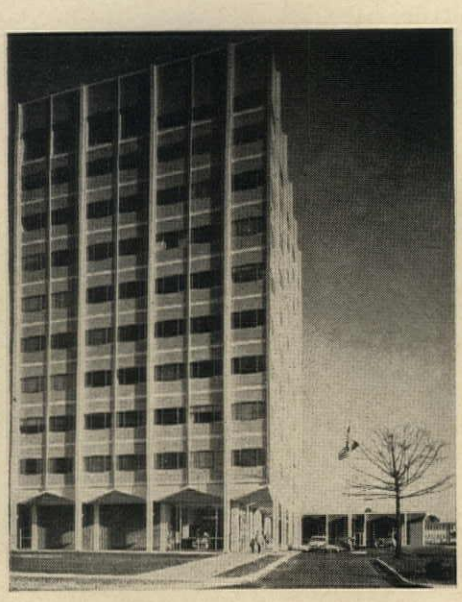
Stage two will see the joining of the two elements with an entry, indoor dining area, and a large kitchen, all on the deck level. The playing field is oak-enclosed, with stables nearby.

Idea of Unity Stressed in Design for Temple

PITTSFIELD, MASS. The proposed Temple Anshe Amonim here, designed by Blatner & Williams of Albany, N.Y., is said by the architects to evolve "from the fundamental Jewish concept which stresses the unity and oneness of God." To achieve this unity, the building has been treated as one mass meticulously integrated with its site. To provide a sense of wonder, the entrance will be approached up steps under the overhanging social hall, and the sanctuary, roofed with a series of clerestories, will be entered as from a cave. Surrounding this center on the second level, the social hall and classrooms will fulfill the needs of education and assembly.

The project recently won an award from AIA's Eastern N. Y. Chapter.





Kling's Medical Tower Opens in Norfolk

Norfolk Medical Tower, designed by Vincent G. Kling (Childs & Smith associated) for 94 physicians, surgeons, and dentists, opened recently. The site of the building is six acres provided by the Norfolk Redevelopment Authority adjoining the new Norfolk General Hospital, King's Daughters Hospital, and Public Health Center. Building is square in plan, with a central core for elevators and mechanical services freeing the periphery for office space. Structure is steel frame with an exterior of normandy gray insulated, porcelain-enameled steel spandrel panels. Heating plant is located on the roof to eliminate need for a basement that might become flooded with the tidewaters of the nearby Elizabeth River. In addition to professional offices, the building contains clinical and pathological laboratories, radiological facilities, pharmacy, optician, telephone answering service, secretarial services, restaurant, and libraries and offices of the Norfolk County Medical Society and the Virginia Tidewater Dental Society. A one-story shopping building is connected to the tower by a covered arcade. Fraioli-Blum Yesselman, Structural Engineer; George Matz Associates, Mechanical and Electrical Engineer.

Kennedy Backs Nile Monument Preservation

President Kennedy has proposed that the U.S. contribute $10 million to help preserve ancient monuments on the Upper Nile threatened with extinction by the Aswan High Dam (p. 53, DECEMBER 1960 P/A). The major temples saved thereby would be those on the Island of Philae. Kennedy deferred for the time being consideration of our participation in the program to save the monuments of Rameses II at Abu Simbel (p. 58, APRIL 1961 P/A). This program has been estimated as costing between $55 and $80 million.

The President's current proposal would allocate $6 million for preserving the Philae temples, $2.5 million for "lesser temples," and $1.5 million for archeological research in areas threatened with flooding. The Government of the United Arab Republic promises to cede to Governments assisting in preservation activities about half of the finds from the new diggings.

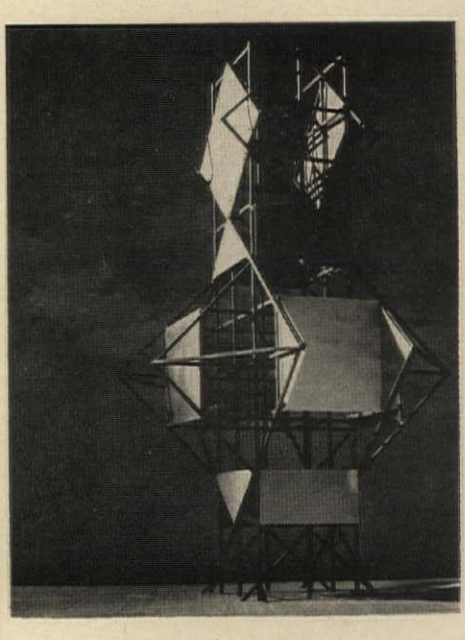
Dakota Saved

P/A is happy to report that its prediction of the fate of the Victorian-style Dakota apartment building in New York (p. 66, MARCH 1961 P/A) was overpessimistic. Tenants of the building will buy it from the entrepreneur-owner (who had planned to tear it down to make room for what would have been the largest single residential structure in the city) for $4.8 million. The Dakota will now become a co-operative. It was designed by Henry Janeway Hardenbergh, architect of New York's Plaza Hotel.

Physics Buildings Include Round Lecture Hall

The master plan for the expansion of the Physics Department at Rutgers' University Heights Science Campus in New Brunswick, N. J., will begin with two buildings by McDowell-Goldstein Associated Architects. They will stand on a raised earth podium that provides a level platform on the sloping site.

The lecture hall (right), a quadrant design, has a folded-plate concrete roof. It consists of a circular lobby from which quadrants branch off to form the lecture hall seating 300 students, preparation rooms, and other smaller rooms. The three-story, 44,000-sq-ft laboratory building (foreground) will be concrete throughout, including precast window frames that sheath the upper two floors. The interior will feature a full-length centralized vertical shaft serving all laboratories with piped, ducted, and wired services, which will save cost in installation and future expansion. The building will contain offices for theoreticians and experimentalists, 40 laboratories, a library, an electronics shop, and a precision machine shop.



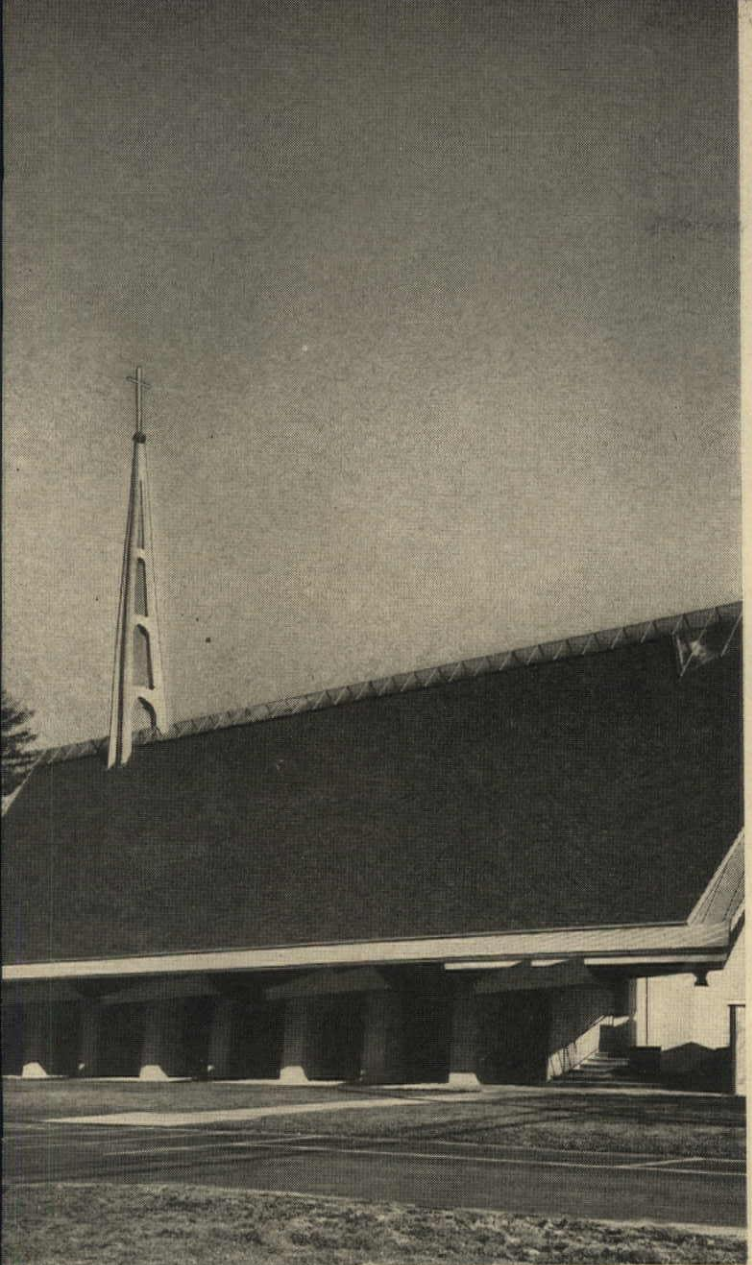
Thames-side Tower to Mark I.U.A. Congress Site

A 42-ft-high tower of tubular steel embellished with asbestos-cement panels will serve as the "main advertisement" for the Sixth Congress of the International Union of Architects, which meets in London in July. The tower, designed by John Ernest, will rise between the River Thames and the two major buildings of the exhibition: a showcase for building products and a tetrahedron-roofed meeting hall,

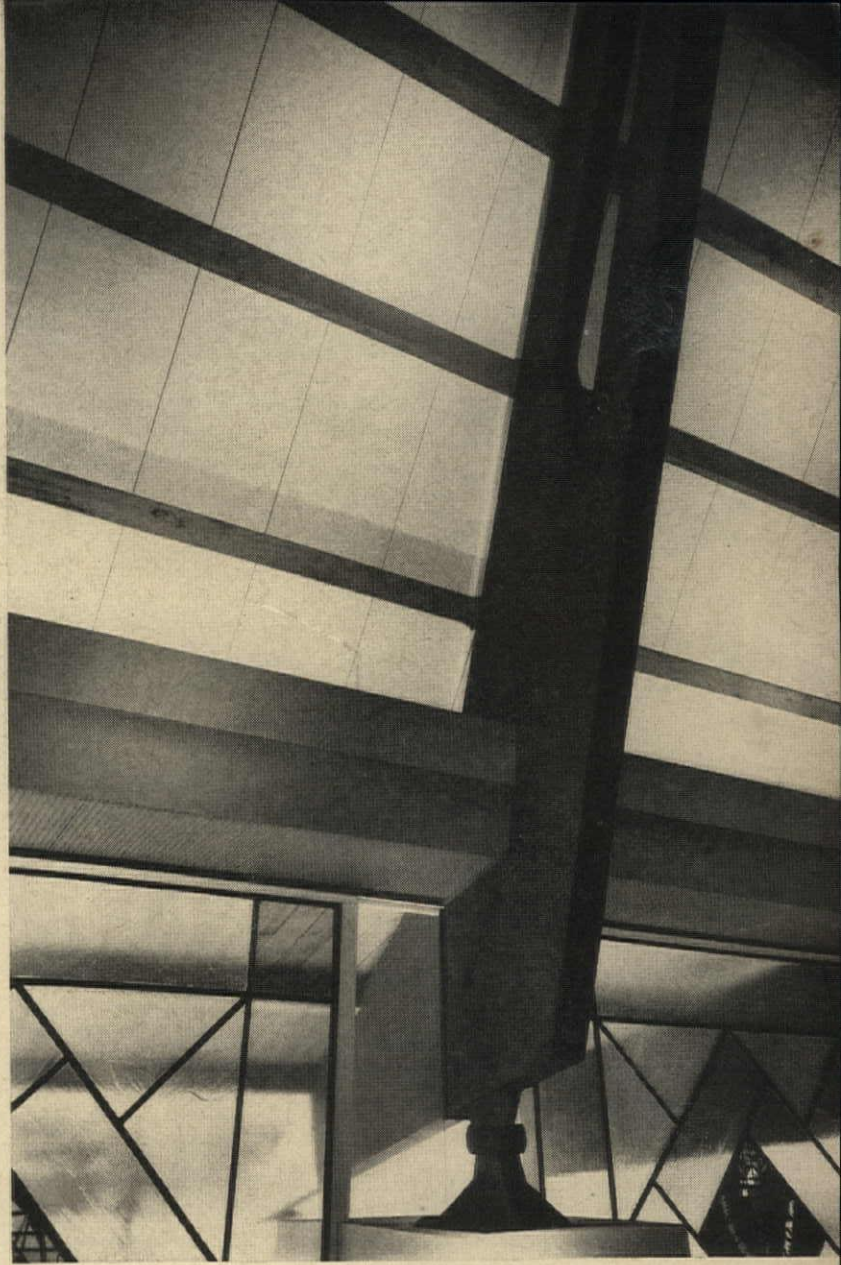
Continued on page 54

Design flexibility of Insulite Roof Deck ideal for contemporary church architecture. This impressive design is a fine example of the movement toward the greater use of contemporary forms and modern building materials in church architecture. This church will seat 500. Provisions have been made for future air conditioning.

White pre-finished Insulite Roof Deck reflects light. In addition, the ridge at the apex is of textured plastic which admits colored light and provides a view of the gold cross on the plastic coated wood fléche, 120 feet off the ground. At the opposite end of the church is the baptistry, second only to the altar as an architectural feature.



Shingles applied directly to roof. 3″ Insulite Roof Deck was applied vertically to purlins. Asphalt shingles were nailed directly on the roof deck. The interior surface of Insulite Roof Deck is pre-finished—saves cost of lath and plaster, and interior decoration.



Insulite Roof Deck establishes contrast. Laminated timbers are used as structural members which terminate at point supports on isolated piers. The general feeling created is one of light and spaciousness. White interior surface of Insulite Roof Deck gives pleasing contrast to pre-finished beams.

Design freedom on a modest budget made possible with Insulite Roof Deck

One application provides roof deck, insulation, vapor barrier, pre-finished ceiling

Featured on these pages is Grace Episcopal Church, Massapequa, Long Island. Architects were Edward W. Slater and Daniel Chait, New York City.

The contemporary design is used with a basic plan in keeping with the Episcopal liturgy.

To hold costs down while maintaining the beauty of the steeply pitched open beam ceiling, the architects specified Insulite Roof Deck. This modular material is fast and easy to work with, is an ideal material for a roof of this type.

Insulite Roof Deck cuts application costs way down because it does 4 jobs in 1! It provides a strong, durable roof decking . . . efficient insulation . . . a continuous vapor barrier . . . an attractive finished ceiling that is washable. All this is done in one application!

For technical data and literature showing Insulite Roof Deck in many other buildings and homes, write Insulite, Minneapolis 2, Minnesota.

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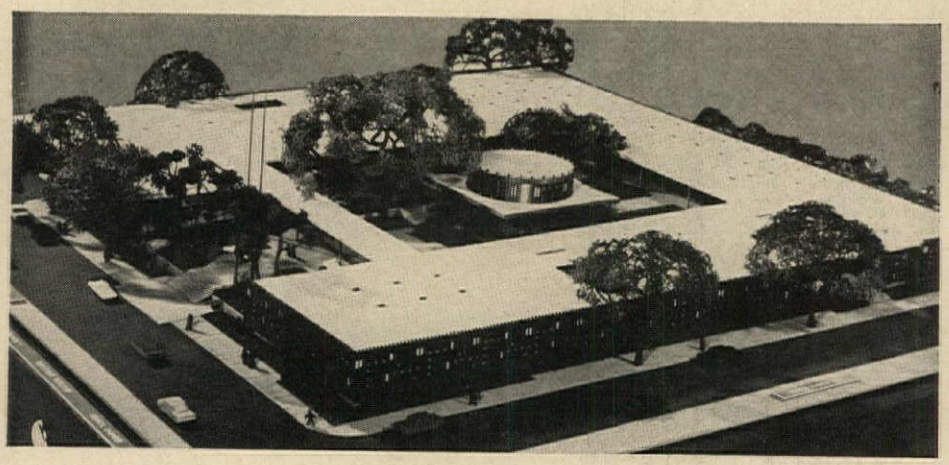
Continued from page 51

Three-Airline Terminal at Idlewild Airport

Braniff, Northeast, and Northwest Orient airlines have combined their facilities into one terminal to be completed in spring 1962 at New York's International Airport. Ten gate positions have been spaced around the periphery of the rectangular building itself instead of using the usual "extended finger" type of plan. This should make it more convenient for passengers, who will have less distance to walk to their flights and who will be able to do all their waiting in lounges at their boarding gates. A concrete canopy made of three rows of 36-ft, octagonal slabs will protect the entrance of the building. Outbound passengers will take a ramp to the upper level and enter the main concourse to go to check-in counters. Incoming passengers will leave from the lower level after claiming their baggage on the level below the main concourse. The main concourse will be 204′ x 528′ with a 23-ft ceiling in public areas. Architect: John Jamieson White.



Competition Winner for City Hall

On the eleventh of this month, voters will go to the polls in Eugene, Oregon, to approve a $2.4 million bond issue for the construction of a new city hall. Anxiously awaiting their verdict will be the local firm of Stafford, Morin & Longwood, which recently won a statewide competition for the design of the proposed building.

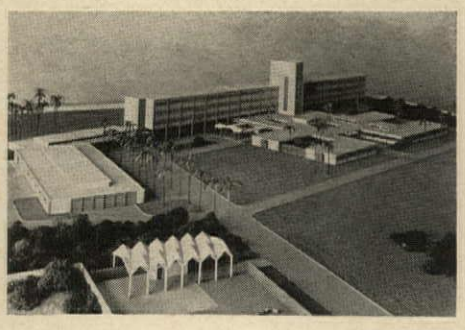
The winning design shows a low, block-square building embracing a smaller structure housing the city council chambers. A stepped entrance to the court surrounding the chambers would rise from a major street. Offices would be provided on the second floor; parking at ground level. The building would accommodate all city offices, including police and fire departments. An arcade would surround the landscaped court, connecting all offices.

Three other finalists in the competition received $2000 each (winning firm got $2500 and gets the commission): they were Wilmsen, Endicott & Unthank of Eugene; Balzhiser, Seder & Rhodes of Eugene; and Stewart & Richardson of Portland. Architectural jury consisted of Paul Hayden Kirk of Seattle, Francis Joseph McCarthy of San Francisco, and Robert B. Price of Tacoma.

both designed by Theo Crosby. AIA is sending a delegation to the meeting headed by President Philip Will, Jr.

Hall of Engineering at Carnegie Tech

The Alan M. Scaife Hall of Engineering at Carnegie Institute of Technology in Pittsburgh will house the Institute's Computation Center, a 120-seat auditorium, and provide laboratory space, classrooms, a lounge, and offices for the Dean of the College of Engineering and Science. Completion is expected by fall 1962. Architect: Altenhof and Bown.



Liberia to Have Hospital by American Firm

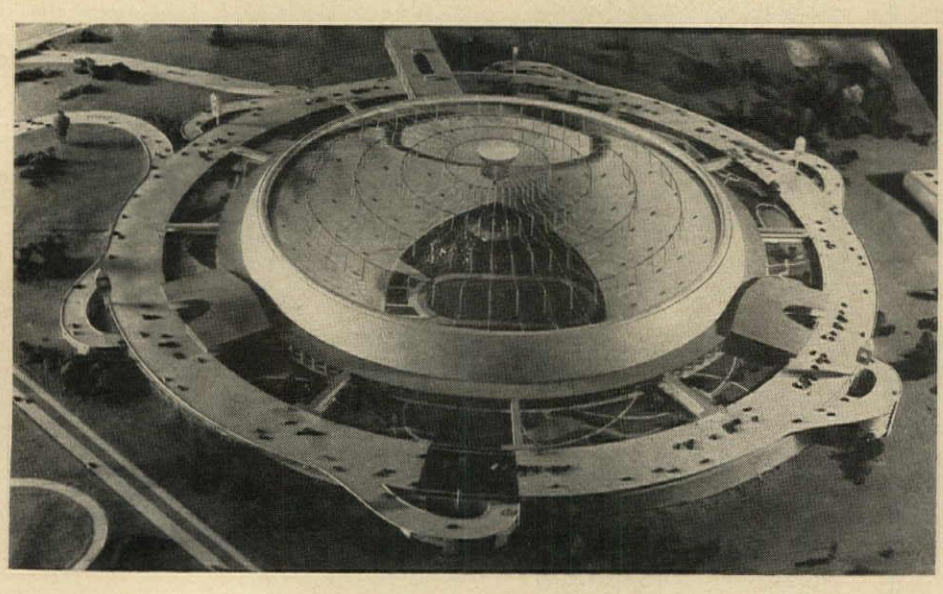
Monrovia, Liberia, will be the site of West Africa's first modern medical center. Construction of the hospital will begin this June, and the architects, Litchfield, Whiting, Bowne & Associates, are preparing additional designs for a medical college in collaboration with the Medical College of the University of Zurich, Switzerland, which will staff the center. The hospital will be in two main parts: a long, narrow, four-story section containing the inpatient and surgical facilities, and an adjoining one-story horizontal section for outpatient and general services grouped around interior and exterior courts. The vertical section's three upper stories will be raised on columns above the roof of the ground floor, allowing the prevailing trade winds to blow through to cool the low-lying adjacent buildings. The inpatient building, which will face south for a view of the Atlantic Ocean, will

have an initial capacity of 230 beds, expandable to 320 with additional construction. Sun protection will be provided by metallic fins, and by pierced concrete blocks at ground-floor level. Many major areas will be air conditioned. Among the facilities will be operating and recovery rooms, radiology department, pathology laboratories, electrocardiography and electroencephalography equipment, and a small research laboratory.

San Francisco Co-op to Grace Russian Hill

Royal Towers, a 24-story co-operative apartment house consising of two towers containing 66 luxury apartments and two penthouses, will rise on San Francisco's Russian Hill on the site of the old Hiram Johnson mansion. Each floor will have a semiprivate lobby at

the entrance of the individual apartments. Features will include a heated outdoor swimming pool at a terrace on the lobby level. Architect: Barbachano, Ivanitsky & Watanabe; Landscape Architect: Ribera & Sue.

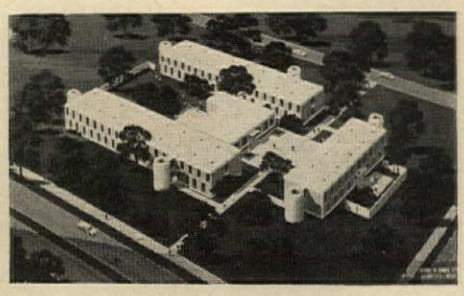


"BICYCLE-WHEEL" DOME FOR A SPORTS-CULTURAL CENTER

St. Louis architects Schmidt, Perlsee & Black have designed a proposed community center called "Metro" that would include a 100,000-seat stadium covered with a bicycle-wheel dome 1300 ft in diameter. The enclosed stadium would be the world's largest. Shopping and business areas, theaters, a concert hall, a museum, convention areas, and chapels would take up 1,119,000 sq ft around the periphery of the stadium. A five-level circular restaurant would perch at the top of the dome 385 ft above the stadium floor, giving a good view of the surrounding countryside. Parking for 28,000 cars would be arranged so that ticket-holders could park within 500 ft of the entrance nearest their seats. The center would be on the new Mark Twain Expressway (Highway 40) west of St. Louis, within 30 minutes driving distance for 1¾-million people. It was originally designed when a bid was being made to bring the 1964 Olympic Games to St. Louis, but since Detroit has been decided on for the site of the Games, construction on Metro has been delayed.

The architects comment: "The uniqueness to us is that we were actually getting a sag structure to rise above its support points. The key to the dome structure is a series of circular cables supporting triangular sections placed radially around the circles."

Associate Architects: Russell, Mullgardt, Schwarz & Van Hoefen; Structural Engineers: Eason and Thompson; Mechanical Engineer: William K.Y. Tao.



Prefab Coast Guard Barracks

Cape May (N.J.) Receiving Center will boast handsome quarters for Coast Guard men. Three two-story buildings and a one-story recreation lounge will enclose a central muster court and an activity court. The living quarters will be divided into cubicles for four enlisted men or two chief petty officers. The entire building will be fabricated off the base and transported to the site for erection. Exterior will be precast concrete with skin panels. The exterior, skylighted circular stairwells may well remind the salts of lighthouses. Architect: George M. Ewing Co. of Philadelphia and Washington, D.C.

Duty-Free Center and Viewing Tower for Niagara

A 300-ft high viewing tower overlooking Horseshoe Falls at Niagara Falls will be opened this August. Called the Seagram Tower, it will consist of a seven-level tapered crow's nest crowning a tall elevator column and will contain lounges, photographic areas, and enclosed and open observation area. At its base will be a free-form building constructed on a reflecting pool in which fountains will play. It will contain a duty-free center selling imported merchandise to American tourists; its first stage will open June 15. Structure will be steel frame with precast concrete panels, will start at 12,000 sq ft and be expandable to 36,000 sq ft. Designer and Planner: Floyd H. Magnuson & Associates of Chicago; Consulting Engineers: Office of J. Fruchtbaum, Toronto and Buffalo.

Look for the label that assures weather resistance . . . high strength . . . pleasing appearance

This label on a glass-fiber reinforced panel is your assurance of *unmatched weatherability*. It appears only on panels made with PARAPLEX® P-444 acrylic-polyester resin. Extensive laboratory and field tests have proved that the proper combination of acrylic and polyester resins produces the *best* weather resistance in reinforced panels. This combination is found only in PARAPLEX P-444, made by Rohm & Haas. The resin also imparts pleasing appearance, high strength, excellent light transmission, and ease of installation. Write for the names of panel manufacturers who use PARAPLEX P-444.

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CAPITAL REPORTING CALLED DISTORTED

By E.E. Halmos, Jr.

Some of the reporting you've been reading in your newspapers about action on legislation that affects architects and the construction industry is little short of amazing.

It puts everything in terms of political conflict, pays little attention to the underlying facts, and distorts a picture that's very important to any business-oriented group: Facts and figures and details play an enormous part in whether or not legislation is approved.

That's not to say that politics isn't important, or that it doesn't lend color to most Congressional action. But it isn't nearly as dominant as some of the stories would have you believe.

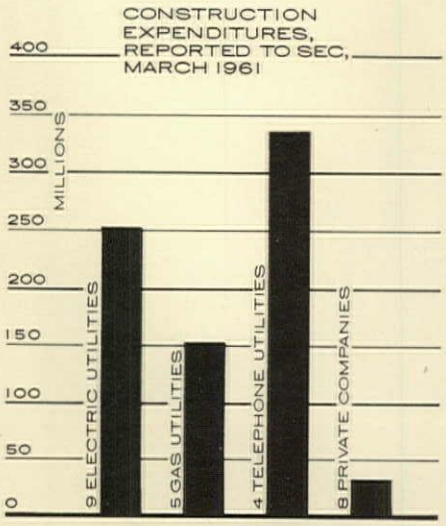
A case in point is the close action in the House on minimum wages—hailed in general reports as a defeat for the Kennedy Administration. Quite true, it was a defeat, and politics was being played to the hilt on both sides.

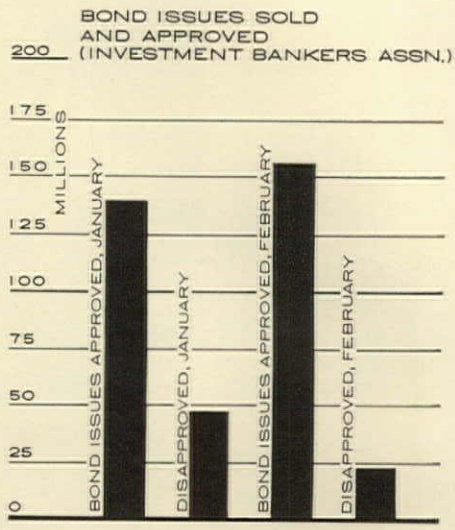
But the real, hard-core fact that brought the Administration's proposals down wasn't politics. It was the fact that a majority of the House wasn't satisfied with the fuzzy wording of the bill presented, nor with the wisdom of setting up a four-year program without opportunity for further Congressional review.

The House debate brought out some of these points: Congress' dislike for dropping the traditional definitions of interstate commerce for minimum wage coverage in favor of simple dollar-volume criteria; the very great difference between the President's use of the term "making a million dollars" and actual net income of most business enterprises.

These are important points for anyone interested in major legislation still to come.

They will affect many of the proposals that Congress started to work on in mid-April as it returned from Easter vacation—very particularly Federal aid for school construction, further action to boost housing, increases in stream-pollution clean-up grants, and the like.





BOND ELECTION RESULTS – FEB 1961 BY USE OF PROCEEDS

USE OF PROCEEDS	APPROVED AMOUNT	DISAPPROVED AMOUNT
EDUCATION:		
ELEM. & SEC.	56,135,000	14,748,000
OTHER	3,910,000	270,000
ROADS & BRIDGES	10,030,000	220,000
WATER & SEWER	52,000	5,618,000
OTHER UTILITIES		
HEALTH & WELFARE	25,000	
RECREATION	7,500,000	2,730,000
PORTS & AIRPORTS	3,430,000	
INDUSTRIAL	225,000	
REFUNDING		
FLOOD CONTROL	4,600,000	
PUBLIC HOUSING	12,000,000	
VETERANS AID		
ADMIN. & OFFICE BLDG.	140,000	207,000
UNCLASSIFIED	6,335,000	140,000
TOTALS	$ 156,529,000	$ 23,933,000

BOND ELECTIONS SCHEDULED AS OF MARCH 3, 1961

MONTH	AMOUNT
JANUARY	
FEBRUARY	
MARCH	151,182,000
APRIL	174,766,000
MAY	202,938,000
JUNE	10,257,000
JULY	7,750,000
AUGUST	
SEPTEMBER	6,145,000
OCTOBER	2,840,000
NOVEMBER	1,194,674,000
DECEMBER	
NO DATE SET	103,455,000
TOTAL	$ 1,854,007,000

USE OF PROCEEDS	AMOUNT
EDUCATION:	
ELEM. & SEC.	151,071,000
OTHER	13,405,000
ROADS & BRIDGES	94,591,000
WATER & SEWER	268,036,000
OTHER UTILITIES	917,161,000
HEALTH & WELFARE	56,915,000
RECREATION	9,738,000
PORTS & AIRPORTS	140,883,000
INDUSTRIAL	602,000
REFUNDING	175,000
FLOOD CONTROL	
PUBLIC HOUSING	
VETERANS AID	
ADMIN. & OFFICE BLDG.	5,520,000
UNCLASSIFIED	195,910,000
TOTAL	$ 1,854,007,000

Proponents are going to have to prove their case of need—over and above politics and emotionalism—before Congress will buy the bills.

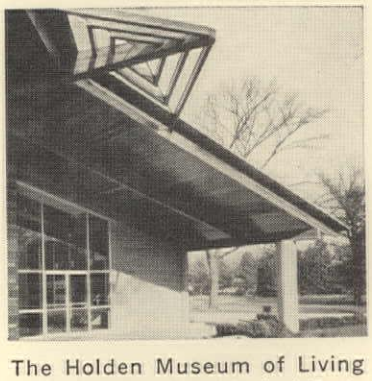
The housing bills—led off by the President's program—face a particularly rough passage, even though the odds favor some sort of legislation this session.

Main reason: The proposals are very broad and far ranging, making it very difficult to package them into one piece of legislation. Another: Again, there's evidence of an upturn generally, so that a lot of urgency has gone out of the claim of need. A third: There's no definite price-tag, though "estimates" put the cost at about $3 billion over a period of years.

As you've read, Mr. Kennedy set up a 10-point program that includes: (1) extending present FHA no-down-payment, 40-year mortgage financing (now available to displaced families only) for a 12-to-18-month "exper-

"design flexibility plus the appropriate natural appearance"—*architect*

"Rilco laminated wood arches and beams gave us design flexibility plus the appropriate natural appearance," state the architects. "They blended in perfectly to create a warm, colorful and informal atmosphere." ■■■Rilco laminated wood structural members are easily adapted to any design—church, school, residential or commercial. They gracefully span large areas—provide the warm, friendly feeling of wood without extra cost. Rilco field sales engineers will be happy to consult with you■■■Write Weyerhaeuser Company, Rilco Engineered Wood Products Division, W817 First National Bank Building, St. Paul 1, Minnesota. District offices: Linden, New Jersey; Fort Wayne, Indiana; Tacoma, Washington.



The Holden Museum of Living Reptiles, Detroit Zoological Park, Detroit, Mich. Architects: Charles N. Agree, Inc., Detroit. Rilco laminated wood arches and beams erected by Laco, Inc., Fraser, Mich.

Weyerhaeuser
RILCO ARCHES

imental" period, then enact a new low-interest rate program; (2) call[i]... for 100,000 low-rent housing unit year (instead of present 35,000-[1] limitation); (3) $100 million for di loans for housing for the elderly; authorize $2.5 billion over four y for loans for urban renewal, autho FHA to insure loans for home provements far beyond present lim (5) okay $100 million to aid com nities in buying "open spaces"; $50 million for added loans for sew water, and to study urban tr portation systems; (7) provide a year extension for the $200 mi unused balance of farm housing authority; (8) extend loan guaran for direct loans to World Wa veterans, and increase the exis $150 million loan authority; (9) propriate funds for research housing and urban problems; create a department of Housing Urban affairs.

As you can see, any one of t proposals could be the subject an individual bill; together they r a terribly bulky package.

And, although most observers agreed that something must be about housing, there's no agreer at all as to what, and how m National Association of Home B ers, for instance, is opposed to p housing, is lukewarm on hand housing for the elderly outside FHA; individual homebuilders told interviewers they aren't ple that their long-boosted idea c central lending agency under Federal National Mortgage Ass tion isn't covered in the bill.

Underlying the whole discussic serious doubt as to the extent of national housing shortage, and much the Federal Government sh do about attempts to ease it.

Three aspects of Kennedy's omn housing proposal have a special terest for architects: proposals renewal and growth of metropol areas; the emphasis on urban p ning, which would include recrea areas, transport, and highways; the expected call for establishn of a Department of Urban Affair the Cabinet level.

(As you know, AIA's leaders is a statement in mid-March stro backing the broad housing propos

The problem of co-ordinating ur renewal and highway and tra needs has already been attacked, w in the framework of existing dep mental machinery: Commerce, HH and other agencies have set up ordinating machinery on an exp mental basis to see if proper plann

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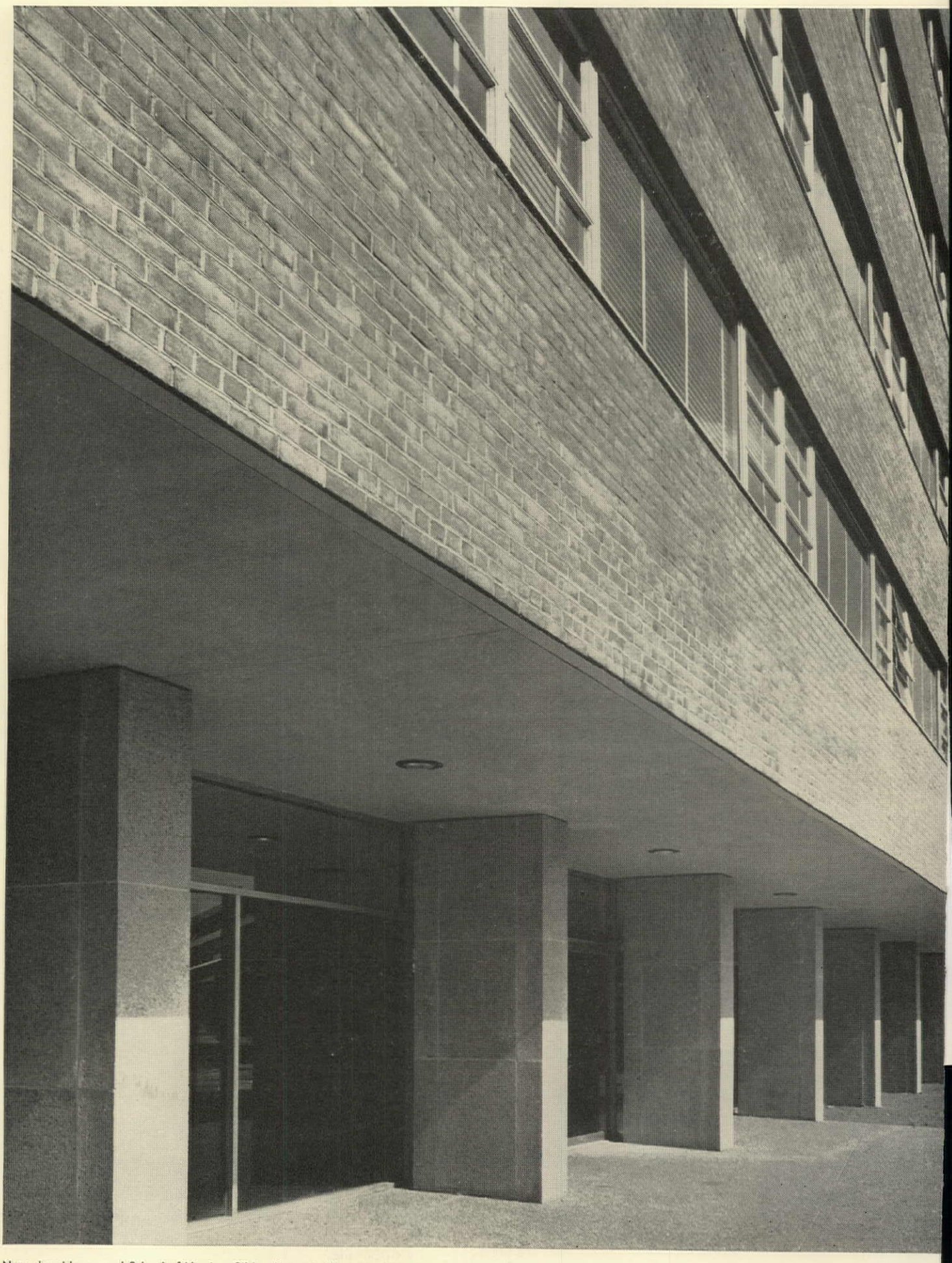
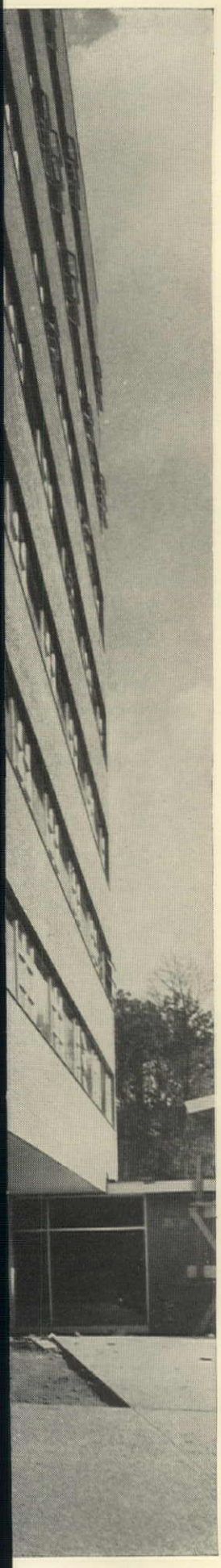


Nurses' residence and School of Nursing, Sibley Memorial Hospital, Washington, D. C.



Architect: Justement, Elam, Callmer and Kidd, Washington, D.C.

STYROFOAM® saves on new hospital insulating costs

. . . reduces heat loss through wall by 35%

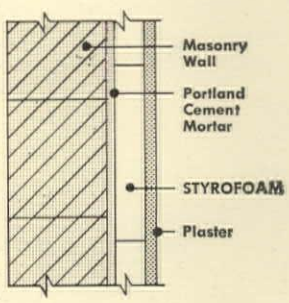
In specifying Styrofoam insulation board for the 350-bed Sibley Memorial Hospital, the Architects provided a three-fold advantage. First, Styrofoam insulation acts as its own vapor barrier, an important factor in areas where high humidity levels must be maintained, such as nurseries and operating rooms. Second, its permanently high insulating efficiency assures keeping even temperatures throughout hospital rooms, thus helping to assure maximum patient comfort.

The third reason was economic. Styrofoam permits savings in construction costs. For example, Styrofoam insulation was used as a "plasterbase," eliminating furring and lathing. In this method, Styrofoam insulation is bonded to the masonry walls using portland cement mortar; plaster is then applied directly to the Styrofoam. This technique often results in a wall insulated at a lower cost than conventionally insulated masonry walls and in some cases at a cost equal to or lower than uninsulated masonry walls.

Construction costs were drastically reduced in building air intake plenums. Because Styrofoam insulation board provides its own horizontal support, external supporting members were done away with. In this application, Styrofoam reduced construction costs by almost half.

At Sibley Memorial Hospital, Styrofoam insulates all external walls of the main structure and of an adjacent dormitory-classroom building. In addition, multiple layers of Styrofoam insulate the hospital's meat freezer and many coolers and refrigerators.

Styrofoam insulation board contains millions of tiny non-interconnecting air cells. It provides a low "K" factor that *stays* low, permanently, because Styrofoam doesn't absorb water. Nor does this chemically engineered insulation rot or mildew. It has no food value to attract vermin. And lightweight Styrofoam is so easy to handle and install—for both cavity wall construction and solid masonry—that installation costs are reduced to a minimum. For more information write to THE DOW CHEMICAL COMPANY, Midland, Michigan, Plastics Sales Department 1500EB5.



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

Other Dow Building Products

ROOFMATE* lightweight insulation for built-up roofs that serves as its own vapor barrier. It provides permanent high resistance to water vapor. Light weight and ease of handling reduce installation time.
*TRADEMARK

SARALOY® 400 flexible roof flashing. Accommodates expansion and contraction. Can be bonded quickly, permanently to most construction materials. Easily conformed to fit building contours.

SARALOY® 200 flexible through-wall flashing and membrane waterproofing. Won't crack or become brittle. Makes long-lasting, waterproof liners for shower pans.

SCORBORD® (Patent applied for) permanent insulation for foundations and perimeters. Pre-scored for easy use. Excellent moisture barrier.

THE DOW CHEMICAL COMPANY DOW Midland, Michigan

Continued from page 60

can't be done. But funds and authority are limited.

And of course, the establishment of a Federal department for urban problems has been debated for some years.

This last is a stickler all by itself, and there's still considerable doubt that such a department could be created this time around. It could be done, however, by Presidential order —with approval of Congress under new reorganization powers recently granted.

UPGRADING PROFESSIONALS

There were two efforts before Congress in early April to enhance the status of professional engineers, architects, and other scientific and professional men. One got qualified support (it entailed raises for professionals in Government service); the other got no support at all.

Both bills were introduced by New York's Rep. Victor Anfuso (D., Brooklyn), who seemed amazed at the reaction from the professional men.

The bill that got no support at all was an Anfuso proposal to establish a "National Science Academy" to be patterned after West Point. Representatives of engineering schools and professional societies flatly opposed the bill on grounds that such an academy would: (1) drain resources available for staffing existing schools; (2) cost more than it could possibly be worth. As alternatives, the witnesses suggested loans or grants to the existing schools.

Getting qualified support was Anfuso's call (HR 5563) for a new classification system in Government service, which would set up the grade "PES" ("Professional Engineer Scientist") to replace present "GS" grades, and which would carry pay increases of about $400 a year in salary scales ranging from $6,400 to $20,000 yearly.

Included in the PES classification would be employees who "advise on, administer, supervise, or perform professional work in engineering research, investigation or development of engineering projects, or in the development, design, construction inspection . . . on engineering facilities, structures, systems, processes . . . materials. . . ." This one has the solid backing of the National Society of Professional Engineers, which reportedly had a large hand in writing it.

STRIKES OUT?

There's now a real prospect of an end to construction industry strikes—both for jurisdictional and other reasons.

It came with ratification by the Associated General Contractors, in Washington during the first week of April, of a pact with AFL–CIO's Building Trades Department.

FINANCIAL

Whether or not the Federal Government spends heavily for construction in what's left of this year (and the evidence is in favor of such an eventuality), there is little doubt that the economy has turned and is heading upward again.

P/A's own indicators (see p. 58) show every evidence of strong support for construction from private sectors of the economy, as well as continuing support for spending by local communities and Governmental units of all kinds.

Leaders in the private sector, as usual, were the utility organizations, which were going ahead with major plans (biggest: a $266 million expansion program by Southern Bell Telephone), and it is safe to assume, as has been the case in the recent past, that these utility programs are bellwethers for the rest of the construction economy.

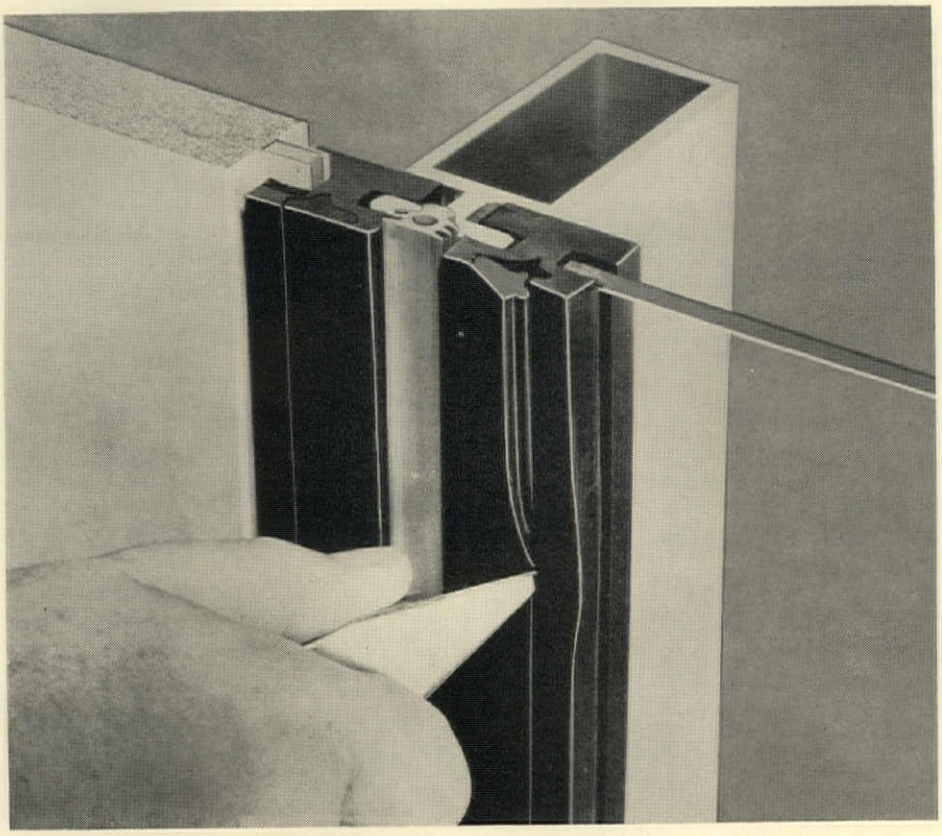
In the public sector, voters continued to support public works projects at an overwhelming rate, approving nearly six times as many projects (in dollar value) during February as were turned down. In this connection, it is interesting to note that voters still don't seem to like proposals for new municipal and county office buildings, but will approve schools, roads, recreational facilities and the like almost unanimously.

Another indicator of improving conditions was the report of the Federal Housing Authority, which commented that mortgage market conditions continue to improve—a sure sign that money pinches are easing. FHA was inclined to credit the easing to reduction last month (by Presidential order) of the FHA interest rate from 5¾ to 5½ per cent.

That's a bit paradoxical, and needs some explanation: ordinarily, a reduction in interest would mean a lack of enthusiasm by investors.

But new FHA Commissioner Neal Hardy said that secondary market prices for the new 5½ per cent mortgages averaged 97.1 as of March 1. That's a drop of only 1 point from the price, a month earlier, for the 5¾ per cent mortgages. The drop, said Hardy, is less than half what was expected—so FHA concludes that the demand for the mortgages is heavy; thus the money market, generally, is easier.

Zippered Neoprene Gasket for Curtain Walls



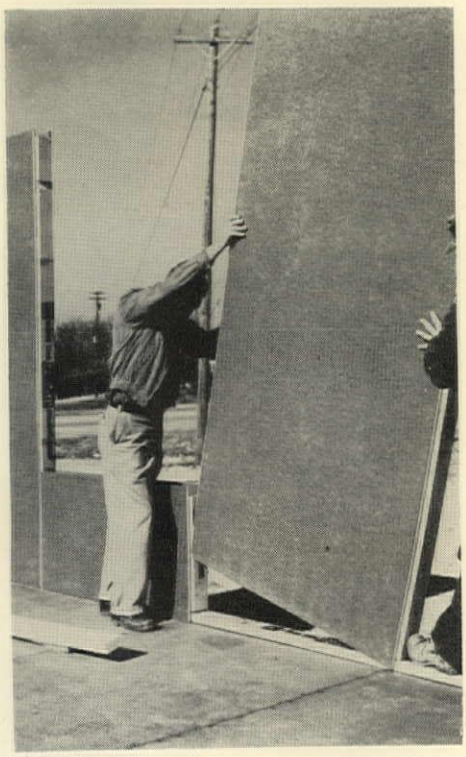
Units are "zipped" in and out using specially developed tool.

NILES, MICH. "Zipperwall," a low-cost, factory-fabricated system of aluminum mullions, panels, windows, and adjustable perimeters, uses H-shaped neoprene extrusions as weatherstrip and as connector of most structural components. The gaskets also are used as part of the horizontal members, thereby becoming an actual part of the wall framing. The system is quite easily erected and is said to be "the lowest-cost quality curtain wall system in existence." It is designed primarily for the economy-budget school and commercial construction market.

Assembly procedure is simple: (1) adapter angles are secured to base and head; (2) sill runners, cut to adapter length, are attached temporarily with bolts that are screwed into tapped mullion clips (at plan-designated intervals mullions are secured by the bolt through common, job-drilled holes); (3) infill components of glass, panel, sash, or combinations are "zipped" into the exposed inboard opening of the neoprene gasket with a special tool. Kawneer Co., 1105 Front St., Niles, Mich.

On Free Data Card, Circle **100**

Stressed-Skin System for Residential Construction



Stressed-skin panels are assembled easily, cut for windows, doors.

NEW YORK, N.Y. An economical, rapidly erected structural system for houses has been announced by Johns-Manville. "Flex-Ponent System" consists of load-bearing exterior insulated wall panels, with associated door and window headers and corner posts, and load- and non-load-bearing interior wall panels with door headers and related fixtures. Units are faced with a "new manufactured lumber" specifically developed for the system; all exterior, stressed-skin panels have tempered board on both surfaces, and interior panels have untempered board on both surfaces. Insulation is thick rock wool, and vapor barriers are equivalent to asphalt-impregnated kraft. External panels contain wood spacers, bonded to the skin with phenol resorcinol. Precision manufacturing enables the constructor to position the units, nail or staple them together, and fill the interior joints with the special epoxy adhesive. Finishing of joints can be effected with a spackling compound. Johns-Manville, 22 E. 40 St., New York 16, N. Y.

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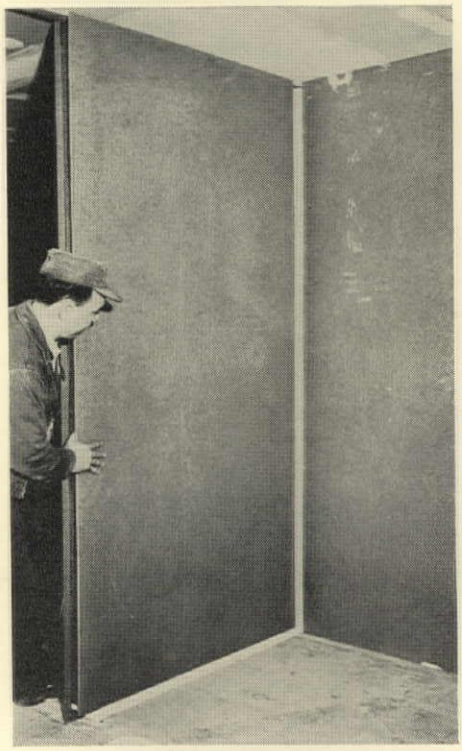
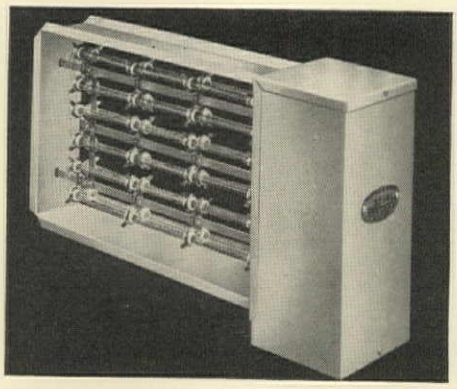


Interior panels accommodate standard millwork such as baseboards, moldings.



Zoned Heating from Duct Heaters

Lennox "EDT1" electric duct heater handles 5.7 kw for an output of 19,500 Btu. As many heaters as needed can be installed, either parallel on one duct or in series in one duct, regardless of direction of air travel. Unit has own low-voltage transformer for activating thermostat, and can activate relays in three "slave" units. Time-delay switching is available to bring units on and off the line at 20-second intervals to eliminate line surge and sag. Lennox Industries, Inc., 200 South 12th Ave., Marshalltown, Iowa.

On Free Data Card, Circle **102**

Drama School Teaches Stage Lighting

Advanced stage lighting can be learned by students in the new drama and speech school of San Fernando State College in California. One hundred lucky students enjoy the facilities of a $2.5-million building that provides, among other amenities, classrooms fully equipped with up-to-date stage-lighting facilities. Using Superior's "Luxtrol" magnetic amplifier light controls, students can control lighting effects from the back of the area, thereby witnessing the performance and the lighting as they take place. Operation of lighting is by remote console unit. System is so set up that students learn easy steps first, then go on to more complex lighting "arrangements." The Superior Electric Co., Bristol, Conn.

On Free Data Card, Circle **103**

Chrysler Airtemp's 1961 Air Conditioners

Chrysler Airtemp's new air conditioners have three innovations: a 28,000 Btu "heavyweight" unit, a unit for easy installation in casement windows, and a "decorator panel" to make the "Power King" line match its surroundings. The 28,000 Btu unit can cool 1800 sq ft and was developed mainly for hot, humid southern areas and for commercial installations. Chrysler Airtemp says that its casement window air conditioner is the only one that can be installed without removal of the glass or alteration of the window frame; it requires only four screws. The "Power King" line has a panel that can be covered with drapery material, wallpaper, paint, etc., to match the room; ventilating is done by a special directional air door on top and a more powerful blower. "Power King" units range from 7000 to 17,000 Btu and 2 out of 11 have reverse cycles. Chrysler Airtemp, 1600 Webster St., Dayton 1, Ohio.

On Free Data Card, Circle **104**

In and Out–the Window

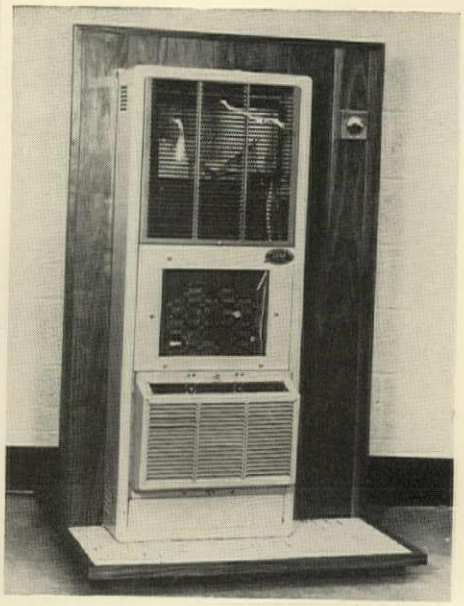
This reversible window for both single and double glazing units has a 360-degree rotation with automatic latching at the 180-degree position. It is available with hopper or hopper insert, in aluminum or bronze, and in all mechanical and electrochemical finishes. The corners are reinforced to reduce distortion, and it is double weather-stripped with vinyl plastic. The sash is removable from inside the building. Albro Metal Products Corp., 944 Longfellow Ave., New York 59, N. Y.

On Free Data Card, Circle **105**

New Composition Floor Tile Is Durable, Cheap

A new kind of tile has been developed that costs the same as asphalt tile but is said to last twice as long, be easy to clean because of low porosity, and resistant to many household stains. Called "New Concept," the tile has a binder ("Polymerite") that gives it these properties. It is also flame-retardant and can be installed below grade. It comes in 37 colors at about 15¢ per sq ft. The Mastic Div., The Ruberoid Co., 500 Fifth Ave., New York, N.Y.

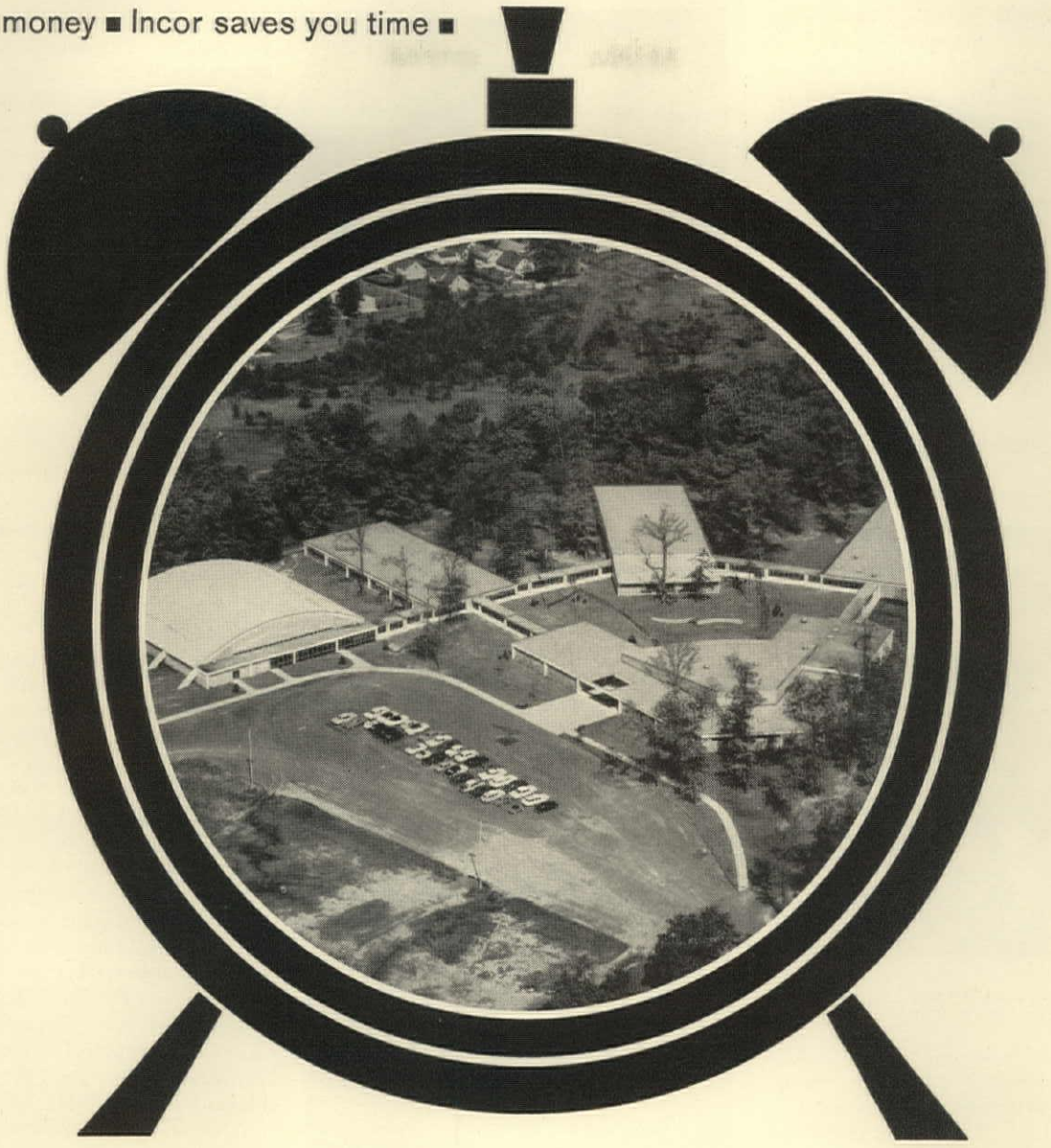
On Free Data Card, Circle **106**



HeaterWouldGenerateOwn Heat for Power Failures

A prototype gas-fired wall heater using a thermoelectric generator—a device that converts heat energy to electrical energy without moving parts—was shown by MMM at the recent "Festival of Flame" of the American Gas Association in Atlantic City. The generator, drawing its heat energy directly from the heater's combustion

time is money ■ Incor saves you time ■



precast concrete and Incor cut school cost $216,000 below New Jersey average

Exceptional construction economy along with fire-safety, quality, and beauty . . . that's the sharp lesson taught by Iselin (N. J.) Junior High School. Built for Woodbridge (N. J.) Board of Education, this $1,462,000 school opened right on schedule.

Economy was achieved by extensive and imaginative use of precast and prestressed concrete units made with Incor. Incor 24-hour cement gives any job a head start in construction time and cost savings. Here, the cost per pupil of $1,462 compared with the New Jersey average of $1,678, thus saving taxpayers $216,000 on this 1,000-pupil school.

With Incor, jobs get done faster . . . men, forms, and equipment are released quicker. And its durability is proved by 33 years of performance. Estimate with Incor on your next project . . . you'll find it pays.

Iselin N. J. Junior High School—Architect-Engineer: Finne-Lyman-Finne, Elizabeth, N. J. Educational Consultant: Engelhardt, Engelhardt, Leggett & Cornell, New York, N. Y. General Contractor: Michael Riesz Co., Fords, N. J. Prestressed Concrete: Atlantic Prestressed Concrete Co., Subsidiary of The Warner Co., Trenton, N. J.

AMERICA'S FIRST HIGH EARLY STRENGTH CEMENT

INCOR®

LONE STAR CEMENT CORPORATION, NEW YORK 17, N. Y.

chamber, would provide electrical energy required to operate the fan circulating warm air throughout a room, thus causing the system to operate normally during power failures and even providing a source of stand-by electrical power for emergencies. Developers hope for enthusiasm on part of manufacturers and heating fuel suppliers to accomplish additional research and development steps necessary before such an innovation reaches the market. Department of Communications, Minnesota Mining & Mfg. Co., 900 Bush Ave., St. Paul 6, Minn.

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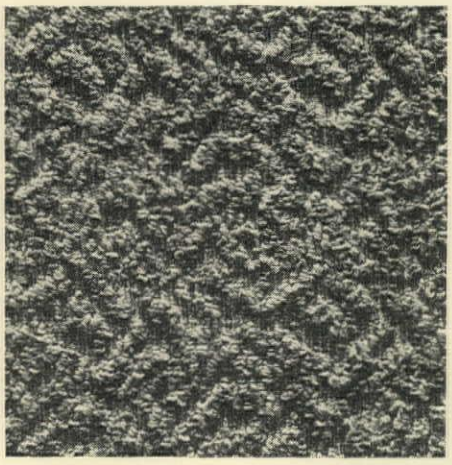


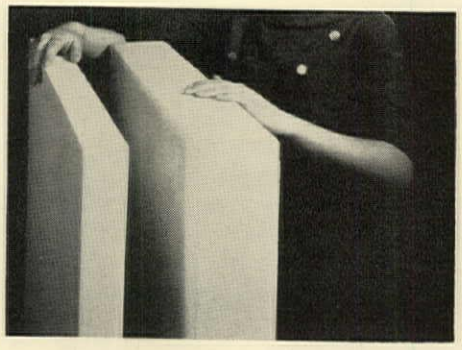
Integral Pattern

"Nocturne," an all-wool, tufted Gulistan carpet, achieves a nondirectional look with its alternating high and low loop pile yarns. This high-low loop texture provides both pattern and color variety in the 10 monochromatic colorings, which include white-on-white, cocoa, and jade. Retail about $9.95 per sq yd from A. & M. Karagheusian, Inc., 295 Fifth Avenue, New York 16, N. Y.

On Free Data Card, Circle **108**

New Potentialities in Polyurethane Foam

A new polyurethane foam, "Foamthane," is being produced in rigid slabs for a wide variety of thermal-insulating applications, including walls, ceilings, and prefabricated metal curtain-wall panels. Its insulating effectiveness at extremely low temperatures makes Foamthane particularly suited to freezer or cold-storage applications. The material has approximately the same density as polystyrene foam, but claims twice the insulating efficiency; thus an insulating layer of Foamthane need be only half



as thick as one of polystyrene foam. Manufacturer suggests that Foamthane's greatest potential lies in its combination with their cellular-glass "Foamglas." Placing a layer of Foamthane over a layer of Foamglas combines the structural stability of the cellular glass with the cost and space savings of the polyurethane foam. Foamthane also offers an excellent plaster base, making possible the elimination of lathing and furring. Wide variety of sizes is available, in thicknesses from ½" to 15". Pittsburgh Corning Corporation, 1 Gateway Center, Pittsburgh 22, Pa.

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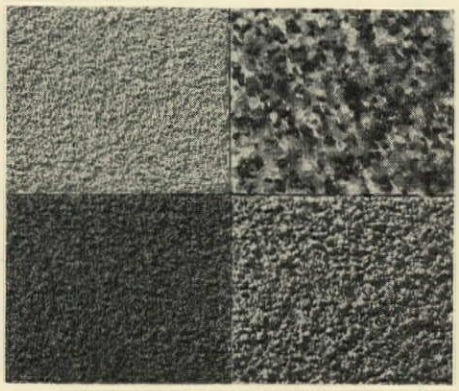

Tough Spray Coating for Masonry Façades

A newly developed material and application technique for coating masonry façades gives a tenaciously adhesive film that is said to be tougher and more durable than any other known air-dried material. It utilizes clear or colored polyurethane compounds mixed with a dry-grit aggregate; by varying the grit sizes, texture can range from smooth-troweled concrete to a nubbly pebble-grained surface. At the same time, colors can range from the most brilliant primary hues to the softest pastels. The urethane is a two-package composition consisting of the vehicle and a catalyst; fluid and dry grit are sprayed simultaneously from a single, hand-held gun equipped with three nozzles. The resulting coat provides an excellent weathertight sealing of the surface against all forms of climatic attack. Used in Europe since 1955, the coating is to be marketed in the United States through franchised applicators as "Bostik Coating." B.B. Chemical Co., 784 Memorial Dr., Cambridge, Mass.

On Free Data Card, Circle **110**

Heating Units for Luxury, Economy Installations

Line of "winter air conditioners" has been announced, which, stripped, is competitively priced for the mass house market and, with deluxe optional equipment such as special filters, gas valves, and summer cooling equipment, is suitable for the luxury market. The "119/219" heating line includes as standard equipment large capacity blowers with special blower mounts to reduce operation sound levels. Units have continuous duty motors with blowers designed for easy adjustment to continuous air circulation. The 119, gas-fired models have "Endural" silicone-aluminum treated heat exchangers, reported to be the first time a silicone-aluminum finish (now used for missles and rockets) has been used in the heating industry. The finish will prolong the life of the system. Four gas and four oil-fired models are available with inputs ranging from 110,000 to 175,000 Btu/hr. Oil-fired models are easily convertible to gas. Mueller Climatrol, Division of Worthington Corp., 2005 W. Oklahoma St., Milwaukee 1, Wis.

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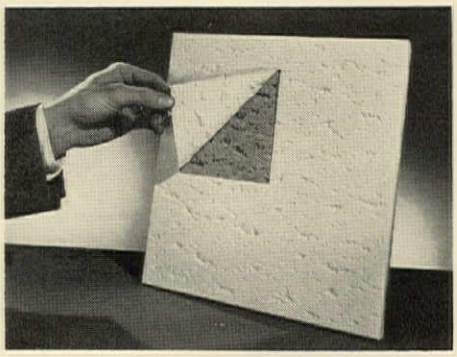

Acoustical Tile with Protective Vinyl Facing

"Armstrong Vinyl Face Travertone" tile has a thin, waterproof vinyl sheet covering its fissured surface. This allows repeated washing, protects the tile from water damage, but does not interfere with sound control: sound is transmitted into the porous tile core by diaphragmatic action. The

O'Hare-Chicago Motor Hotel, Chicago, Illinois. Architects: Arthur Swanson & Associates, Skokie, Ill. Contractor: H. Andrews & Sons, Inc., Chicago, Ill.

Space provided: main lobby, gift shop, vestibule, registration desk and office, carport. *Structural framing:* glulam beams spaced at 6′-8″, resting upon glulam columns. Butterfly beam-and-column bents placed in pairs and spaced at 16′-5″ and 21′. *Exterior walls:* weathered lanon stone with light weight concrete backup. *Interior walls:* stone and vertical wood paneling. *Floors:* carpeting over reinforced concrete slab; terrazzo in vestibule. *Roof:* 4-ply built-up surface over 3″ insulating board. *Lighting:* incandescent and fluorescent. *Heating and ventilating:* combination heating and cooling of gas absorption type, using central type installation with individual thermostatic controls for each room. *Area:* framed by glulam timbers, 7,675 square feet including carport.

Architects who seek to avoid the ordinary, get a powerful assist from the natural warmth, texture and pattern of glued laminated timbers. As manufactured by Timber Structures, Inc., these quality controlled structural members provide dependable performance and handsome appearance that richly reward the architect's judgment.

TIMBER STRUCTURES, INC.

P.O. Box 3782, Portland 8, Oregon

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

District Representatives in Major Cities Throughout the United States

Member A. I. T. C. and Producers' Council

vinyl material is pure white but can be painted without affecting the acoustical quality or maintenance advantages of the tile. The manufacturer states that the facing will not shrink, crack, or separate from the core. The tiles are incombustible, 12″ x 12″ x ¾″ with beveled edges, and can be installed by mechanical suspension or cementing. Armstrong Cork Co., Lancaster, Pa.

On Free Data Card, Circle **112**

Subtly Colored Vinyl

An addition to the Koroseal vinyl wall covering collection is the new texture named "Aspen." Available in 23 colors, Aspen resembles a simple linen weave in the color called eggshell. Fabric-backed Koroseal is flame retardant, durable, and as easy to care for as wood, stone, and similar natural materials, with which the new colors are designed to blend. For swatches write: The B. F. Goodrich Company, Coated Fabrics Dept. KWC-110, Marietta, Ohio.

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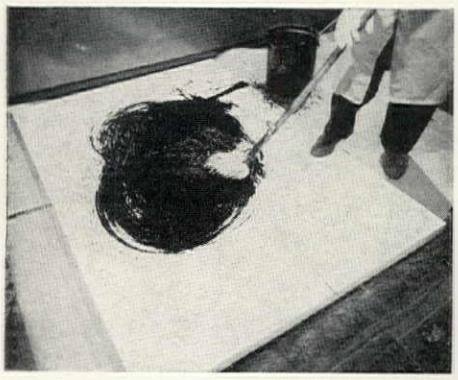

Developments from Dow

This gentleman is not a Greenwich Village "action" painter in violent communion with his muse, but a workman mopping hot asphalt directly on Dow's new rigid urethane foam "Thurane." The foam board has high solvent resistance and heat distortion, and low thermal conductivity. The permanent "K" factor is .16 to .17 at 70 F. It will be priced higher than "Styrofoam." Another introduction by the company is a new, blue Styrofoam insulation board possessing flame-retardant properties. It is designed to replace other forms of Styrofoam in major construction applications. This version will be "competitively priced." A third new foam is "Tyrilfoam," for flotation use where resistance to gasoline is desirable. The Dow Chemical Co., Midland, Mich.

On Free Data Card, Circle **114**

Outdoor Lights Employ Reflection

Two new models for outdoor lighting employ porcelain-enamel reflector hoods to provide "an atmosphere of restful well-being" in outdoor public areas. They are of rigid steel construction, with a vitreous fired porcelain-enamel finish. Standard finish for reflector tops is dark-green baked enamel, but other colors may be specified. "Corona" model has a 34-in. diameter reflector, with three PAR-38 medium base lamps (75-150 w, not furnished). It is available in 3 ft and 6 ft heights. "Moonbeam" model has one R-40 mogul base lamp (300-500 w, not furnished), and comes in an 8 ft height only. Revere Electric Mfg. Co., 7420 Lehigh Ave., Chicago 48, Ill.

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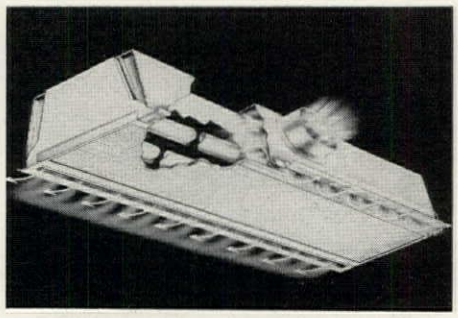


FIXTURE PERFORMS FOUR FUNCTIONS

New luminaire and air diffuser combination performs four jobs; it provides light, heat, cooling, and ventilation. "Ventro-Lux" with Anemostat air diffuser is said to be the first troffer to be combined with a high-capacity air diffuser. The diffuser directs warm or cool air horizontally along the ceiling for even distribution, eliminating drafts and sudden temperature changes. Since a high capacity unit is used, fewer units are needed for satisfactory heating, cooling, and ventilating. Ventro-Lux features exclusive "CALux" lens, advantages of which include effective concealment of lamps and superior diffusion of light. The entire unit assures a low silhouette, 6″ or less. The two elements for lighting and ventilating can be installed separately, thereby eliminating conflicts in trades. Curtis AllBrite Lighting, Inc., 6135 W. 65 St., Chicago 30, Ill.

On Free Data Card, Circle **116**

Hinged Wire Fabric Saves Time

Use of hinged sheets of welded wire fabric for slab reinforcement proved valuable in saving time and money in construction of the Mall Park Garage in Dayton, Ohio, recently. As illustrated, two men can carry the folded sheet which, when open, is 16 ft long and 9½ ft wide. System of using welded wire fabric was shown on p. 96, JULY 1959 P/A. Wire Reinforcement Institute, Inc., National Press Bldg., Washington 4, D. C.

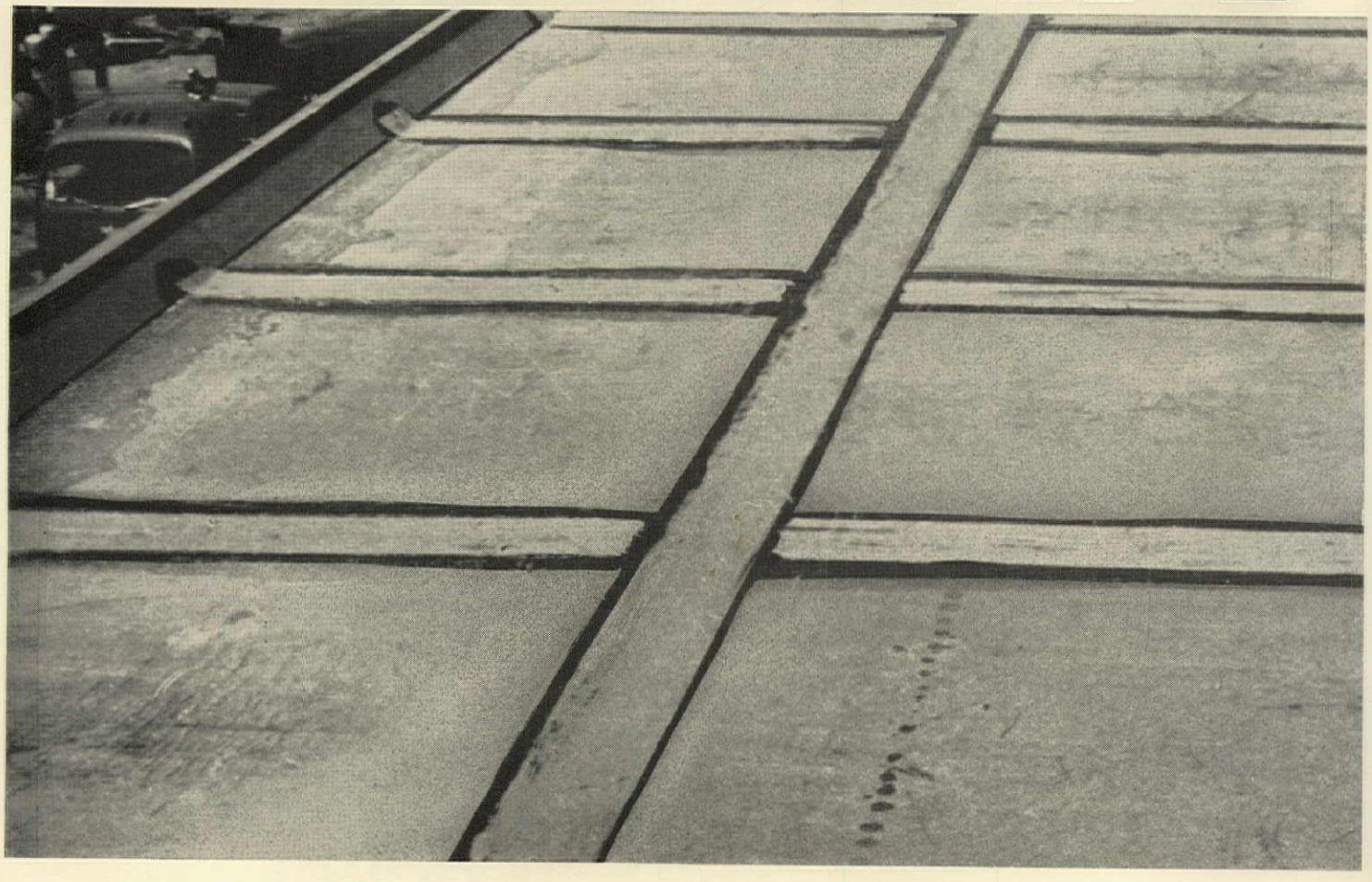
On Free Data Card, Circle **117**

Textured Steel Is Custom Designed

Sharon Steel Corporation has started a program of custom-designing patterned and textured steels to fit specific requirements of its customers. An industrial design firm, Francis Blod Associates of New York, created for Sharon an initial series of patterns; one of these already has been used in a line of acoustical ceiling blocks. Customers consult with a symposium that includes industrial designers, salesmen, and specialized personnel before purchasing the steel and determining which pattern would be best for the function, strength, and cost of each product. Sharon Steel Corp., Sharon, Pennsylvania.

On Free Data Card, Circle **118**

THIS 2-PLY BONDABLE ROOF COMBINES THERMA



NEW FROM OWENS-CORNING—a bondable roofing system that is truly fast to install, and provides "built-in" thermal insulation. It consists of two plies of heavy-duty Perma Ply* bonded firmly to Fiberglas* Roof Insulation.

The top surface of the roof insulation serves as one ply. It is heavy kraft paper factory-applied with 50 pounds of asphalt per square. The insulation joints are taped with Fiberglas reinforced tape, forming a smooth unbroken surface for application of two plies of heavy-duty Perma Ply #11. The system is topped off with a pour coat and gravel or Fiberglas Perma Cap*†.

The result? Savings in installation costs—

WATERPROOFING AND INSULATION...

GUARD ROOFING SYSTEM

plus a weather-tight, insulated roof bondable for up to 20 years. No blisters or curling of edges with Perma Ply. No layered construction, because time-tested Perma Ply is a porous glass-fiber inorganic felt that *reinforces* the asphalt. It is *put down* in layers, but the asphalt blends into and through it, to form a monolithic roof.

For complete information about Therma Guard Roofing System, see your Fiberglas representative or write: Owens-Corning Fiberglas Corp., Industrial and Commercial Division, 717 Fifth Avenue, New York 22, N. Y.

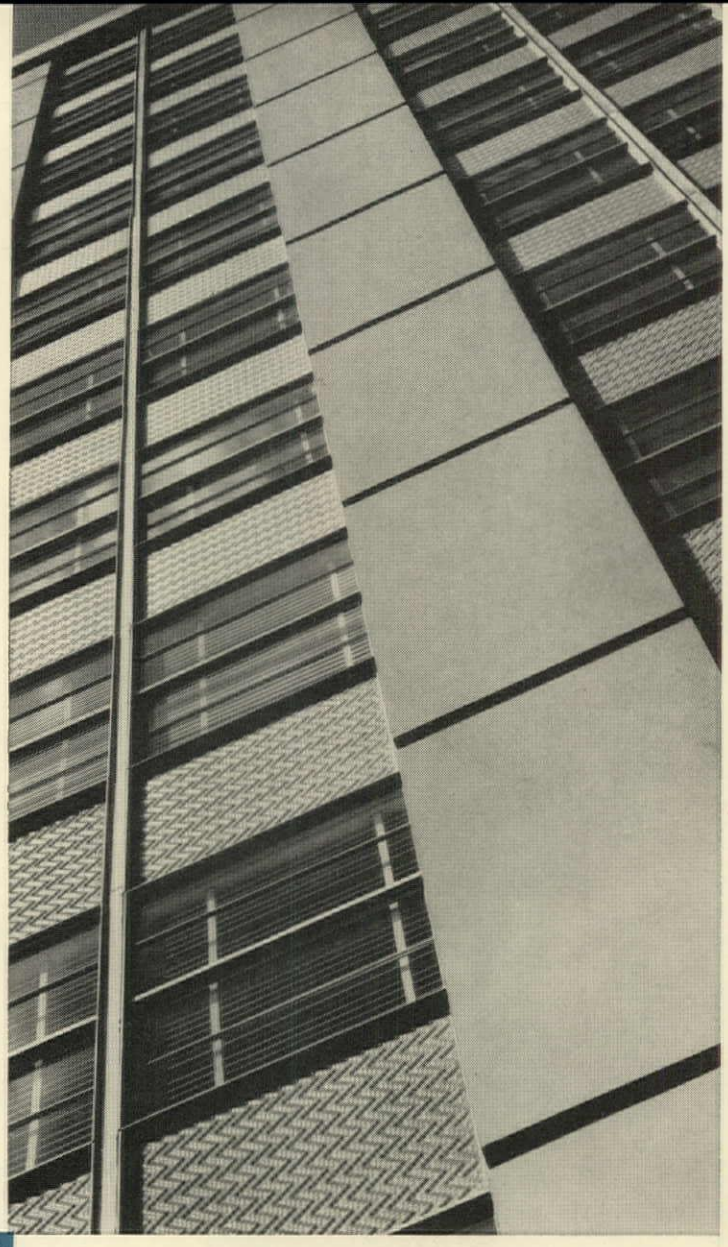
†Fiberglas Mineral Surfaced cap sheet

OWENS-CORNING RESEARCH pioneers in making things better with

OWENS-CORNING FIBERGLAS

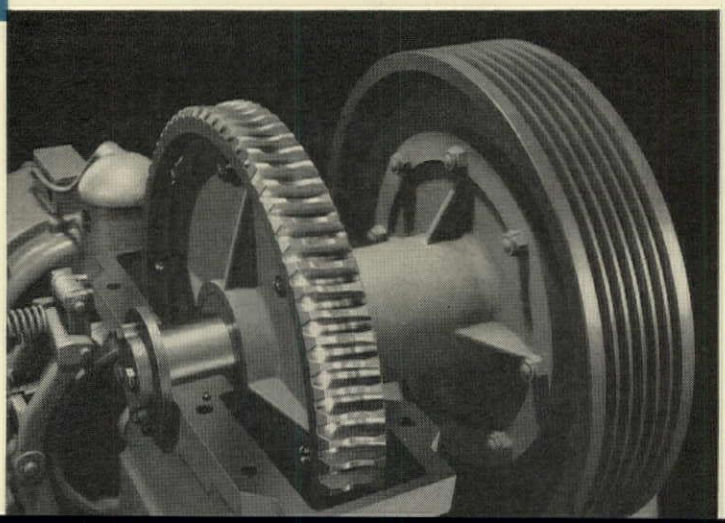
T. M. REG. U. S. PAT. OFF.

*T.M. (Reg. U.S. Pat. Off.) O-C.F. Corp.



Attention to detail

Details are significant in building design . . . and in the equipment that goes into a building to make it function as the architect planned. For 100 years the manufacturers of Dover Elevators (formerly Shepard Elevators) have consistently improved elevator hoisting machinery with assiduous attention to details. Design of a better worm gear, for instance, contributes materially to long machine life and extremely quiet operation. Dover Elevators, geared and high-speed gearless, are now available throughout the United States and Canada. See our catalog in Sweet's or write Dover Corporation, Elevator Division, 1131 Kansas, Memphis 2, Tenn.



DOVER ELEVATORS

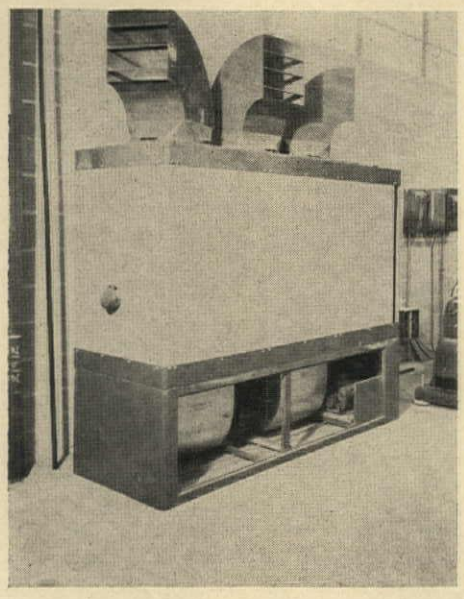
DOVER®

For more information, circle No. 324

AIR/TEMPERATURE

Combination Oil-Gas Industrial Heaters

New 12-page publication provides data on the company's combination oil-gas line of industrial heaters which offer heating, cooling, and ven-



tilating in one compact unit. Various styles of the all-purpose "0G4" unit are shown, with explanations of operating and construction features. Blower-performance charts show a range from 280,000 Btuh to 1,000,000 Btuh. Diagrams indicate the arrangements possible with "the most complete range of auxiliary equipment." Lennox Industries Inc., 200 South 12th Ave., Marshalltown, Iowa.

On Free Data Card, Circle **200**

High Efficiency Roof Ventilator

New direct-drive, centrifugal roof ventilator, which claims "more air moved per horsepower," is described in 8-page folder. Specific design features and operating characteristics of the new "CRD" ventilators are illustrated. Selection and rating tables indicate relative quietness ratings, motor horsepowers, fan speeds, and fan deliveries for different static-pressure conditions. Simplified installation drawings are correlated with tabular data to provide information necessary for engineering and architectural layouts. Industrial Division, American-Standard, Detroit 32, Michigan.

On Free Data Card, Circle **201**

Split System Serves Any Business Need

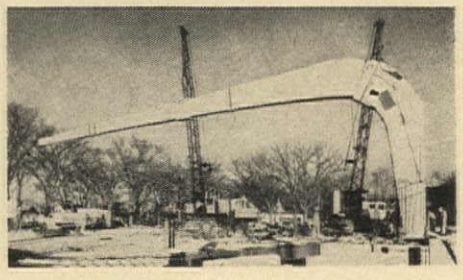
Complete line of air-cooled and water-cooled split system equipment is listed in new 6-page *Form LL-487*. Specifications and dimensions are given for all condensing units; rated capacity for matching evaporator units indicates the pairings required for cooling needs from 22,000 Btuh to 420,000 Btuh. Engineering features and various application advantages are described. Advertising Department, Chrysler Airtemp, 1600 Webster St., Dayton 4, Ohio.

On Free Data Card, Circle **202**

CONSTRUCTION

Design Data for Laminated Wood

The *1961 Manual of Design*, 32 pages contains complete technical data on the proper use of laminated-wood structural members. Features included are arch and beam design procedures, connection details, recom-



mendations on adhesives and treatments, a color-selection chart for stain finishes, and description and specifications for "Unit Deck" and "Clear Panel" structural roof-decking systems. Photos of several noted buildings are shown. Manufacturer announces that it is "the first laminator in the industry" to utilize electronic computing for design analysis, and urges engineers and architects to make use of this service. Advertising Department, Unit Structures, Inc., Peshtigo, Wis.

On Free Data Card, Circle **203**

Curtain-Wall Variations Number 445, 652

More than 445,000 curtain-wall panel combinations are outlined in new 8-page catalog. Considered by company officials as one of the most comprehensive sources of panel information now available, the brochure gives extensive data on porcelain-enamel panels. An easy-to-read chart outlines the variety of skin and core materials, thicknesses, and assemblies, which total 445,652 panel variations. Special emphasis is placed on innovations in the curtain-wall panel field, with a major section of the catalog devoted to description of colors, finishes, textures, and patterns. Architectural Division, Erie Enameling Co., Erie, Pa.

On Free Data Card, Circle **204**

Porcelain on Aluminum

Advantages of using porcelain on aluminum in building applications, and outstanding examples of colorful building design, are illustrated in new 8-page booklet. The brochure outlines a wide choice of shapes and colors available for use on wall panels, spandrel panels, and entire walls. Before and after pictures dramatically highlight imaginative applications of porcelain on aluminum in modernizing old structures. H. H. Robertson Co., 2400 Farmers Bank Bldg., Pittsburgh 22, Pa.

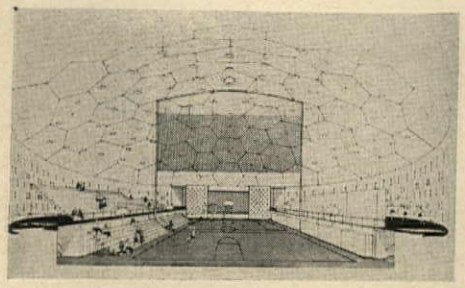
On Free Data Card, Circle **205**

Western Pine Grade Book

With all provisions brought up to date, the 1961 edition of the Western Pine *Standard Grading Rules* is off the press. It integrates the new framing-lumber grades and grade names adopted a year ago by the association grading committee and published at that time as a supplement to the old book. Several lesser changes adopted at the 1960 meetings are also incorporated in the 244-page book. Write (*enclosing $.50*) to: Western Pine Association, Yeon Bldg., Portland, Ore.

More School for Less $

The story of what will be the first geodesic dome in a high school in the United States is described in a report entitled *Conventional Gymnasium vs. Geodesic Field House*. The project was sponsored by EFL, a nonprofit corporation established by the Ford Foundation to help American schools and colleges with their physical problems. Two alternate plans for physical education space in a Maryland high school were drawn up by Architects McLeod & Ferrara, AIA, Washington, D. C.—one a conventional rectangular gymnasium, the other a circular field



house covered with a geodesic dome. The dome design gave more space (4000 sq ft) for less money ($6087)! Design considerations, cost data, and plans are presented in 16-page report. Educational Facilities Laboratories, 477 Madison Ave., New York 22, N.N.Y.

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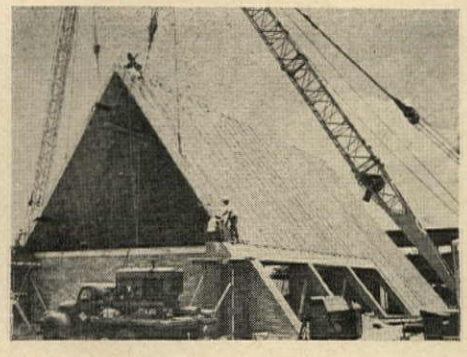

High Quality Prestressed Concrete

Unlimited applications for high-quality prestressed concrete are described in a 20-page publication showing outstanding prestressed-concrete structures. Among the 16 projects depicted are a prestressed lift slab, 120′-long prestressed bridge girders, lightweight prestressed roof slabs, and fast-curing post-tensioned girders. The role played by "Pozzolith" in achieving the high quality required for prestressed work is discussed. The Master Builders Co., Cleveland 18, Ohio.

On Free Data Card, Circle **207**

REDWOOD FOR CHURCHES

New publication, *Redwood in Ecclesiastic Architecture* is a 24-page, 11″ x 14″ booklet designed for use by church building boards and architects who specialize in church work. It is an idea book showing the many and varied uses of redwood in this field, and giving examples from a wide range of locations. A number of noteworthy buildings are presented. Write (*on letterhead*) to: California Redwood Association, 576 Sacramento St., San Francisco 11, Calif.

Glazed Masonry Units

Technical information on "Spectra-Glaze" concrete-masonry units is contained in new 16-page brochure. Among subjects discussed are the product's special advantages, cost savings, and test data. The 37 specific shapes, 18 standard colors, and 26 accent colors are illustrated. The Burns & Russell Co., Baynard and Severn Sts., Baltimore 30, Md.

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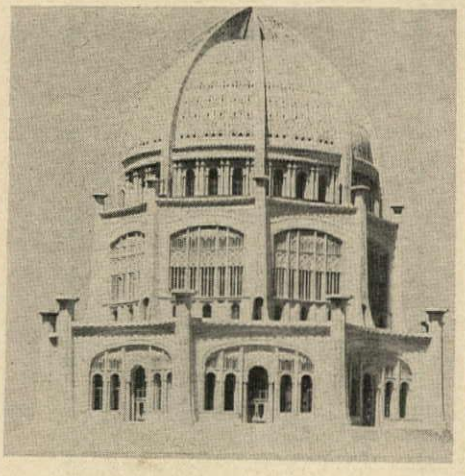

Precast-Concrete Panels

Handsome brochure entitled *White Concrete in Architecture*, 32 pages, shows the design versatility of precast-concrete panels made of white portland cement. Photos of completed buildings, and renderings of projects under construction, illustrate exposed-aggregate panels of various colors and textures, and units in various patterns, sizes, and shapes. A system of casting concrete panels with a backup of lightweight insulating concrete is described. The strength, durability, moisture resistance, fire resistance, handling, and erection of precast units are discussed. Several typical installation details are included. Universal Atlas Cement, Division of United States Steel, 100 Park Ave., New York 17, N.Y.

On Free Data Card, Circle **209**

Steel Framing System

New 48-page design manual contains a complete structural analysis of "V-LOK" framing, an economical and flexible system of interlocking steel

components. Standard columns, girders, and purlins are shown; specific design considerations are explained; and design features for external and internal wind forces and seismic loads are discussed. A 14-page load-table section is provided. Typical details—for V-LOK offices, industrial and commercial buildings, and schools—cover another seven pages. Macomber, Inc., 1925 Tenth St. N.E., Canton 1, Ohio.

On Free Data Card, Circle **210**

DOORS/WINDOWS

Aluminum Windows for Variety of Buildings

Aluminum windows for commercial, industrial, and monumental buildings,

and housing projects are described in new 36-page *Catalog 6013-H*. There are easy-to-use section and installation details for aluminum commercial and monumental windows, intermediate windows, residential housing project windows, projected windows, and screens. Suggested specifications are given for all types. Ceco Steel Products Corp., 5601 West 26 St., Chicago 50, Ill.

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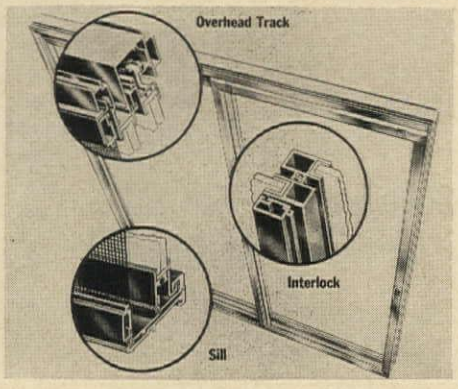

Top-Hung Sliding Doors

Catalog, 12 pages, shows complete line of "Fleetlite" sliding doors and fixed sash. The doors are all top-hung to keep the track and mechanism free of dust, and are provided with a tightly interlocking sill for exposed locations. A flat sill is also available. Doors will take 5/8" insulating glass, plate glass, or crystal sheet. Catalog includes specifications and scale details. Fleet of America, Inc., 2015 Walden Ave., Buffalo 25, N.Y.

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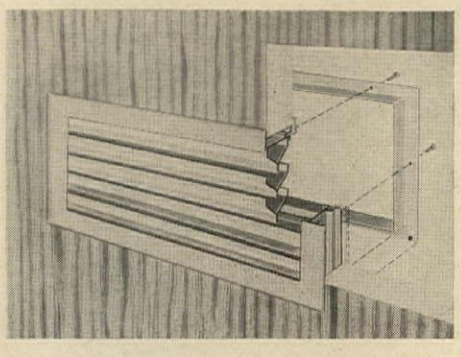

Door Louvers for All Conditions

With the addition of three new special-purpose louvers, manufacturer now offers extruded-aluminum door louvers for all situations. To "C/S" standard and sightproof models have been added a lightproof louver, a soundproof louver, and an operating unit. Complete descriptive, engineering and specification data are presented in new 4-page catalog. Construction Specialties, Inc., 55 Winans Ave., Cranford, N.J.

On Free Data Card, Circle 213

Glazing Specifications for Vision Glass

New brochure, 12 pages, helps evaluate the important factors involved in the proper and economical use of glazing sealants. The principal causes of glazing failures are reported; factors governing sealant selection and placement are outlined. Booklet also gives minimum standards and basic glazing recommendations for aluminum, steel, and wood sash. The Tremco Manufacturing Co., 10701 Shaker Blvd., Cleveland 4, Ohio.

On Free Data Card, Circle 214

Fire-Door Release Gets UL Approval

New "Pyromatic" automatic fire-door release, "the first and only [such] device approved and bearing the label of the Underwriters' Laboratories," is described in 8-page catalog. The Pyromatic release will be used exclusively in installations of the company's recently introduced flush-sliding fire door, eliminating the conventional rope, sheave, and traveling counterweight arrangement that has been standard with the industry for over half a century. With the release, the fireproof sliding door is closed automatically in the event of fire; manual operation, however, is permitted at all times. Complete details and specifications are contained in *Catalog DHSL-61*. Dusing & Hunt, Inc., Lake St., Le Roy, N. Y.

On Free Data Card, Circle 215

ELECTRICAL EQUIPMENT

Adjustable Lamps Positioned Anywhere

New 4-page catalog illustrates manufacturer's line of incandescent, fluorescent, combination, and magnifying lamps. The lamps are portable, and have brackets, bases, and stands that permit them to be positioned anywhere. Ideal uses are over assembly and inspection benches, drafting tables, as office equipment, and in laboratories. The versatile lamps are portable, and available in various lengths and colors. Luxo Lamp Corp., Dock St., Port Chester, N.Y.

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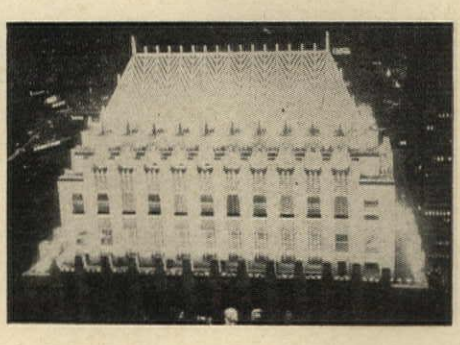


Floodlighting Data

How to Select and Apply Floodlights, 16 pages, is a comprehensive outline of the essentials of efficient, economical floodlighting. It describes floodlighting classifications, general principles of floodlighting applications; tells how to calculate light levels in floodlighting both vertical and horizontal surfaces. Sample problems and solutions are given, along with data for GE floodlights equipped with filament and mercury lamps. General Electric Co., 1 River Road, Schenectady 5, N.Y.

On Free Data Card, Circle 217

New Surface Luminaire

New line of "SF" surface-mounted fluorescent luminaires is described in 6-page folder. Typical applications of the 3 5/8" deep fixture are shown; construction features and the variety of shields (aluminum, glass, and plastic) are illustrated. Lighting Division, Westinghouse Electric Corp., 1216 West 58th Street, Cleveland 2, Ohio.

On Free Data Card, Circle 218

Grounding Requirements

Latest information on National Electric Code requirements most likely to affect the installation and operation of portable electric tools and equipment is available in revised edition of 8-page *Grounding Facts*. Designed to benefit those who specify, install, and inspect electrical appliances and equipment, the booklet interprets revised code requirements and provides up-to-date information on new types of grounding devices developed to satisfy the new safety requirements. The Arrow-Hart & Hegeman Electric Co., 103 Hawthorn St., Hartford 6, Conn.

On Free Data Card, Circle 219

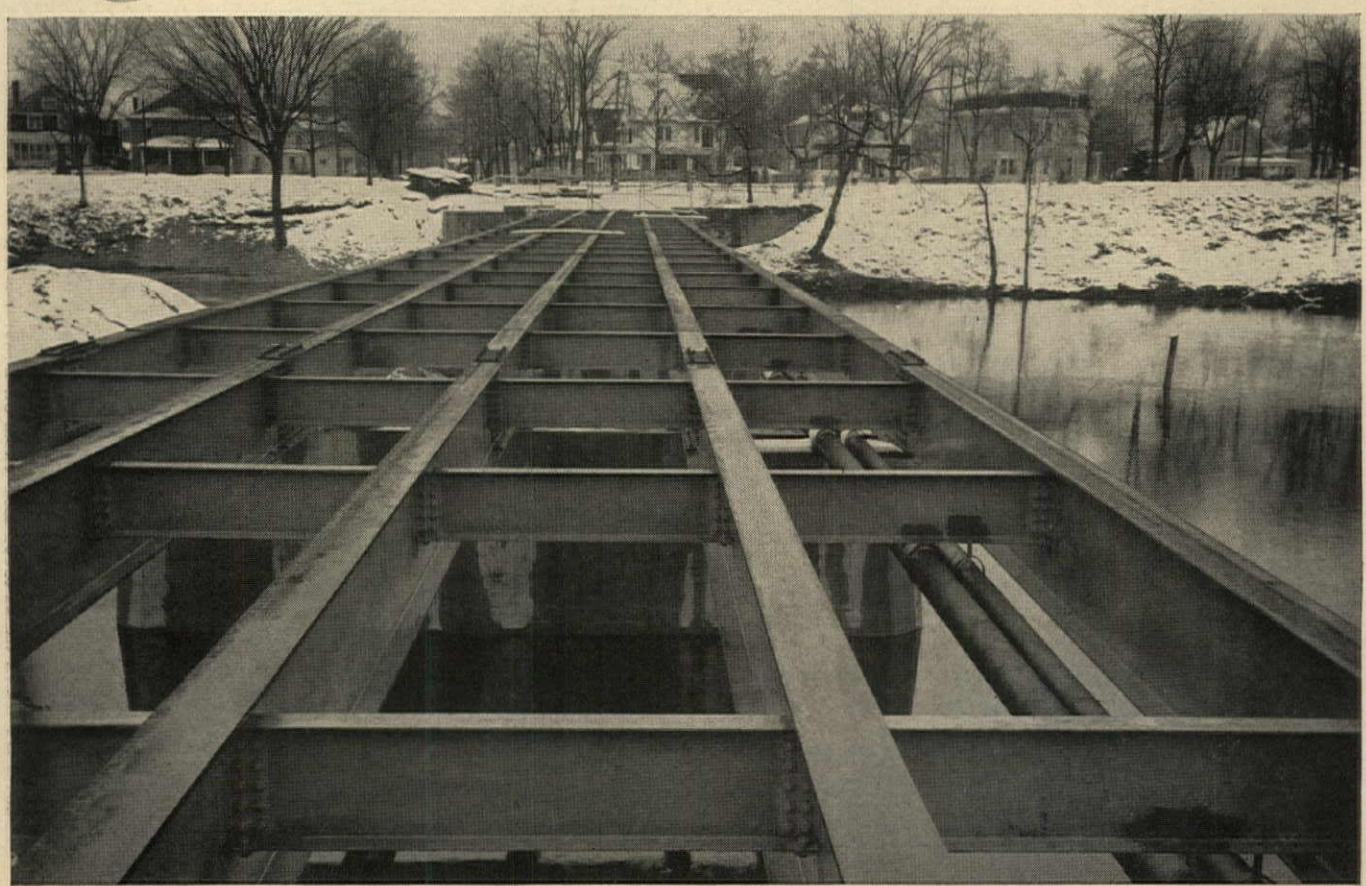
no wonder the contract went to steel—steel cut costs by $23,000!

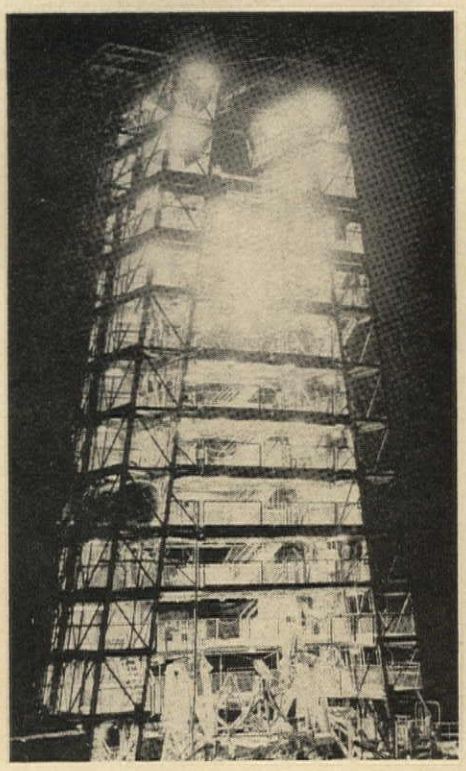
They were almost ready to go ahead on the new bridge in Elkhart County, Indiana, when they decided to take a second look at costs. Original plans called for material other than steel, but maybe steel construction could save money.

And save, it did! Steel bids were actually $23,000 lower and that wasn't all. Maintenance had not been one of the considerations till the steel bid suggested its importance—as one consulting engineer put it, "I've never seen or heard of any type bridge which is maintenance-free." Thus, even with maintenance included, steel construction was shown to be less costly than any other material. In fact, accompanying studies clearly showed the only maintenance required would be painting and that only $4,488.84 invested at 3% would take care of that for 50 years. Thoroughly convinced, the County Commissioners changed the plans and awarded the contract to steel.

Use Steel for Modern Construction

This is another example of the efficiency, lower initial cost and minimal maintenance required when construction plans call for STEEL!





Electrical Work for Hazardous Locations

Comprehensive 60-page bulletin details the applications of "Condulets" in hazardous locations. Appropriate articles of the National Electrical Code are quoted, along with recommendations of specific equipment to meet the requirements. More than 300 product photos, installation photos, and diagrams are included. Crouse-Hinds Co., Wolf and Seventh St. N., Syracuse 1, N.Y.

On Free Data Card, Circle **220**

FINISHERS/PROTECTORS

Color for Mortar and Ready Mixed Concrete

Application of "Davis Colors," used integrally in ready mixed concrete and colored mortar joints, is described in new 4-page brochure. Also documented are the advantages of "Davis Abrasive Grains," which produce nonslip surfaces while greatly increasing the wearability of the surface. Frank D. Davis Co., 3285 E. 26 St., Los Angeles 23, Calif.

On Free Data Card, Circle **221**

Roofing Maintenance

New 4-page catalog describes "Dri-N-Tite" products for patching, prim-

ing, and coating of roofs. The various maintenance products are suitable for built-up, sheet metal, slag, gravel, concrete, and felt roofs. Detailed specifications, descriptions, uses, application, and coverage are included. A.C. Horn Companies, Division of Sun Chemical Corp., 2133 85th St., North Bergen, N.J.

On Free Data Card, Circle 222

Corrosion Prevention for Many Materials

"Pioneer 1008 Vapor Seal," a mastic protective coating for corrosion prevention, is described in new 4-page bulletin. The product is a blend of asphalts, petroleum resins, plasticizers, asbestos, mica, and solvents. Applied as a coating, it protects against rust, corrosion, abrasion, sunlight, and weathering. Surfaces on which it can be used include metals, glass, brick, cement, fiber, and a variety of insulators. Witco Chemical Co., Inc., 122 E. 42 St., New York 17, N.Y.

On Free Data Card, Circle 223

Spray-Applied Plastic Gives Tilelike Surface

"Glaz-Tile," new spray, brush, or roller-applied finishing material that dries to a durable tilelike surface, is presented in 4-page brochure. The plastic product is described as "a process for upgrading low-cost construction materials for lifetime durability." It can be used on a wide variety of materials—masonry, concrete, wood, metal, plaster, and wallboard—for either interior or exterior use. Plastic Kolor, Inc., 1813 Luzon St., Houston 9, Texas.

On Free Data Card, Circle 224

INSULATION

Specifications for Insulating Roof Deck

Recommended Product and Application Specification for Structural Insulating Roof Deck, 13 pages, has been published recently. The new specification contains chapters on product description, methods of testing, minimum physical requirements, and application instructions. As defined in the IBI specification, insulating roof deck is a structural insulation-board product designed specifically for use in open-beam-ceiling roof construc-

May 1961 **PROGRESSIVE ARCHITECTURE**®

REINHOLD PUBLISHING CORPORATION
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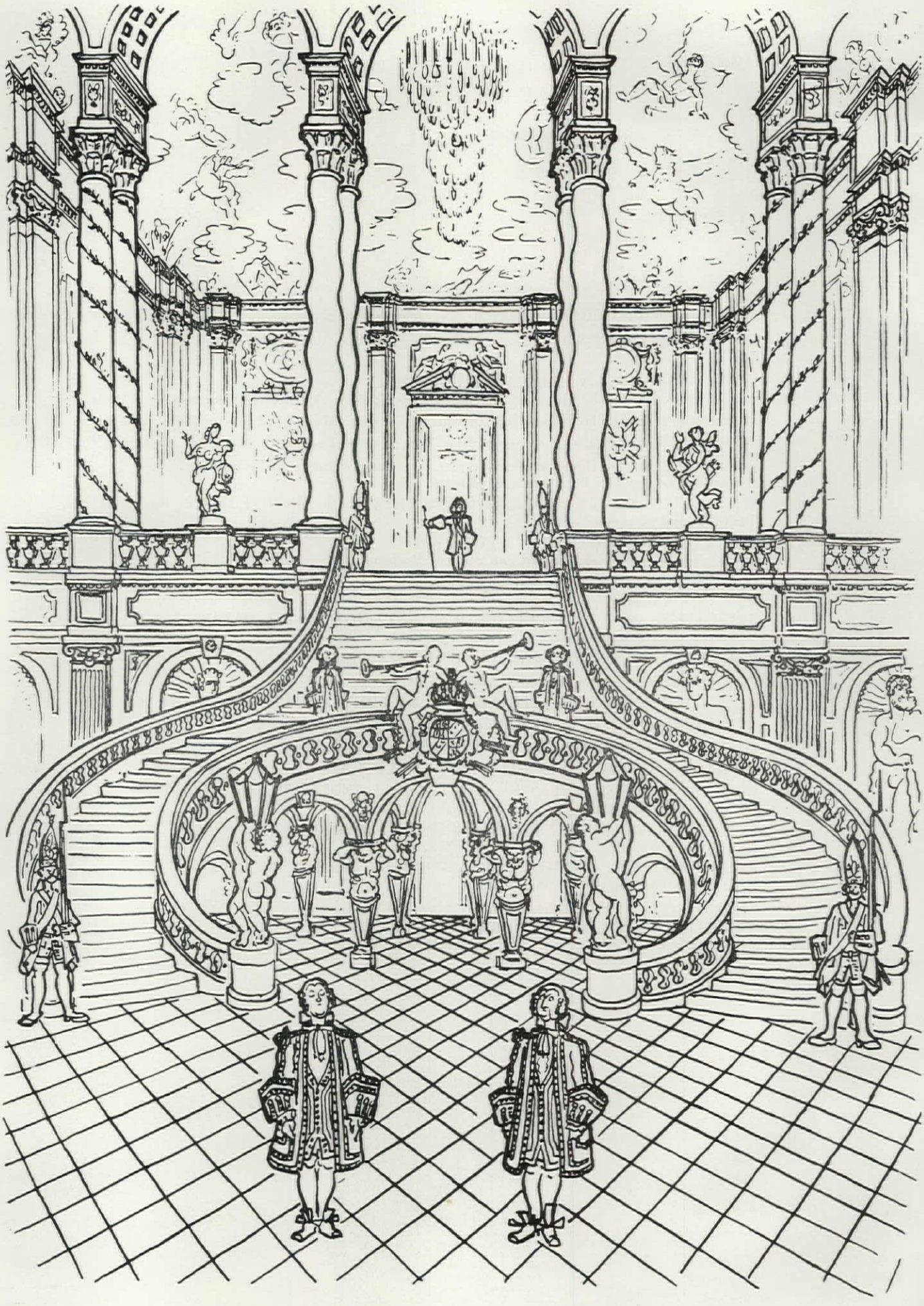


Illustrations from "Here, of All Places," by Osbert Lancaster (Courtesy Houghton Mifflin Company).

Residential Design: Formal vs. Informal

One of the initial objectives of the modern movement was freedom from academic precepts of symmetry and proportion. The new dogma that form must be developed out of function specified an irregular configuration for most functions—the "machine for living" among them. Indeed, asymmetry and spatial irregularity became the hallmarks of the "modern" house. Even in the field of the popular American "home," the dominance of the formal "colonial" style eventually broke down before the charms of the pseudo-modern "ranch house" and "split level."

The desire for formal clarity survived, however, within the movement. Symmetry appeared occasionally, even in the "organic" works of Wright. In the late 40's, the severe formalism of Mies and his followers became a major influence, while the new preoccupation with structure pointed toward formalism of another kind. In this atmosphere, the formal house made its reappearance. New Canaan was its first stronghold, but it soon gained acceptance in a wider sphere. Today the question of formality in house design is an open one.

Of the four houses presented here, two are clearly formal and two informal in concept. In order to discover the thinking behind their designs, we asked each of the four architects a number of questions as to his feelings about formality or informality in house design:

1 Why is the design of this particular house *formal or informal*? What are the principal structural, economic, or aesthetic advantages?

2 Which kind of spatial composition is more satisfying to live in: *geometric or irregular*? Is geometric order reassuring or limiting? Does irregularity carry with it the risk of picturesqueness?

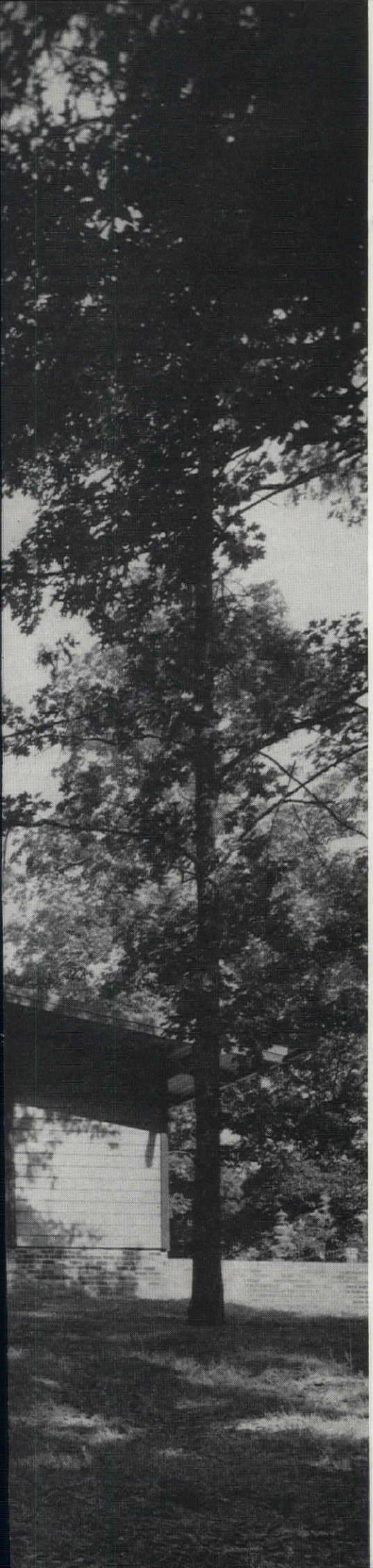
3 Should a house be primarily *a work of art or a pleasant environment*? Can it be both? Does formal order involve a sacrifice of comfort? Do practical considerations impose a degree of formalism upon informal design?

4 Should a private house be a *"prima donna" or a background building*? How does this house relate to its neighbors?

5 What should be the *influence of the place* on the design? How was this design affected by site and climate? Were the formal or informal traditions of the locality a factor in your design?

6 What was the *influence of the client* on the design?

The answers suggest a state of uncertainty. Neither of the formalists really advocates formalism, while neither of the informalists really objects to it.



Photos: Alexandre Georges

HOUSE AT HELENA, ARKANSAS · A. L. AYDELOTT & ASSOCIATES, ARCHITECTS

The wooded site slopes sharply downward from the approach side, dropping 16 feet within the building area. The house closely follows the original contours, the slopes of the roof echoing the profile of the land. Its wood post-and-beam structure establishes a four-foot square module as a framework for the casual plan.

A few simple materials—wood and earth products—have been used consistently inside and outside. Dark-stained wood battens applied to the bleached wood siding carry out the modular rhythm of the windows and roof beams. Retaining walls and interior paving are of brick. The roof, which is conspicuous because of the change in elevation, is surfaced with white marble chips.

A Ramble in the Woods

AYDELOTT'S COMMENTS

Formal or Informal: There are as many varieties of formal systems using geometric plan forms as there are informal ones using irregular plan forms. Actually, this house is disciplined to a rigid structural system, and the volumes are developed in close relation to the nature of the wooded site.

Geometric or Irregular: Although I did not consciously develop this design for the sake of picturesqueness, the house may have acquired a naturally picturesque appearance. I suppose this is almost unavoidable when you stick to nature. Believing in this approach does not deprive me of getting a kick out of the chaste, geometric type of architecture. On the other hand, the client must be considered, and his *true* desires should be reflected in the final result.

Work of Art or Pleasant Environment: I associate some kinds of formality with the atmosphere of a vodka ad, which may show two men lifting their glasses over a single white pedestal chair. All this in black tie against a white background. I believe this atmosphere is used effectively in many of the ladies' magazines. I suspect that when the same atmosphere is translated into house design, it should be mandatory for the male to dress in ballet slippers.

What I mean to say is that many times interior spaces are as elegant as jewels when they are precisely detailed and formally, if scantily, furnished—but a man is a man and a woman is a woman "for a' that." This house is designed for a healthy man and his wife and two all-American youngsters. The Maker did not

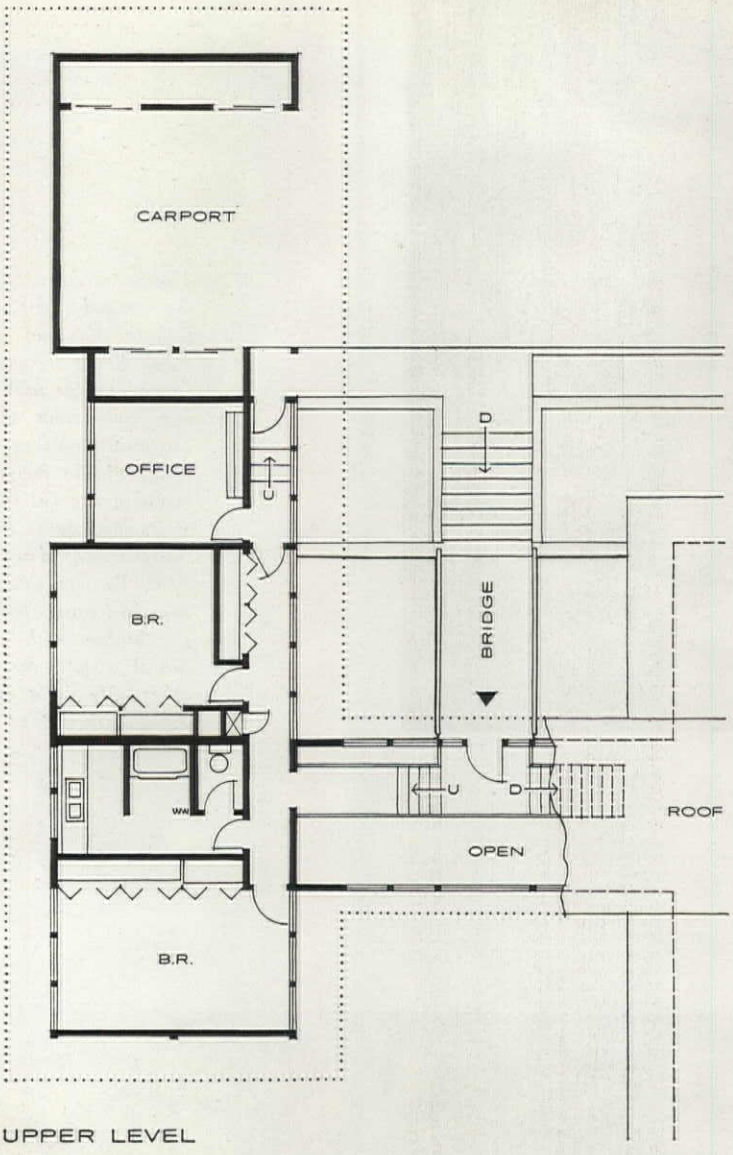
design the youngsters to be inhibited by the frailties that go with precision.

"Prima Donna" or Background Building: With reference to houses being background buildings, I think particularly of Breuer and his philosophy of house design. He makes strong architectural statements that are at odds with nature, and yet these houses are not at all "formal" or "prima donna."

Influence of Place: I believe the characteristics of the steeply sloping wooded site call for this sort of approach. Materials and colors were chosen to express close relationship to the site.

Influence of Client: Of course, the architect has to be able to separate whimsy from the real wish, but many a psychopath has been created by architects doing houses for clients who never existed. The clients in this case are: a doctor enjoying a good small-town practice, with his eye on hunting and fishing and on someday taking a big sailboat to the South Seas; a wife who has a background as a nurse, who enjoys working with ceramics and generally making herself useful in the community; and the above-mentioned children. I can tell you honestly that they all are unreservedly enthusiastic about this house. They fit it and it fits them.

The main entrance court is at the second floor level, overlooking the roof of the principal living spaces. A steel-framed bridge with wood decking leads from this court to the glazed passage between the wings of the house. From the entrance door at the half level, stairs lead up to the children's bedrooms and down to the main floor. To one side of the passage is a small courtyard under the bridge, with a surface of gravel around a pool. To the other side is a large terrace paved with washed concrete.

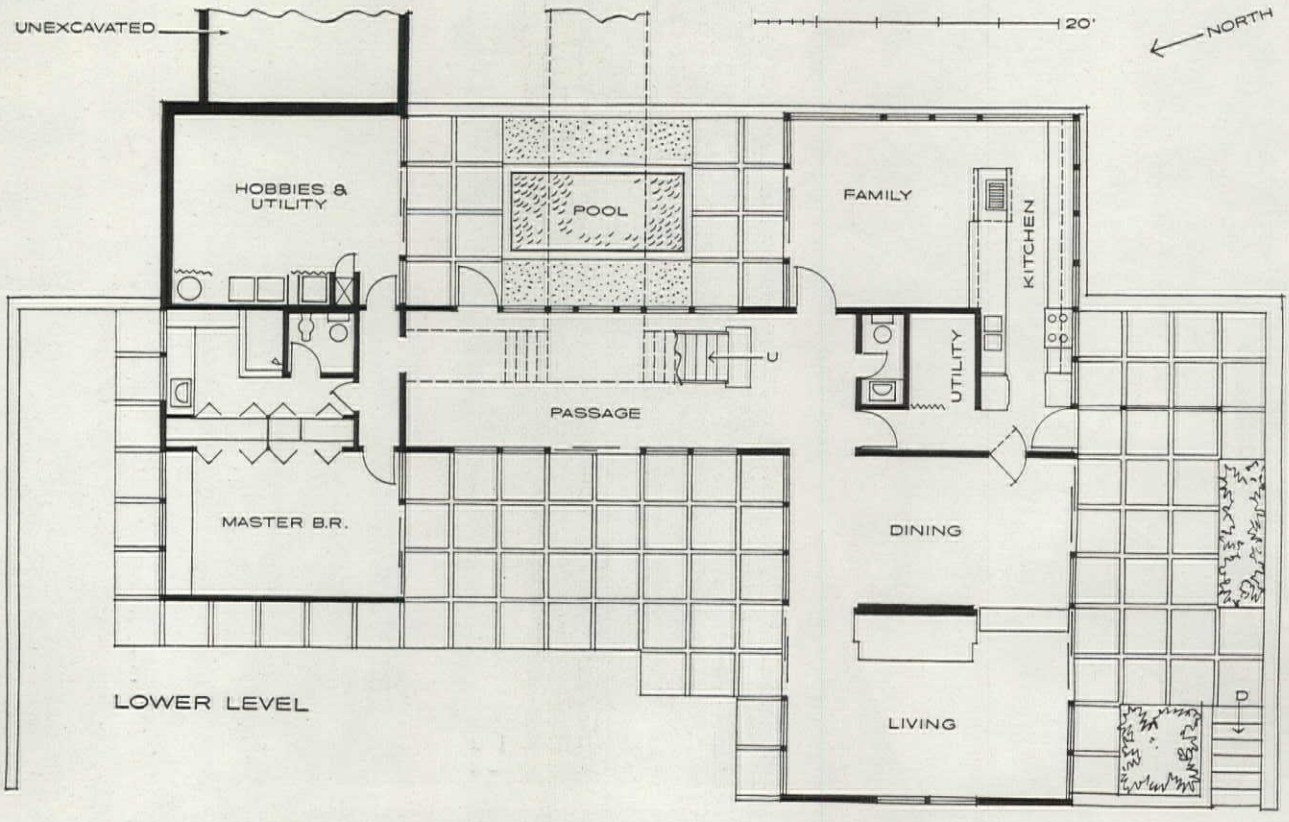


UPPER LEVEL

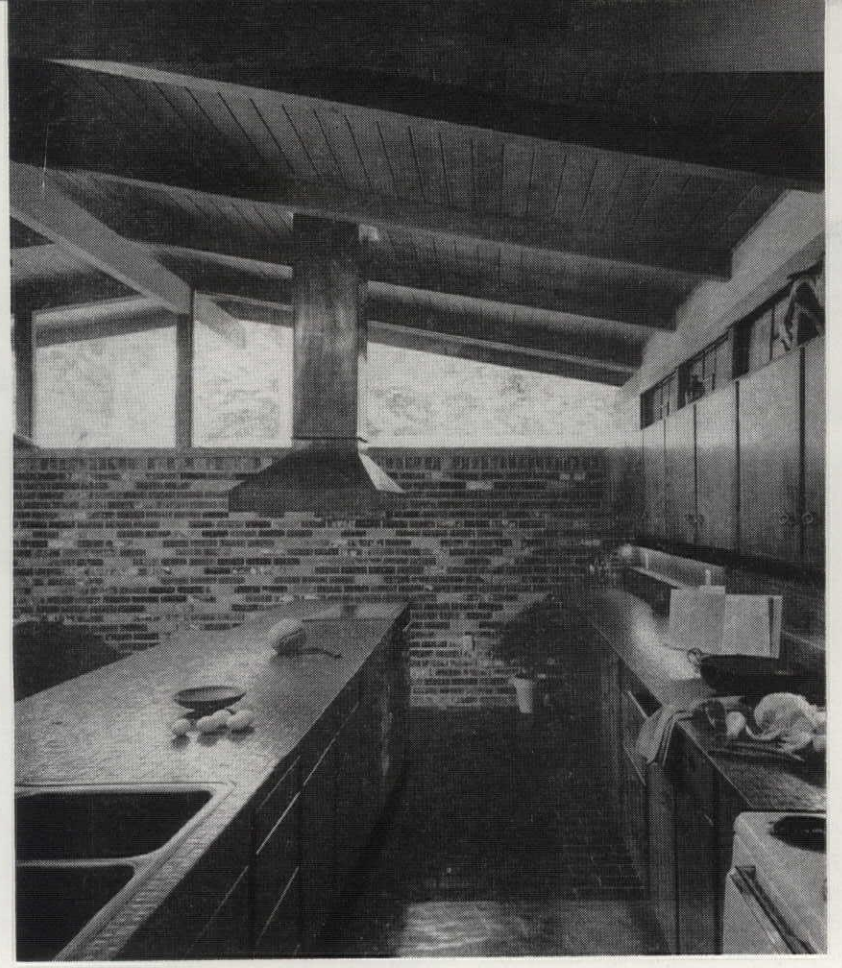
The four-foot module on which the plan was based is repeated visually in the paving pattern of the terraces. The spatial organization of the house, with the main living area one story below the entrance level, was determined by the steep slope of the site.

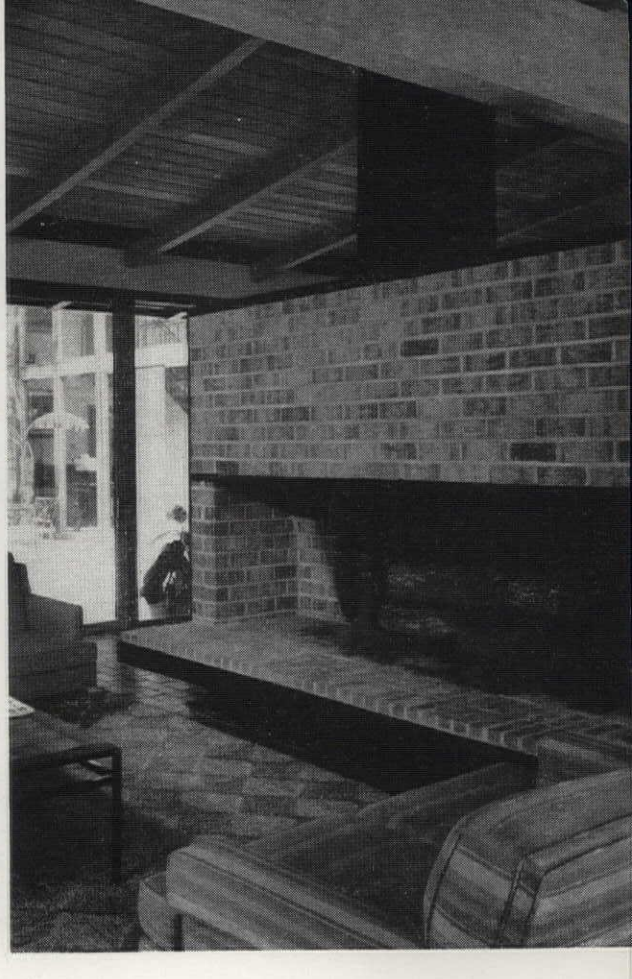
The family room (acrosspage, upper left) *has a charcoal grill set into a tile counter, with a suspended copper hood above it. The kitchen appliances are in an alcove, partially concealed from the rest of the room. The brick wall is, in effect, an extension of the exterior retaining wall.*

The living room (acrosspage, below) *is exposed to the oak woods on three sides, yet produces a distinct feeling of enclosure. A free-standing brick fireplace* (acrosspage, upper right) *delimits the dining area.*



LOWER LEVEL





Photos: Roland Chatham

Unpretentious Vernacular

HOUSE AT SAN ANTONIO, TEXAS • O'NEIL FORD & ASSOCIATES, ARCHITECTS

There is an abrupt drop of 100 feet at the western edge of the rather confined and featureless site. The view to the west from this cliff has been recognized in the layout of the house and the location of openings, but it has not been allowed to dominate the design.

There is a terrace between the wings of the house from which the view may be enjoyed in the morning or the evening. An enclosed play court for the three small children is between the house and the carport, safely removed from the cliff.

The roof structure, with wood trusses over most areas and laminated beams over the living room, is supported on brick cavity walls. The frame end walls are faced with cedar boards, which will weather to a silver gray.

FORD'S COMMENTS

Formal or Informal: This house was designed to provide an elegant yet informal home that would best suit the clients' desires and would be suitable to the life and climate of Texas. In this case, a formal solution would have been out of tune with the site, the neighborhood, and the client. I am not, however, opposed to formalism in house design. What I am most emphatically opposed to is the static design so often associated with formal solutions.

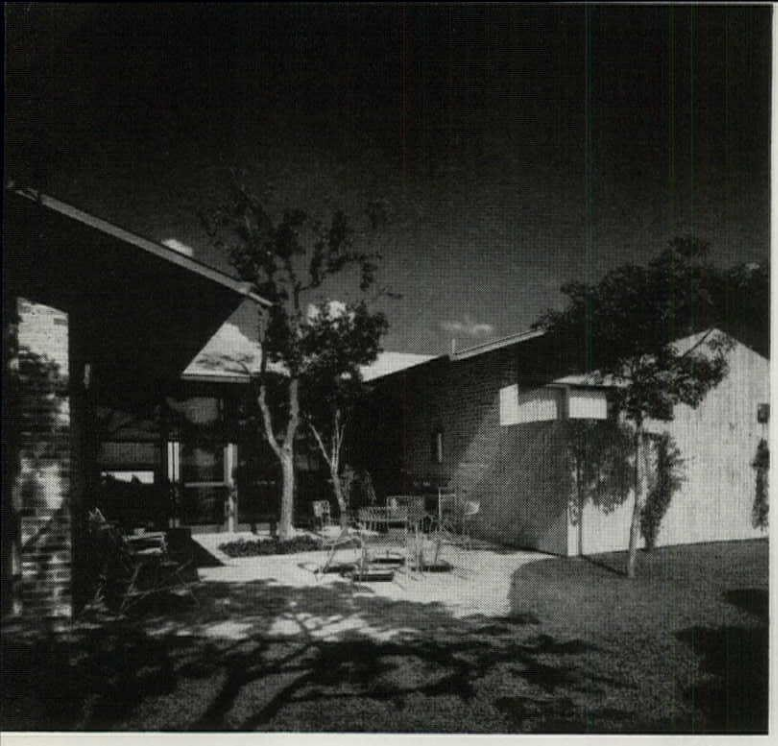
Geometric or Irregular: In a sense, this house is somewhat formal in that we made definite repetitions of materials, details, and openings throughout the house. In areas where rigid geometric forms prevail, we have divided the area geometrically and, in some cases, symmetrically. I believe, therefore, that it would be erroneous to think of this house as being completely divorced from formality.

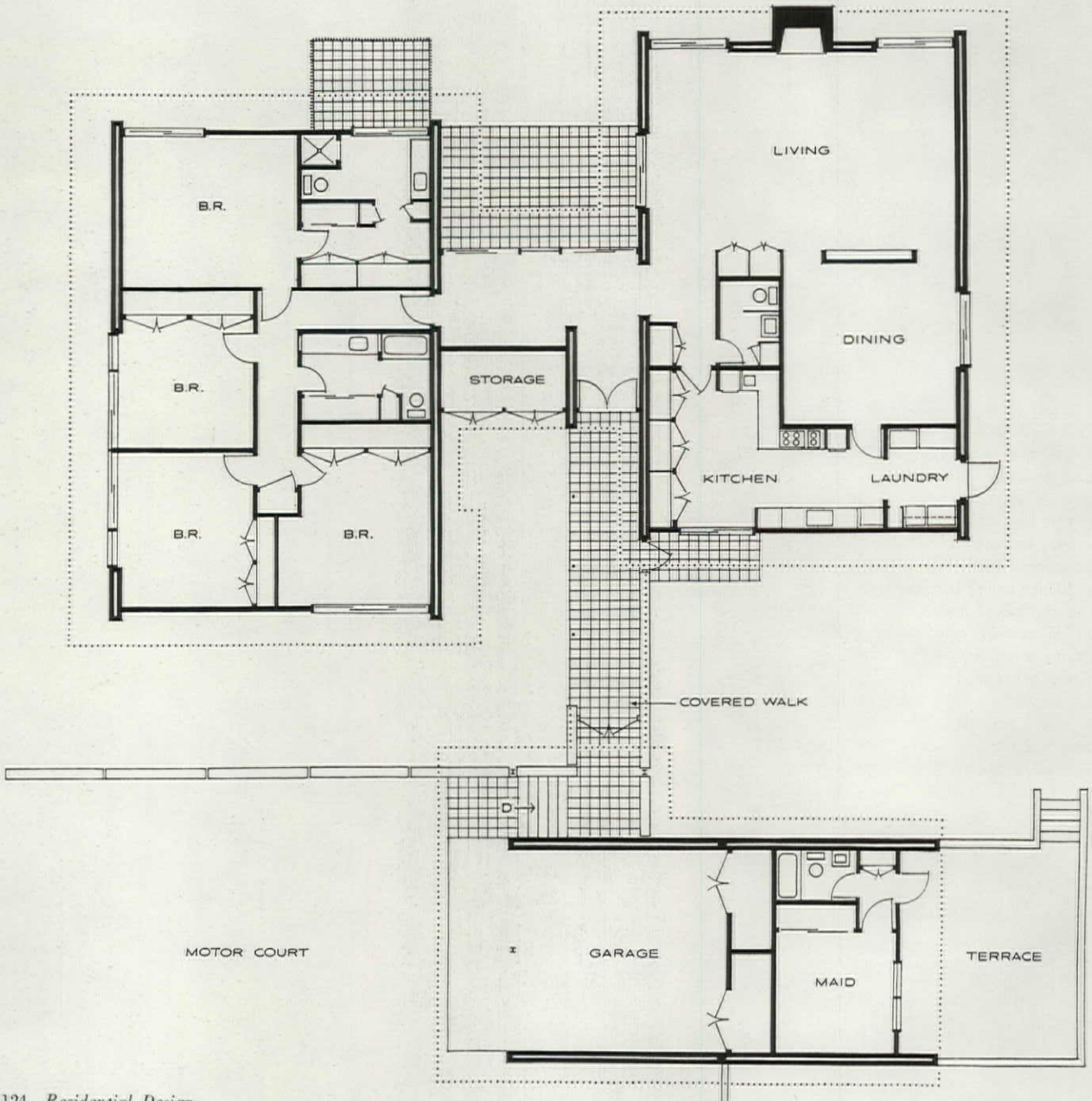
Work of Art or Pleasant Environment: It is my belief that the designer should be concerned with making the house pleasant to live in—in the manner in which the client likes to live. Then the house may well become a true work of art. We believe that a house that grows in beauty as the materials take on added luster assumes a timeless character that serves well the needs of the client. Because of the fine craftsmanship available, we were able to create this sense of quality without incurring high expense or using extravagant materials.

Influence of Place: Climatic conditions certainly influenced the over-all form of the house, in that various areas were created as a means of seclusion from the sun and wind. Although San Antonio is, for the most part, blessed with nearly perfect weather the year round [*sic*], houses in this region are, at various times, subjected to intense heat, bright sun, occasional torrential rains, and sudden bitter cold spells.

San Antonio is only a few hours drive from Mexico, and much of the city's architecture reflects profound Mexican influence. We felt that we were fortunate to build in an area that has not yet been overwhelmed by machine architecture.

Influence of Client: It was the clients' desire to build a house that was friendly and personal. The small courtyards, adorned with lush plantings, create pleasant, serene surroundings, unaffected by the outside world. The harmony of effect between these areas and the house reflects to a great extent the personality and interests of the owners.




LIVING
B.R.
DINING
STORAGE
B.R.
KITCHEN
LAUNDRY
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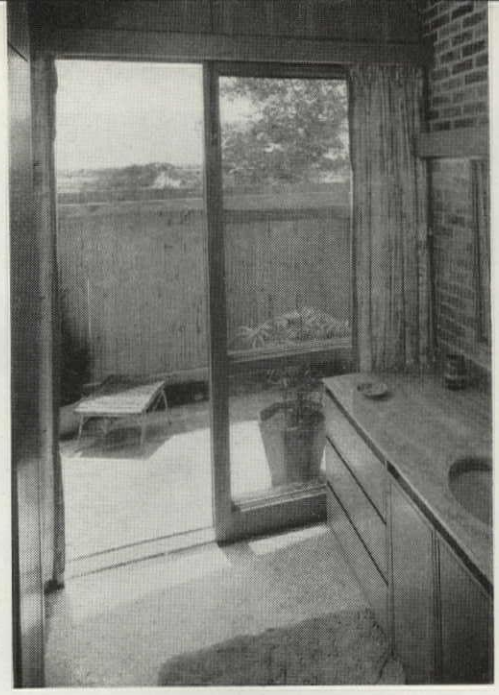
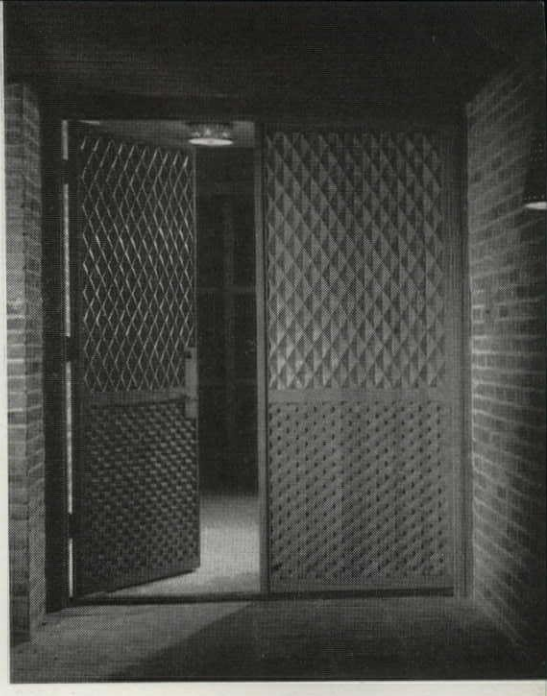
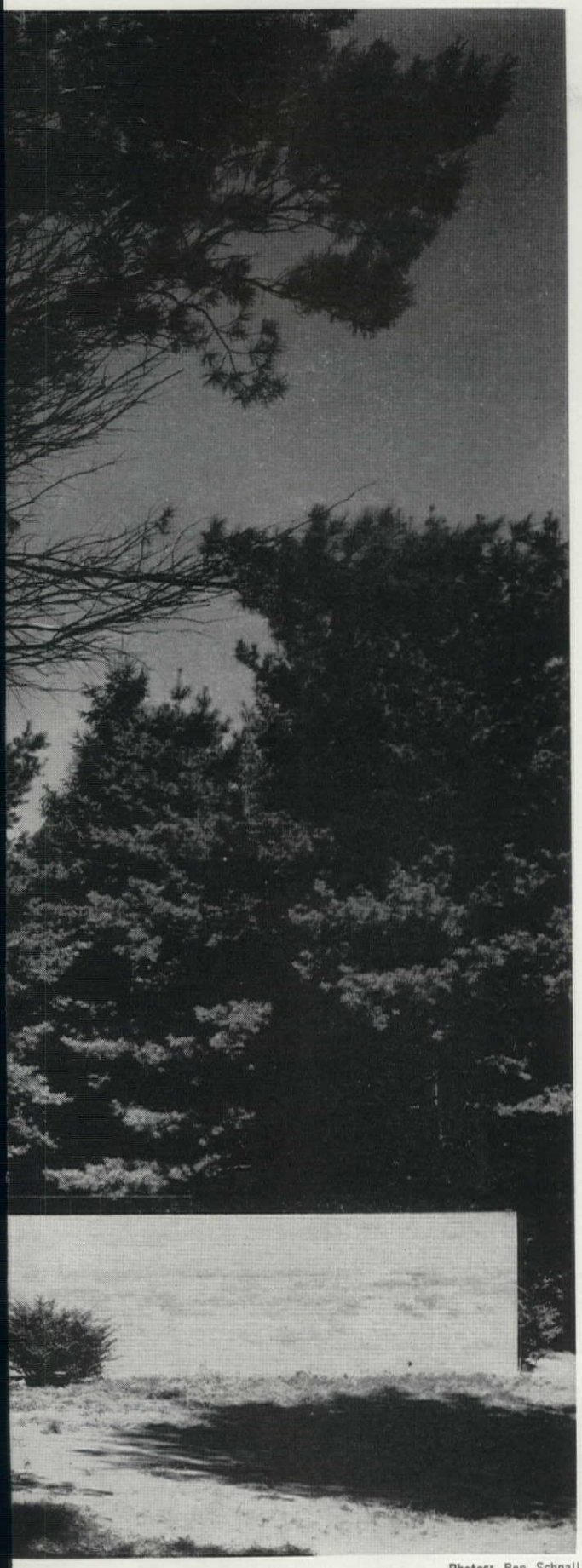
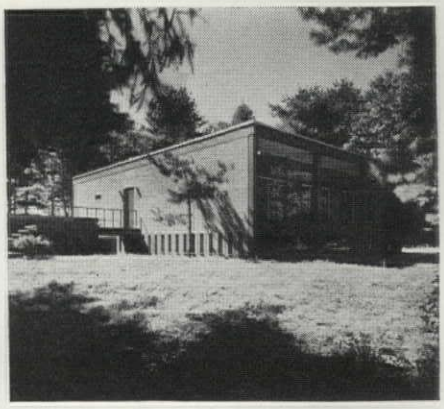




The house proper is divided into two distinct areas, for living and sleeping, connected by a glazed passage (photos across-page). *A third element, housing the carport and servant's quarters, is joined to the house by a covered walk. The view of the living room* (right) *illustrates the use of materials that lend themselves to craftsmanship and improve with age. The exposed brick is a gold-colored Mexican variety; the ceiling is of cedar boards; the floors throughout the house are of off-white onyx terrazzo. The entrance doors* (above right) *were designed and hand-carved by sculptor Lynn Ford, Hardware and lighting fixtures were also custom-designed and handmade, either by local craftsmen or in Mexico. The small fenced area outside the master bathroom* (above left) *is one of several sheltered outdoor spaces around the house.*



Photos: Ben Schnall



Prism in the Pines

HOUSE AT BREWSTER, NEW YORK • ULRICH FRANZEN & ASSOCIATES, ARCHITECTS

The location of the house, amid 20 acres of fields and woods, imposed no special limitations. The house took the form of a single parallelepiped. The north and south walls are of glass, with covered decks outside. There are insulated brick cavity bearing walls to the east and west.

The structure is supported on steel columns and girders to minimize interior supports. All partitions stop at door height, with four feet of glass above. Expansion space for future bedrooms and an office has been included in the basement, which also houses the garage.

In our discussions with Franzen, we made a statement equating formal design with "classical" and informal with "romantic." Franzen objected to this comparison.

FRANZEN'S COMMENTS

Formal or Informal: Your interpretation of classical as being geometric and romantic as being irregular is as popular as it is inaccurate. Philip Johnson's geometric Glass House is as romantic as the Acropolis' irregular site plan is classical. To me, the classical attitude does not imply formalism but humanism. Through it runs the confident assumption that we are masters of our own environment. The romantic attitude rejects order and asserts the ever-changing nature of life. It underlines the "I," the sensual, the individualistic; it recognizes no scale of values except self-assertion.

I don't think this house is "formal." It is assertively ordered, man-made.

Geometric or Irregular: The house is rectilinear, not geometric. Most building materials and buildings are rectilinear, and since this is a budget house it seemed like a reasonable thing to do.

Work of Art or Pleasant Environment: Are you suggesting that art is not a pleasant environment?

Form does not follow function and never did. Form evokes function. What really are the functional needs of a house? Any concept, whether classical or romantic, affects each and every detail within a composition. It therefore affects the manner in which the spaces are used. I think the only question you can ask is whether the concept is appropriate, and I cannot answer that because I am prejudiced.

I assume that when a client commissions an architect, at great expense, to do a house, he expects more than backed-up plumbing. I believe he expects a work of art—to the extent that the limitations of the problem permit. For I think that in solving any problem you must try for perfection. If you don't, you are not earning your fee.

"Prima Donna" or Background Building: I think an assertively romantic building, because it is primarily concerned with itself, does not always make a good neighbor. An assertively classical building, because of its broader aesthetic base, stands a much better chance of being a good neighbor. In any event, our little work stands by itself surrounded by 20 acres of forest and rolling fields.

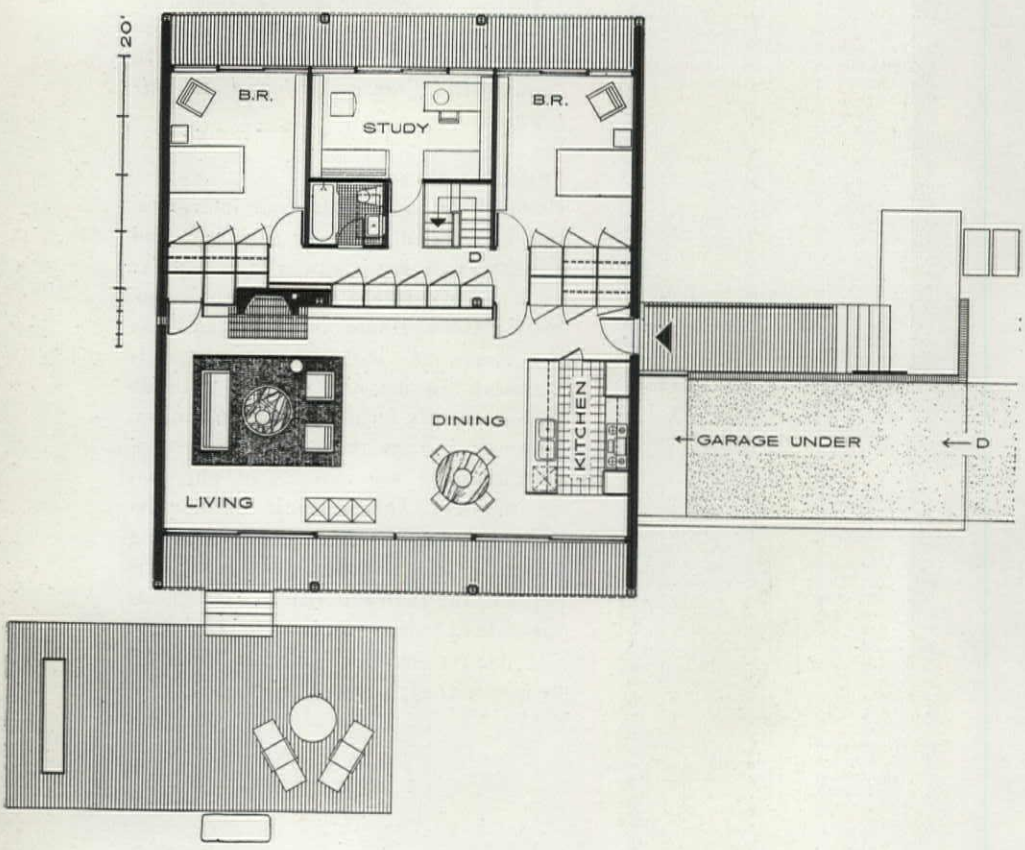
Influence of the Place: I don't consider regionalism to be critical. This house is in New England (topographically, if not politically), and I could argue very nicely that the ordered life has always been preferred there, but I don't believe it would be valid.

Influence of the Client: I know you won't believe me, but the desires of our clients are paramount. It is a real pleasure to me that the clients with whom we deal are most anxious for a life with some serenity and peaceful beauty in their environment.

The strength and calm we aim for in our space concepts are intended for the many-hued moods of life. In this little house, the ceilings are very high, light streams in from many directions, partitions stop at door height. The only color is that of natural materials counterpointed by white panels. And all of this is contained within the sturdy brick walls and the massive steel skeleton.

The pitch of excitement or calm is set by the owners, their moods and clothes, their activities and friends.

The plan shows the division of the house into active and quiet areas. The bedrooms and study to the north look out on an intimate clearing carved out of the woods. The living room (acrosspage, above) *offers a panoramic view between the trunks of the pines to the rolling countryside beyond. The kitchen* (acrosspage, lower left) *is an assembly of cabinets at the end of the living area. The view through the sliding doors from the wood deck* (acrosspage, lower right) *shows the fireplace wall, with its white-painted cabinets and low display shelf* (*page 179*, SELECTED DETAIL). *The continuous plane of the board ceiling, visible beyond the limits of the room, serves to unify the entire interior.*



Photos: Frank Lotz Miller

HOUSE AT NEW ORLEANS, LOUISIANA • CHARLES R. COLBERT OF COLBERT-LOWREY-HESS-BOUDREAUX, ARCHITECTS

The client, a young pediatrician, selected a lot in the midst of a rather crowded and unpretentious neighborhood in order to be near the hospital and the private clinic where he practices. The house Colbert designed for the beleaguered site comprises four pavilions of identical form and size, connected by glazed passages that define two interior courtyards.

The unusual pyramidal roofs of the pavilions are of conventional wood and steel construction. The architect's original intention to use a stressed-skin system was altered due to the limitations of local building practices.

The house received a P/A Design Award in 1959 and an Award of Merit at the 1961 AIA Convention. The clinic that Colbert designed for the same client won an AIA award in 1959.

COLBERT'S COMMENTS

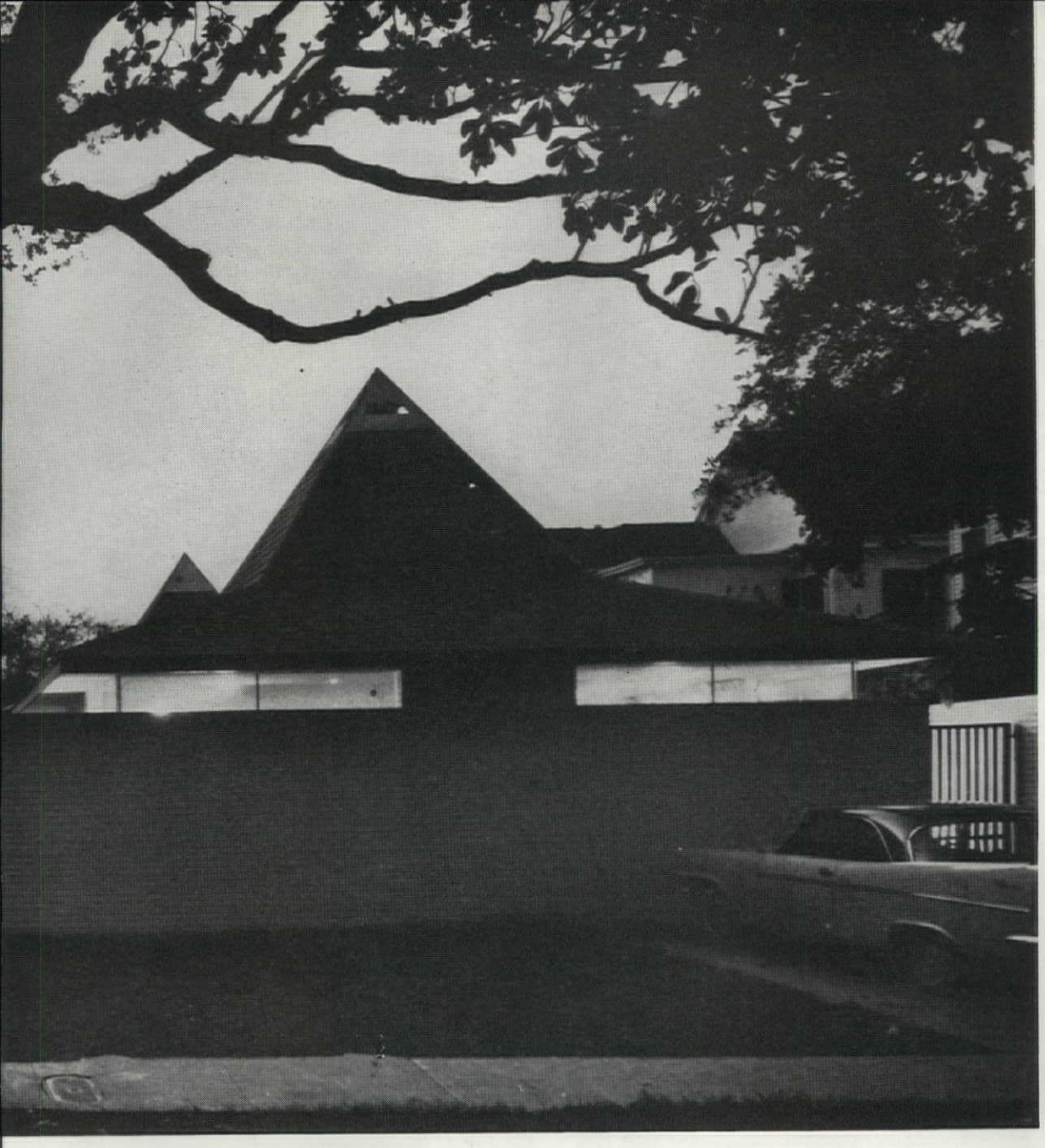
Formal or Informal: The house was given its geometric formality for the following reasons: The clients desired zoning of functions to insure privacy and segregation of diverse activities. They wanted maximum order and predictability of plan, adequate exposure for all rooms, and a central court (not a New Orleans patio). With these factors in mind, the four pavilion-type enclosures were developed.

The lot was very limited in size and in natural beauty of surroundings. I could therefore find little reason to warp planes, deform shapes, or otherwise break the economy of repetitive parts.

Geometric or Irregular: It is the preconceived forms of the regular and the predictable that help relieve the jangling, insecure inner life of people today. While I realize that geometric order is but one of the many kinds of order suggesting human security, I believe that, at this particular moment in architectural history, it should by no means be belittled.

Work of Art or Pleasant Environment: I do not believe that formal design sacrifies anything in comfortable living, but in fact usually represents careful planning that leads to comfort.

I would never aspire to create a merely pleasant environment. I find,



Foursquare Urbanity

however, that the results are always unpredictable and therefore I work first for a pleasant — I would prefer to say "emotion-evoking" — environment and hope that some day one of my designs will be able to reach the level of a "work of art."

"Prima Donna" or Background Building: I believe that all houses should be background buildings to the degree that they do not seriously detract from neighboring property in tight urban and suburban settings. In this house, I have attempted to recall the earlier forms of architecture in Louisiana, maintain a reasonably constant residential scale, and repeat some of the roof forms within the immediate environs. I can honestly report that the long-term neighbors have received the house well.

Influence of Place: In order to limit the view of the neighboring houses, and concentrate attention instead on the live oak and magnolia foliage, the exterior walls have been provided only with small, high windows. All large glass areas, on the other hand, face inward toward the courtyard.

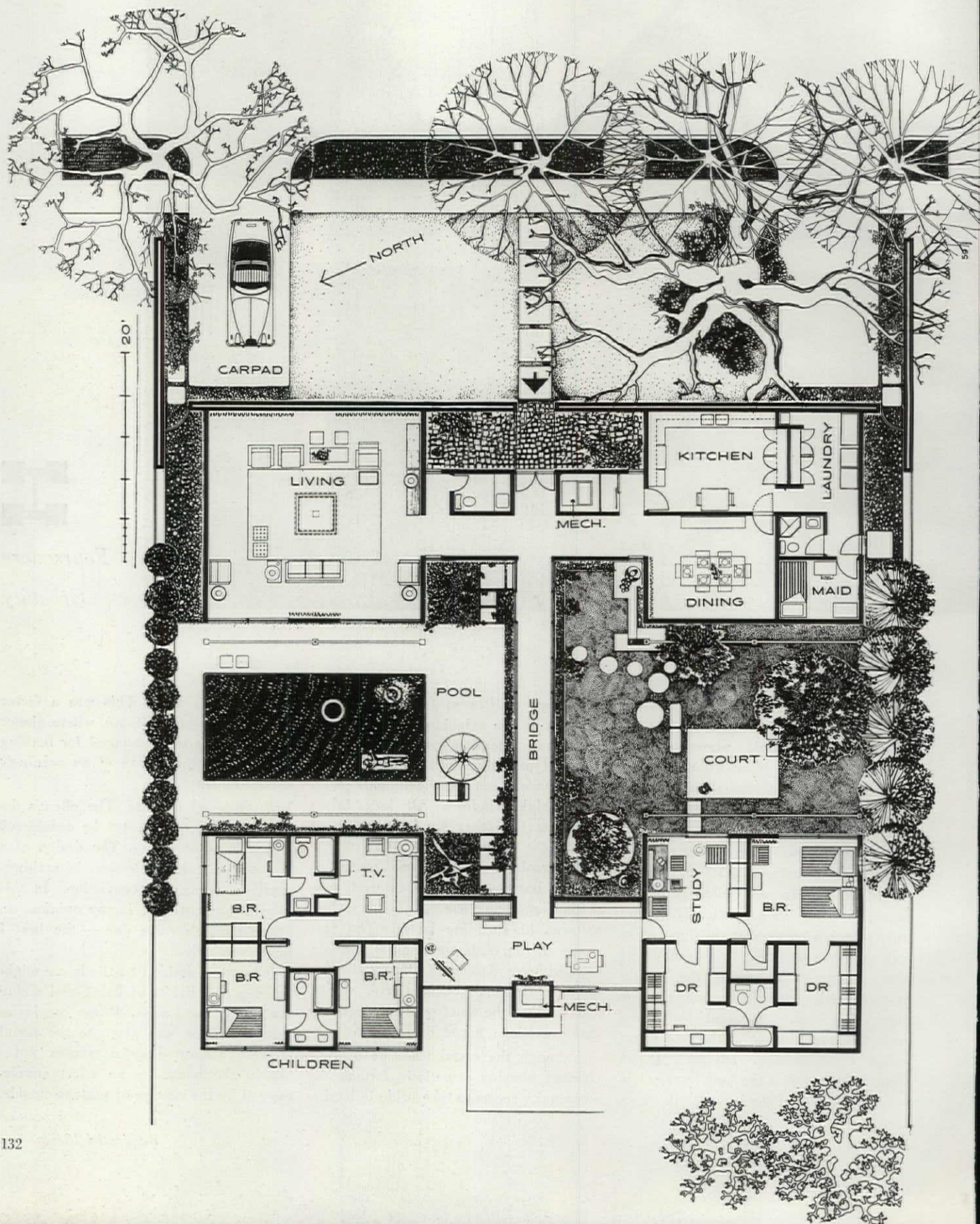
The roofs are not merely protective devices, but also shapes of interest, generating changing views, shadows, and patterns of shedding water. The roof shape, of course, is not original, but is a reworking of dozens of similar designs in New Orleans' Vieux Carré, where, historically, the roof encompassed an entire carriage house or small cottage.

Although the social tradition of New Orleans remains essentially formal, the community seems to take pride in its disregard of the usual. This was a factor in the design of the house, where dinner jackets might be exchanged for bathing suits during the course of an evening's entertainment.

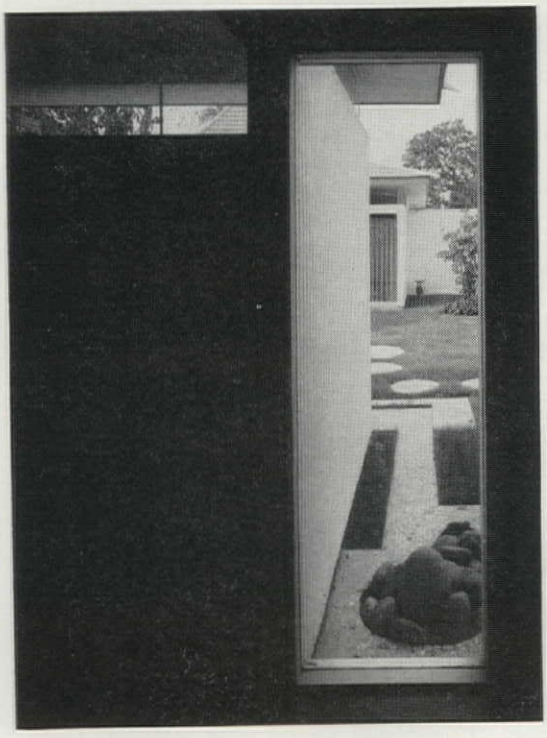
Influence of Client: The client's desires as to design should be considered as much as *necessary*. The design of a house is a series of lessons in architectural reasoning and conviction. In this case, the client was, in my opinion, an unusually perceptive one — the best I have ever had.

It was our desire that the house might develop new habits of living and *seeing* for the young family. Prime consideration, therefore, was given to the visual interest generated as a person walks within the house — an effect supplemented by the change of seasons outside.

The lot was chosen because of its greater than usual frontage and its plantings: a very old live oak tree, several magnolias, and a grove of fig trees. The entire lot, as well as the house, is divided into three zones of activity: entertaining and dining area, comprising the two front pavilions and one courtyard; parents' study and sleeping area, occupying one pavilion and the other courtyard; and children's living and sleeping area, which includes the fourth pavilion and the play yard to the rear. The outermost walls were fixed by the setback requirements of the zoning laws.



As one passes through the house, openings reveal fragmentary views of the house itself and the surrounding foliage. In the entrance court (left), *walls painted the predominant white provide a backdrop for sparse plantings and ceramics by the Newcomb Art School faculty, set among cobble stones (from the city dump). The glass "bridge"* (right) *separates the two central courts: the entertainment court, with its swimming pool, on one side, and the quiet garden court on the other. Eventual plans for these courts call for a series of pools, flumes, and fountains to produce interesting water effects as they carry off the abundant rainfall. Each of the pavilions overlooks its related outdoor space, but high walls give each one privacy from the others. The living room* (right) *overlooks the swimming pool. The high windows provide a view of the encircling foliage and create the illusion of a hovering ceiling. They admit even, modulated light and can be opened for ventilation when the air conditioning is not operating. The painting is by Pat Trivigno.*



THE SIXTIES A P/A SYMPOSIUM ON THE

Technological Freedom

The two previous installments of this discussion among some 50 architects and P/A's Editor have indicated a philosophy of Chaoticism in the theory of design, and a dissatisfaction with, but no specific recommended changes in, the practice of architecture. The reasons given for the present chaotic state in design (which was defended rather than deplored) were many; among them, however, the increase in technological means at the architect's disposal was mentioned many times. This subject seemed of such importance that it is explored separately in the discussion that follows.

The advances in technology are many. There are industrialized methods of construction, using industrially produced building components and involving some sort of modular co-ordination. These may range from small products such as mass-produced hardware to large components such as the curtain wall, and in some instances imply a type or degree of prefabrication. There are new researches in concrete and new documented uses of its technology. There are advances in the use of steel that carry it far beyond the "steel frame" that not so long ago was revolutionary. The same is true of some other metals; aluminum has particularly been the medium for design efforts of an advanced nature. And there are the new materials and methods of construction still battling production difficulties, general acceptance, and code restriction: most notably plastics.

In the previous discussions, this situation has been referred to as one of "exploding technology." Other members of the Symposium have looked for a "technological breakthrough" similar to the ones that have been made, or soon will be made, in other fields. But what the conversations that follow seem to indicate (with some dissent) is that the profession of architecture is faced with neither an explosion nor a shattering of barriers, but a progressive development that has resulted in increasing **technological freedom.** The first part of the discussion, then, has to do with the question of whether too much or too little use has been made of the new possibilities; whether chaos in design is due to full use of the multiplicity of means at our disposal, or whether it is the result, rather, of a superficial or incorrect use of those means.

The first question, therefore, is a leading one:

T.H.C.: ***Do you think that the architects' present use of materials, construction techniques, and production methods is making full use of our available technology?***

PIETRO BELLUSCHI: No.

A. G. ODELL, JR.: No matter how far the American architect is ahead of other countries with respect to use of materials, products, methods, construction techniques, development of detailed contract documents, and resultant economies for his client, one can never say these factors are being employed to the "fullest."

HARRIS ARMSTRONG: The answer is inevitably no; none of us reaches his total potential—no man, no machine run by man, does this. . . . What we are doing is moving along together in the development of architecture and the parallel development of materials and techniques. I cannot see any way of separating them. They are all part of the architecture of the present time.

T.H.C.: ***Is this really a "moving along together?" Or, if we are not making full use of available means, is there a separation between architecture and technology today?***

JAMES R. LAMANTIA, JR.: The breach between most of us in the constituted professional world of architecture and technology is of course an enormous one; it seems to me that only token efforts on either side have been made to bridge it.

R. BUCKMINSTER FULLER: I cannot answer your question. . . . It is as though I were being asked to discuss modern medicine by answering a questionnaire written centuries ago in terms of the going witch doctory. [Your question] should be asked in terms of the increasing competence and knowledge of man to deal with his ever-increasing inventory of the everywhere orderliness of nature.

GEORGE NELSON: . . . It occurs to me that the very nature of the question may stem from the circumstance that the architect is perhaps the last professional type in our society to realize that mass production is a fact.

T.H.C.: ***If this is true, why? What would cause these breaches between present architecture and technology; between the present technology in this field and "the increasing competence and knowledge of man"?***

JOHN LYON REID: I believe that our technology has provided us with a magnificent palette of building material. I believe that the architect is capable of exploiting to the fullest degree the opportunity afforded him by our technology. The architect is seldom allowed, however, to use his own ability, judgment, and experience in the production of work that he is capable of doing. The inherent conservatism of the client and the ever-present considerations of budget and building codes that are unsympathetic to new materials and methods, together make it difficult—sometimes impossible—to do for our client what our technology and the competence of our profession make it possible for us to do.

WILLIAM PEREIRA: . . . The danger here, as I see it, is letting our anxiety to be technologically *au courant* overshadow our more basic responsibilities to our craft.

SERGE CHERMAYEFF: Modern technology and mass production are progressively producing elements that are more and more collective, typical, anonymous, universal in character and function—yet the profession as a whole tends to value the individual, special, expressive and localized, exclusively.

EDWARD DURELL STONE: To some architects, redwood is God's greatest gift to man. To others, plate glass has a place today that Pentelic marble did in the time of the Greeks. The plastic possibilities of concrete enables others to ground great blimp-like structures. Steel in tension holds another architect's world together. All of these points of view are healthy and enrich our basic vocabulary. I find that I am not given personally to flexing my structural muscles in public, and I am content to hobble along on the old post and beam, which still seems to have possibilities.

T.H.C.: ***Is there, then, no "basic responsibility" to exploit technological improvement?***

PERCIVAL GOODMAN: The degree to which a technological improvement is exploited depends on what the society is seeking. In classical Alexandria, slot machines were invented but used as toys. In darkest Africa, highly elaborate wood-carving methods were developed and these had top importance in the life. For the architect, technological improvement per se is neither good nor bad for it is a means; he selects what is appropriate. The gift lies in the ability to select, modify, and when called for, re-form the available material to suit his purpose.

HARRY WEESE: Technology promised more for less and in most ways it performs, but there are notorious examples of the king who wore no clothes. As soon as we shake out the claims and counterclaims and put the manufacturers in their place, we

STATE OF ARCHITECTURE: PART III

will restore the prerogatives of design decision.

T.H.C.: ***Since much of present-day "technology" in building stems from "the manufacturers," in the form of mass-produced products and components, how do you feel about this particular point? Has mass-production of elements been harmful or beneficial to design?***

L.L. RADO: Mass production, like any tool, if used creatively and with discrimination, is useful and beneficial.

ODELL: It has assisted good design.

WILLIAM W. WURSTER: Many improvements have come through mass production, it seems to me.

WILLIAM CAUDILL: Much good has been done, yes, but some harm.

WELTON BECKET: One of the harmful phases has been the creation of sameness or similarity of approach. One of the gains of mass production is a more favorable cost.

PEREIRA: Most blessings are mitigated ones, and this is no exception. But the good that has resulted from the universal availability of superior building products far outweighs the incidental evils of monotony and imitation.

NELSON: Has there ever been unmixed blessing or evil? Wasn't harm and good also created by the hand production of products?

WALTER A. NETSCH, JR.: Of course both harm and good have resulted. The bastardization of the curtain wall is a prize example of harm; now technical developments in steel and concrete are *good* examples.

RALPH RAPSON: To say that there has been both good and bad in design as a result of mass production of products would seem to be simply an evasion of the question. However, this would seem to be the case. Probably the harm that results from mass production of products is due more to the inherent lack of good design or proper understanding of the material or problem than to the fact that it may be mass produced.

FRED BASSETTI: There were great, good lessons to be learned from the production methods and consequent design of the Model-T Ford. There are equally important negative lessons to be learned from today's abominable styling of most of Detroit's cars. Henry Ford's genius has been totally lost on his grandson.

EDGARDO CONTINI: It costs just about as much to produce a bare stall to shelter a car in a parking structure as it costs to assemble and market its powerfully mobile and richly endowed inhabitants! . . . There have undoubtedly been products to which mass production has brought both good design and economy, thus increasing availability for our enjoyment. In general, however, the divorcing of the designer from the producer and the loss of the feeling for material that the craft engendered on the designer-craftsman have had a damaging effect on the ultimate environmental design.

CHARLES COLBERT: Eventually good must come from mass production of products, but not mass production of *all* products.

GOODMAN: To produce vacuum cleaners by hand would hardly be worth the trouble, and, contrariwise, who (except our Civil War ancestors) would mass produce monuments to heroes?

T.H.C.: ***But what about the effect on that architecture which is not monumental?***

LAWRENCE B. ANDERSON: The most effective architectural achievements consistent with high technology have been highly organized group efforts on large projects. At their best, these projects express eloquently the great power, scale, control, and productivity of corporate life, affecting both the corporate client and the corporate architect. But there is not enough room in such activity for the highly creative individual who is so often a nonconformist. Therefore, much of the work of our most valuable and brilliant men (Aalto, Corbusier, Kahn) expresses a repudiation of mass production, standardization, and machine slickness and finesse of execution. We need these works to keep our perspective on the reality of human existence, yet who can avoid confusion in the confrontation of Ronchamp with Seagram?

I believe the chief issue here is not what technology has done to our building materials and construction techniques, but what it has done to our social framework and our ways of thinking and working together.

A. QUINCY JONES, JR.: Mass production of products can no more be blamed for poor design than the automobile can be blamed for poor city planning. Mass-produced products and the automobile are here to stay; therefore they become "factors" in the statement of the problem to be solved. . . . Today's technology should open the way to new and exciting ways to good design and a liveable environment.

VICTOR GRUEN: Technology and sociology will both play a decisive role in architecture. Sociological needs for fast and inexpensive construction, better facilities to house, teach, and give working space to ever-broadening segments of the population force us into mass-production methods. Technological developments simultaneously will make this mass-production development feasible. Inasmuch as it is senseless to stem the tide, the architectural profession will have to take on increasingly the responsibility for development and design in the field of prefabrication of complete housing units, or elements of prefabrication and mass-prefabrication methods in all other fields of architecture.

The effect of mass production and prefabrication is necessarily that the importance of the individual building, as a design expression, declines. Simultaneously, however, the importance of another creative activity grows. As the urban population of the world grows dynamically, distribution of wealth over broader masses in all parts of the world, including dark Africa, spreads, and therefore cityscape and landscape become more and more crowded with man-made facilities. The solving of problems of organizing individual facilities and groups of such facilities in relation to each other becomes increasingly urgent. Here is a tremendous, fertile field for the application of creativity and imagination, for the giving of form and aesthetic and spiritual content.

CARL KOCH: If architects were able more often to think in terms of groups of buildings instead of single ones, they could spend less time worrying about infinite variety of surface treatment and obtain with a standardized skin treatment a much more useful and satisfying variety. . . . As we live longer and increase our living standards, we also increase the number of dwelling units per population unit. . . . The increasingly obvious answer is industrialization.

RICHARD STEIN: There has been an overburden of nonessentials and diversions loaded onto the clarity of the earlier architectural work of the modern movement, in addition to a most rapid and worthwhile improvement in the techniques of building with contemporary materials. The use of these techniques, though, must be the object of our constant critical concern. There is a tendency in the curtain wall, for example, to overwhelm and negate the substance of the building, denying the great statical reality of the interior spaces and slabs and columns and vascular systems that penetrate into all spaces. What is in itself a powerful, assertive, multicelled organization of volumes can become trivial and decorative when a reflective membrane is spread over all of this, even with a lacelike embroidery of metal tracery. There is the great contrast between the virility of the Pirelli building under construction and with the lattice of scaffolding and its final domesticated appearance. When this tendency is fostered, as it was in the Lever House by setting beams back so

that nothing internally revealing appears on the façade, one tends to lose even the forthrightness of the skeleton.

CRAIG ELLWOOD: Structure is the only clear principle. And by "structure" I do not necessarily mean the steel or concrete cage. I readily accept and greatly admire the poetic structuralism of Nervi, Candela, and Torroja, but these men work within structural, mathematical, and geometrical disciplines and each works within a culture and economy compatible with his plastic concepts. "Discipline" is the key word. There must certainly be something beyond arbitrary decisions. There must be some underlying force that motivates the forms of architecture. The moment form becomes arbitrary, it becomes novelty or style; it becomes something other than true architecture. Form must express logic, meaning, and rationality; it cannot exist by itself. And structure through technology is the only means to valid form.

Materials and methods will change, but the rules must be timeless. As architects, one of our main tasks will be to apply with sensitivity the new machine technologies and to find valid structural forms for the new materials—because only through structure can we create new architecture.

ROBERT A. ALEXANDER: As do-it-yourself curtain walls and meccanoset architecture appears to take over, we will need the art of the sculptor and the ceramicist in building design as never before.

STEIN: The scale of building, the tendency to overwhelm the individual, makes necessary an analysis of how technology with its demanding repetitiveness can be used intelligently, but not in a way that makes unimportant the act of going through the space, of participating in it. There is more than nostalgia in the fascination of walking through a town like Viterbo with its marvelous variety of spaces and details. There is, when one analyzes it, a unity of material, a continuous ground plane, an interval of detail related to the pace of walking, a spontaneous variety resulting from the technology of the time, an inclusion of sculpture in capitals, fountains, cartouches, monuments, always within the fabric of the whole space—defining walls, and other equally identifiable elements. These have implications in our design approach today, and analysis of them can help to explain the failure of most of our urban renewal projects. To attempt to reproduce them or re-establish the scale is of course futile and idiotic.

T.H.C.: ***Is it then an improper use of technology that we object to—loss of scale, poor design of components, lack of contrast—rather than the mass-production process itself?***

ERNEST J. KUMP: I think that the present use of materials, production methods, and construction techniques employ technology to the fullest within the limitations that are imposed. By this I mean that the use of technology to its fullest cannot go beyond progress in development of many other aspects of a society. In other words, labor conditions, building codes, custom and tradition must all progress simultaneously with technology or it cannot be fully developed. We cannot isolate technology from all of the factors that are involved in its successful application. Mass-production techniques without proper architectural leadership can only result in chaos as far as design is concerned. However, with the architect assuming his proper role, mass production can only be a great aid and benefit to society.

PAUL SCHWEIKHER: Manufactured materials made methods of production go one way, architecture another. It is logical to search for an idiom in the rolling of steel sections or in the stressing and casting of concrete, but what of reproducing handcraft techniques by machine? Here we need a sharper look at the borderline between cleverness and debasement.

JOHN J. JOHANSEN: Mass production of products is good only when the artist remains in control.

T.H.C.: ***Could the architect-designer act as "the artist" who might lead the manufacturer away from pure cleverness and from debasement to better design of components and products?***

RAPSON: There is little question but that our environment is far too often at the mercy of poor product design and questionable production methods and policies. Greater attention to design at the conceptual level is a crying need, regardless of whether this is accomplished by the architect-designer or another. It quite naturally is difficult to get the sensitive and talented designer to give proper attention to design at this level, vicious though the cycle may be, since he is often more interested, and necessarily so, in the larger scheme of things.

CAUDILL: Who cares for names? What is important is that people with design skill take over. Call them architects if you wish. Just don't let the machine design machines, at least for the time being.

COLBERT: Since I consider myself an architect-designer, my answer must be: "Naturally, if the architect-designer is best qualified for the work."

SIDNEY KATZ: In an integrated industry he would be.

GOODMAN: Plato says, "The charioteer knows most about the chariot." Does the architect know most about product design and production methods? Product design is mostly an advertising gimmick so he doesn't (shouldn't) know about that. Production methods are typically geared to turning out a product for maximum money profit, so why should the architect qua architect know about that?

HENRY STEINHARDT: Today's architect is awash in a storm of unexpected materials and methods. Perhaps he will regain control after he has been brainwashed and is assigned a fitting role in a team of scientists and stylists. Let us hope that he rises to the captaincy of this team, and it will at last fall upon him to control design of the industrial products that are in fact the basis of building design.

ODELL: . . . Yes, but by stimulation, assistance, and persuasion —not "control."

PEREIRA: The architect can best exercise his influence by creating a demand. A majority of the mass-produced building products on the market today are, in this respect, architect-designed.

RADO: He should certainly influence product design, as mass-produced components are an integral element of the over-all design. Such influence is automatically exerted by accepting or rejecting products on the market. It should also be exerted by active participation to eliminate waste motion and to advance the field in a more creative manner.

ARMSTRONG: I believe the architect does, to a large degree (possibly as much as he should), control the products that go into buildings. It is his expressed need that is recognized and leads to the new product. Plastic skylights were custom-made to architects' details for some years before they became commercially available as stock items.

NETSCH: Inadvertently, the architect-designer influences both product design and production methods. Industry often relies on the talented architect to give it "product direction." The modification of these ideas for mass marketing when the machine wins (the machine may be the actual producing machine or the taste machine or the shipping regulations, etc.) causes the trouble.

T.H.C.: ***Should the architect then try to control the machine? That is, specifically, should the architect concern himself with production methods as well as product design?***

BELLUSCHI: Heavens, no.

CONTINI: The architect-designer cannot possibly control production methods. He could—and should—control product design, but before this can be allowed, a major economic revolution will have to take place. As long as the purpose of production is production itself, as long as the wheels of industry have to be kept humming by building-in accelerated obsolescence, either in the form of rapid mechanical deterioration or by artificially induced styling decay, the designer can either remain uncorrupted, and soon lose control of design, or maintain the control (often by substituting virtuosity for creativity) at the price of personal loss of integrity.

BASSETTI: The architect-designer cannot control production

methods; he can only determine which to use. He should certainly work in the product design fi ld, and especially with furniture, because it is an unequaled training ground for the serious architect. It is like the geneticist working with the fruit fly Drosophila —many generations in little time. Design and build; redesign and rebuild; all the elements of a building problem occur in a short enough time within a project of limited enough scope so that the lessons are clarified. Working closely with both materials and machines away from the drawing board leads to an understanding that is rarely acquired otherwise.

KOCH: The connection between the architect and the manufacturer must . . . be more intimate than ever, since architectural design must move into the factory.

MINORU YAMASAKI: I think that it is up to us to use our industrial processes in such a way as to attain the type of architecture to which we aspire. Consequently, I think the architect-designer will be very much involved in the product and production methods and should be familiar with the industrial processes which, to a measure, control and affect the design of our buildings.

ROBERT GEDDES: Technology is the fundamental idea, the dynamic force in our society. The architect must be first of all the medium and instrument of our present society. The decision as to when, where, and how to introduce a technological idea is a social decision for which the architect shares responsibility. Architecture is a social decision. Our work is in part like that of the scientist and engineer, but the heart of the true architect is always closer to the poet and philosopher. I personally do not feel confused by these diverse demands: in technology, the architect's role is to interpret and to initiate.

T.H.C.: ***We come again to the question of confusion; there are so many interpretations and initiations visible today. Lou Kahn has said that "the few who are considered masters don't work like each other." This is true even in a technological sense. Why is this?***

LOUIS I. KAHN: I think it is really the multitude of means at our disposal.

T.H.C.: ***Do you think it has been the "multitude of means" that has separated Mies, Le Corbusier, and Wright?***

KAHN: I think the fascination of steel is Mies; Mies is steel, he is associated with the material itself. Mies knows nothing about space; he knows about steel and glass. His work comes from a fascination with this craft, and his sense of perfection. Le Corbusier is a Renaissance man: the architect, the sculptor, the painter. He is very conscious of spaces and what space can do. He works in concrete, a fluid material; to him, concrete is a thing he holds in his hand like a piece of clay, and molds it the way he wants to. And he has truly an international sense of some great explosion that will bring architecture a kind of new freedom. He above all others. Wright, in my opinion, was a man who knew art; he was the best architect of the 19th Century. I think he had a very romantic and a very necessary sense of space. But the way he handled it, I'm afraid, was too highly personal.

T.H.C.: ***Kahn speaks of Le Corbusier's use of concrete as a "fluid material." Is there a general feeling that concrete technology frees design more than other basic construction materials?***

PEREIRA: If this means, can you design trickier structures in reinforced concrete than in steel, I suppose the answer is yes. But the basic restriction . . . is the imagination of the architect. Is there a great architectural concept on any drafting board today that cannot be realized because of the limitations imposed by the present state of our technology? I doubt it.

BASSETTI: Reinforced concrete . . . is limited in shape only by the economics of formwork; the reinforcing can be bent at will. It does not corrode and is inherently fire resistant. Because of this combination of properties, its possibilities are tremendous, but the danger is that we still tend to *seek* certain forms rather than first to solve the functional problems and let the forms manifest themselves.

ALDEN DOW: A plastic material such as concrete adds to the flexibility of our structural materials as well as their textures.

WURSTER: Concrete, with its precast, prestressed, and presurfaced panels offers much now and for the future.

COLBERT: Concrete probably offers less restricted design possibilities in visual terms, but in my mind it must be a much more exacting design process than most of the recent buildings indicate.

KATZ: At present, our native concrete technology is still not developed for mass use and therefore not less restrictive on design possibilities. When this technology becomes more universal, as in Mexico, Brazil, Italy, Spain, etc., then we will see less restrictive design possibilities.

GOODMAN: Consider the sculptors who have a free choice—David Smith, Ibram Lassaw, Herbert Ferber work by choice in metal rods, tubes, or sheets; they don't think their work could be better if they used concrete. Jacques Lipchitz' and Henry Moore's plastic is such as to call for more solid forms: stone, concrete, casting. Could it be otherwise? As I've said, the artist picks the appropriate means to suit his end. All means are appropriate to some end. For example, the hydrogen bomb is the appropriate means for getting from the biblical sixth day to the first.

STEIN: This brings us back again to a basic factor in judgment—appropriatenesss. For certain types of structures, concrete has obvious advantages. Where spaces are required that would force an unnatural use of steel, or where the economy of masonry is sought, concrete with its special tactile and volumetric characteristics can be employed. However, when one can achieve the plasticity of form in concrete only by building enormously intricate formwork, as occurs at Saarinen's TWA building at Idlewild Airport, there seems to be an imbalance between means and end. In the hands of Nervi, the technical method of accomplishment is always felt as part of the total solution.

YAMASAKI: I am almost totally committed to precast concrete because I believe that through its means, which are much less restrictive than metal processing, the architect is able to contribute to the art of his time. In this way we become masters of the machine, rather than letting the machine dictate design.

WEESE: The materials lobbies turn the heads of some architects, but when the economic truth is known, we will find ourselves entering the Concrete Age. Extruded and precast buildings will exploit the plastic possibilities of concrete in a way which gives us every technological advantage without cramping our style. This age will be the age of concrete, glass, and plastics, and a tradition will develop around the disciplined use of these permanent materials.

GEDDES: I believe that our recent experience in precast concrete technology is influencing our attitudes on metals and plastics, and on the mathematical processes in complex geometric and topological problems. We feel personally responsible for the technical development of the prefabricated units, the forms, the finishes, the ways of erecting and joining, the provision for various services. With great precision, the form of the structure is generated by the repetitive use of one or more prefabricated elements. These elements may be rectangles, triangles, or other polygons which can be linked together in co-ordinate or rotational systems. Mechanical services, lighting, and acoustical solutions can be made integral parts of the prefabricated units, or introduced in the joints between the units.

T.H.C.: ***This approach to precast concrete, with its "repetitive use of one or more prefabricated elements," would seem to lead to the same modular design approach that a steel frame implies. Does a repetitive structural system restrict design?***

RAPSON: In a general way, the production methods due to the inherent properties of metals are more "restrictive" than those generally associated with contemporary concrete technology—more restrictive in the sense that "free," "plastic," nonrepetitive design

has been more costly in metal tooling and production.

NETSCH: The only restrictions are our prejudices or lack of imagination. This statement must, of course, be tempered in the case of concrete by the fact that concrete as a conglomerate depends on steel as part of its technology. Obviously, concrete has an "in situ" advantage and a "break-the-mold" advantage in production. And the statement must, of course, in the field of metals, be tempered by the restrictions by code for fire protection which inhibit some visual possibilities.

NELSON: All materials, from the beginning of time, have simultaneously restricted *and* offered possibilities.

T.H.C.: ***Have the plastic possibilities in the use of metals been sufficiently studied and exploited?***

JONES: Stock metal sections of steel, aluminum, and other rolled, cast, or extruded metals are restrictive only because they are taken too literally—without imagination—on the part of the designer.

CHERMAYEFF: . . . It is quite patent that the technical utility of the curtain wall is such that you must produce an art form out of it. The trouble is that it became depreciated due to the attempt to make it an exclusive art form, rather than using it as a useful tool.

RADO: Any material and technique used to the exclusion of others is restrictive and harmful. Only the selective use of the most fitting technique leads to good architecture.

T.H.C.: ***What will likely be the attitude of the architect toward steel and other metals in the period ahead? Will he search for new forms in metal; will he work within its present limitations; will he consider those limitations too restrictive?***

BELLUSCHI: Nothing restricts a good designer.

CONTINI: The use of steel and other rolled or prefabricated elements does restrict design, but certainly no more so than the limited availability of materials restricted design of any of the other cultures of the past. So while this restriction of design is real, it should in no way prevent the accomplishment of a mature and consistent architectural environment. We suffer, if anything, from a too extensive availability of design potentials rather than from too great a limitation. It is true that until the recent past the dogma of steel construction (with its erector-set, standardized meagerness of expression, codified by the AISC handbook-bible) has limited the understanding of the potentials and characteristics of other materials, such as wood and reinforced concrete. However, changes of technology (welding of steel and gluing of lumber on the one hand, and precasting and prestressing of concrete on the other hand) have tended to reverse the trend; perhaps today it is concrete, in the form of precast girders or lift-slabs, that is responsible for the most rigid architectural expressions. Yet the limitations are still far less than the potentials, and it is from the misuse of the available potentials that the most dangerously eclectic results seem to derive.

PEREIRA: How the shades of Bernini and Wren must smile as we discuss the restrictions of structural steel! Our problem is an embarrassment of riches, and most of our restrictions are self-imposed, such as the present compulsion to "articulate" the structure of our buildings. If we let the materials themselves determine our design, rather than the reverse, then naturally they are restrictive. But the decision is up to us.

COLBERT: Steel is no more limiting than any other of our material fabricating systems.

BECKET: In fact, the use of steel and other rolled, cast, or extruded metals has lent flexibility to design approaches, and the limit of their use has not been reached.

BASSETTI: When one limits oneself to the use of steel and other rolled, cast, or extruded metals, his designs, if logic prevails, will certainly reflect the character of these materials. This is only proper, and to this extent they may be called restrictive. No sane designer would want buildings of steel to look as if they were made of stone or concrete. Nor can concrete properly be made to look like steel. All materials may thus, in a limited sense, be said to restrict design.

STEIN: The use of any material necessarily restricts design. And yet, materials are not the only limitations. The freedom of the designer is curtailed by a list of factors too extensive to enumerate fully. Just think of the limitations imposed by property lines, building departments, clients' programs, budgets, state of technology, soil conditions, zoning ordinances, review and approval procedures and professional preconceptions. This is not a wholly negative state of affairs. The appropriate use of material has a positive quality of satisfactory design that results from the recognition of the limitations in a particular situation. If there is a building need that present materials cannot fill, it is quite probable that a new technique or material will be devised, providing the need is a real one.

T.H.C.: What new techniques or materials do you foresee at the present time?

CAUDILL: We need some meat and potatoes, like rustproof steel, crackproof concrete, fadeproof paint, and weatherproof, fireproof wood—plus practical plastics.

BASSETTI: I would expect great development in the field of composite materials. Unthinkable advances may be made in the production of materials with presently unknown property combinations through the work now being done at a tremendously increasing rate in solid-state physics. The new materials will first be used in highly sophisticated military and engineering applications and only later will become economical enough to be used in the building field.

BECKET: Plastics are being developed and probably will be further developed, as will glass and related ceramic materials. Moreover, the use of post-tension stressing of materials such as granite and marble is becoming a reality.

ODELL: The important developments in materials and methods continue to be in reinforced concrete and plastics.

DOW: Plastics are contributing in many ways as a building material. Almost all building products and materials today somehow are influenced by these new plastic products. I look for plastics to give us a hard-wearing floor finish; a clean plastic plastering material that sets within seconds when applied with a gun; a new exterior surfacing material for our buildings which absorbs heat in cold weather and reflects it in warm weather; a new kind of bathroom which does not require a city sewer connection; prefabricated building modules small enough to provide flexibility in the form of the building.

CONTINI: Undoubtedly, plastics will play a more and more important role in the building field. As it becomes possible to duplicate artificially the physical or chemical characteristics that have been, so far, available only through natural materials, it is obvious that the use of synthetics will find greatly enlarged scope in the coming year. This will result in the development of new techniques and forms made possible by the new material. So there will be one more distraction, one more temptation to delay the definition of architectural form for our environment!

RADO: The problem is to digest our new technical developments properly.

STEIN: . . . We live at a time of technical flowering. For every material we digest and learn to use, ten additional ones become available—stronger metals, new adhesives and sealants, plastics, old materials in new dimensions, new erection devices, etc. This assures, I think, that no crystallization of style or technique is imminent. The danger to architectural design is the tendency to reach for these—to reach for their novelty without understanding or purpose.

OSCAR NITZCHKE: With the advent of new structural materials, we now have unlimited possibilities for new expressions, but fortunately there is always a limit. Take the example of the Gothic masters, who with stone, a material of great weight and bulk, solved methodically and definitely the double problem of stone setting for penetration-vaults and their equilibrium. . . . Excited by obstacles, they went farther and farther; they could not stop. Only when they faced the impossible did they abdicate, but before that they brought

out of the method all they could produce with it. Optimists are saying that from the atavistic construction principles of bearing and loading, construction literally is exploding. Fortunately it is not. It would be more appropriate to state that it is flying, or sliding, or undulating, or avoiding rigidity in form, by fluid continuity between members that serve different functions, which leads us to the conception of the structure as a whole. Construction is still on the ground, even though it rests there by only one point. Although considerably reduced in our time with the new structural materials and science, there will be always a limit.

GOODMAN: It depends on where you're going. In the underground testing that was done in the desert, the following occurred: within a millionth of a second after the explosion, a chamber was formed 125′ in diameter surrounded by a 4″-thick wall of fused glass. Now what about that for a building method in the atomic age!

T.H.C.: ***This may not be as farfetched as it sounds. Do we see any truly radical new developments—beyond plastics, for instance, which so many have mentioned?***

NETSCH: The tension structures, and more flexible basic materials (especially sheet—homogenous and woven).

JOHANSEN: Enclosure of city-sized conditioned spaces.

KATZ: The field of highly developed scientific advances, such as airplanes, rocketry, etc., should indicate new directions and possibilities.

RAPHAEL SORIANO: Now we can test before we build, and build after we have tested, with methods which seem magical to most of us—but not to the man of knowledge. He knows the reliability of his instruments—electronic brains—which in a matter of minutes produce for him the answers that would have taken months or years of mathematical work in the past, with great possibility of errors. These wonderfully sophisticated devices can be fed problems of stress, analysis, assembly, and other working conditions.

MIES VAN DER ROHE: We are not at the end, but at the beginning of an epoch: an epoch which will be guided by a new spirit, which will be driven by new forces—new technological, sociological, and economic forces—and which will have new tools and new materials. For this reason we will have a new architecture.

BUCKMINSTER FULLER: A few decades will see such changes in world man's mode of living that only his increasingly well cherished examples of the historical artifacts will remain to remind us of 1960 and all the years before.

CONCLUSION:

Once more, this group of architects seems to arrive at a mixed conclusion. There are no restrictions on design because of materials or technology: concrete is desirable because it is "fluid" or "plastic"; steel and the other metals offer no real restrictions to the "imaginative" architect; plastics and other now "unthinkable" construction methods "which seem magical" will furnish "new directions and possibilities." These facts produce a climate with "unlimited possibilities," which seems desirable; and yet there appears a number of times within the comments a belief that this situation also "provides one more distraction, one more temptation to delay the definition of architectural form for our environment." The word "chaos" is used again, and there seems to be a realization that a chaotic condition exists because of a lack of "disciplined use" of the technological means available; but the majority seem to be straining hard against any implication of "restrictions."

There is another dichotomy, related to this one but not precisely the same, in "monotony" vis-à-vis "a consistent environment." We must avoid deadly sameness by constant experiment, by using every technological means at our disposal; we must also solve the problem of the jumpy, mediocre environment by a sense of unity and a harmony of parts.

On the one hand, even mass-produced components must be enriched (redesigned and perhaps retooled by the architect-artist) in order to give scope to the "highly creative individual" and reduce "sameness or similarity of approach." Surely no one wants to ignore "the multitude of means at our disposal."

But on the other hand, we must accept the fact that these same mass-produced, "prefabricated" elements are essential to provide shelter for "ever-broadening segments of the population." We must take advantage of "technological elements that are more and more collective—typical, anonymous, universal in character and function." We must cease being "individual, expressive, special," in a situation where "the importance of the individual building declines." Surely no one wants to ignore this responsibility.

So the issues in architecture today do not seem to be plasticity *vs.* modularity, smooth skin *vs.* articulation, Mies *vs.* Corbu, or even steel *vs.* concrete. We will live with various interpretations and use various technologies. There will be lingering structuralism and increasing historicism; there will be emotional expressions that we will call sensualism, and there will be angry expressions that we will call brutalism. New industrialized components and new ways to use them will develop; they will jell from time to time into concepts such as the curtain wall; they will become "monotonous" and have to be "enriched"; new technologies will jell again into new concepts such as prestressed concrete—and they will in turn become monotonous and "rigid" and have to be made "less restrictive."

The Period of Chaoticism will continue. The issue is whether it will in time find its own order, discipline, and coherence. Will that vague sense these architects seem to have that there *is* some underlying principle within the confusion justify itself? And the answer, after all this discussion, seems to be yes.

Inevitability—the peculiarly appropriate choice of solution for each problem—is the dominant criterion running like a thread through all three parts of the Symposium whenever the question of disciplines is raised. Netsch said, "I would like to see a true inevitability in each area." Jones desired "the ability to state the problem before attempting a solution." Ellwood insisted that "form must express logic, meaning and rationality; it cannot exist by itself." Even Johnson, believer in the Principle of Uncertainty, mentioned his "desire for order and clarity." Geddes and Stein, among others, emphasized the need for a new understanding of *appropriateness.* And there is a use of the words *consistency, harmony, congruity.*

Inevitability might well be the underlying criterion of the thoughtful and responsible designers of this time. Inevitability: the logic of form, the appropriateness of design, the clarity of progress from problem to solution, the order that lies in totality of the creative process. This might become the broader principle that supersedes the more vague, early 20th-Century ideologies such as structural honesty and the functional source of form. Inevitability is very close to Kahn's more poetic expression that a building "knows what it wants to be," which was so fully expressed in these pages last month. The inevitable totality of creation is not far from the meaning of Wright's word *organic.* And Mies espouses above all an inevitable consistency through "clarity in *thought and action.*"

Inevitability does not imply dogmatism, nor positivism. Above all, it explains chaos—in fact, sanctions a Period of Chaoticism —by simply asking the solution to each given problem to justify itself. Each design is a (not *the*) correct, orderly, inevitable act called for as a result of its own program. Variety within the environment, variety within one man's work, is warranted—especially when relation with the environment is considered a part of the totality of the solution.

The desire to try, to search, to shock, to lead, to reach, to stimulate will continue to motivate some designers. The criterion of inevitability, or totality, or even appropriateness, will seem too simple and too obvious to be meaningful to everyone. But this is the one sober principle that emerges from the Symposium, the one described quality that might resolve the "foreground and background architecture" problem, and the question of hierarchy of design; the one that might distinguish between opportunistic individualism and creative originality; the one that might make technological choice purposeful rather than haphazard; the one, in short, that might separate the men from the boys in this Period of Chaoticism.

THOMAS H. CREIGHTON

THE SCHOOL IN THE URBAN ENVIRONMENT

City schools are the forgotten educational plants. The reasons are numerous and the consequences are evident in a variety of social and educational problems.

The innovations in school planning of the past two decades have generally not been applicable to city schools. The relatively few that have been built have shown only superficial changes in design. Building adequate city schools would involve overcoming the high cost of land, the absence of large sites, and the unpredictability of enrollments.

The School in the Urban Environment *was the title of an architectural study and conference conducted at the Harvard Graduate School of Design under the sponsorship of the Educational Facilities Laboratories of the Ford Foundation.*

The student projects explored the possibilities of combining schools with other facilities, including provisions for eventual conversion of educational space to other uses.

The conference held at the completion of the study assembled leading architects, educators, and administrators from the entire country to discuss the planning of urban schools and to evaluate the proposals offered by the students. This meeting opened up a whole range of issues beyond the initial limitations of the study, involving the critical role of the school in the field of urban renewal.

On the following pages are excerpts from the conference texts and discussions, along with presentations of the student solutions.

Lettering from a brochure designed by Peter Chermayeff

Urban schools today are confronted with major difficulties produced by congested and aging cities. The exorbitant cost of land in overcrowded urban areas severely limits the size of school sites. Shifts in population make it difficult to provide teaching space to meet long-range needs.

Till now, schools have deteriorated along with their neighborhoods, creating problems for city youth. Families who desire a better education and environment for their children move, if possible, to newer communities.

Yet city schools are surrounded with opportunities for cultural development and training that go far beyond anything suburban schools can offer. The city has museums, libraries, theaters, and concert halls for cultural stimulation, and offices, stores, workshops, hospitals, and a multitude of other facilities for occupational training.

City schools have not been built in adequate numbers and with sufficient freedom from frustrating limitations to permit progress in their design. Hence the prevailing architectural concept for schools has developed in the suburbs. It depends upon generous use of land, and leads to low, sprawling complexes that are not feasible in the city.

Recent innovations in teaching methods require variations in the size and form of spaces to accommodate the individual learner and the teams of teachers with their mechanical aids. Beyond the practical problem of creating the maximum flexibility of space lies the architectural problem of expressing human qualities in the design. A city school must provide a setting for the daytime life of thousands of children from different walks of life and cultural backgrounds. Most of their activities and contacts take place inside the building. Hence the indoor campus, the cafeterias, and the libraries are the spaces where the opportunity and atmosphere for friendly contacts must be found.

Future schools must convey a feeling of pride in the environment to combat the destructive impulses that are often vented against schools today. (Architect B. Sumner Gruzen pointed out at the conference that every New York City school must be surrounded by a steel fence, that sheets of glass are limited to sizes that can be replaced by janitors, and that glass spandrels are no longer permitted.)

Till now, public schools have not been conspicuous in the renewal plans of our cities. Slums have been cleared; new housing, commercial centers, and roads have been built; but the old public schools have been left standing, leaving education to struggle on in obsolete quarters.

Schools have been given greater prominence in the rebuilding and replanning of some European cities. In the postwar rebuilding of London, Rotterdam, and Hannover, they have become key elements of the city plans.

In New Haven, Connecticut, an ambitious effort has been made to integrate school construction with urban renewal. At the conference, Edward J. Logue, Development Administrator of the New Haven City Plan Commission, described the Wooster Square project, which involves slum clearance, rehabilitation of dwellings, and carefully related highway development. A new $2½-million school will provide a focal point for the whole neighborhood and "demonstrate to the tenants and property owners in the area that the city cares enough about that run-down place to put a brand new school in the middle of it."

Herbert A. Landry of the New York City Board of Education pointed out that the New Haven development would house only half as many people when completed as it had originally: ". . . I thought of our population of 7 million. If you redeveloped the whole area of New York City, where would the other 3½ million go?"

All of New York's current difficulties obviously cannot be solved through such redevelopment. Acting on the thesis that New York has the most acute problems of school planning of any U.S. city, the Educational Facilities Laboratory is sponsoring a study by the New York City Board of Education. Six possible approaches to these problems are being considered:

1. Provisions for conversion of school buildings to commercial, industrial, or other use as population shifts reduce the educational needs of certain areas.

2. Compensation for the lack of adequate playground area by the use of space under elevated buildings, intermediate play floors, and roofs, as well as interior recreation space.

3. Provision of space for the education of small children within large-scale housing projects.

4. Integral design of school facilities and commercial space to facilitate work-study programs.

5. Possibilities of demountable and transportable classrooms to meet changing needs.

6. Reorganization of food service programs to make use of technological advances.

As a result of these studies, the city has already published proposals for a combined commercial high school and office tower and a kindergarten-to-third-grade school in a public housing project.

The Harvard study was undertaken by a group of 24 students in the last year of Architectural Design as an eight-week problem. Their studies were limited to the exploration of shared occupancy, convertibility to noneducational use, and utilization of air rights.

The specific subject of the problem was a high school, or "center for secondary education," which would enroll students from an entire city. The programs were prepared by Professor Walter F. Bogner and Assistant Professor F. Frederick Bruck of the School of Design, with the collaboration of Dr. Cyril Sargent, Professor of Education at Harvard; John Harkness of The Architects Collaborative; and Dr. Harold Gores, President of the Educational Facilities Laboratory. The students were organized into six teams to prepare proposals for either comprehensive or commercial high schools.

The legal concept of air rights, which formed the basis of these proposals, allows for the erection of educational facilities, under separate ownership, above or below private building spaces or over public highways. Alternative legal bases for combined occupancy, such as lease-back or joint venture agreements, would not have substantially affected the architectural solutions.

The studies assumed a site of one typical city block, 250′ x 600′ (about 3½ acres), or a similar area above an expressway. The specified area is just adequate to house the required facilities in a scheme without elevators. Vertical construction would be necessary, however, to make room for playgrounds or plazas.

Five of the student designs involve combined occupancy. The first three schemes are flexibly planned to allow for reduction or expansion of educational space. The sixth design is based on the utilization of air rights over an expressway.

In most of the proposals, garages are included on lower levels for teacher and employee parking. Stores are located on the street level in some of the schemes. In each of the commercial schools the auditorium is intended to serve both the school and the private tenants.

An important consideration in the studies was flexibility in the location of partitions and furnishings. The dimensions of structural bays had to be suitable for cars in the garage, as well as for the diverse school spaces and the offices,

stores, or apartments of the shared occupancy. In most of the studies, a 30-foot-square bay appeared to be the best solution.

The proposed measures illustrate mere expedients toward the solution of immediate school needs while the city is being rebuilt. They are means for coping with a variable school population and offer special opportunities for job training in private enterprise. The economic advantages gained could be applied to improvements in educational facilities.

The long-range prospects of private or public activities sharing a project depend on the future of the neighborhood. By expanding the planning of improvements from a single lot to an area of several blocks, the advantages of shared land use could be obtained with either vertical or horizontal separation of functions. Landscaping, access, and parking could be co-ordinated to the benefit of all occupants.

Diverse reactions to the possible solutions were obtained from those assembled at the conference. Architect Arthur Q. Davis of New Orleans took exception to the concept of shared occupancy: "Anywhere else but New York these solutions would be almost unheard of. I am idealistic enough to feel they are not right even for New York. The basic premise here disturbs me tremendously, and I think it is not merely an architectural problem, but a city planning problem.

"Economically, I know this is folly, but if we can spend $10 million per mile to bring our cars into New York . . . I wonder why we can't take some of this money . . . to buy up the land to create a community."

Professor Bogner, while affirming that urban redevelopment offers the only real solution, defended the premises of the study: "We all know that every one of these schools is a compromise forced on us by the unfortunate conditions that exist in cities. . . . We recognize that educational environment should not last longer than forty years at the most, and that during that forty years the city will be in transition."

Edward J. Logue also attacked the premises of the designs: "I say that our goal should be an urban neighborhood school system on a par with the suburbs. . . . We want something that is plainly identifiable as a school, and furthermore we want to have openness around it . . . [although] the standards of openness needn't be as grand as they are in the suburbs. . . . I am therefore suggesting that our goal should be suburban schools in our urban neighborhoods.

"Why bother with multiple land use? The land is there; it can be made available in adequate amounts. There is enough work to do in urban renewal areas to take care of all the schools we want in cities for some time to come."

In one report, Stanton Leggett, New York educational consultant, took an opposing point of view: "There is no point in putting a clump of trees around two acres and saying that we are making it as near as possible to a suburban school."

His discussion group raised a challenging question: "Why can't we just take existing space in these towers or slabs . . . space that is flexible and interchangeable, and just put the school right into that space? This would be the converse of trying to give the school an identity."

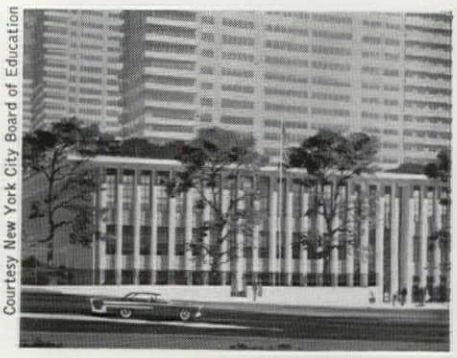
John Harkness commented further on the problem of making schools identifiable, yet flexible: "We see here buildings that are certainly a far cry from the little red school house. In fact, you might say they are nice-looking buildings, but are they schools? Just for a moment, let us think of certain well-known buildings in relation to their function. If we had not been around much, and had not read the magazines, could we really say that Mies's apartments are residential in character, whereas Lever House or Seagram's is commercial? And yet they both fit their function well. I think the point is that a building is formed just as much by its relation to land values, its city-country relationship, as by its function.

"Let us look for a moment at the city. It is a vast, living organism, housing a multitude of functions that are constantly changing, and institutions that are growing and shrinking. Perhaps it is a mistake to think of these various functions as housed in buildings, each designed to the nth degree to fit its particularized function. . . . Rather, we might think of important aspects of the urban scene as centered around important spaces. And close in around those spaces would be those more specialized functions. . . . Farther out, both horizontally and vertically, the enclosing structures would be more generalized . . . and therefore more adapted to change.

"Thus the city school might not be a building of fixed size, on a city lot of fixed dimension, and surrounded by a fence. Rather it might have its focus and derive its identity from its central space (just as the Piazza of St. Marks in Venice gives unity to buildings around

Photo: Walter F. Bogner

Photo: Walter F. Bogner



Courtesy New York City Board of Education

Obsolete schools on cramped sites are typical of our metropolitan centers. Boston Technical High School (top) *was built in 1893, enlarged in 1908. Public Latin School* (middle), *one of Boston's newest, was completed in 1932. In New York, new schools such as P.S. 199* (bottom) *designed by Edward D. Stone, differ little in site or program from those of the 1930's.*

Photo: Chicago Aerial Industries, Inc.

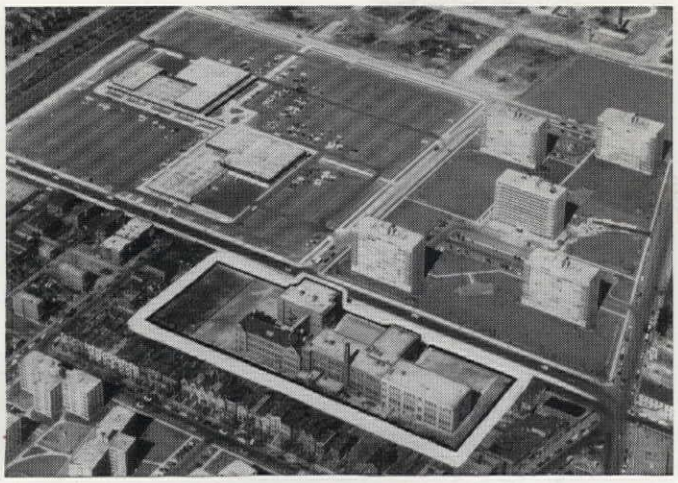
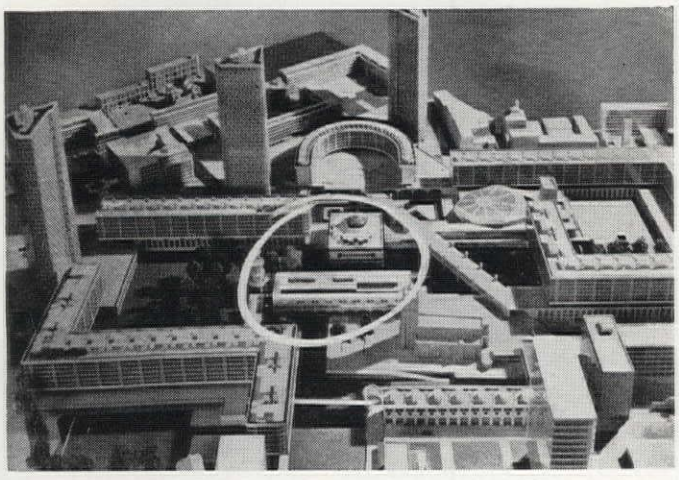


Photo: Peter Roll



Schools in this country have benefited little from recent urban renewal efforts. As land was cleared in Chicago's South Side Redevelopment (top) *investment was attracted for new housing and shopping centers, but the old school remains. The recently completed Junior High School 22 in Manhattan* (middle) *by Architects Kelly & Gruzen is no less crowded on its site, but uses the recreation facilities of an adjoining park. In London, the Barbican Redevelopment Project* (bottom) *includes two schools overlooking a pond at the heart of a 25-acre civic, commercial, and residential complex.*

it) and grow or shrink into these universal generalized structures. Actually, of course, this is happening all around us. The physical symbol of Harvard is the Harvard Yard—the space—not any particular building.

"So if we say these buildings don't look like schools, just what do we mean? They don't look like the little red school house. They don't look like the multistory old fashioned city school. They don't even look like the new suburban rambling school. Agreed. And agreed also that it is very important for a school to have a focus, a heart, the spirit of education. But to do this, I am not sure it is necessary to build a building separated from all other city structures and put a fence around it."

Archibald B. Shaw, Editor of *Overview,* said that although his committee could not wholeheartedly accept the premise of the study, it was disturbed "that no solution did anything but contradict that premise."

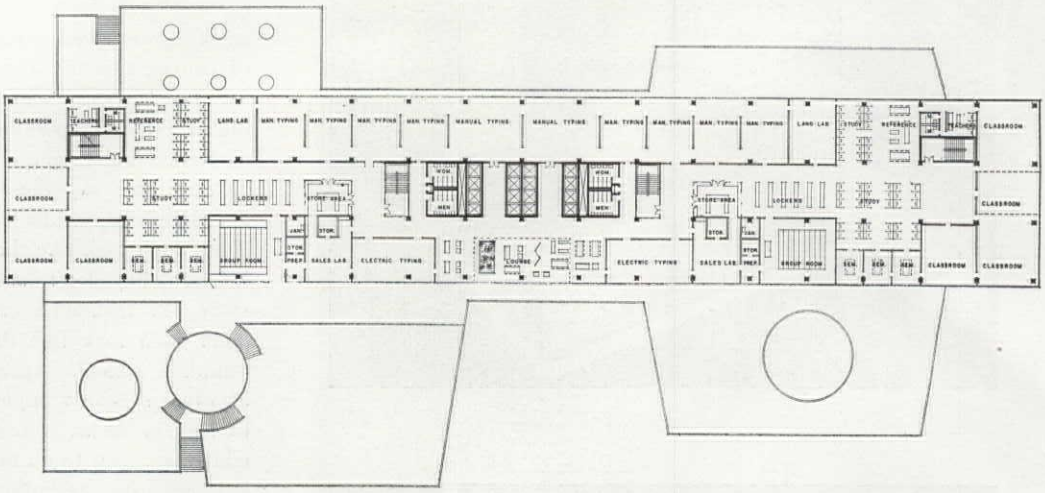
Not one of the first five solutions, he said, took into account any fundamental relationship between the educational program and the other activity included. "The school that existed under the apartment house could as well have existed without . . . it, and similarly the one that existed beside a 'trylon' . . . could have existed without the 'trylon,' so educationally there was no involvement."

San Francisco Architect John Lyon Reid maintained that these studies overlooked the basic problem of urban schools today: the failure to make use of the great educational potential of the city. "It would have been impossible," he conceded, "to deal with this at all in the limited time available to these students."

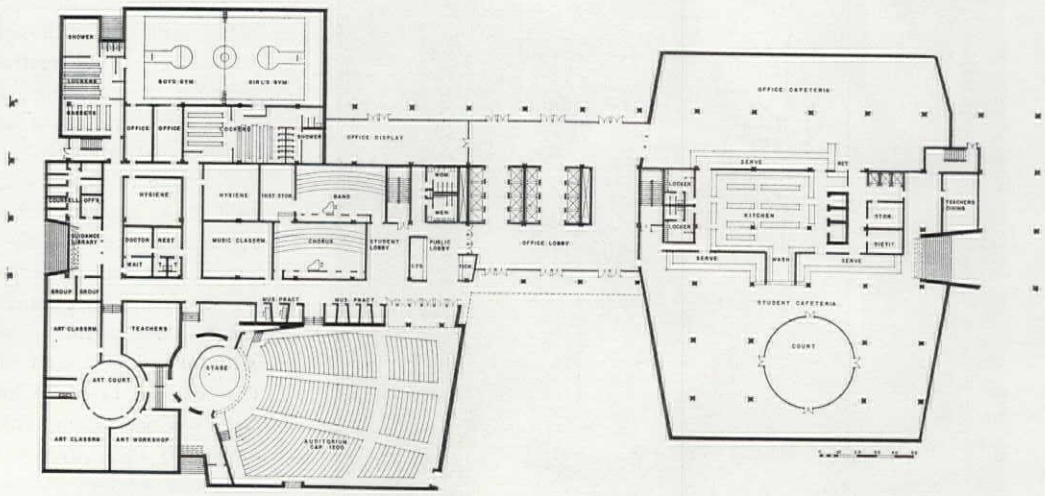
The discussions at the conference made it clear that special solutions to the problem of the urban school are essential, and that the shortage of urban land has to be taken into account. Education surrounded by steel fences, protected against the attacks of neighborhood vandals, cannot flourish.

The device of shared occupancy makes it economically possible to obtain sites of more adequate area in better locations. Although long-range solutions lie beyond such expedients, they may, if properly planned, contribute to the ultimate objective.

The conditions for a real solution lie in the large-scale application of urban renewal, which is now finding increased public support. It is essential that the school be given a major place in these redevelopment programs—not only for the sake of education, but for the survival of the city itself.

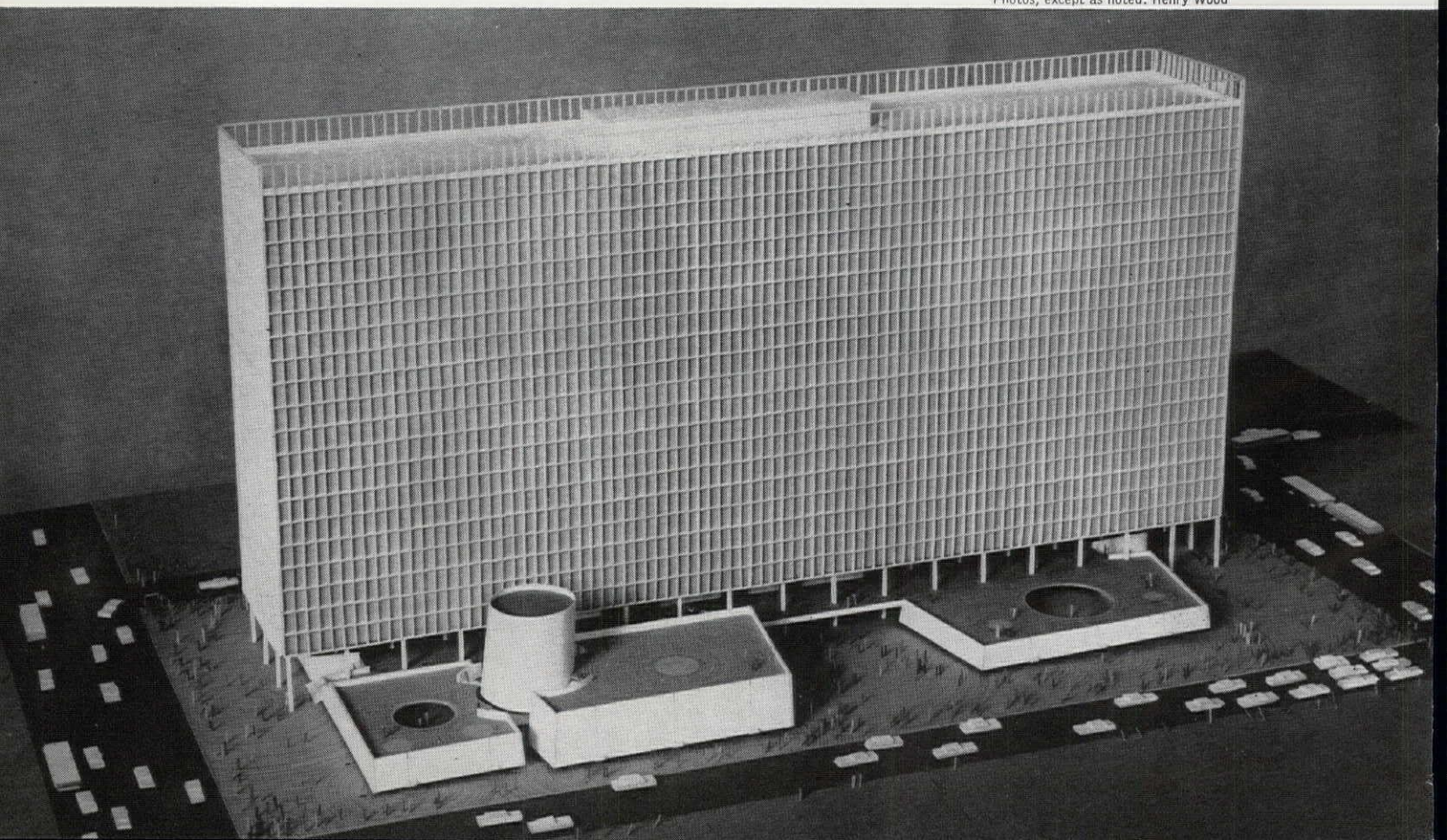


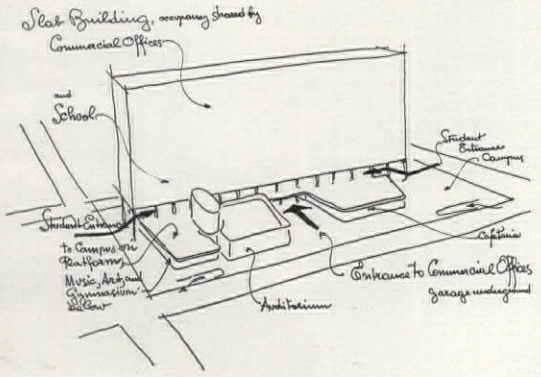
FIRST FLOOR



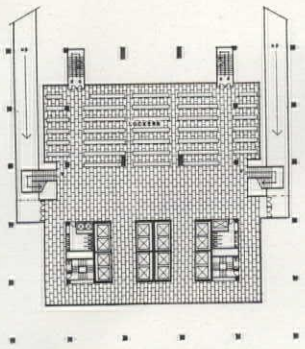
GROUND LEVEL

Photos, except as noted: Henry Wood

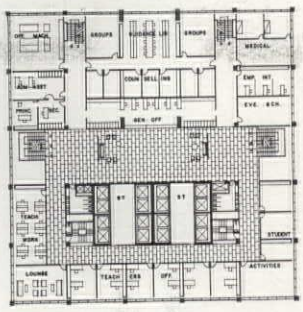




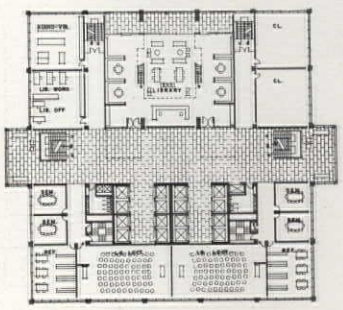
Project for a Commercial High School with Office Building by Harvard Students Bolgil, Kashian, Reynolds, and Coletti. A location in the heart of the city is advantageous for the commercial high school, since it facilitates the work-study programs that are especially effective for teaching office skills. It also permits use of the same facilities as a night school for further study by office workers. Joint occupancy with a commercial firm would help to offset the high cost of such a site. In this scheme, the ground floor houses functions with special space requirements. Of these, the auditorium and the central kitchen would be used by both school and offices. The roof area above them has been developed as a series of platforms. The school administration and library are on this platform level under the office slab. The first and second floor of the slab are devoted to teaching spaces and are similar in layout. An increase in the student body above the programed 2500 could be accommodated by incorporating the third floor of the slab.



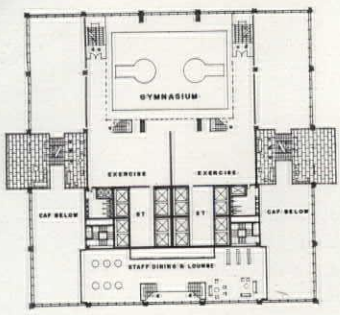
STUDENT ENTRY LEVEL



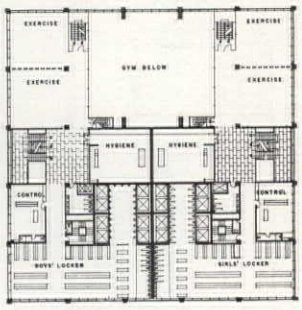
1 ADMINISTRATION



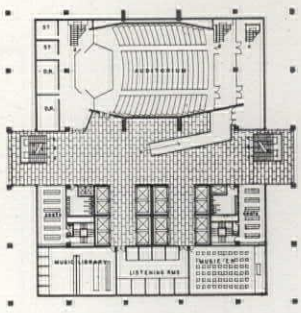
2 LIBRARY



9 GYMNASIUM

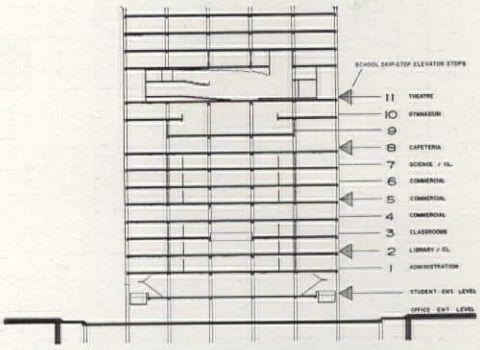


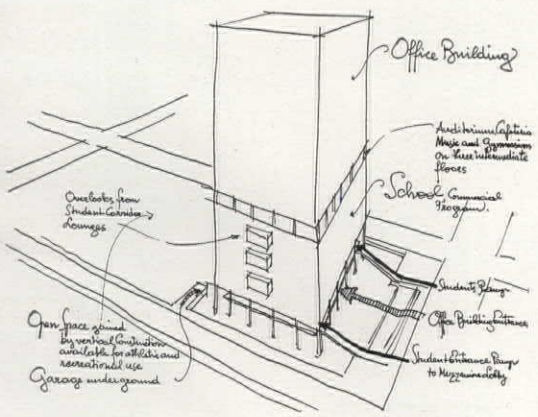
10 UPPER GYM

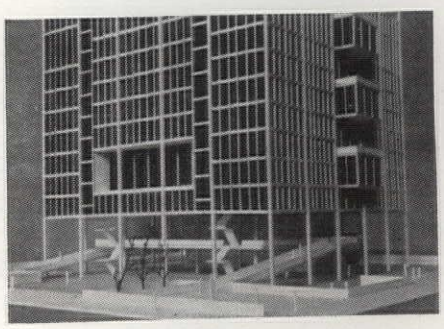


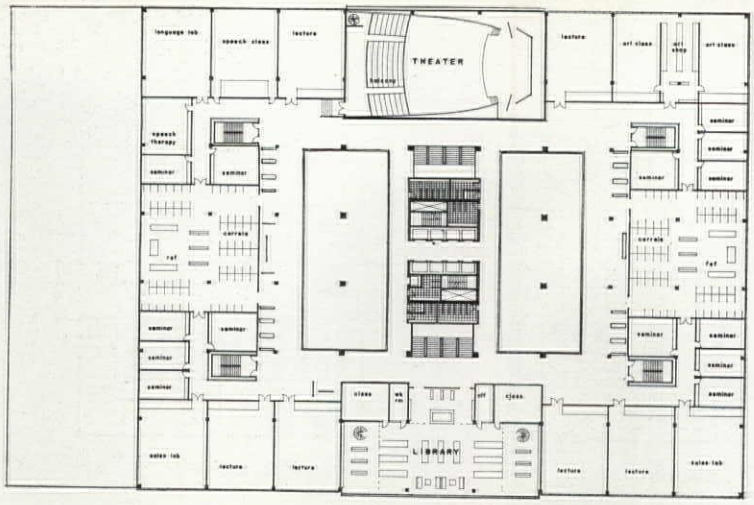
11 THEATER

Commercial High School with Office Building by Harvard Students Bakanowsky, Martin, Ticknor, and Sobin. This solution combines a 12-floor school and 20 floors of offices in one tower. The pooling of elevators is advantageous to both facilities, since the extreme fluctuation in the needs of the offices is partially offset by the relatively constant demand of the school. Controls would be so arranged that an elevator called to a school (or office) floor would operate only within the school (or offices) until idle again. There are only four elevator stops in the school. The stairs that carry the bulk of vertical movement are located in cantilevered bays. The design includes three levels of parking below ground. The office lobby is slightly below street level; the student entry level above it is reached by ramps.

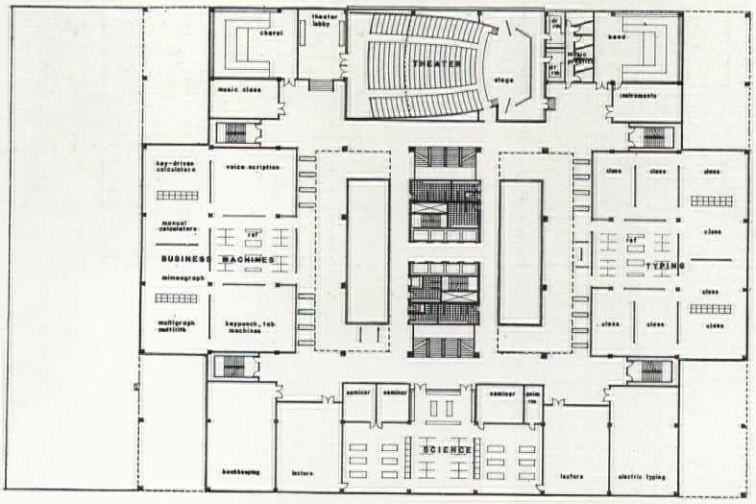




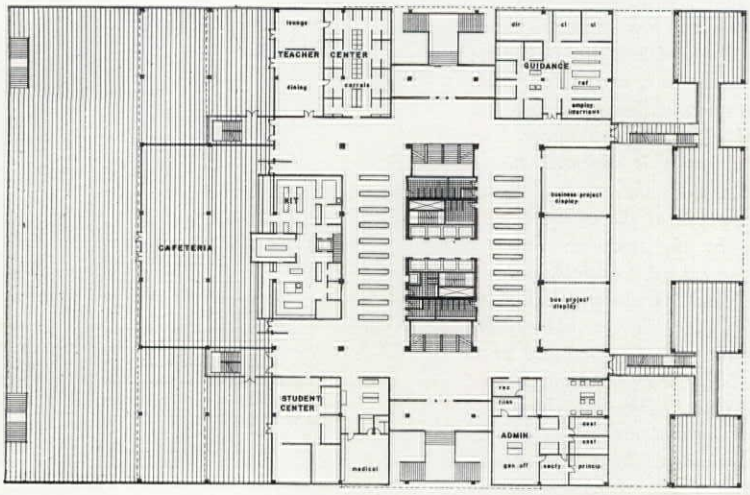




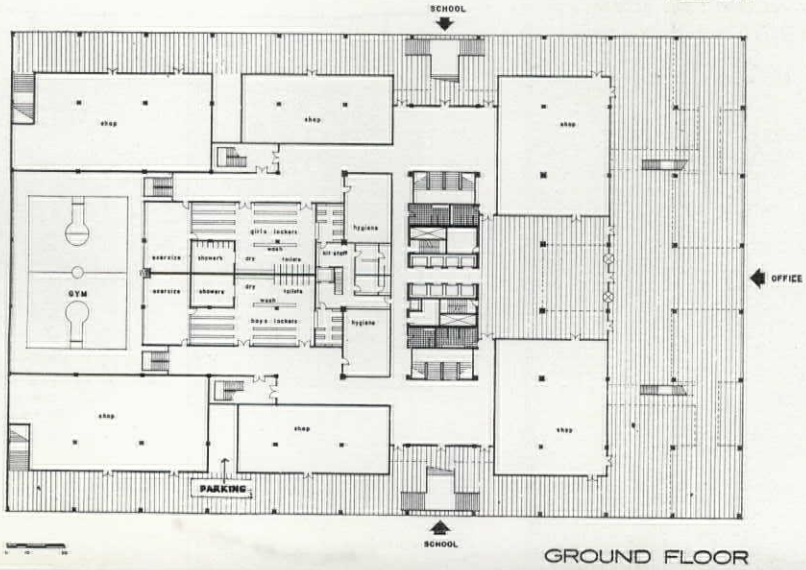
4TH FLOOR



3RD FLOOR

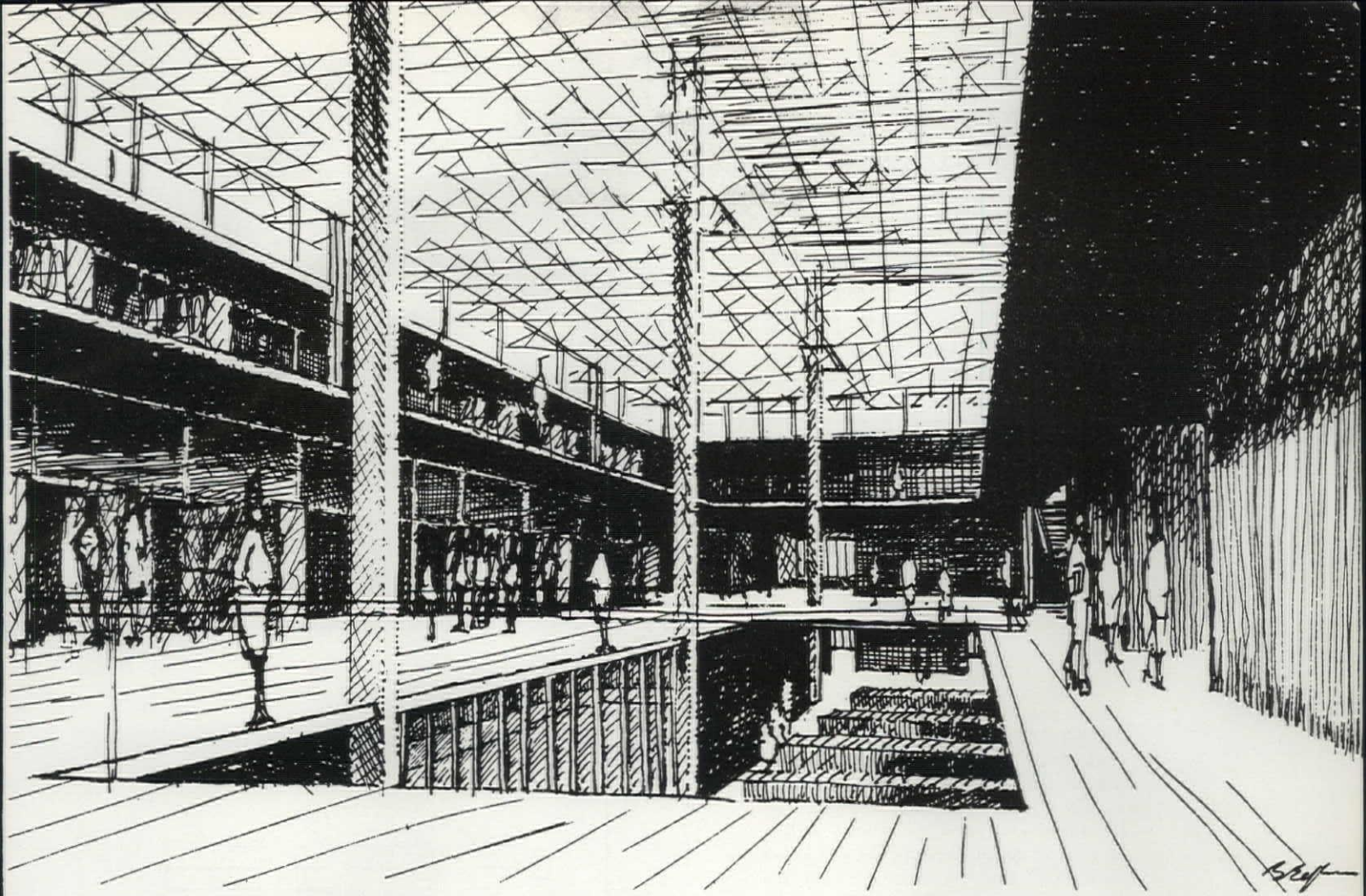


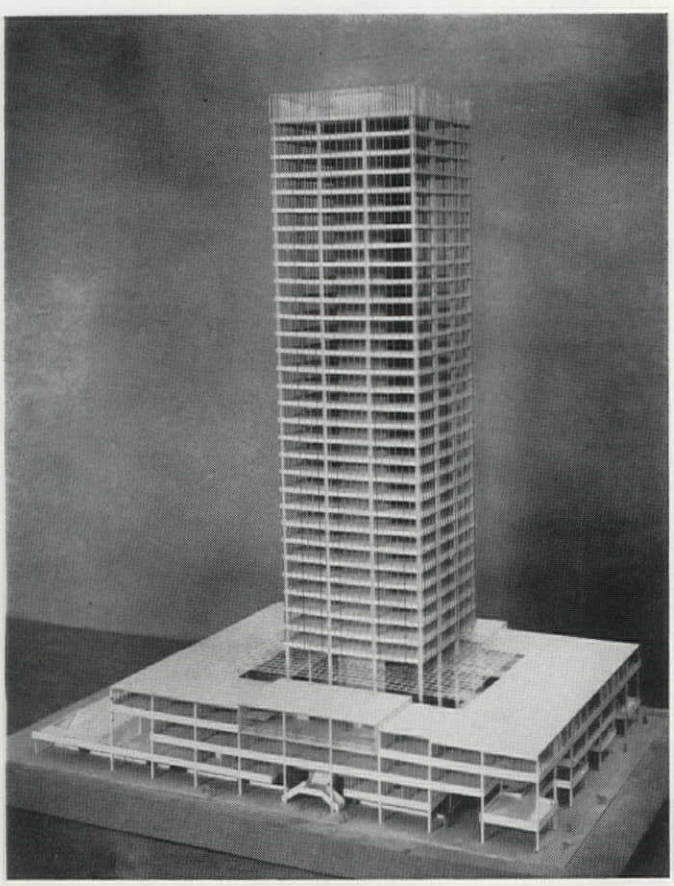
2ND FLOOR

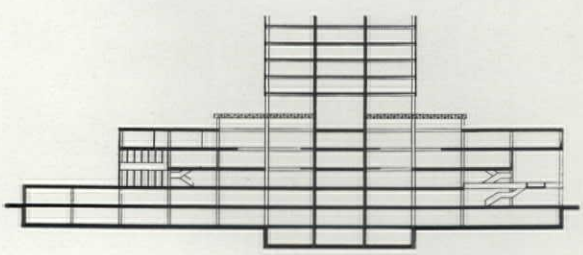


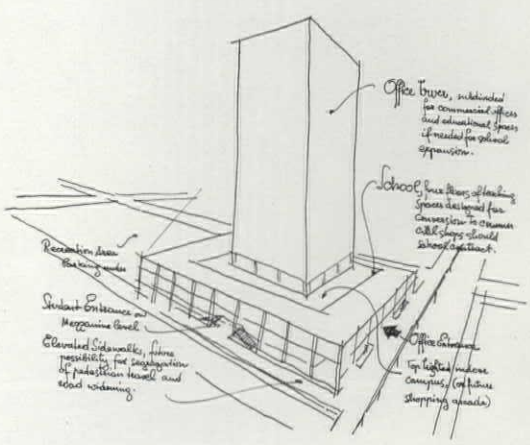
GROUND FLOOR

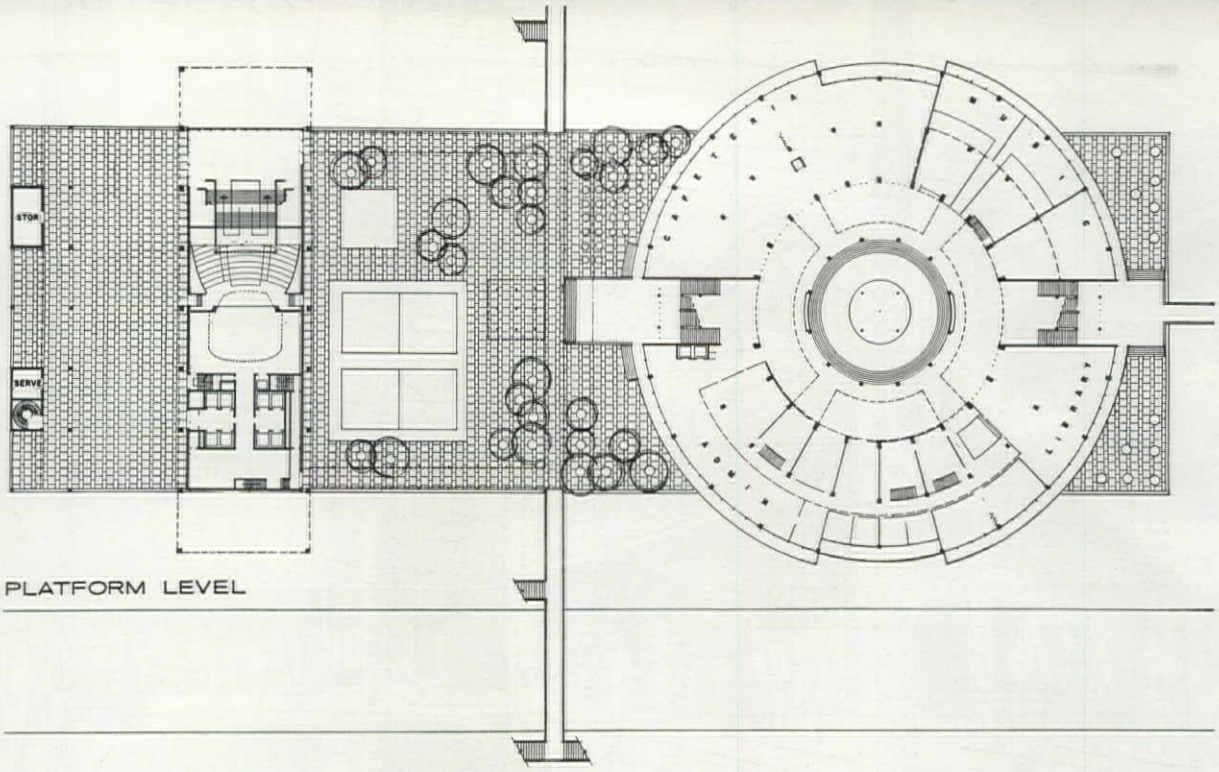
Commercial High School with office Building by Harvard Students Beyer, Wintersteen, Shaw, and Chermayeff. The possibility of converting the school into a shopping center is the basic premise of this design. Flexible spaces on the three teaching floors are arranged around large central circulation areas. These spaces, with natural lighting from above, would provide suitable gathering places for either students or shoppers. After the conversion, each distinct block of teaching space would become a shop, and the theater and cafeteria would be operated on a commercial basis. Shops at street level would remain as in the original design. The basement parking area would be converted to receiving and storage facilities. Escalators would replace the main stairs, and service elevators would be installed. The scheme is adaptable, either before or after the conversion, to access from elevated pedestrian malls.





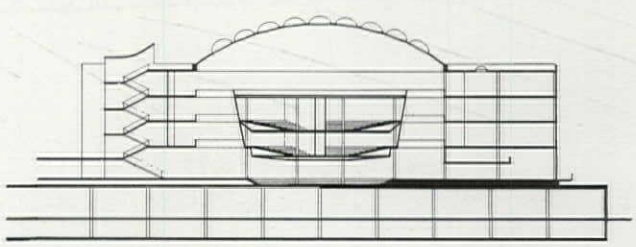


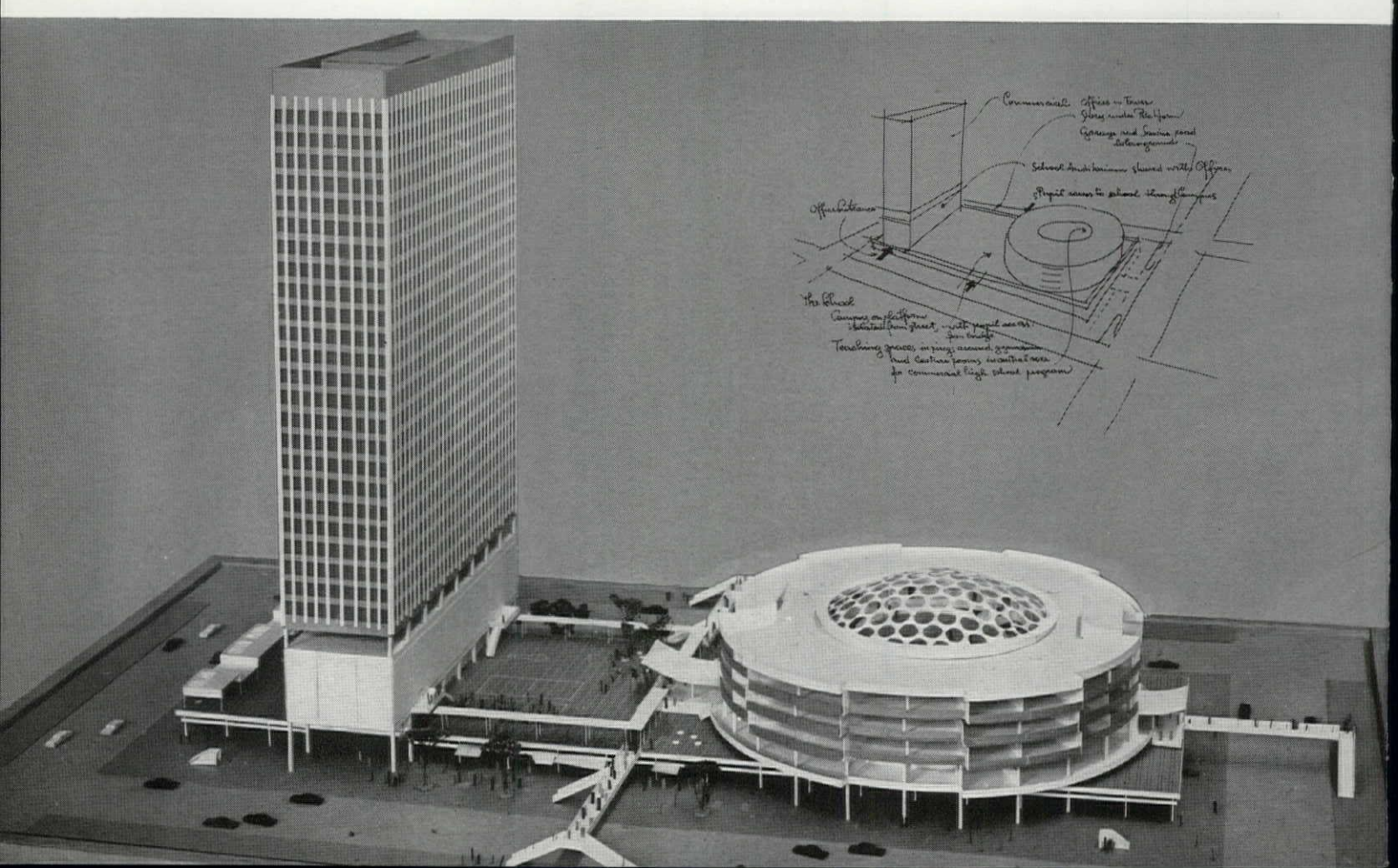

Office Tower, subdivided for commercial offices and educational spaces if needed for school expansion.
School, four floors of teaching spaces designed for conversion to commercial shops should school contract.
Recreation Area
Sheltered Entrances and Mezzanine Level
Elevated Sidewalks, future possibility for segregation of pedestrian travel and road widening.
Office Entrance
Enclosed/Landscaped Courtyard (of future shopping arcade)

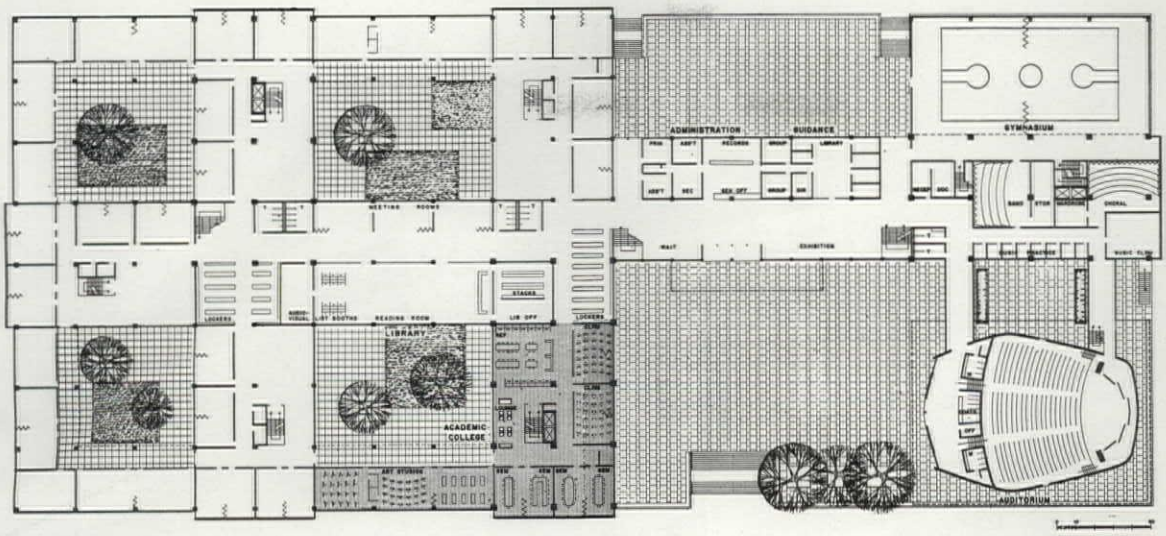


PLATFORM LEVEL

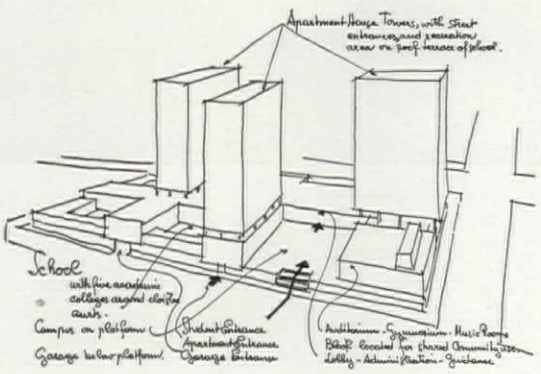
Commercial High School with Stores and Office Buildings by Harvard Students Broadhead, Lew, Shenefield, and Hollander. In this scheme, and the one on facing page, the noneducational facilities are separated from the school and could be omitted without affecting its design. Here the school is placed on a raised platform, above the noise and hazards of the street. The retail stores beneath are served by a central delivery drive at street level. The circular school wing includes a central congregating space at the platform level. Above it are lecture halls and the gymnasium. Teaching spaces are located on the perimeter. The auditorium occupies the lower floors of the office slab.



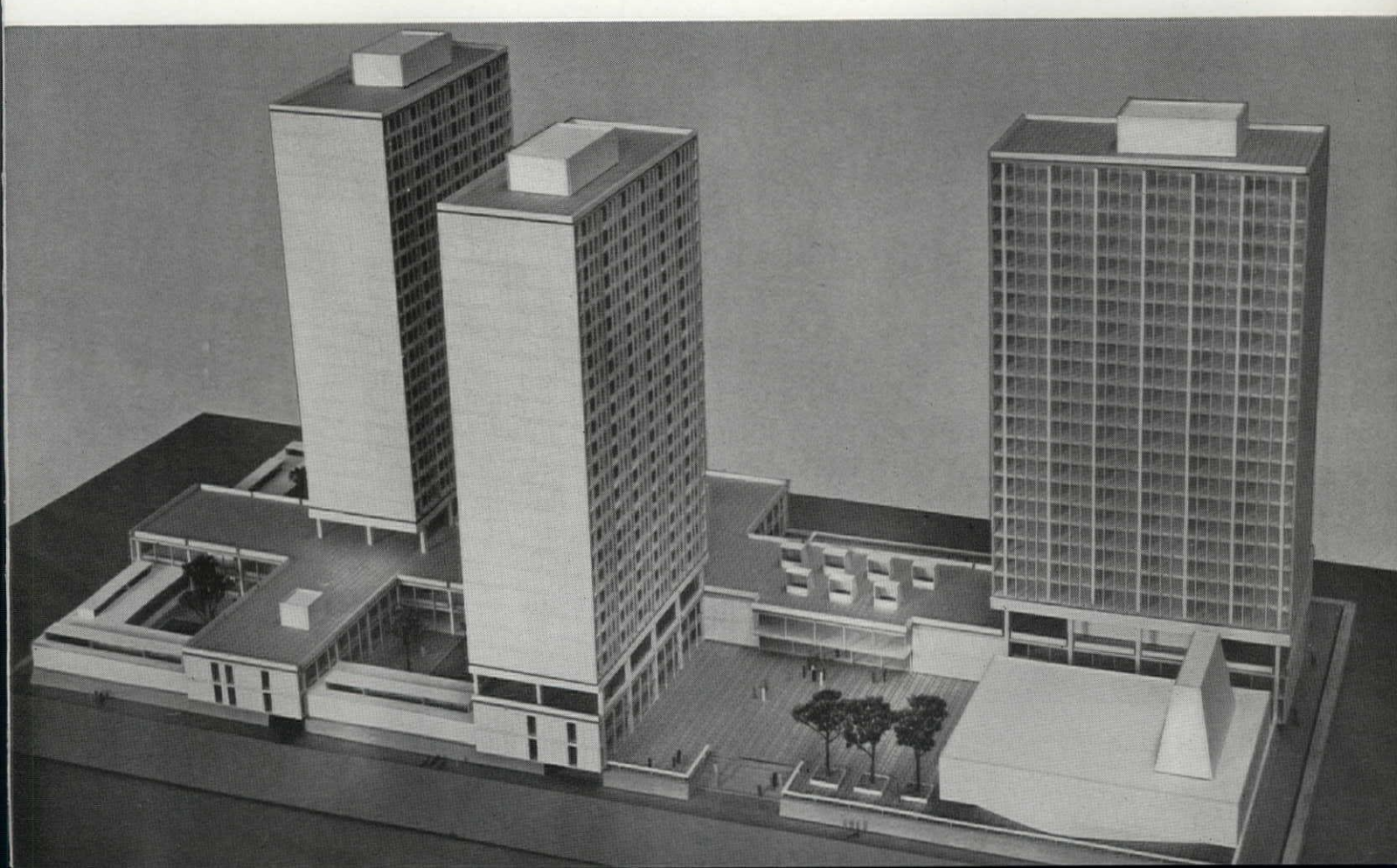


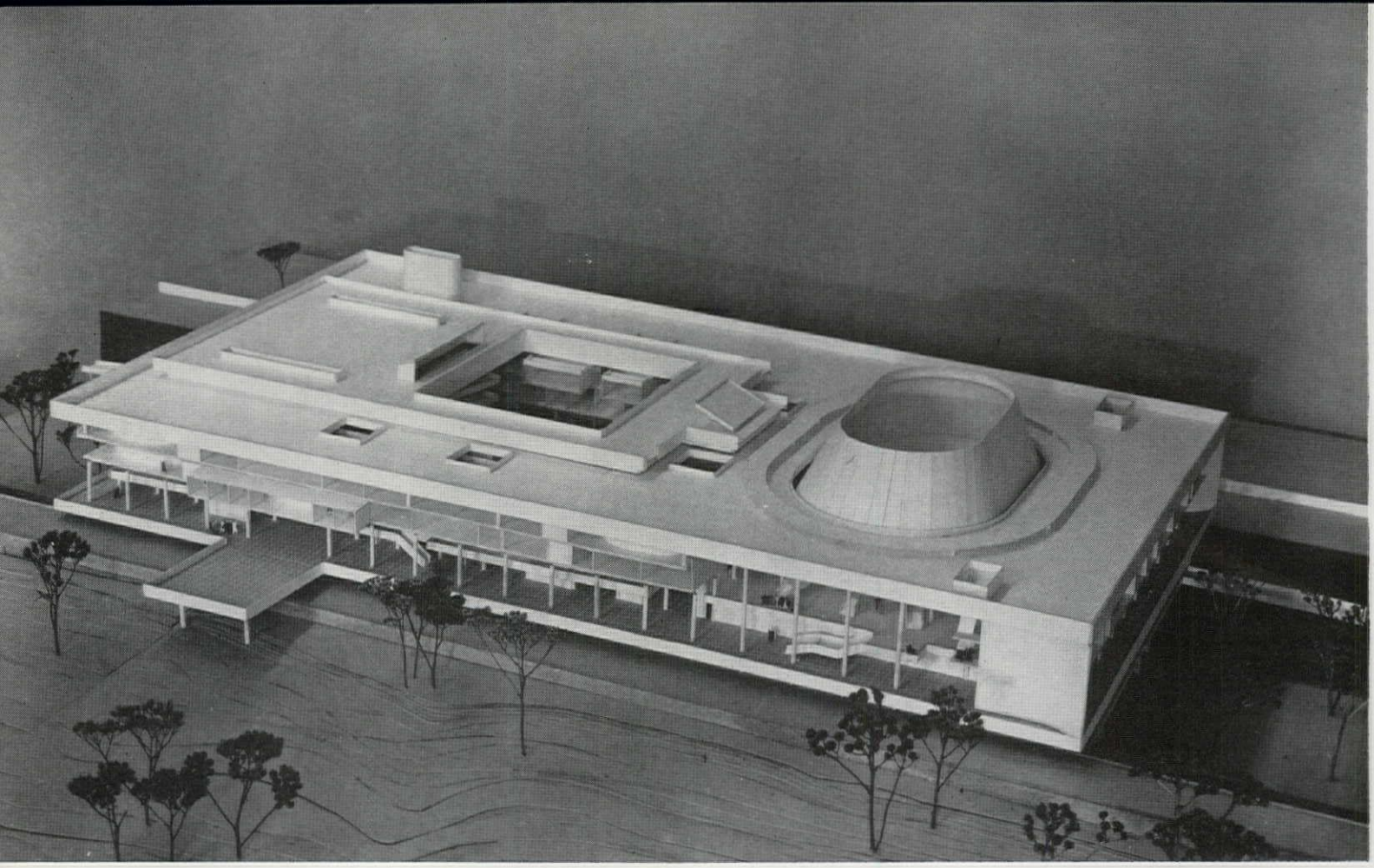


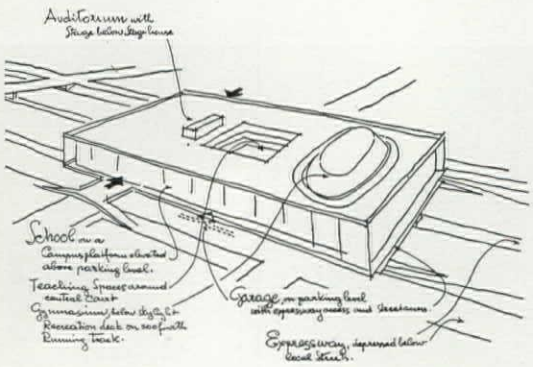
CAMPUS LEVEL



Comprehensive High School with Apartment Buildings by Harvard Students Joslin, Chafee, Lincoln, and Law. The roof of the street-level parking garage serves as a raised campus for this school. Teaching spaces on two floors face landscaped interior courts. The school roof provides outdoor recreation space for the apartments. Each apartment tower has a separate entrance from the street. Architect Herbert H. Swinburne commented at the conference that this solution was superior to the others in that it "turned its back on the city street and shut out the noise." He pointed out, however, that the noise of student activities might be disturbing to apartment dwellers.







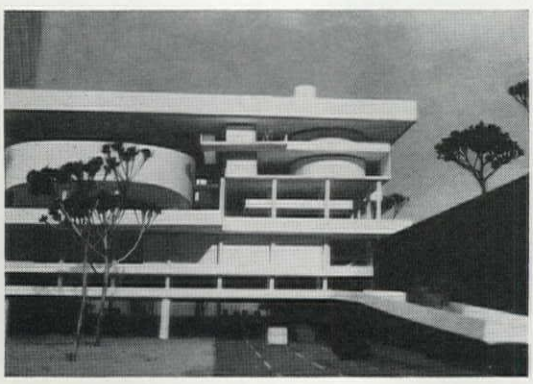
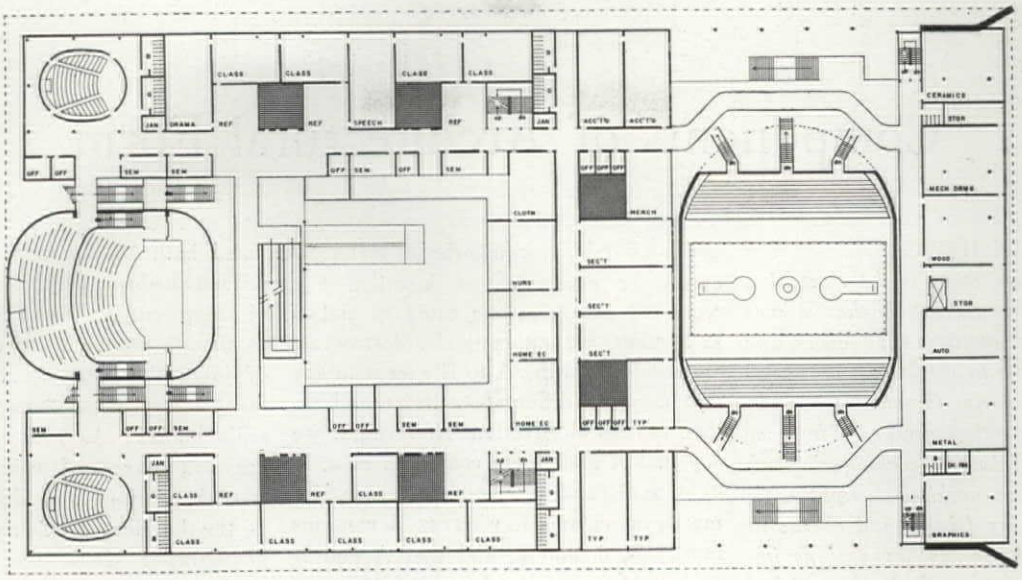
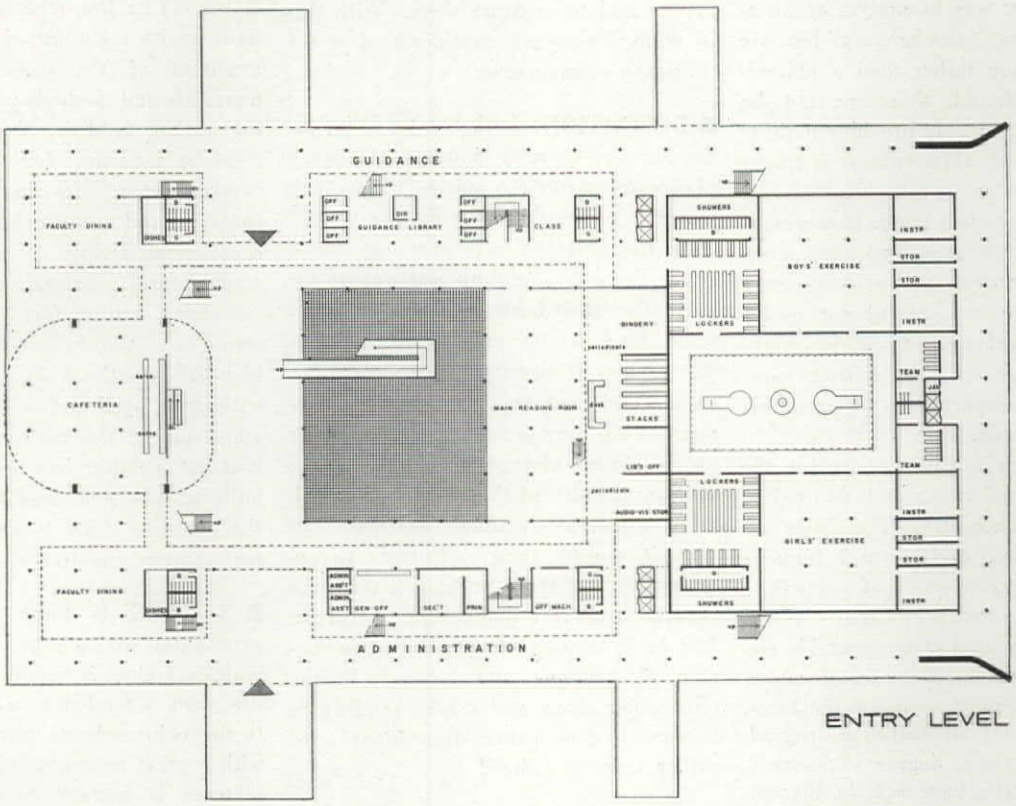


Photo: Peter Chermayeff

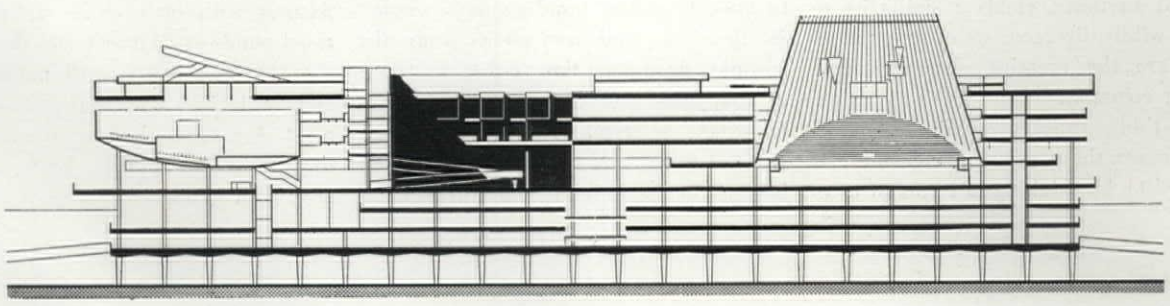
Comprehensive High School over Expressway by Harvard Students Christie, Loverud, Sobel, and Drake. The location of the school over an expressway would make advantageous use of otherwise unavailable land. It would also provide a link between the areas separated by the road and facilitate access for students from either area. In this design, there are three levels of parking, directly accessible from the depressed roadways. Above them are the entry level, mezzanine, and two academic floors of the school. Interior spaces are arranged for a high degree of flexibility within the framework of the main circulation elements and the structure. The second academic floor is similar in layout to the one shown.



ACADEMIC LEVEL



ENTRY LEVEL



Components of Architectural Form

BY R. MARTIN HELICK

Although it may seem to be stretching terms to consider the article that follows a PRACTICE OF ARCHITECTURE *essay, the question of "how to see buildings" nevertheless remains an important one in architect-client relationships. Thus we present Mr. Helick's "technique" with the thought that architects might want to assist their lay friends and clients in evaluation of buildings—as well as improve their own methods of critical appraisal—by his simple and rational analysis. Mr. Helick is an engineer from Pittsburgh, Pa.*

Here is another way to analyze architectural form. I say "another way" because it is a technique rather than a philosophy, and it should, therefore, not be taken too seriously. It provides nothing in the way of absolute values; it might clarify the problem of criticism, but it is no basis for criticism itself. However, it does seem to have a psychological interest, and its precepts are at least semirational. If we are careful not to become too carried away by it, we might find its conclusions enlightening, especially in the slippery area of architect-client relationship.

The approach is analytical, using the word "analytical" much as it is used in the study of chemistry. The basic assumption is that architectural form is not an ultimate essence or, if you will, a Platonic Ideal, but a spatially defined compound, composed of recognizable elements, the lack or presence of which gives specific quality to a specific form. This implies that all buildings, regardless of time, place, degree of success, function, or style, have certain ingredients in common or, in our context, certain components of form. A Chaldean ziggurat, a Pompeian brothel, Chartres Cathedral, a 20th Century oil refinery: what, if anything, yields a similarity to to this wildly divergent set of structures? What are the creative elements these have in common?

One thing appears certain. We will not uncover these common elements (if such exist) by thinking in terms of categories of style, or categories of historical epoch, or categories of function. For when we put A in one category and B in another, we automatically destroy all chances of relating A to B except to say that they are different—a naïve and rather useless observation. However, if we say that A and B are composed of a, b, c, d, e, f, and g, but that A contains mostly a, c, and f, whereas B contains mostly b, d, and g, and that A and B each contain an equal amount of e, we have found not only a logic for their difference: we have found also a logic for a certain latent similarity that we had noticed but that we had disregarded in our zeal to separate them. With this in mind, I now ask consideration of the following components:

■ DEFINITION: Is there a tendency for the building to read in terms of opaque planes and unbroken masses rather than in terms of textures and flowing space? Does the building have a strong major axis? Does the building rise out of the site rather than harmonize with it? Does scale tend to be monumental, or, at worst, does it seem to be absent? Are colors and textures powerful and elemental; do they cut off sharply, usually at an abrupt change of plane? Is the sculptural unity of the building immediately apparent, without overtones, or does it require time and study to apprehend it? Is there perhaps a tendency toward structural overdesign, either in fact or in illusion, due to the extra furring of columns and beams? Is the circulation clean and direct, tending to be conceived as a three-dimensional grid rather than as a flow?

■ EXUBERANCE: Is there an intermittent quality to the building; that is to say, must the eye travel over a diversity of forms and spaces in order to apprehend the building as a whole? Is there a tendency away from the straight, unbroken line, either in terms of diagonals and free curves or, more important, in terms of chunks of space? Are the colors and textures friendly and bright? Is the building carefully illuminated both by day and by night, with defined shadows and at least some degree of chiaroscuro? Does the building look as though the architect designed it out of joy rather than as a duty or as a task, or even as an "expression"? Is the scale human? As you walk through it, are you aware of constantly shifting spatial relations and design elements? Is the building particularly difficult to photograph? Does the plan have a tendency to wander? Is there a quality to some parts of the building that, for want of a better word, we can only describe as lunatic?

■ VANITY: Does the building seem to have as its main function catching the attention of the passer-by? Are the materials and methods used in the building rather faddish; that is to say, is there a tendency for the building to become dated? Are there a great many surfaces, and a preoccupation with such ornamental devices as mirrors, spangles, architectural plaster, moldings, drapes, tapestries, and so forth? Are there elements of "stylism" and/or eclecticism blended into the building, even if done with great skill and subtlety? Upon examination of the building, is it evident that not a dollar has been spent on the building where it does not show? Does the building tend to make the visitor feel vaguely shabby and ill at ease?

■ NATURE: Is there an element of primordial shelter and coziness to the building? Does it possibly blend into the site with a tendency to overlandscape? Is the color scheme warm but low-key, with a great tendency for the colors and textures to merge? Is there a feeling for design elements producing enclosure, such as long, sweeping roofs with great overhangs, domes, low ceilings or ceilings lost in darkness, pendant lighting fixtures with little or no uplight, muntined windows, shutters and the like? Is there a tendency toward natural materials, especially ones that mellow as they age? Are they also compressive rather than tensile in quality, heavy and massive, such as masonry, large wood beams,

adobe, together with such roofing materials as slate and tile? Is there a general feeling of darkness and privacy?

■ ARTISTRY: Is there a jewel-like quality about the building? Does the design of the building indicate a high degree of artistic imagination on the part of the architect? Has he been unafraid to experiment with new or unusual materials? Is there an idealism implicit in the design of the building, requiring a similar show of idealism on the part of the client in order that the building be properly occupied? Will a minor change in any part of the building or in any part of its furnishings tend to mar the over-all effect of the building? Are the selections of colors and textures sensitive almost to the point of being esoteric? Taken out of context, does the building become sculpture? Is the floor plan weak and perhaps not in relation to the rest of the building? Occasionally, do the purely plastic elements of the building encroach on structural and mechanical considerations? Does the building look as though the architect conceived it primarily as a statement of an aesthetic idea?

■ TECHNIQUE: Has the building been well thought out from a practical point of view? Does the detailing make sense? Are the foundations dimensioned to block size; are the sunshields precisely the right length and right orientation; are there enough floor drains in the basement? Is the concept of the building intellectual in quality; does it seem to express construction techniques rather than ultimate human use? Is form constantly following function, often blindly? Are the structural and mechanical components adequately provided for; when a duct interferes with a hung ceiling, which gives way: ceiling or duct? Is there a preoccupation with formal proportion in matters of fenestration, disposition of volumes and siting? Are the working drawings complete and without mistakes; in some strange way, do they seem more impressive than the building itself? Are there places in the building where such details as toilet doors, floodlights, chimneys, and so forth seem too much in evidence? Is there something barren and jumbled about the building, a quality that we cannot quite put our finger on?

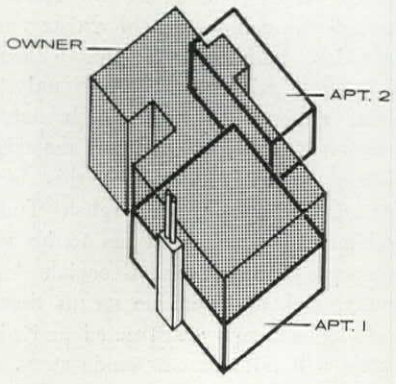
Although each of these components evokes a rather specific type of building, we must realize that no building can be a success if only one component is present. For example, good store design must have a high vanity component, but if vanity is not supplemented by a strong artistry component, the building will be shoddy and vulgar. And if these two are not in turn lightened by a thrust of exuberance, people will stop and look, but no one will buy. A building that is all *definition* becomes a set of chunky, opaque prisms. A building that is all *exuberance* has a carnival quality, wild and irrational, almost obscene. Gaudi, at his worst, approaches undiluted exuberance. A building that is all *nature* becomes an overgrown hermit's shack, brooding and rank and depressing. All *artistry* weakens a building, both structurally and architecturally, since unity is lost in exquisite, unrelated planes and in oversophisticated nuances of color and texture. And pure *technique*, of course, is handbook engineering and handbook architectural detailing with no creative synthesis—Chief Draftsmanship at its absolute dreariest.

No building, however, can be a success and lack any one of these components. Like chemical elements in the human body, each has its function, even though its size may be extremely small. Without definition, there can be no untiy. Without exuberance, the building is lifeless and dull. Without vanity, there is no presence, no human individuality. A building without nature is brittle and difficult to live with. Mies van der Rohe, for all of his tremendous contributions through the components of artistry and definition, perhaps lacks this element. A building without artistry is ugly or plain, although, when a high nature component is present, the materials themselves tend to redeem this lack. For this reason, bad English Tudor architecture somehow seems to be less grotesque than, say, bad Georgian. And, finally, lack of technique means that a building is poorly constructed and ultimately will fall apart or erode away.

Much more could be said about these components and their application. A superficial study of architectural history could very well indicate a relation between the cultural and technological quality of the times and the form component which that culture or that technology would allow. It is possible, for example, to ascribe a high definition component to the architecture of Hellenic Greece, relating in a poetic sort of way to the definitive quality of their polytheism and their arts and sciences in general. As another example, Romanesque architecture flowed into Gothic as the monastic nature component waned, and as the popular and evangelical exuberance component increased. At the risk of becoming too involved in this for our own good, we can state further that the technique component increased only slightly. Granted that Gothic architecture represents a higher degree of structural sophistication, it is nevertheless a moot point whether the *rate* of structural knowledge increased. And today, where practically anybody has the affluence, the technological resources, and the political freedom to build practically anything, all components are out of the box, so to speak, and we live in what some call a stylistic chaos. In other words, the very disparity of our architectural forms is in itself an expression of our times.

These are rapid and somewhat careless generalizations and as such have no genuine importance, no matter how intriguing some of them may be. As was stated in the beginning, this is a technique, not a philosophy, and any attempt to freeze it into a philosophy will bring more trouble than good. But it does have its uses. It gives us something to say when we are asked for a comment on a man's work and we do not have the heart to tell him what we really think of it. It is something to mull over in the mind while waiting for a train or when it is difficult to go to sleep at night. It is, also, a splendid insight as to why that client, who seemed so promising, never called back. The answer may be no more complicated than the simple fact that he had *definition* or *vanity* or *nature* on the brain, whereas the architect was thinking of *artistry* or *exuberance* or *technique*.

Architect's Own Remodeled House



RESIDENCE • SAN FRANCISCO, CALIFORNIA • GEORGE T. ROCKRISE, ARCHITECT & INTERIOR DESIGNER • LAWRENCE HALPRIN, LANDSCAPE ARCHITECT

The owner-architect of this residence wanted to find a property on San Francisco's Telegraph Hill that would fulfill several firm prerequisites: a view of San Francisco and the Bay; gardens to give a semblance of the country; adequate garage space; and rentable units to defray project cost. Since there was no suitable vacant property on the Hill, it was necessary to buy an existing building and make improvements.

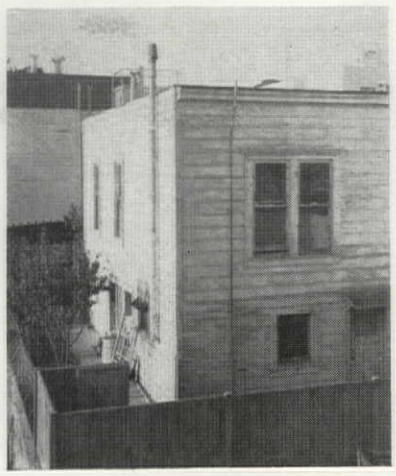
The property meeting these requirements was an L-shaped site climbing up the Hill, which contained a two-story clapboard house (*top of page, left*) constructed in 1908—two years after the Great Fire—and a small cottage in one corner of the site. It was apparent to the architect that three living units were inherent in the complex.

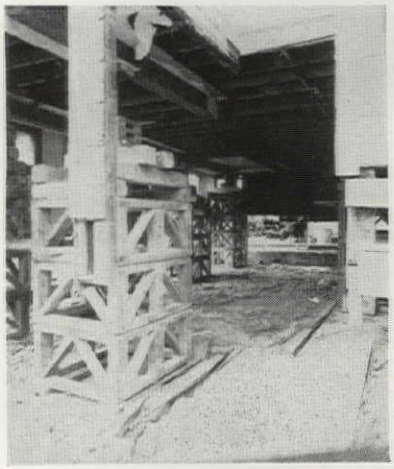
The owners moved into the cottage and over a period of six years carried out a process of remodeling that indicates their perception of the site's potentials. Work proceeded in three phases: (1) the main house was raised on jacks nearly three feet (*top of page, right*) to provide a panoramic vista of the Bay from the upper floor. Each floor was then converted into a separate apartment. (2) Next, the owners occupied the upper floor and proceeded to remodel the cottage as a rentable unit. (3) Finally, a new two-story wing to the owners' apartment (*acrosspage, shaded area of sketch*) was built, comprised of master bedroom and children's playroom (*bottom of page, right*), utility rooms, and two-story entry hall.

The over-all objective of this program was to give each of the three apartments a feeling of isolation from the others. All tenants share the street-front entry through a covered gate. This shelter functions like the lich gates of churchyards: the entrant is purged and the "body" of city commotion left behind. Farther up the hill, each tenant has his own secluded garden and private front door.

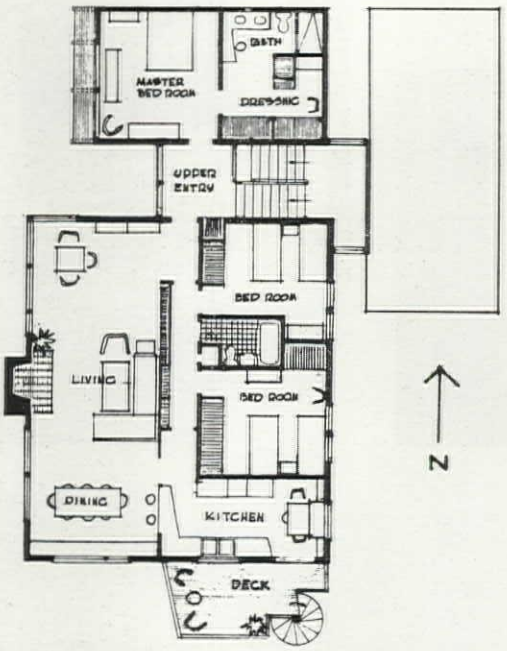
Fences are used to screen off the neighboring buildings, in effect detaching the site from its congested surroundings. Tenants retain contact with the life of the city, however, through dramatic vistas.

The exteriors of the buildings are sheathed in redwood boards stained dark brown. The doors, window frames of the two-story addition, and the flues are painted brick red to match the chimney.

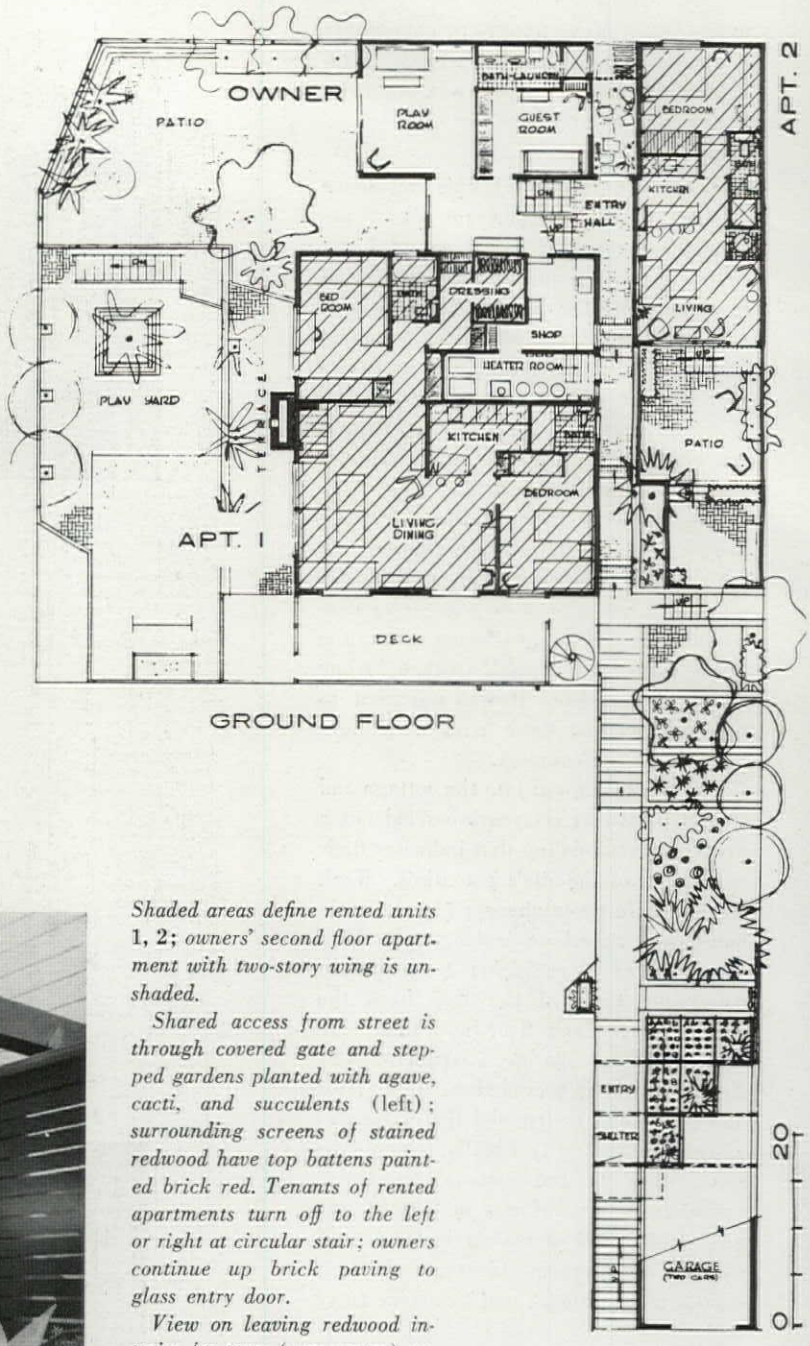




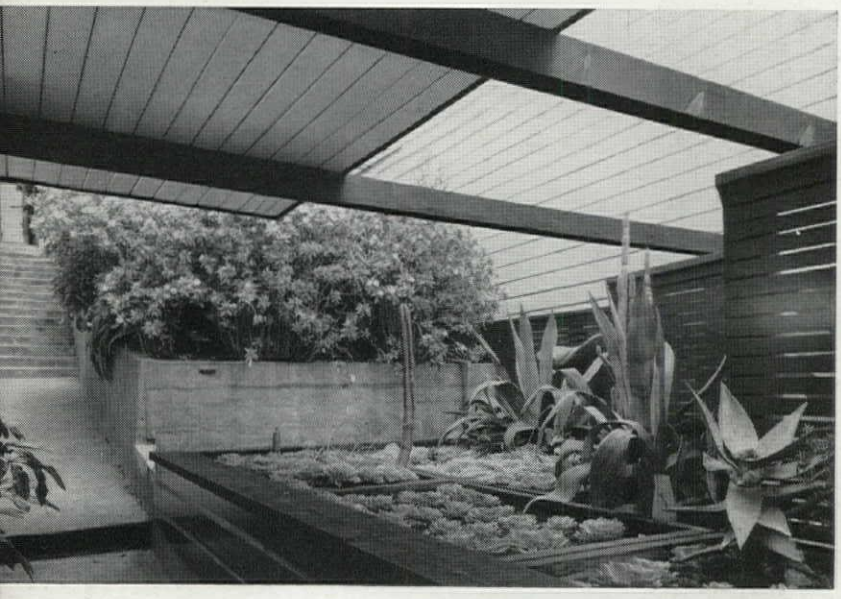
Photos after remodeling: Karl H. Riek



OWNERS UPPER FLOOR



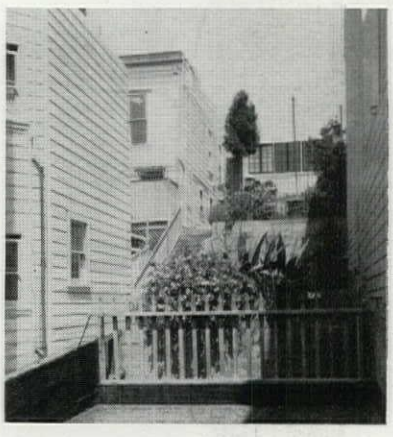
GROUND FLOOR

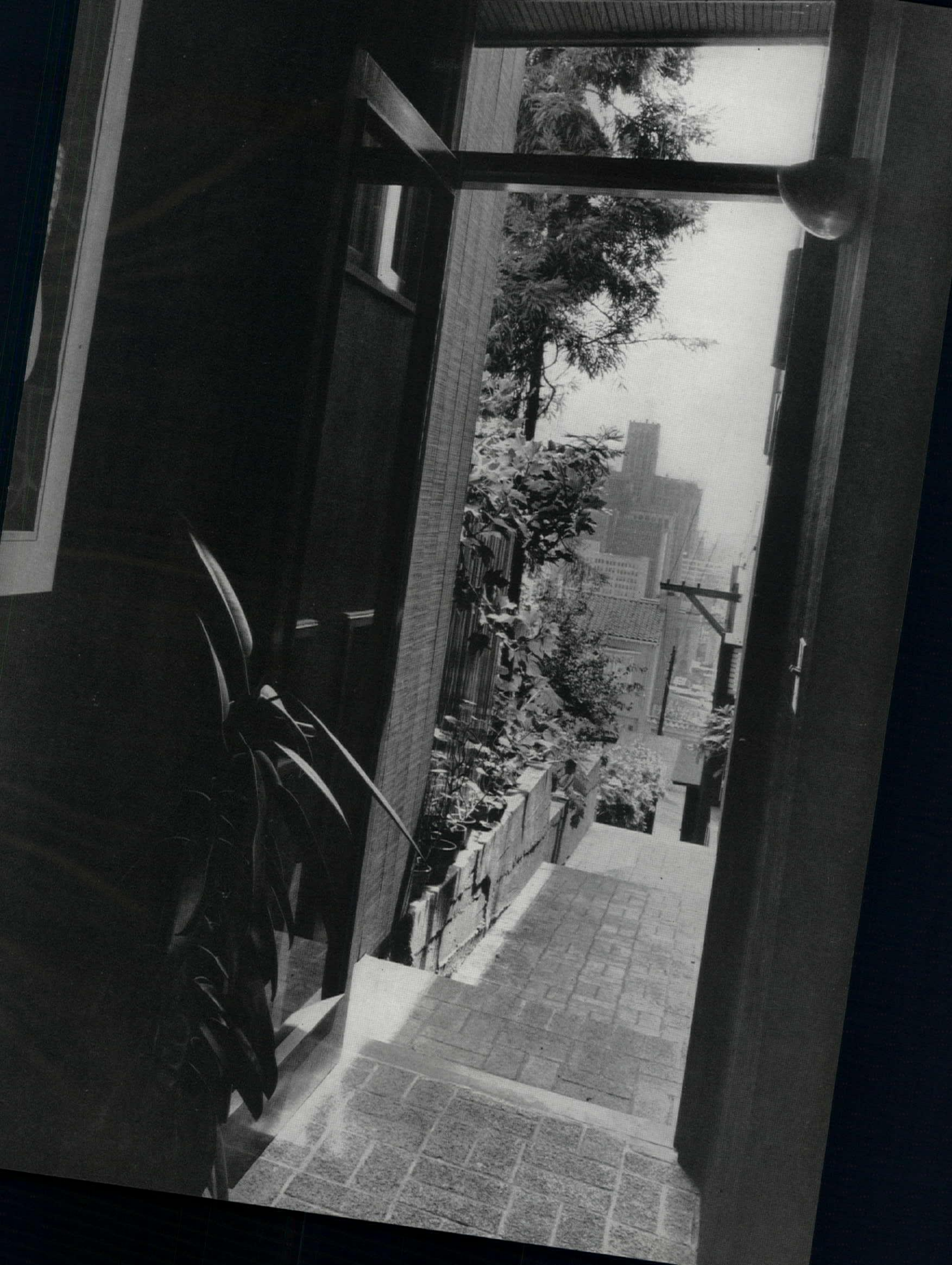


Shaded areas define rented units **1, 2**; *owners' second floor apartment with two-story wing is unshaded.*

Shared access from street is through covered gate and stepped gardens planted with agave, cacti, and succulents (left); *surrounding screens of stained redwood have top battens painted brick red. Tenants of rented apartments turn off to the left or right at circular stair; owners continue up brick paving to glass entry door.*

View on leaving redwood interior for town (acrosspage) *exemplifies the effect of seclusion created within existing confinement. Before remodeling, entry was bleak and exposed to neighboring congestion* (below).



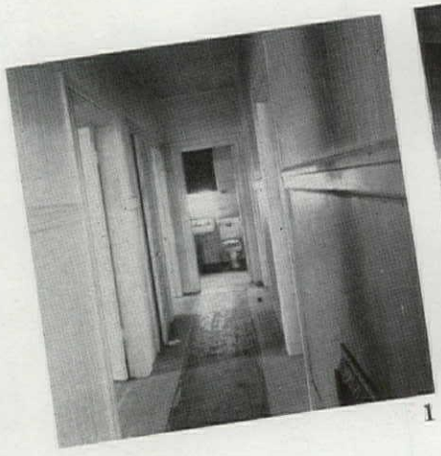


The gray of the city's frequent mist is carried into the living-dining room by a light gray, wall-to-wall carpet **4, 5.** Gray-beige draperies maintain this effect when drawn over the expansive windows.

Warm, gold-brown redwood walls and a raw brick chimney breast form a solid backing against the panorama's invasion of the room. A dark Etruscan travertine table and a soy-brown textured sofa continue the color of this protective background, within which patches of brilliant red and light blue occur on diamond chairs and pillows on sofa; light blue is repeated on the backwall of the bookcase. The subtle yellow-gray ceiling color is echoed in yellow tones of the oak and walnut dining group, in the terracotta and yellow collage by Jean Varda, and in yellow candles.

The master bedroom **6** has a similar though lighter tonal effect. Pale gray-blue fabrics designed by Frank Lloyd Wright are used for bedspread and draperies within honey-colored, natural-hemlock walls. From this enclosure, the view stretches across an ivy-covered trellis, through the patio trees, to the neighboring hill crowned with several high-rise buildings.

The tidy patio, used for entertaining, is enclosed by a wooden screen that conceals surrounding buildings yet admits an ornamental light through several panels of stained glass. The children, whose playroom looks out onto this patio, also have an adjacent—and presumably less tidy—play yard.



1

2

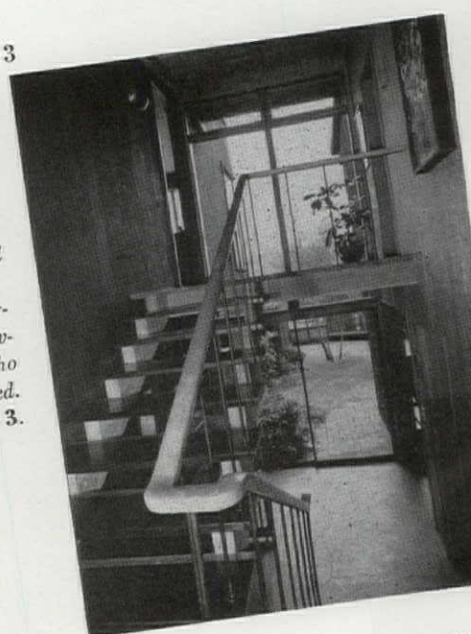
DATA: descriptions and sources of the major materials and furnishings shown.

ENTRY HALL AND STAIR Walls, Ceiling: vertical grained redwood/1 x 6 tongue and groove. **Sliding glass door:** Arcadia Metal Products, 801 So. Acacia Ave., Fullerton, Calif. **Stair:** Douglas Fir stringers and treads/rubber rabetted to treads/⅝" round iron balusters/oak handrail. **Lighting:** indirect/aluminum fixtures/Hanschen & Goddard, 483 Tehama, San Francisco, Calif.

LIVING-DINING ROOM Walls, Built-in Bookcases: redwood. **Floor covering:** gray India carpet. **Ceiling:** sheetrock/painted soft yellow. **Window draperies:** beige-gray casement/D.N. & E. Walter, 562 Mission St., San Francisco, Calif. **Lighting:** indirect/window-cornice trough/continuing above kitchen pass-through/architect-designed/custom-made. **Sofa:** sectional/walnut frame/M. Singer & Sons, 36 E. 19 St., New York, N.Y. **Sofa upholstery:** nubby texture/soy brown/Jack Lenor Larsen, Inc., 677 Fifth Ave., New York 22, N.Y. **Coffee table:** walnut frame/filled and polished travertine/custom-made. **Diamond chairs:** black frame/red fabric; white frame/blue fabric; white frame/white pad/Knoll Associates, 575 Madison Ave., New York 22, N.Y. **Dining table:** walnut/ custom-made. **Dining chairs:** oak frame/cord seat/Hans Wegner design/Pacific Overseas Inc., 478 Jackson Square, San Francisco, Calif. **Collage:** above chests/Jean Varda. **Painting:** above sofa/Jean Halpert-Ryden.

MASTER BEDROOM Walls: natural hemlock. **Carpet:** white nylon/F. Schumacher & Co., 60 West 40 St., New York, N.Y. **Draperies:** blue-gray/cotton/F. Schumacher & Co. **Bedspread:** blues, gold, metallic/F. L. Wright Collection/F. Schumacher & Co. **Chairs:** oak/Hans Wegner design; rattan/iron frame.

3



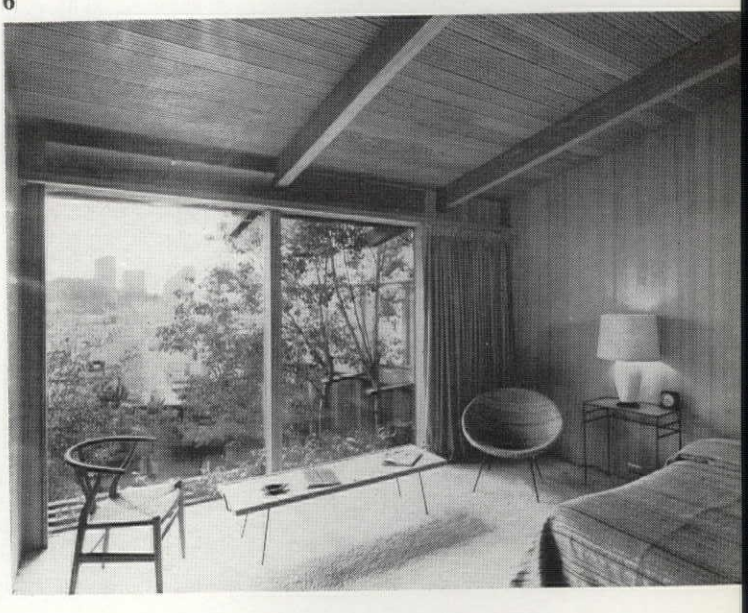
Typical views of original interior **1, 2** *show restricted areas that held the potentials of new, free-flowing living-dining room* **4, 5.** *Entry hallway* **3** *and master bedroom* **6** *reveal the ever-present city horizon beyond the patio.*

Brick paving of patio surrounds a grass plot where several small-scaled mounds echo an adjacent S-curved shrub bed. A birch clump adds a canopy **3.**

4

5

6



Simplified Deflection Calculations

BY IRA HOOPER

The present trend to long, slender spans in buildings requires the frequent computation of beam deflections. This article, by an Associate of Seelye, Stevenson, Value & Knecht, Consulting Engineers, New York, develops rapid methods for determining the deflections of simple-span beams of constant section, with several types of loading. Beam materials considered are steel, aluminum, wood, reinforced concrete, and composite steel-concrete; effects of creep and shrinkage in concrete are also included. (Effect of end-fixity will be the subject of a subsequent article.) For purposes of this discussion, it should be noted that high precision is not usually required for a deflection calculation, since it is a check after *the strength of a member has been established.*

As an example of the simplified method, consider the following formula for the deflection of a simply supported beam, uniformly loaded, designed for 20,000 psi. The formula will be derived after the example.

$$\Delta = \frac{L^2}{100c}, \text{ where} \qquad (1)$$

Δ = deflection (in.)
L = span (ft)
c = distance from neutral axis to extreme outer fiber (in.)

For a 14 WF 34, spanning 25 ft, designed for 20,000 psi:

$$\Delta = \frac{(25)^2}{100\text{x}7} = \frac{625}{700} = 0.89 \text{ in.}$$

The computation is simple and can be done mentally; the basic formula can be memorized easily.

Basic Formula

The derivation of formula (1) follows. For a simple span with uniform load:

$$M = \frac{wl^2}{8}$$

$$s = \frac{Mc}{I} = \frac{wl^2c}{8I}$$

$$\Delta = \frac{5wl^4}{384EI} = \left(\frac{wl^2c}{8I}\right)\left(\frac{5l^2}{48Ec}\right)$$

$$= \frac{5}{48}\left(\frac{s}{E}\right)\left(\frac{l^2}{c}\right)$$

$$= 15\left(\frac{s}{E}\right)\left(\frac{L^2}{c}\right) \qquad (2)$$

Formula (2) is general and can be applied to any material by the proper choice of s and E. For A7-type steel:

$$\Delta = 15\left(\frac{20{,}000}{30{,}000{,}000}\right)\left(\frac{L^2}{c}\right) = \frac{L^2}{100c}$$

For other materials (Table I):

$$\Delta = K_{\text{Mat'l}}\left(\frac{L^2}{100c}\right) \qquad (3)$$

$$K_{\text{Mat'l}} = \left(\frac{s}{E}\right)\left(\frac{30{,}000}{20}\right)$$

$$= 1500\left(\frac{s}{E}\right)$$

Steel, wood, and aluminum beam sections are generally symmetrical and c is equal to one-half of the depth. Concrete beams are usually critical in the steel reinforcement that is designed to resist moment with a stress of 20,000 psi, assuming c as 0.60 d for balanced design and assuming E for 3000 psi concrete as 3,000,000 psi. For composite beams, the designer usually prepares tables of section properties of typical members including values of S and c. ("Composite Construction," JULY 1960 P/A.)

Effect of Nonuniform Loading

Deflection of a beam is a function of the area of the moment diagram. A moment diagram can be chosen (Table II) that closely approximates most actual conditions.

Creep

For concrete beams, the use of c as 0.60 d in formula (3) will result in the deflection for short-term loading; under long-term loading, creep will reduce E, for 3000 psi concrete, from 3,000,000 psi to about 1,000,000 psi, which accordingly will increase the beam limberness by about 50 per cent (Appendix A). Allowance for increased deflection due to creep is obtained by multiplying the proportion between long-term load and total load by 50 per cent:

$$\Delta_{\text{Creep}} = 0.50\Delta\left(\frac{DL+\frac{1}{2}LL}{DL+LL}\right)$$

$$\Sigma\Delta = \Delta + \Delta_{\text{Creep}}$$

$$= \Delta\left[1+.50\left(\frac{DL+\frac{1}{2}LL}{DL+LL}\right)\right]$$

$$= \Delta K_{\text{Creep}} \qquad (4)$$

It is apparent that $1.25 < K_{\text{Creep}} < 1.50$.

For composite beams, the designer prepares tables of typical sections that give values for S and c for both values of E—3,000,000 psi for short-term loading and 1,000,000 psi for long-term loading. Deflections for long- and short-term loads are calculated separately and added.

Shrinkage

Concrete shrinks about 0.00045 times its length. In a simple reinforced-concrete beam, or a simple composite-steel beam, the deflection caused by shrinkage is similar to the deflection caused by a uniform moment for the full length of the beam, so that the unit shortening of the concrete plus the unit lengthening of the steel equals 0.00045. This deflection is shown (Appendix B) to be about

$$0.48\,\frac{L^2}{100c};$$

therefore, for the rest of this article $K_{\text{Shrink}}=0.48$.

Effect of Overdesign

Formula (2) shows that deflection, Δ, varies directly as unit stress, s. If a beam is oversized, the unit stress will be reduced in the proportion of S_{Req} divided by S_{Furn}, and the deflection will be reduced by the same proportion.

Example 1

Find the deflection of a 12-in. deep aluminum beam. Alloy 6061-T6, which has been designed to span 18 ft with a concentrated load at midspan, simply supported.

$$\Delta = \frac{L^2}{100c}\,(K_{\text{Mat'l}})\,(K_{LD})$$

$$= \frac{(18)^2}{100\text{x}6}\,(2.25)\,(0.8) = 0.97 \text{ in.}$$

Example 2

Find the deflection of an 18-in. deep concrete beam that has been designed to span 25 ft with equal loads at its third points, simply supported. Include the effects of creep and shrinkage; dead loads equal the live loads.

$$\Delta = \frac{L^2}{100c}\left[K_{LD}\left(K_{\text{Creep}}\right)+K_{\text{Shrink}}\right]$$

$$= \frac{(25)^2}{100\text{x}.60\text{x}16}$$

$$\times\left[1.02\left(1+\frac{.50\text{x}3}{4}\right)+.48\right]$$

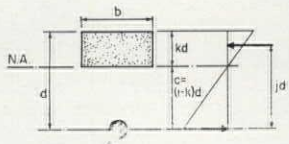
$$= 0.65\text{x}1.88 = 1.22 \text{ in.}$$

Legend

c = distance from neutral axis to extreme outer surface (in.)
d = depth of concrete beam to center of steel area (in.)
E = modulus of elasticity (psi)
I = moment of inertia (in.^{4})
K = factors defined in text
l = span (in.)
L = span (ft)
M = moment (in. lb)
S = section modulus (in.^{3})
s = maximum stress due to bending (psi)
w = uniform load (lb per in)
Δ = deflection (in.)
ϵ = unit strain

Appendix A: Effect of Creep in Reinforced-Concrete Beams

As creep occurs in a concrete beam of balanced design, the neutral axis moves closer to the reinforcing steel, reducing c and j.



f'_c = 3000 psi
f_s = 20,000 psi

$$\Delta = 15\frac{sL^2}{Ec} = \frac{15ML^2}{cjdA_sE}$$

$$s = \frac{M}{jdA_s}$$

$$\frac{\Delta_{30}}{\Delta_{10}} = \frac{c_{10}j_{10}}{c_{30}j_{30}} \qquad \text{(Table IV)}$$

Appendix B: Effect of Shrinkage in Reinforced-Concrete Beams

For a beam designed for uniform moment at balanced design:

$$\Delta = 1.2\left(\frac{L^2}{100c}\right) \qquad \text{(Table II)}$$

$$\Sigma\epsilon = \epsilon_s + \epsilon_c = \frac{20\text{ ksi}}{30{,}000\text{ ksi}} + \frac{1.35\text{ ksi}}{3000\text{ ksi}}$$

$$= 0.00067 + 0.00045 = 0.00112$$

By proportion, the deflection due to shrinkage is:

$$\Delta_{\text{Shrink}} = \frac{0.00045}{0.00112} \times 1.2\left(\frac{L^2}{100c}\right)$$

$$= 0.48\left(\frac{L^2}{100c}\right)$$

$$= K_{\text{Shrink}}\left(\frac{L^2}{100c}\right) \qquad (5)$$

TABLE I: **BASIC FORMULAS;** $\Delta = K_{\text{Mat'l}}\dfrac{L^2}{100c}$

Beam Material	s_{ksi}	E_{ksi}	$K_{\text{Mat'l}}$
Steel, A7	20	30,000	1.0
Steel, A36	22	30,000	1.1
Wood	1.5	1,760	1.28
Glued laminated wood	2.4	1,800	2.00
Aluminum 6061-T6	15	10,000	2.25
Aluminum 2014-T6	22	10,600	3.11
Reinf. concrete	20	30,000	1.0
Composite steel-conc.	20	30,000	1.0

TABLE II: **EFFECT OF LOADING ON** Δ; $\Delta = K_\Delta\left(\dfrac{s}{E}\right)\left(\dfrac{L^2}{c}\right) = K_{LD}\,(15)\left(\dfrac{s}{E}\right)\left(\dfrac{L^2}{c}\right)$

Load	Load diagram	Moment diagram	M_{max}	Δ	K_Δ	K_{LD}
1 Uniform			$\frac{wl^2}{8}$	$\frac{5\,wl^4}{384\,EI}$	15	1.00
2 Conc.—midpt.			$\frac{Pl}{4}$	$\frac{Pl^3}{48\,EI}$	12	0.80
3 Uniform moment			M	$\frac{Ml^2}{8\,EI}$	18	1.20
4 Moment 1 end			M	$\frac{Ml^2}{16\,EI}$	9.25	0.62
5 Conc.—⅓ pts.			$\frac{Pl}{3}$	$\frac{23\,Pl^3}{648\,EI}$	15.3	1.02
6 Conc.—¼ pts.			$\frac{Pl}{2}$	$\frac{19\,Pl^3}{384\,EI}$	14.3	0.95
7 Conc.—⅓ pt.			$\frac{2\,Pl}{9}$	$\frac{Pl^3}{56\,EI}$	11.6	0.77
8 Conc.—¼ pt.			$\frac{3\,Pl}{16}$	$\frac{Pl^3}{69\,EI}$	11.1	0.74

TABLE III: **SUMMARY OF FORMULAS**

Beam Material	Combined Formula
Steel, aluminum, wood	$\Delta = \dfrac{L^2}{100c}\left[K_{\text{Mat'l}} \times K_{LD} \times \dfrac{S_{Req}}{S_{Furn}}\right]$
Concrete	$\Delta = \dfrac{L^2}{100c}\left[K_{LD} \times K_{Creep} + K_{Shrink}\right]$
Composite	$\Delta = \dfrac{L^2}{100c}\left[K_{LD} \times K_{Creep} \times \dfrac{S_{Req}}{S_{Furn}} + K_{Shrink}\right]$

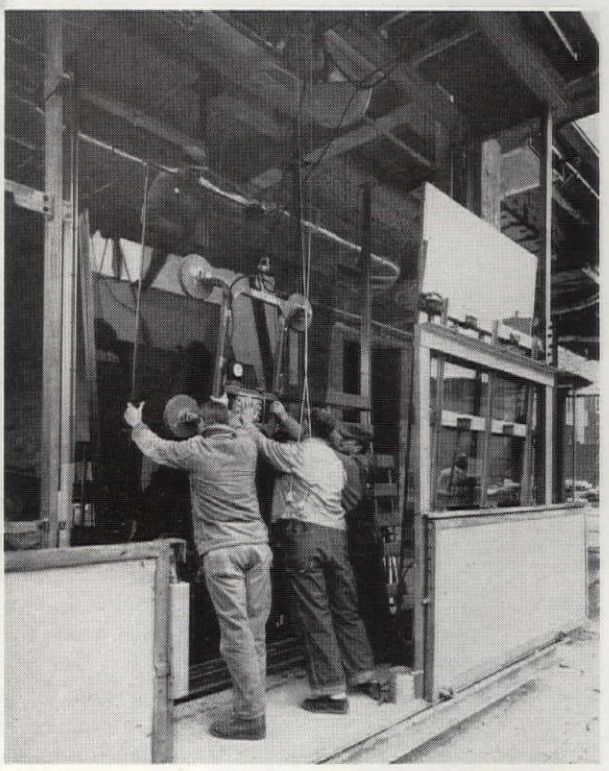
TABLE IV: **EFFECT OF CREEP**

$p = \frac{A_s}{bd}$	$n = \frac{E_s}{E_c}$	K	$c = (1-K)d$	$j = 1 - \frac{K}{3}$	cj	$\frac{c_{10}j_{10}}{c_{30}j_{30}}$	Remarks
.0136	10	.403	.597d	.866	.517d		Assume 1.50 as conservative average
(balanced)	30	.585	.415d	.805	.334d	1.55	
.0068	10	.31	.69d	.90	.62d		
(half of balanced)	30	.47	.53d	.84	.45d	1.38	

Economics of LOF's Glass-Walled Skyscraper

First major office structure to be built in downtown Toledo, Ohio, in many years is the Libbey-Owens-Ford Executive Office building—a new glass showcase for an old glassmaker. Designed by Architects Skidmore, Owings & Merrill and completed last summer, this glass-walled, 120-foot square, 15-story, air-conditioned office building is an outstanding example of commercial architecture. Since the owners wished their new building to reflect its long-time good-neighbor policy for its plants and properties, as well as exhibit its glass products, the designers were given broad latitude in its creation. Of particular interest to architects will be a report of the design and erection of the curtain-wall system, the luminous ceiling and partition construction, and engineering studies that have been focused on its operating results. Structural Engineers were Severud-Elstad-Krueger Associates; Mechanical Engineers, Guy B. Panero Engineers; and General Contractors, George A. Fuller Company.

Several factors were conspicuous in the evolution of this curtain-wall design: (1) the architects had been responsible for designs of some of the most advanced glass-wall envelopes erected in the preceding ten years or so, and they brought with them this backlog of experience to the LOF project; (2) the owners themselves had been suppliers of the glass components for many of these same structures, and therefore provided not only enthusiasm for this kind of wall but also an extended knowledge of the manufacture and supply of various types of glass units; and (3) the fact that some of LOF's plants were so near by



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Photos, except as noted: Hedrich-Blessing

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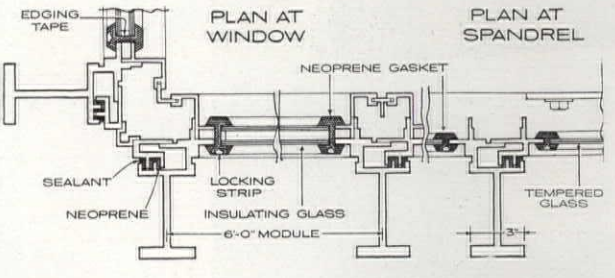
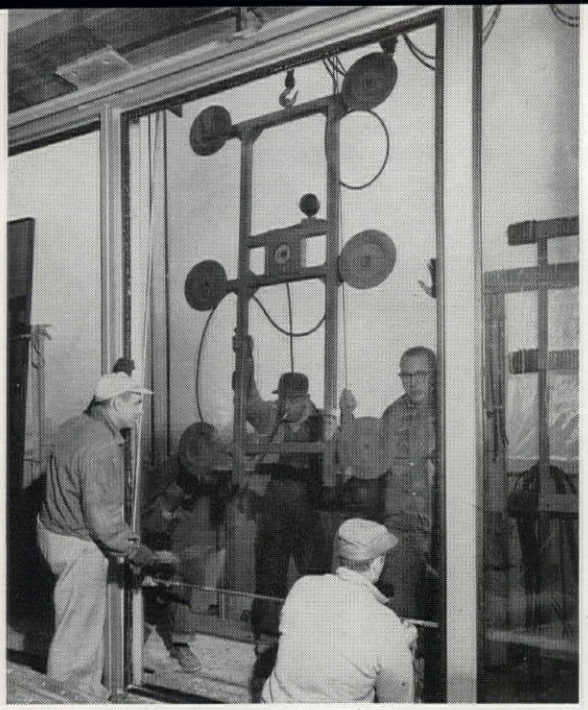


1 *Workmen load 6' x 10' insulating-glass units onto window-washing platform at ground before raising platform to installation level.* **2** *Neoprene structural gaskets are inserted into modular aluminum enframements.* **3** *Bi-level plan of curtain wall through insulating glass and tempered-glass spandrel.*



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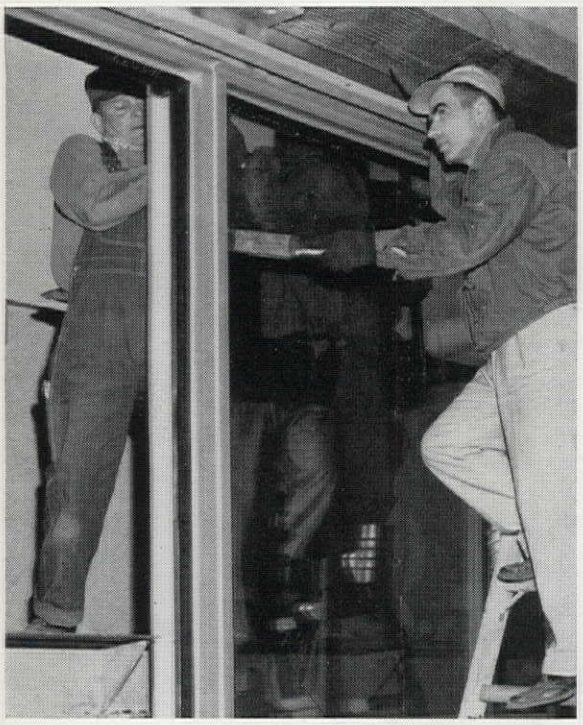

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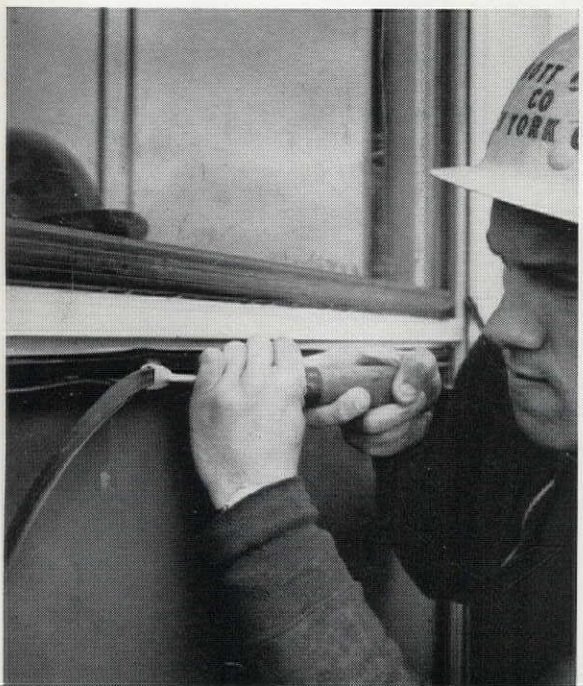


that the glass components could be brought directly to the job site, ready for installation, without even having to be crated.

After preliminary designs had been approved, a full-scale mock-up of the proposed curtain wall was erected. From a study of this, several design refinements were evolved, not only in the framing and glazing, but also in the proposed method of erection. Since the final study produced several "firsts" in curtain-wall design—the 6′ x 10′ x 1″ insulating glass units were to be among the largest ever erected in a multistory building, the type of gasketing was a refinement over previous schemes, and the method of glazing had never been used previously in a high-rise building—the architects had to work closely with the subcontractors during the bidding time as well as during erection. From the mock-up, the details of erection procedure were developed.

Several factors, including the size of the glass, required the building to be glazed from the outside. Since the lights were to be fixed and a mechanically operated window-washing platform would become a part of the building's equipment, it was also decided to use a platform of this kind for the glazing operation. Accordingly, a permanent platform —as well as one of less permanent construction for temporary use—was built. Each platform—30′ long, or the equivalent of five 6′ window modules—is guided by the 5″-deep, I-beam-shaped mullions of the curtain-wall framing.

Framing

Floor-to-floor aluminum frames, one module wide, minimized the cost of field installation as well as maintaining the minimum tolerances required for the insulating units and gasketing. In addition, they adequately provide for the expansion and contraction of each modular frame. The actual glazing was by means of a black neoprene structural gasket, known as the proprietary "Inlock" system, with a zipper method of locking.

Factors affecting the use of glazing equipment were: (1) the weight of each insulating glass unit is approximately 400 lb; (2) to reduce the possibility of breakage, a minimum amount of handling of the glass was desirable; and (3) for future replacement of damaged glass, scaffolding was not practical.

In view of the above considerations, it was considered that optimum results could be achieved by incorporating a glass-handling mechanism, in the form of power-vacuum equipment, as part of the window-washing platform.

Provisions included in the platform, for glazing, were: provision for 3,000-lb. live load; available space to accommodate four lights of insulating glass; an overhead rail for the transfer of glass from delivery truck to platform, and subsequent installation, supplemented by a frame housing vacuum equipment as designed by LOF engineers. In operation, the overhead rail brought the glass within 4″ of the neoprene gasket, prior to installation. As a safety precaution, an auxiliary vacuum storage tank, combined with an alarm in the event of a power failure, was provided.

Based on experience gained from the mock-up, it was felt that a six-man crew would be required for the glazing operation—plus one additional workman inside the building for the purpose of leading the glass into the gasket.

Installation

Ease of installation of the aluminum frames and glass, as expected, was borne out in the field. Frames were installed at the rate of approximately 80 per day. Utilizing both platforms, installation of the insulating glass, as well as the spandrels of tempered glass, averaged about 20 units per day—ranging from a low of 16 to as many as 30. This successful method of installation, resulting from careful analysis of the mock-up, produced no breakage due either to handling or final setting. The building was

4 *Power-vacuum equipment carries insulating-glass unit as it is seated into neoprene gasket.* **5** *Glass unit is worked into gasket so that contact is smooth and continuous.* **6** *Neoprene strip, "zippered" into gasket, serves as locking device.*

Ceiling gridwork shows separate plenums for ducts and lighting.

glazed vertically, six floors at a time. A platform would then be moved to the next bay.

The power-vacuum equipment was also used to glaze the ground-floor lobby, where ½″-thick glass, 20′ high and 6′ wide, was installed. Neoprene strips and a Thiokol sealant were the glazing agents for this glass.

Luminous Ceiling

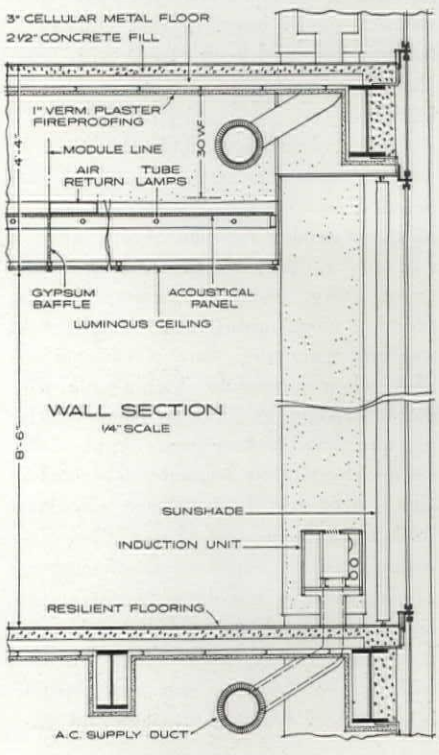
Space above the finished ceiling was separated into two sections: the upper, containing ductwork, piping, and conduit; the lower, containing fluorescent tubes and ballasts, which furnish 70 ft-c of illumination at work level of the typical floor. Immediately below the ducts, a plane of acoustical boards is supported by a gridwork, which in turn has suspended below it a 3′ x 3′ grid of T-runners containing light-diffusing ceiling panels. This ceiling grid was arranged in such a way as to coincide with all possible movable-partition locations. All air diffusers and returns were mounted on this lower grid, and complete ventilation requirements are provided on a modular basis.

Such a design affords the following: flexibility in partition layout without affecting mechanical and electrical services to these areas; sound control above partitions by installing precast-gypsum board vertically, between ceiling runners and the grid above; use of gypsum boards of equal size to eliminate cutting around ductwork, piping, etc.

Engineering Studies

Considerable study has been focused on the operating results of this building. Guy B. Panero Engineers, the air-conditioning and heating designers for the structure, have completed an analysis of the air-conditioning and heating costs as affected by various types of glass used.

Vision glass comprises 77 per cent of



the gross wall area. The walls are oriented approximately 30 degrees counterclockwise from the cardinal directions. Insulating glass with vertical venetian blinds is used in all vision areas above the ground floor.

In the double-paned insulating glass, which hermetically seals a cushion of dry air between the panes, the outer glass is gray plate and the inner pane is clear plate. Calculations show that the use of insulating glass, as compared with a single pane of gray plate, reduced the air-conditioning requirement by 92 tons, thus cutting the initial cost of the air-conditioning equipment by $55,200.

As will be explained in detail later on in the article, the engineers found that operating costs on the same comparison would bring an annual reduction of $2,190 for air-conditioning and $5,030 for heating costs, so that these combined savings of $7,220 would pay for the premium cost of insulating glass in 3½ years.

These studies also show that if the additional capital cost of the double-insulating glass used—as compared with single glazing of gray plate and the extra cost for the air-conditioning equipment required if single glazing had been used—were both considered as investments at three per cent, then a cost comparison for this portion of the building shows that it would be more economical to use gray-plate insulating glass than to use single glazing of gray plate.

Since ¼″ gray-plate glass and ¼″ green-tinted, heat-absorbing plate glass both exclude approximately the same amount of the sun's heat, the same comparison would have applied equally if the building had been glazed with heat-absorbing instead of gray-plate insulating units.

Other advantages not calculated in dollars were also observed during this detailed study. For instance, a saving in space needed for central-refrigeration and air-handling equipment may result from using insulating glass, thereby creating more rental area. During cold weather, personnel may work comfortably when nearer to double-pane windows than single glass, in effect providing more usable floor area. Appreciable sound attenuation (outside noise reduction) may add to employee efficiency. And, through the use of insulating-glass walls, possible complications of temperature control, architectural layouts, space conditions, and increased equipment, noise levels may be avoided. Further, without the use of a gray-plate insulating glass, they conclude it would have been practically impossible to have these advantages that exist in the LOF Building—small, compact air-conditioning units in each room, reduced ductwork space in the ceilings, and minimum space for the air-conditioning equipment.

One of Panero's air-conditioning and heating specialists states that "in reality it was not economically practical by means of commonly used induction units to properly air condition this building using conventional single glazing."

In arriving at these conclusions, the engineers ventured into several interesting byways. In studying the glass walls, the orientation of the structure, and the geographic location of Toledo, they found that the maximum air-conditioning load due to heat transfer through the glass areas occurs at 4 P.M. sun time on July 23. The building was designed using a summer outdoor temperature of 95 F, and an indoor temperature of 78 F.

Comparisons are shown for gray-plate insulating glass and single glazing of gray plate, each in combination with white, vertical venetian blinds. In determining the size of the air-conditioning equipment, the blinds are assumed fully drawn (although there is frequently justification for assuming half-drawn blinds for at least a part of the system). For

TABLE I

	Single gray plate		Insulating gray plate	
	Unshaded	Venetian blinds	Unshaded	Venetian blinds
Northeast	11	8	9	6
Southeast	11	8	9	6
Southwest	98	77	80	52
Northwest	87	70	71	47

TABLE II

	Cooling loads			Tons of refrigeration* (glass areas only)
	Solar	Air-to-air	Total	
Venetian blinds				
Single gray plate	2.35	0.88	3.23	269
Insulating gray plate	1.60	0.52	2.12	177
Unshaded**				
Single gray plate	2.93	1.04	3.97	330
Insulating gray plate	2.43	0.55	2.98	248

* One ton of refrigeration = 12,000 Btu per hr. ** Used only in determining annual operating costs

TABLE III

	Single gray plate	Insulating gray plate
Air-conditioning operating costs	$ 7,550	$ 5,360
Heating operating costs	10,160	5,130
Interest on added cost for air-conditioning equipment	1,660*	.....
Interest on added cost for insulating glass	.....	2,420*
	$19,370	$12,910

* These values assume that any cost savings would have been invested at a simple return of three per cent. On this basis, an annual cost savings of $6,460 is realized, using insulating gray plate in place of single-glazed gray plate.

operating-cost comparisons, the blinds are assumed half-drawn.

Heat gains were calculated using shading coefficients and U-values based on published ASHRAE data. The shading coefficient is the ratio of the heat gain due to transmitted and absorbed solar energy, by the combination being considered, to the heat gain due to transmitted and absorbed solar energy by unshaded regular glass.

Shading coefficients (Using inside venetian blinds)	
Single gray plate	.53
Insulating gray plate	.36

U-values (summer conditions) (Btu/hr/sq ft/degree F)	
Single-glazed plate unshaded	1.06
Single-glazed plate with blinds	.90
Insulating glass unshaded	.56
Insulating glass with blinds	.53

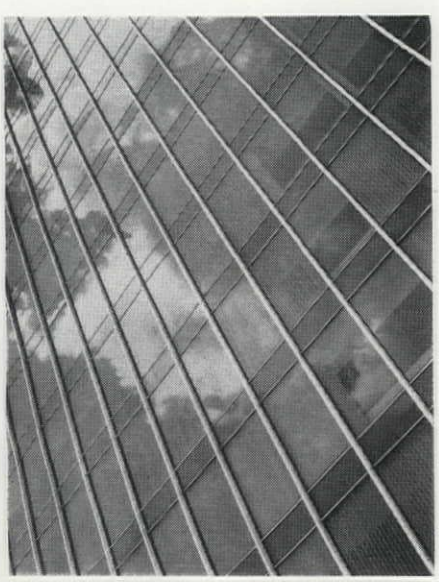
This building uses approximately 57,600 sq ft of glass equally divided on the four exposures (14,400 sq ft per exposure).

The heat gains per sq ft due to transmitted and absorbed solar radiation for 4 P.M. on July 23 are shown in Btu/hr/sq ft (Table I).

Air Conditioning: Initial Costs

Using values from the preceding text and table, the design air-conditioning loads due to heat transfer through the glass areas were calculated in millions of Btu/hr (Table II).

Using insulating gray plate in place of single-glazed gray plate reduced the required air-conditioning tonnage by 92 tons. The cost savings per ton reduction in air-conditioning load will vary with the type of equipment selected. Based on a system costing $1,200 per ton complete, each ton reduction in size will result in a savings of approximately $600. Thus the use of insulating gray plate reduced the initial cost of the air conditioning by 92 tons x $600, or $55,200.



Air Conditioning: Operating Costs

Assuming the venetian blinds are half-drawn, on an average, throughout the building, the annual air-conditioning operating costs were calculated with the following formula:

$$\text{Power cost} = T \times H \times C \times \frac{E}{100}$$

where T = air-conditioning load, tons
H = equivalent full load operating time, hours
C = power cost, cents per kwh
E = power required for air conditioning, including auxiliaries, kw per ton

The following values were used:

T = 300 for single gray plate
213 for insulating gray plate
H = 1150
C = 1.75
E = 1.25

The power cost due to heat transfer through the glass are then equal to the following:

Single gray plate	$7,550
Insulating gray plate	5,360
Annual savings	$2,190

In the above calculation, the equivalent full-load hours were based on an induction air-conditioning system requiring chilled water at relatively low outdoor temperatures.

Heating: Operating Costs

The annual heating costs may be calculated with the following formula:

$$\text{Heating cost} = \frac{U \times A \times D \times C \times 24}{100{,}000}$$

where U = over-all coefficient of heat transmission (winter conditions), Btu/hr/sq ft/degree F
A = total glass area, sq ft
C = cost of heat, dollar per therm (1 therm = 100,000 Btu)
D = degree days

For this analysis, the following values apply:

U = 1.15 for single glass
0.58 for insulating glass
A = 57,600
C = 0.10
D = 6,394

The resulting annual heating costs are as follows:

Single glass	$10,160
Insulating glass	5,130
Annual savings	$5,030

Cost Comparisons

Financing of this building was from earnings reinvested in the business. It is assumed here that the added initial cost for insulating glass, and the added initial cost for air-conditioning equipment required if single gray plate had been used, would have been invested at three per cent rate of return. Based on studies made by the George A. Fuller Company, the added initial premium cost for insulating gray plate for this building would have been approximately $1.40 per sq ft of glass. This includes alterations necessary in the sash. Based on 57,600 sq ft of insulating glass, this amounts to $80,640. The annual operating costs, including a conservative return on the investments involved, are shown (Table III). This cost comparison can also be illustrated as follows (Table IV). Therefore, the pay-off period is a little over 3½ years.

Operation of Air-Conditioning System

A large proportion of high-rise commercial structures built in recent years use the induction air-conditioning system for air conditioning perimeter areas. Such is the system selected for this building. Two of the most important reasons were: (1) considerable space savings for ductwork as compared with all-air systems; and (2) availability of heating or cooling at any time of the year for each room, allowing adjustment of the room temperature as the occupant desires.

In the induction system, individual induction units are located at each perimeter module of the building adjacent to the glass. Primary air from central air-handling equipment is distributed to each of the units. Usually, only enough air for ventilation is distributed, since each unit contains a coil to take care of most of the heating or cooling load in the room.

The air-conditioning load on sunny exposures can vary considerably during cool fall days due to solar radiation. In mild and cool weather, therefore, the cooling-coil refrigeration is still operated, since the lack of full outside air for cooling requires that chilled water be available to the room coils. To supply available heating to each room on cool days, the primary air is warmed. This provides the system with a complete range of heating and cooling capacities. In cool weather, a room can shift from the requirement of a large cooling capacity to a heating capacity in a few moments. This could occur with the sun shining at one moment and a cloud intervening at the next.

When the outdoor temperature falls low enough, refrigeration is not required, since the primary air alone can be used to furnish the smaller cooling load that a room might require. The outdoor temperature at which this occurs is called the "change-over point." The induction air-conditioning system is then switched to its winter cycle of operation, and hot water is supplied to the room coils in the induction units.

If single glazing of gray-plate glass and its higher solar load were used instead of insulating gray-plate units, the following features of the induction system could be effected:

1 It may be necessary to increase the primary air quantity beyond that necessary for ventilation in the summer, tending to offset the advantage of smaller ductwork.

2 It is possible that the air-conditioning load in a module may be larger than can be handled by the largest induction unit manufactured, or it might not be physically possible to fit the unit and its accessories into the space available.

3 The air quantity may have to be increased to an extent that the noise level is unacceptable.

The following three points should be noted in reference to Table V:

1 With single gray-plate glass, the air-conditioning load on the unit cooling coil may be much greater in the cool fall weather than at a summer peak. This may be explained by the fact that during the fall and spring change-over periods, warm air is introduced to the units to provide heating during periods when the sun is not shining. When the sun is shining on the window, the unit cooling coil must overcome the heat in the air introduced into the unit as well as the solar heat through the glass. As a result, a greater cooling capacity must be installed for these brief change-over periods.

2 During the winter period, the primary air supplied to each induction unit on the southeast and southwest exposures must be sufficient to overcome the solar load when warm water is available for the unit coil. As shown (Table V), the load at the change-over point determines the amount of primary air to each unit. This was taken into account and is included in the engineers' cost analysis.

3 The change-over selection with gray-plate glass indicates primary air quantities of 145 and 130 cfm, but these are not acceptable selections for induction units. The air quantities would result in extremely noisy units. This means, in reality, that it is not economically practical, by means of the commonly used induction units, to air condition the LOF Building module using single glazing of gray plate.

There would have been three possible ways to solve this problem if single glazing had been used in the LOF Building.

1 A special high-capacity induction unit with two coils could have been furnished. This unit is not furnished in the low silhouette model.

2 The control scheme of the induction system could have been changed so that the primary air is not warmed in cool, sunny weather. This defeats one of the prime functions of the induction system: a separate cooling and heating source at all times to allow adjustment of the temperature of each room as the occupant desires.

3 Supplementary conditioned air could have been supplied to the room to handle the remainder of the load. This means

TABLE IV

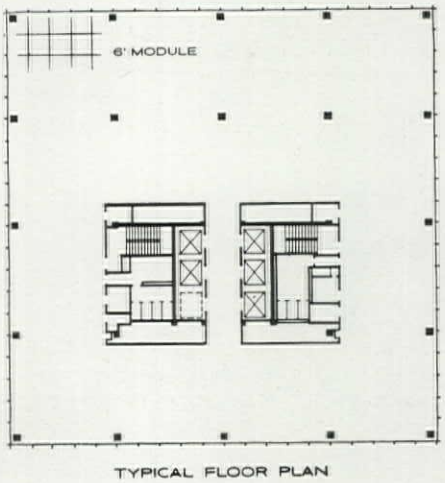
Premium cost of insulating gray plate	$80,640
Savings in initial air-conditioning costs using insulating gray plate	−55,200
Added initial cost using insulating gray plate	$25,440
Reduction in operating costs using insulating gray plate	
Air conditioning	$ 2,190
Heating	5,030
	$ 7,220

TABLE V
SELECTION OF 48″ INDUCTION UNITS FOR A TYPICAL MODULE

	Summer	At change-over point (34° F)
Southeast		
Single gray plate	110 cfm	145 cfm
Insulating gray plate	90 cfm	115 cfm
Southwest		
Single gray plate	115 cfm	130 cfm
Insulating gray plate	95 cfm	115 cfm

Photo: Ezra Stoller Associates

Induction units, in Finance Committee Chairman's office, are about 1' away from glass.



TYPICAL FLOOR PLAN

that additional ceiling ductwork and diffusers would have been required, plus either larger or additional central air-handling units. In this building, about 24,000 cfm of supplementary air would have had to be added to the perimeter areas of the building if single glazing of gray plate had been used. With the limited space available in the hung ceilings of most office-type buildings, this could create serious space problems and perhaps require an increase in floor-to-floor height, adding to the building cost. Any additional air-handling equipment would also add machine-room space problems.

All in all, the performance of the air-conditioning and heating systems, as predicted by the designers and proved by involved and lengthy calculations for the engineers' analysis summarized here, has been extremely successful. The insulating units of this large building have not only resulted in savings for the building management, but have also afforded many comforts, controls, and environmental benefits for those who use the building daily.

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Synthetic Anhydrite Cement

BY DAVID W. GESLER

Unusual properties of new synthetic cement make it possible to install a 1" concrete topping over a structural subfloor, without reinforcement or bonding, and with a total dead load of only 12 psi. This article, by the Director of Market Research, American Synthanite Corporation, New York, N. Y., discusses the product's qualities and applications.

New synthetic anhydrite cement, together with sand, gravel, and water, provides a concrete topping that is readily installed over any structural subfloor without either bonding or reinforcement. The topping actually floats over the subfloor; it is installed over a membrane separator, such as impregnated building paper, felt, or polyethylene, and is separated from walls and columns by ½" expansion joints. A 1" thickness of the material, with a dead-load weight of only 12 psi, is usually adequate for floors with normal live loads. (The strength and thickness of the concrete are adjusted to meet different live-load requirements.)

The topping can be installed over any sound structural subfloor system—reinforced concrete, lightweight concrete fill over reinforced concrete or metal forms, precast-concrete units, insulation board over structural forms, wood flooring, and insulating concrete on grade. In cost, it is generally competitive with, or more economical than, ordinary concrete floor toppings.

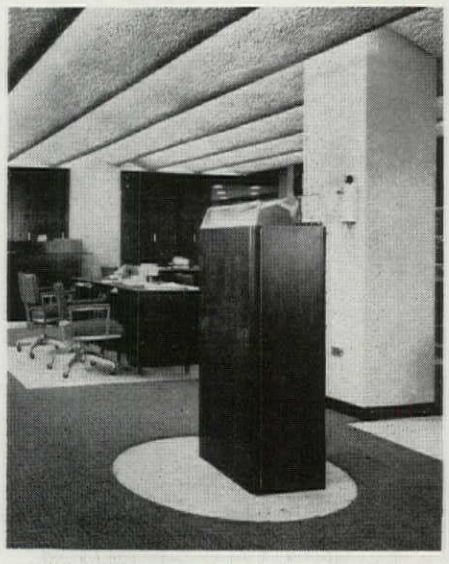
Definition and Origin

Before outlining the synthetic anhydrite cement's unusual properties that permit such construction, some background material will be of interest.

Anhydrite is defined in *Webster's New Collegiate Dictionary* as "anyhydrous calcium sulfate"; and anhydrous is defined as "destitute of water, especially water of crystallization." The patented process for converting hydrofluoric-acid residue into synthetic anhydrite cement was developed in West Germany some nine years ago. Since then, more than 72 million sq ft of the concrete—trademarked "Synthanite"—have been installed in Germany. Additional uses for Synthanite cement in Germany include adhesives, and the manufacture of precast-concrete products and wall tile. In the United Kingdom, the cement has a three-year record of satisfactory performance in floor toppings. In the United States, earliest installations were made approximately two years ago. All basic technical data for the product have been confirmed by recognized U.S. testing laboratories that have followed ASTM testing procedures.

The product is currently being manufactured in the United States by E. I. duPont de Nemours & Co., Inc., and supplied under contract to the American Synthanite Corp. Preparations are under way to provide production and marketing facilities to serve all areas of the U.S., Canada, and Mexico.

Photo: Leni Iselin



Marble and carpeting compose floor design for the new service-department office of Dreyfus & Co., New York. Marble tile was placed under the desks and the financial-news teletype machine in the foreground. One-and-one-half in. of Synthanite concrete, without bonding or reinforcing, was installed as an underlayment to bring the carpeting level with the 2-in. thick marble. Designer was Michael Saphier Associates, Inc.

Synthanite is being installed by approved contractors in order to provide uniformity of application and dependable performance.

Special Properties

Reinforcement is not required with the new cement because of its high compressive and flexural strengths. The minimum compressive strength at 28 days is 2500 psi; minimum modulus of rupture or flexural strength at 28 days is 625 psi. Greater strengths can be achieved by varying the mix.

Because the floating finish does not depend upon bonding to the subfloor for its success, it is an extremely stable topping. By being installed over a membrane separator, it actually floats on the structural subfloor; damage to the floor finish through movement of the subfloor is thus practically eliminated. Shrinkage is negligible: tests have shown that approximately 0.001 per cent shrinkage occurs after 11 days of drying, about $\frac{1}{20}$th that of ordinary concrete. Cracking and curling are eliminated. This smooth and stable topping makes an excellent surface for receiving resilient floor coverings, and is also recommended as an underbed for carpeting and parquet. The stability of the surface contributes to uniform wearing quality of the final floor covering.

The synthetic concrete hardens and dries rapidly, so that earlier occupancy is frequently realized. Initial set normally takes less than three hours. Depending upon atmospheric conditions, a Synthanite topping can take construction traffic after 3 days; a floor covering can be applied in 6 to 10 days.

Early high-strength concrete is provided by Synthanite cement. The typical mixture for a floating floor topping is 1:1½:1—1 part Synthanite, 1½ parts sand, 1 part gravel, and 3½ gallons of water per sack of cement—which produces a concrete with a minimum compressive strength of 1700 psi after three days.

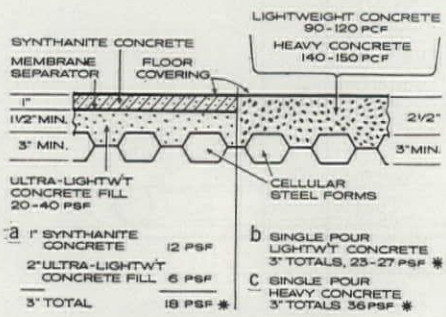
Other technical information on the new material: dry density of 140 lb/cu ft, coefficient of thermal expansion of 0.0000031 for the typical mix, thermal conductivity value of 4.9, and a low residual moisture content of about 0.6 per cent by weight after 10 days. There are several advantages for heated floor systems here: the low moisture content requires less electrical energy to produce a given temperature than ordinary concrete, and the thermal conductivity value helps to provide for even heat storage and transfer.

Placing and Curing

Conventional equipment and application methods are used to install Synthanite

concrete. It has no slump, but becomes a sticky mass of earth damp consistency with a flow of 5 per cent with 15 drops of ½″ in 15 seconds on the flow table (ASTM C-230-57 T). The concrete is placed and screeded to the specified thickness—1″ to 1½″ is usually adequate for all types of structural subfloors and floor coverings. Thermal expansion joints of ½″ air space or ½″ of highly compressible material are installed at the junctures of all walls and columns. The surface is power-troweled, and hand-troweled for the final finish. The completed installation of each average-size floor panel or section usually takes less than four hours.

Special handling is not required in cold-weather applications. For example, it is not necessary to heat the mixing water. The concrete can be placed as



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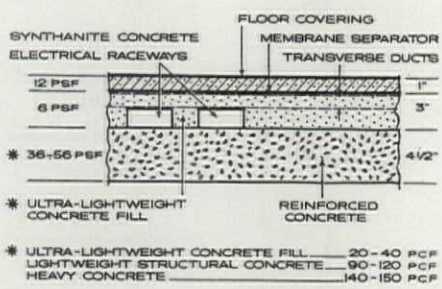


2

long as it is workable and will be trowel-finished within four hours after placement. Synthetic anhydrite concrete should not, however, be installed when temperatures inside the building are expected to drop below freezing within 24 hours after placement.

Curing of the concrete normally requires no special provisions, but care should be taken in the first 48 hours to protect against rapid drying out from severe hot and dry weather. (Too rapid drying during this time may cause premature evaporation of moisture, which prevents sufficient crystallization from taking place and affects eventual hardening.) When the topping is dry, after 6 to 10 days, the final floor covering may be installed.

Applications

The use of the new synthetic anhydrite cement is important in the design of both new and remodeled structures. Now, for the first time, it is possible to utilize lightweight-concrete fills (with a density of 20 to 40 lb/cu ft) over metal forms and for embedding electrical conduit and service ducts over structural concrete. A 1″ topping of Synthanite concrete is installed without bonding over a lightweight-concrete fill. The floating principle eliminates the usual curling and cracking that occurs when a topping of ordinary dense concrete is bonded to a lightweight fill. (The two concretes —dense and lightweight—frequently vary in shrinkage, expansion, and contraction characteristics, making a proper bond difficult to achieve.)

By combining a lightweight-concrete fill with a Synthanite concrete topping, 20 to 50 per cent savings in dead-load weight can be achieved. A typical floor system where these materials are used advantageously is over steel forms. The total weight of the lightweight-concrete fill and the topping for this floor system is approximately 18 lb/sq ft, which can be compared with 23 to 27 lb/sq ft for lightweight structural concrete, and 36 lb/sq ft for heavy concrete 1.

Another example where lightweight-concrete fill is used with a Synthanite topping is over structural concrete arches. Service duct requirements over concrete subfloors may require up to 5″ of fill. A lightweight-concrete fill with a density of 2 to 3 lb/in. thickness/sq ft provides considerable savings in dead-load weight 2.

Additional advantages of the lightweight floor systems include savings in structural and foundation costs, and reduction in dead-load weight for buildings where special foundation problems exist. The lightweight-concrete fill also doubles as insulation for heating and cooling elements that may be included in the cellular steel forms, or that may be embedded in the fill over concrete arches.

By including service ducts for electrical conduit, telephone, and intercom wires, and heating and cooling elements in the floor system, it is also possible to reduce the height of multistory buildings. Floor systems that contain services may be designed with less over-all thickness or depth.

The new concrete toppings have also been installed, without bonding, over precast-concrete planks as an under-layment for resilient floor coverings. In one such project, a 1¼″ topping of Synthanite was used to replace 1½″ of ordinary concrete topping that had cracked and loosened four months after installation. The concrete planks had apparently deflected excessively, causing the topping to separate. By comparison, the Synthanite concrete topping has been entirely satisfactory during the 18 months since its installation.

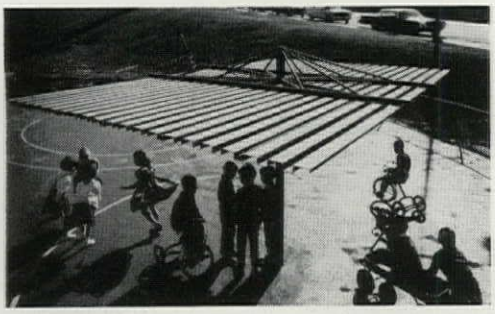
For remodeling, the material has been placed directly over old concrete and wood floors. It is floated over a membrane separator, thus eliminating the cost of cleaning, hacking, or priming the existing floor.

In one remodeling project, a parking garage with a floor area of 30,000 sq ft was converted into a discount store and supermarket. The concrete slab floor in this building was cracked, uneven, and spotted with grease and oil, and had drainage slopes causing low areas of about 12″ in depth. In remodeling, the drain areas were brought level with crushed-limestone fill, compacted in place by rolling. The floor was leveled and finished with a 1¼″ topping of Synthanite concrete installed over building paper, without reinforcing. Asphalt tile was used as the finished covering over the Synthanite concrete.

The topping can also be placed directly over existing roof decks that have been designed for additional floors. This technique provides earlier occupancy, and eliminates the cost of removing and disposing of the insulation and built-up roofing. The topping is usually placed directly over the built-up roofing. The Gertz Department Store at Flushing, New York, illustrates this application of a floating floor topping for converting a roof into an additional floor. A 1¼″ topping was floated over an existing concrete-arch roof system to provide a third floor. Vinyl tile was used as the finished floor.

For floors requiring insulation or reduction of sound transmission, a Synthanite topping is placed over insulation board or lightweight insulating concrete.

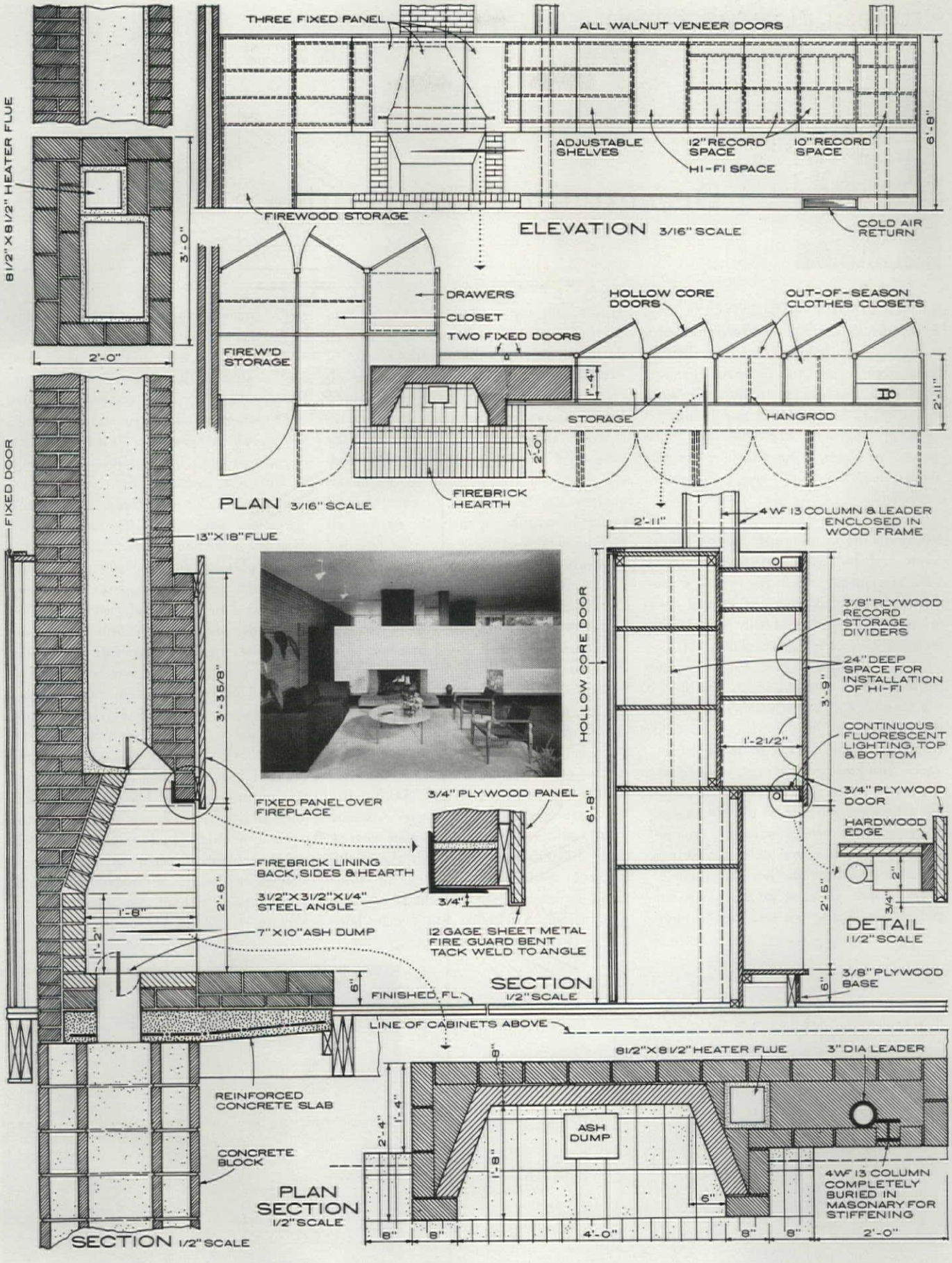
The new concrete is not recommended for outdoor applications or for installations that are subject to permanent dampness. Although it is water-resistant, it is not waterproof. It resists normal water spillage, but is liable to deterioration if exposed to continuous moisture.



*VISTA MAR ELEMENTARY SCHOOL: Daly City, California
MARIO J. CIAMPI, Architect

SELECTED DETAIL
SHELTER UNIT

* See MARCH 1961 P/A



EFINGER-MILLER RESIDENCE: Brewster, N. Y.
ULRICH FRANZEN, Architect

SELECTED DETAIL
STORAGE & FIREPLACE WALL

Decentralized Gas Heating

BY WILLIAM J. McGUINNESS

When the lowest bid for the design of a school with a central boiler exceeded the bond issue, a switch to localized furnaces and other economies brought the total cost within the budget. A practicing mechanical engineer describes the redesigned mechanical installation of this school and its first year's operating experience.

By replacing a planned central boiler room and its heat-distributing network with individually fired gas furnaces, savings in both initial cost and cost of operation were achieved at the Ashton Elementary School in Cumberland, R.I.

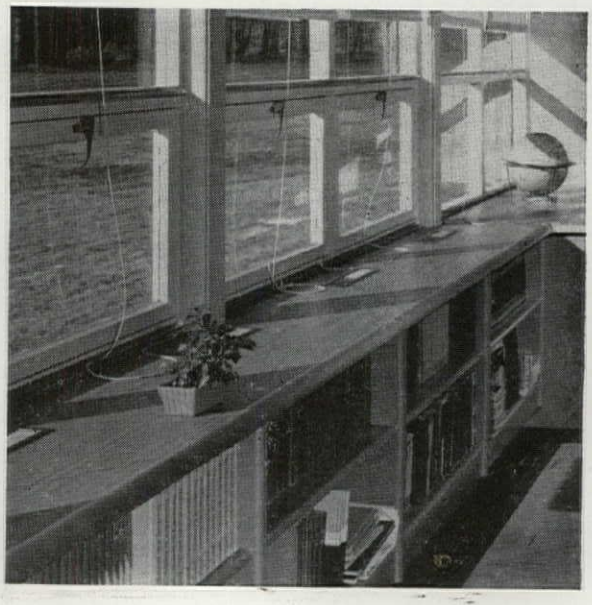
As is usually the case, the economies resulted from a tight budget. The lowest bid for this 10-room school was $335,000, which exceeded the approved $300,000 bond issue. The switch to localized furnaces produced a savings of $18,000, which, together with other minor economies, brought the cost within the budget. Moreover, the school gained a room—the boiler room—now used for storage but earmarked for another classroom.

The minor changes in the classrooms and in the façade are seen in the photographs. Air for combustion and for ventilation is drawn in through twin grilles, designed so as to minimize the effects of excessive wind and the deteriorating effects of the weather. Next to the cabinet-type furnaces are flues emerging directly through the roof. In classrooms, the warmed air is delivered through horizontal ducts on the outside of the bookshelves. At the juncture of each pair of operable ventilating sash, the warmed air is fanned across these areas of possible infiltration by adjustable registers.

Air is taken back at the furnace cabinet, though some is drawn through louvered classroom doors to warm the corridors before it is exhausted. The classroom furnaces project only slightly beyond the window-wall bookshelves and are no more than comfortably warm to the touch. Special insulated linings reduce both heat loss and sound level.

The classroom furnaces are rated at 85,000 Btu per hr, although 100,000 Btu units are used in corner rooms or where small adjacent spaces are also heated. Four 100,000 Btu units heat the multi-purpose room that combines the functions of auditorium, lunch room, and gymnasium. A 140,000 Btu per hr horizontal furnace is suspended at the ceiling.

The school has an area of about 19,000 sq ft, with 10 ft ceilings in the classrooms. It is of block and brick veneer, with roofs of gypsum poured on glass-fiber insulation board. In addition to the 10 classrooms and the 20-ft-high multi-purpose room, the school contains a health room, lounge, janitor's room, storage area, and two offices. One year's operation, beginning after the school's completion in September 1959, showed a saving of more than 30 per cent of the estimated operating cost of a central boiler system. The total cost of heating the school for the 1959–1960 school year was $2560 for 5430 degree days. So convincing were the savings of both installation and operation that this method has been chosen for seven classrooms now being added to another school in the same district, despite the fact that the original boiler is large enough to carry the additional load. The ease of equipping additional rooms is evident in this method of individual room heating. It appears ideally suited to the present widespread need for school expansion. The Ashton School was designed by Architect Linwood A. Gardiner.



Architect: William Tamminga. *Consulting Structural Engineer:* Karl A. Krause. *Steel Fabricator:* Mosher Steel Company. *Steel Erector:* Palmer Erection Company. Bethlehem supplied structural steel for this job.

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Texas motor hotel completed in 8 months thanks to steel framing

Much of the steel frame is left exposed and painted black, or pastel blue with striking architectural effect.

Eight months from the day they broke ground for the Carrousel Motor Hotel, near the International Airport in Houston, it opened for business . . . and the owner's investment started paying off.

A good deal of the credit for this remarkable speed record must be given to the architect's choice of steel framing for the 110 guest rooms, the large dining room, and the promenade. The steelwork not only went up fast, but also permitted all the other trades to move in quickly, and speed the motor hotel's completion.

Thanks also to the steel frame, the owner will be able to expand the hotel quickly and economically. A new steel frame can be tied in to the old one without having to put in another set of columns and losing floor area.

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Evaluating Manufacturers' Products

BY HAROLD J. ROSEN

Preparation of construction specifications during the working-drawing stage requires the use of well-produced manufacturers' literature and often the services of well-informed manufacturers' representatives. Frequent shortcomings of these agents for the manufacturer are analyzed by the Chief Specifications Writer of Kelly & Gruzen, Architects-Engineers.

In preparing specifications for the construction of a building, the specifications writer must be ready to choose and select the materials and equipment that he will specify. He will first establish the criteria that are essential, and then examine manufacturers' literature to determine whether their products meet these qualifications. In addition, he may call in manufacturers' representatives to obtain additional information concerning their products.

This selection takes place during the working-drawing stage, when the various materials can be evaluated objectively. During the construction phase, when contractors attempt to offer substitutions, there is little time to research the substitute materials carefully. All of this ties into the perennial problem of the use of the term "or equal" in specifying materials.

Let us examine manufacturers' literature and see whether the specifications writer can prepare a specification based on specific criteria, and then select manufacturers' products that will meet these criteria. Manufacturers' literature consists, I presume, of the material sent to an architect's office, or material that is contained in Sweet's *Architectural Catalog File*. One would assume that this literature was designed for professional use.

We will start with a requirement for a spandrel waterproofing fabric. It should be a specific type of fabric and contain a stated amount of bituminous material. The bituminous material should be referenced to a Federal specification, an ASTM specification, or an AASHO specification. What does some of this professional literature describe? Nothing. Quote from one manufacturer's literature: "ABC spandrel fabric is sealed with ABC waterproofing compound. It is intended for waterproofing spandrel beams when applied with ABC spandrel mastic." What does the competitive literature state? "Apply one coat of XYZ trowel mastic into which shall be embedded one layer of XYZ flexible spandrel mastic."

Is the fabric cotton, felt, glass-fiber, or miracle-fiber? Is the bituminous material asphalt, tar, or gook? Are there 10, 20, or 30 ounces of bituminous material per sq ft of fabric? Does the bituminous material meet a recognized standard?

Has the manufacturer's professional literature been of any value to the specifications writer? Not at all. He calls in the manufacturer's representative. Some representatives are qualified technicians with architectural or engineering backgrounds and can for the most part be quite helpful. Others are simply salesmen who will describe their (incomparable?) products in glowing generalities and leave one completely in the dark as to the physical and chemical characteristics of their materials.

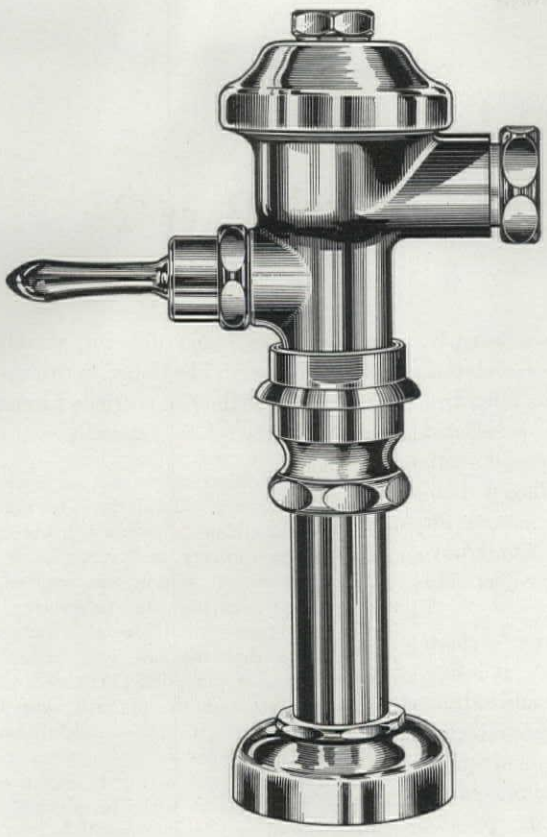
Have you examined paint manufacturers' literature? Some of this literature actually performs a disservice and is an insult to the intelligence of technical people who have to evaluate and use it. We know that there are oil paints, alkyd paints, latex paints, casein paints, etc. How are these described by some manufacturers in their literature? Quote: "An exterior paint for application on wood surfaces." This is most likely equal to his competitor's, who describes his as "a long-lasting paint for exterior wood surfaces." What type is it? You may read the fine print very carefully, but there is no information concerning the type of paint, let alone the formulation. Are manufacturers' representatives any more informed about the products they sell? Again, only those with technical backgrounds know whereof they speak.

Specifications written by specifications writers for materials can be no better than the information obtained from manufacturers' literature or from their representatives. How can the specifications writer compare one manufacturer's product with another unless certain basic criteria are established? How can one equate one product with another if it is offered as a substitution by a contractor, when the specification drawn is vague, indefinite, and no plane of reference is established?

Responsible manufacturers must furnish accurate technical information to professionals. If they can define their products to the satisfaction of specifications writers, and present their data couched in specifics rather than in generalities, both in their literature and through proficient representatives, there will be less opportunity for breaking specifications and a reduction in substitutions of inferior products, through the preparation of tight, sharply drawn specifications.

The Construction Specifications Institute has qualified individuals who can be of assistance to manufacturers in the preparation of their literature. Many of them will be in attendance at the national convention of CSI, which will be held in New York on May 22, 23, and 24, at which time manufacturers' materials and literature will also be displayed before the prime users.

If there is ever a better flush valve . . . its name will be SLOAN



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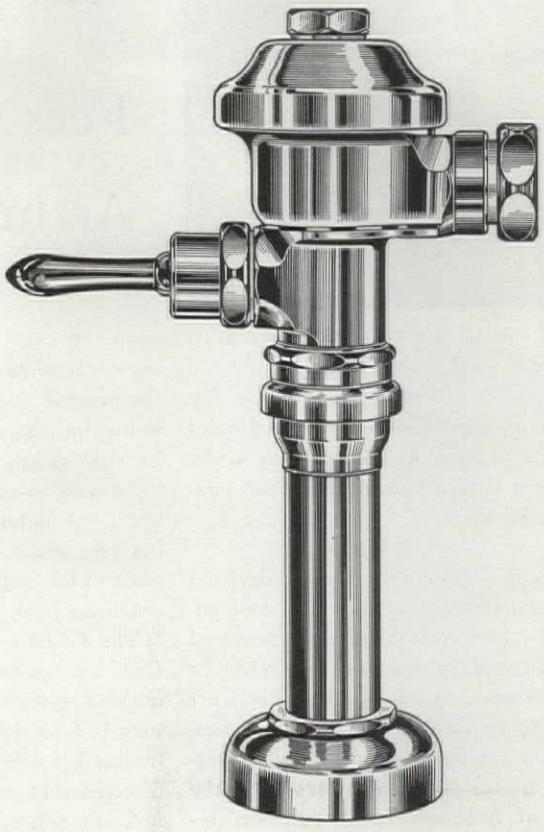

1961

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Fees Denied for Architectural Services: Part 2

BY JUDGE BERNARD TOMSON AND NORMAN COPLAN

This month's column concludes the discussion of recent Connecticut court cases in which persons not licensed as architects were denied compensation for services rendered.

Last month's column discussed a decision of a Connecticut court denying compensation for architectural services rendered by a licensed professional engineer. In still another Connecticut case, the Court refused to require the owner to pay compensation for architectural services performed by an associate professor in the School of Architecture at Yale University *(Nathra Nader* v. *King Lui Wu)*.

The plaintiff in the above case was the owner of certain property in the town of Winsted that had been substantially damaged by the great floods of 1955. The defendant was an associate professor in the School of Architecture at Yale University, and had an extensive education and training in the field of architecture. He was highly regarded in the architectural profession, but was not a registered architect under the laws of the State of Connecticut. The plaintiff and defendant entered into a contract providing for the furnishing by the defendant of plans, specifications, and supervision for the rehabilitation of plaintiff's property. The plaintiff agreed to pay the defendant 14 per cent of the cost of the work.

Several subcontractors were employed on the work but the plaintiff did not engage the services of a general contractor. The plaintiff's son, who had no construction experience, attempted with much difficulty to co-ordinate the work of the subcontractors. The defendant, in supervising the construction, visited the premises approximately once or twice each week. For these visits, it was necessary for him to travel from New Haven, where he taught, to Winsted, Connecticut.

The plaintiff was under the apparent impression that appropriate supervision called for the defendant to be continuously at the premises. Consequently, when completion of the job was delayed, the plaintiff sought to hold the defendant liable for the extra expense occasioned by such delay. When the plaintiff instituted suit to recover these alleged damages, the defendant counterclaimed for his fee, which, except for a small payment at the beginning of the project, had not been paid.

The Court rejected the owner's claim for damages based upon delay, pointing out that specific directions to subcontractors is "the function of a general contractor." A delay arising from inadequate directions to such subcontractors could not, therefore, be chargeable to the defendant under his duty to supervise.

The Court, in considering the defendant's counterclaim for his fee under the contract, reviewed the Connecticut licensing laws. Under these statutes, it is provided that no person shall practice architecture, or use the title "architect," unless he shall have secured a certificate of registration. The practice of architecture is defined as "the rendering or offering to render service to clients by consultation, investigation, evaluations, preliminary studies, plans, specifications, and co-ordination of structural factors concerning the aesthetic or structural design and supervision of construction of buildings or any other services in connection with the designing or supervision of construction of buildings." Certain activities are excluded from the definition of the practice of architecture, such as "the making of plans and specifications for or supervising the erection of any building containing less than 5,000 sq ft total area."

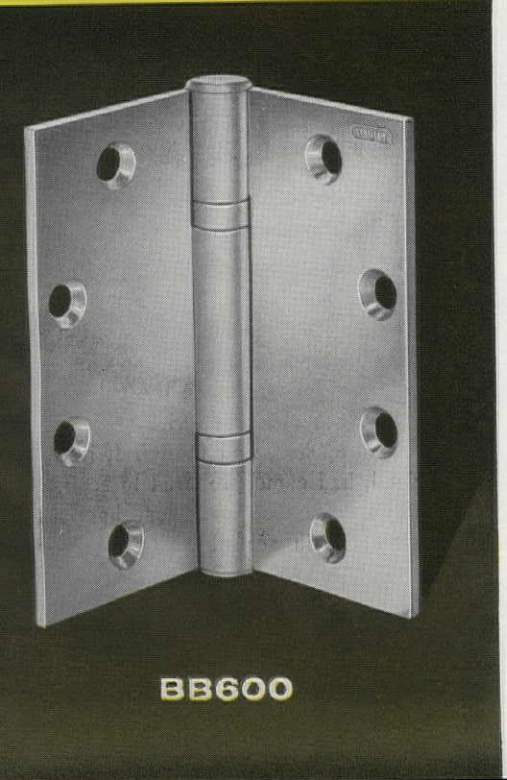
The plaintiff contended that since the defendant was not licensed as an architect in Connecticut, his contract with the defendant was unenforceable, and the defendant could not recover for architectural services rendered. The defendant, on the other hand, argued that the licensing law was a revenue ordinance rather than the exercise of "police power," and did not, therefore, bar his recovery. The Court, in discussing the purpose of the Connecticut Licensing and Registration Law, stated:

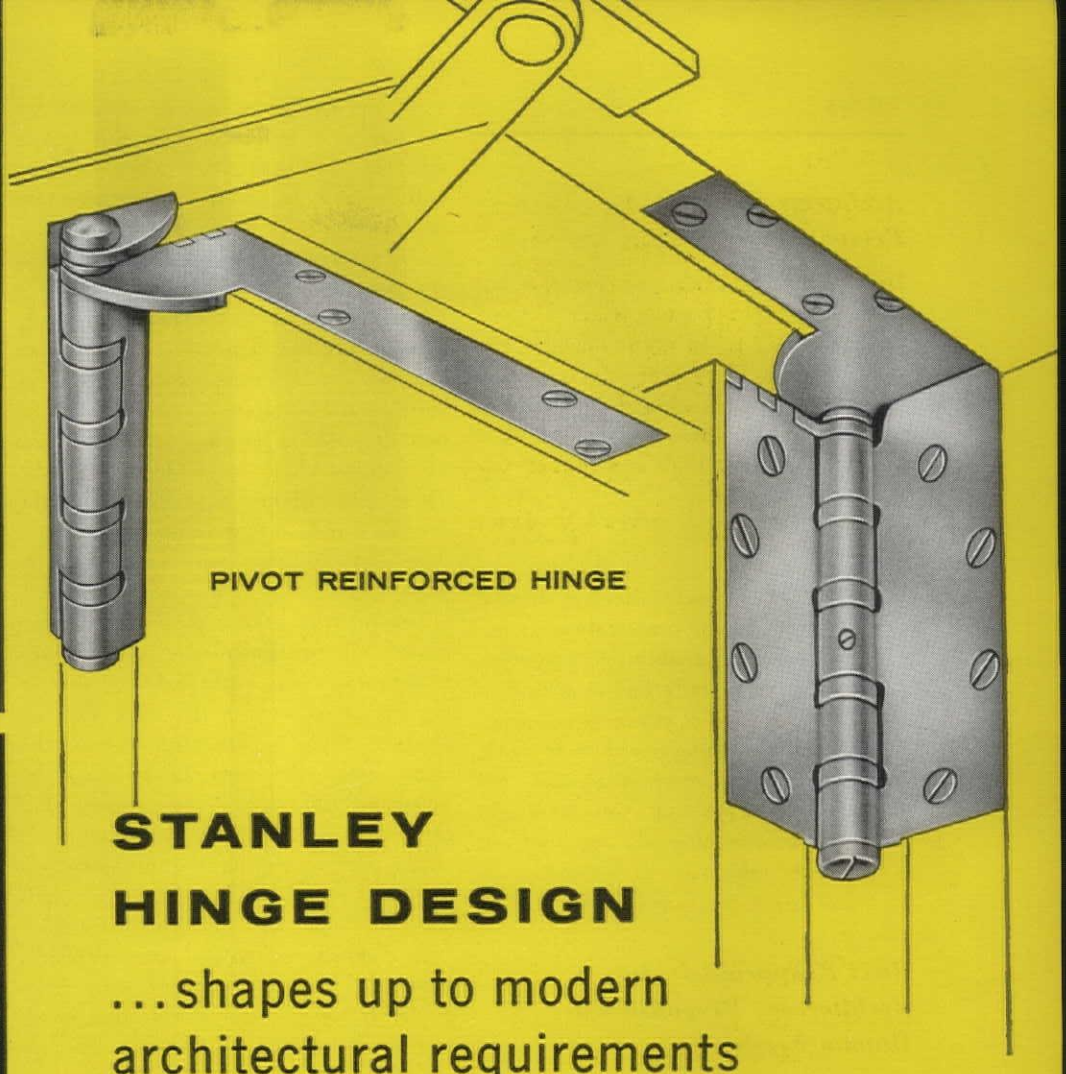
> "Where the object of the statute is merely to produce revenue, the failure to register would not invalidate a contract made by a person acting contrary to law. . . . .
>
> "The Connecticut statute was enacted for the declared purpose 'to safeguard life, health and property.' It seems clear from its language that the law was passed for the protection of the public. The defendant, by his contract with the plaintiff, was practicing architecture within the definition of our statute, and since he was not registered by the board, he was acting in violation of the law. His contract with the plaintiff was therefore void and unenforceable."

The defendant, who was born in China, also challenged the constitutionality of the licensing and registration law in relation to its provision that an applicant for examination and registration must be a citizen of the United States or an alien "who has duly declared his intention of becoming such citizen." The Court found that this classification bore a reasonable relation to the public interest and was not arbitrary or discriminatory. The Court stated:

> "The due process clause of the Constitution is a limitation upon an improper exercise of the police power by the states in that it prevents an arbitrary or unreasonable exercise of power. Class legislation, discriminating against some and favoring others, is prohibited, but legislation which, in carrying out a public purpose, is limited in its application, if within the sphere of its operation it affects alike all persons similarly situated, is not contrary to the Constitution. . . ."

The finding of the Nathra Nader decision affects all architects practicing in states other than the one in which they are licensed. It cannot be overemphasized that, prior to engaging in any work connected with any project in any state, the architect make certain that he is complying with the licensing laws of that state. Otherwise the consequences may be disastrous.





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Architects Praise P/A Presentation

Dear Editor: Thank you for the fine coverage on our Faculty Club (FEBRUARY 1961 P/A). In my opinion, it was well done in every way. Text, photos, layout, and details showed the building well and fairly. Presentation in P/A is the best architectural recognition one may hope to obtain.

VICTOR STEINBRUECK
Seattle, Wash.

Dear Editor: We were all most pleased to see the excellent presentation of our [Villita] Assembly Building in FEBRUARY 1961 P/A. I especially like this kind of story, and am tired of mushy prose praising individual architects and their work. Much prefer the more analytical and objective approach that you used and feel there's something of "teaching" in it that is refreshing.

O'NEIL FORD
San Antonio, Tex.

Ricci Reappraised: An Architecture Responsive to Human Needs

Dear Editor: As a graduate of Columbia University, I am now in Italy on a traveling fellowship. Recently, while in Florence, I came across a copy of the OCTOBER 1960 P/A. Since I have spent the last month and a half in the office of Leonardo Ricci, it was with great interest that I read the reaction to his work shown in an earlier issue—a reaction based primarily on several photographs and Ricci's statement on the architect and painter.

What exactly is meant when it is said that a preoccupation with painting theory hinders a concern with building construction and human needs? If an architect does not answer the human needs of man, what value do technical proficiency and "good construction" have? Let us not criticize an architect on the basis of one or two basic statements or photographs. We can criticize a direction and its results if we spend time within the three dimensions of a solution; only then can we ascertain its value. Buildings are not made new and different through the use of new materials or construction systems, for these only reflect the changes of our technology. An exciting structural system does not create architecture any more than does a modest solution. When we understand that the space created, the enclosure, is the criterion for architectural judgment—not the façade with its technical limitations—then we will be able to understand architecture in relation to its time.

A preoccupation with painting or sculpture is no more dangerous than a preoccupation with the technical problems of business construction. Indeed, an engineer cannot produce architecture any more capably than a painter, but a painter would at least have the advantage of understanding the problems of man. These are simply side roads in the over-all direction that architecture should take—side roads, yet each equally important.

Let us stop trying to search for an answer via two-dimensional photographs of someone else's work and start searching for an answer in the work that we produce. When we can stop blaming the client, stop criticizing the building department and zoning regulations, stop rationalizing our failures and start criticizing and correcting the problems we are faced with each day, I hope we shall start producing an architecture of quality and quantity suited to human needs. Leonardo Ricci says let us start from doubt. If we can accept only that much and understand its implications, then we are one step closer to understanding architecture and Leonardo Ricci.

RICARDO SCOFIDIO
Firenze, Italy

Shocking Fare

Dear Editor: The announcement of a design for the Theme Center at the coming World's Fair is shocking. More appropriate would be the announcement by the Fair Corporation of an international architectural competition with a qualified representative jury.

Instead, we have foisted upon us this "Unisphere" by a group of gentlemen hardly qualified to even enter such a competition. Criticism of the design is to be expected, but the conduct of those responsible for making this decision certainly demands immediate and active opposition by individuals and professional groups concerned.

PHILIP J. KOWALSKI
Garfield, N.J.

The Resident Architect: On-Site Training Urged

Dear Editor: As a graduate architect ('56) now working in construction, I was gratified to read Edward Friedman's article on the resident architect.

I cannot quite understand the Architectural Registration Board's failure to see the value of mandatory construction experience as a prerequisite for admission to the licensing exam.

It is often commented by design instructors and critics that all of the most significant architectural achievements of the past or present are in every case expressive of the designer's ready apprehension of the uses of materials and methods of construction. These buildings, it is said, all have that fabled, ambiguous, "certain rightness" about every aspect of their design, but especially is this so in the "intuition" for materials and methods which they evidence.

I believe the development of this awareness to be a most important but neglected part of architectural education. The school curriculums and early apprenticeship training, tend, I think, to develop competent planners, but fail to develop adequately in the student a feeling for materials and methods. This is due in large measure to the inadequacy of words to do the job. Intuition is difficult to define, and more difficult to teach.

The fastest way to become familiar with and understand the chemical, structural, or economic properties and limitations of materials is to observe them in *action*. On-site training affords an excellent opportunity to do this. Here the student can witness the failure of materials under stress, or listen to a skyscraper groan in a hurricane, or watch a slender strand of wire hoist tons of material, or learn first-hand the cost of an extra. (A mechanics × B hours × C $/hr. + D% payroll tax + E% welfare fund + F% pension fund + G% vacation fund × H% overhead × J% profit). Nowhere can you learn faster. On-site training should be mandatory, I feel, in the schools, but it would be especially helpful on graduation, before pencil ever touches paper.

I hope we may see more articles on this subject.

JOHN TEGELER JR.
New York, N. Y.

More Comments on the FDR Memorial Competition

Dear Editor: I was delighted with your comments on the results of the Franklin Delano Roosevelt Memorial Competition (FEBRUARY 1961 P/A).

It was my privilege to see the exhibition at the Corcoran Galleries on the night it was opened, and though I, like your friend, had come prepared to scoff, I remained to cheer. I was very happy therefore to be in accord with the res-

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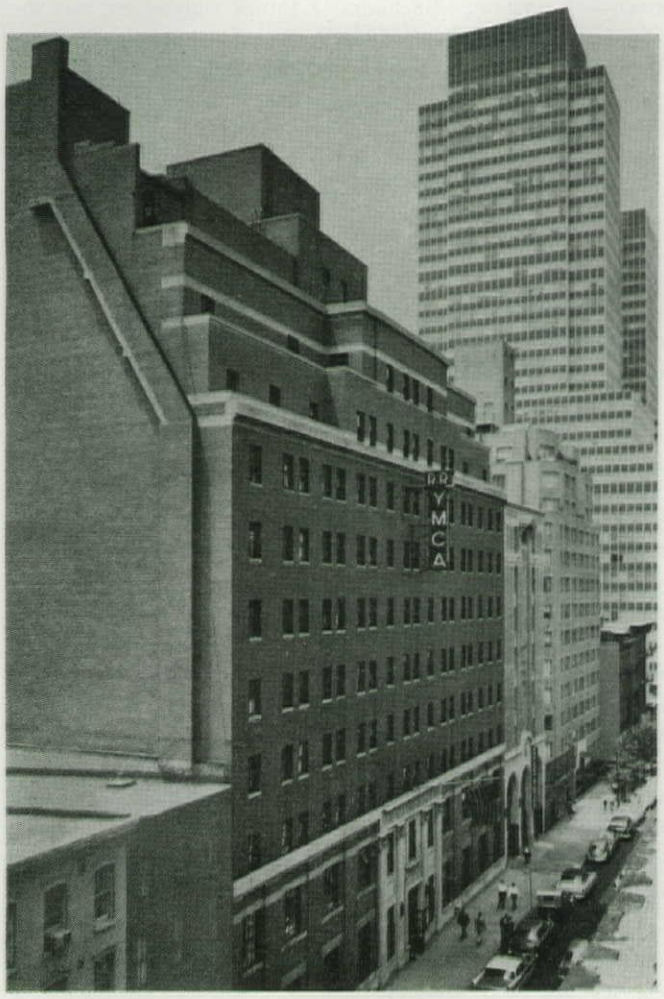
from Vinyl's First Three



Corridors renovated with Fabron and Permon—YMCA Grand Central Railroad Branch, New York City. Erected 1929; Warren & Wetmore, Architects.

Six hundred rooms renovated with Fabron—West Side YMCA, New York City. Erected 1930; Dwight W. Baum, Architect.

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...from letters written by Albert G. Weidensaul, Business Secretary, West Side YMCA, and E. N. Taraldsen, Executive Director, RR YMCA

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olution passed by the Board of the A.I.A. which commended the competition and its conduct.

FREDERIC H. PORTER
Cheyenne, Wyo.

Dear Editor: I thoroughly agree with your analysis of the Franklin Delano Roosevelt Memorial Competition (FEBRUARY 1961 P/A). I have also seen the competition drawings and models on exhibition at the Corcoran Gallery in Washington.

I feel that in the winning design one finds a new and expressive statement of what a memorial to a great man should be. To be sure, there are minor faults and deficiencies, but all these, including the problem of visibility for various inscriptions and the development of auxiliary landscaping, can readily be solved. Let us hope that this successful marriage of sculpture and architecture will be built!

MORRIS KETCHUM, JR.
New York, N. Y.

Dear Editor: Personally, I find the winning design [of the F.D.R. Memorial Competition] excellent. I would say "superb," except for the fact that I think it could stand a little further study. However, I trust the further study will not impair the clarity and brilliance of the idea. It was, in my opinion, a very easy winner. There has been a lot of nonsensical criticism and the competition has produced a great plethora of Sunday morning architectural quarterbacks.

EDMUND R. PURVES
Washington, D. C.

Dear Editor: The Associated Architects, Pedersen, Tilney, Wasserman, and Beer are to be highly congratulated on their winning design of the Franklin D. Roosevelt Memorial to be erected in Washington, D.C. At first look we ask in wonderment, "What is it?" However, after careful study and analysis, we discover that this monument is an ingenious masterpiece in conception, symbolic of the prevailing chaos, crime, and waste of the present era in history of the United States.

Functionally, this monument has very little value, if any, as a structure. It doesn't even provide an umbrella roof to keep people from getting wet when it rains. It does, however, provide tombstone tablets for recording the steps that have been taken toward the decline and fall of the American Republic into communism through too much socialism, capitalism, and greed without enough individual sovereignty and useful productivity to balance the accounts between wealth and stealth. "Something for nothing" has taken priority over justice; therefore, there cannot be good-will, peace, sanity, law and order.

This monument would be a perfect medium for inscribing a list of the stepping stones that have led to damnation and downfall of nations. The tablets should read "There is nothing to fear" except apathy, tolerance and acceptance of: (1) confusion; (2) discrimination; (3) exploitation; (4) corruption; (5) collusion; (6) usurpation; (7) subjugation; (8) compulsion; (9) confiscation; (10) taxation; (11) conscription; (12) monopolization; (13) pauperization; (14) subsidization; (15) stagnation; (16) ruination; (17) damnation; (18) WAR-destruction.

This memorial should be built promptly while the American dollar is still worth 25 cents. If construction is delayed too long, it may have to be done by WPA. In this event, it is uncertain if the project will ever be completed. Made-works are as useless and wasteful as the pyramids. They are very expensive, especially when done on credit charged to the present and future generations, endlessly mortgaging life and property.

G. SZMAK
Economist, Construction Surveyor
New York, N. Y.

Retrogressive Architecture in a "Botched-up" Society

Dear Editor: I noted, with obvious interest, your documentation of the "bicycle wheel" structures in the FEBRUARY 1961 P/A, particularly the one now being studied by Robert Le Ricolais.

I undertook construction of a 20-ft-diameter structure, to be used by me as a two-car canopy to illustrate the obvious efficiency of "islands of compression" situated at optimum crossing points of the triangulated geodesic tensile members terminating in a peripheral compression member.

To maximize the *structural efficiency* of this idea to its limited conclusion, a fabric (vinyl-coated nylon) cover was employed in addition to suspending the entire "wheel" in tetraherdronal tensile slings from three unguyed columns.

Although limited funds prevented the use of the finest materials (the compression ring was made of three ½" x 3½" green-pine slats), this unit was light enough to be lifted intact by two persons.

It is certain that Le Ricolais is not wrong. It has been demonstrated by Buckminster Fuller and others that the appropriate use of "discontinuous compression—continuous tension structural integrities" offer the most efficient presently obtainable space enclosures in terms of the increasingly popular measure—*performance per pound*—of invested materials (and effort). It is structurally possible to warp into any shape the localized islands of compression, utilizing "through" tensile members—the optimum being sphere! Edward Stone's Brussels Fair Building represents to me something of an insult to the logic of clear-spanning such a distance using tension, then *plunking* a great mass smack in the middle to defeat (i.e., increase the necessary load capacity of the tensile member) the gains of a lacy spider web construction —*ergo*, the carport.

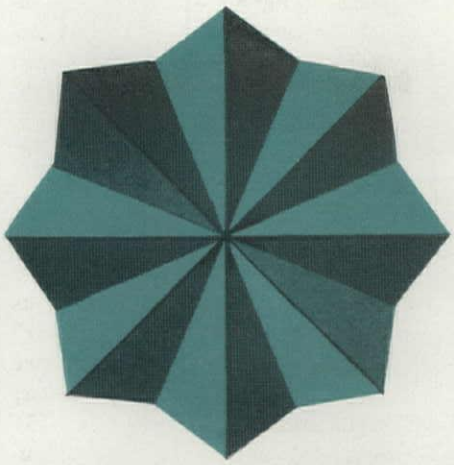
Until our society gets up on its hind legs from the morass of archaic debris, strikes the fetters from its brains and refuses to accept "botched-up" excuses foisted upon them as "the best" available, I am sorely afraid that PROGRESSIVE ARCHITECTURE is doomed to reproduce upon its pages the preponderance of *Retrogressive Architecture*.

The ever-accelerating pace of science demands a reappraisal of the majority of the accepted facets of our world society; and controlled environment, which is lagging the most, yet which directly and personally affects every living human being, is due for the most drastic shake-up.

Inasmuch as it is "brain power" and not manpower which paces science, any so-called intellectual who seeks to limit the acceleration of science on the basis of limited "manpower" because we will soon have more "breakthroughs than we can handle" is a pure idiot. Especially when this country is paradoxically in a position of having its highest employment *and* its highest unemployment.

The crying need is to stimulate individual initiative of each person (and on all interactive social fronts) to educationally improve his status to brain-power-employment. Thus, instead of reducing society to a hand-out socialism, each can perform at an ever-increasing level—for there is no limit to using one's mind.

JEFFERSON D. BROOKS, III
Raleigh, N. C.



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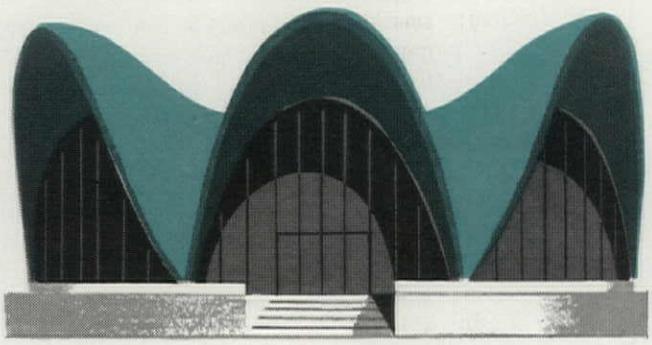

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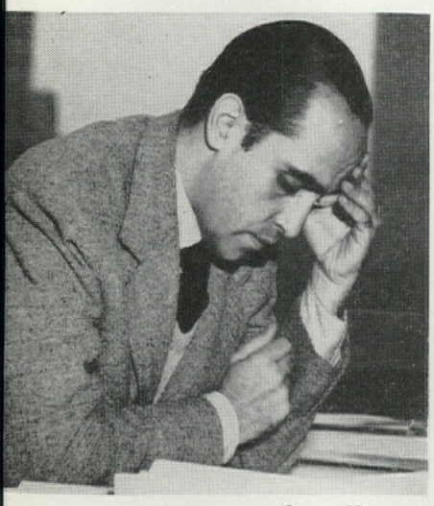
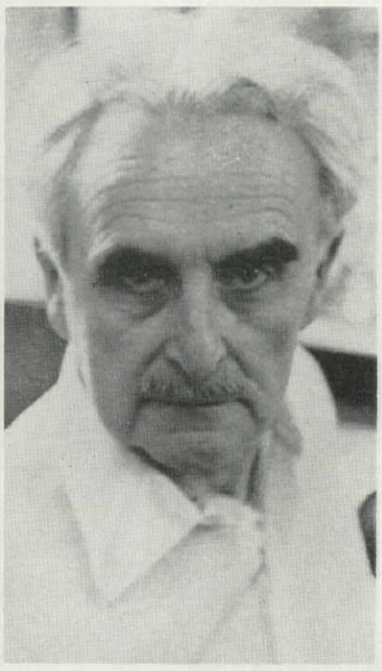
Architectural Five-Foot Shelf

By PHYLLIS DEARBORN MASSAR

An architectural photographer continues her comments on second group of Masters of World Architecture Series: Oscar Niemeyer *by Stamo Papadaki;* Richard Neutra *by Esther McCoy;* Louis Sullivan *by Albert Bush-Brown;* Eric Mendelsohn *by Wolf Von Eckardt;* Walter Gropius *by James Marston Fitch. George Braziller, Inc., 215 Fourth Ave., New York 3, N.Y., 1960. 128 pp. each, illus. $4.95 each*



Oscar Niemeyer



Richard Neutra

Louis Sullivan

Eric Mendelsohn

Walter Gropius

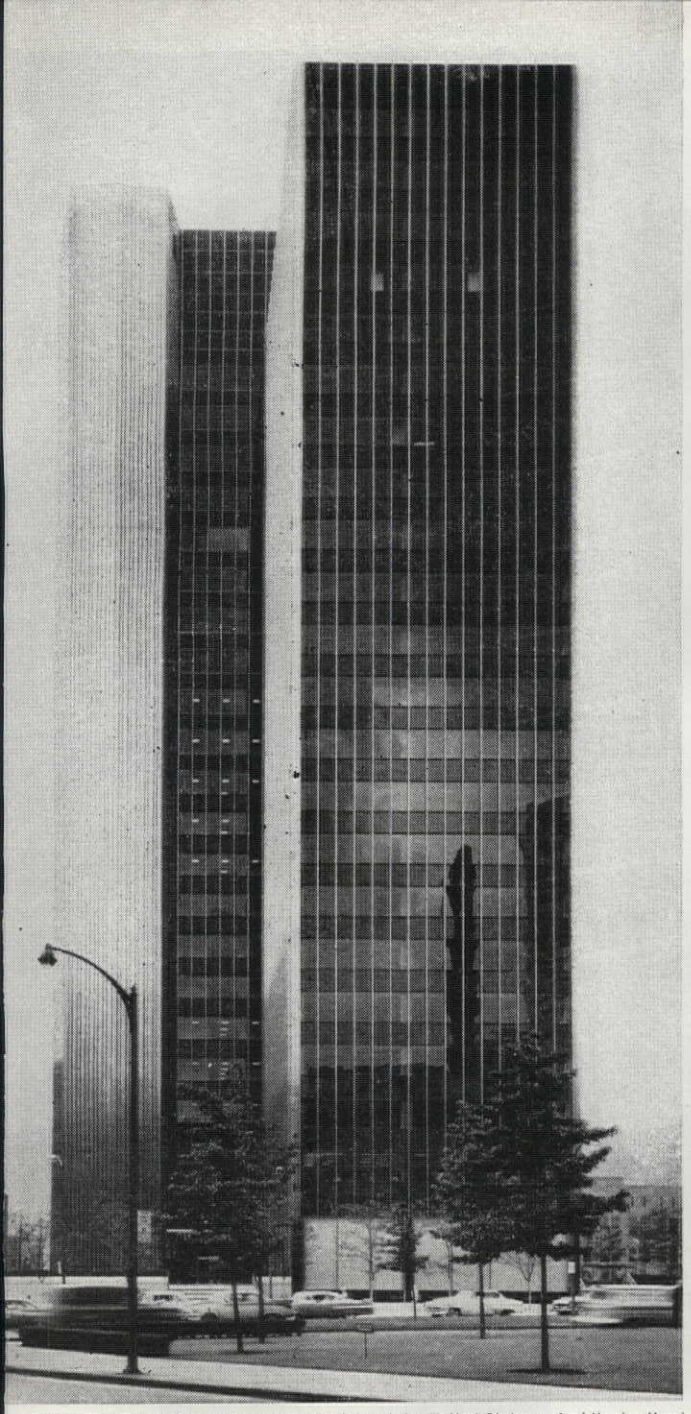
The second group of five *Masters of World Architecture* has been metamorphosed into genuine picture books on architecture. The lately maligned offset reproduction has given way to adequate letterpress. This time photographic blacks, whites, and grays enhance rather than degrade the architecture. If an extra dollar in price can make this difference, one can only shout, "Hooray!" (The first six books are now also available in paperbound editions, large format and offset reproduction, at a praiseworthy $1.95 each.)

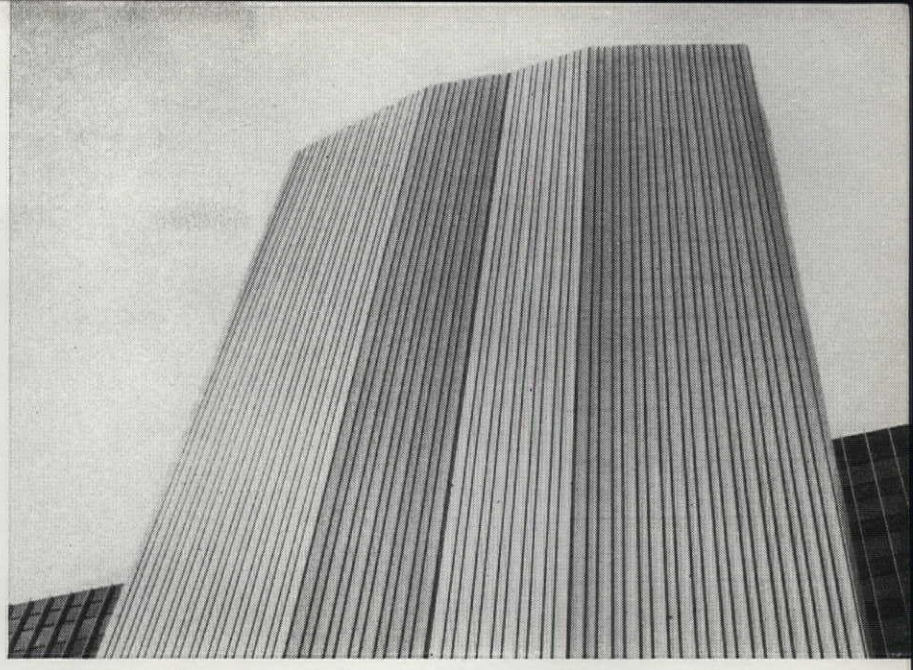
In addition, the neck-twisting necessary to view the plates has been virtually eliminated, appearing, oddly enough, only in the volume by Stamo Papadaki, a former art director who should know better.

With this addition to what may well become the standard architectural five-foot shelf (and with the numerous other recent books chronicling our leading architects, either living or recently dead), one is struck by the sudden emergence in America of the concept of the Hero-Architect, running the whole Algeresque gamut—from near death by starvation, through romantic involvements and idealistic intellectual commitments, to inevitable triumph. How eagerly in this button-pushing day do we grasp at the last straw of individualism!

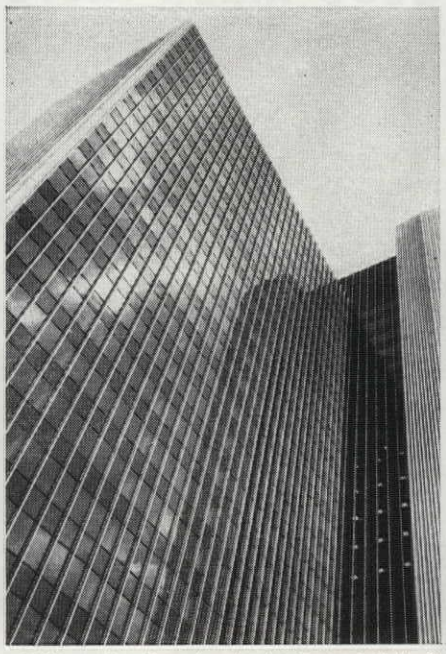
The authors of these latest books in the Braziller series are certainly individualistic, too. In the book on Oscar Niemeyer, one is overwhelmed by Stamo Papadaki's personality, if his profuse quotations from various recondite psychological and philosophical sources are any barometer of it. I cannot believe that those seeking information on the architect, Niemeyer, will be anything but baffled by the abstruse name-dropping. This psychoanalytic gobbledygook might have been redeemed had the photographs been more comprehensive. The virtual absence of architectural interiors, even of Niemeyer's most significant work, makes me wonder whether the architecture is being construed by Papadaki as

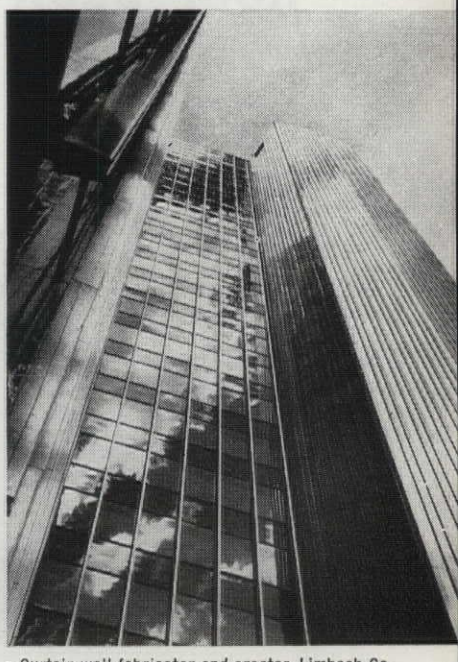
Continued on page 194





From any angle, Nickel Stainless mullions and external service tower give this new 22-story building top-to-bottom beauty. Interesting design note: colored Nickel Stainless strips are used on the service tower for strong vertical emphasis.





Owner: The Equitable Life Assurance Society of the United States • Architects: Harrison & Abramovitz • General contractor: George A. Fuller Co. • Curtain wall fabricator and erector: Limbach Co.

New building keeps full floor space on every level with outside service tower of Nickel Stainless Steel

In Pittsburgh's new Four Gateway Center Building, The Equitable Life Assurance Society of the United States gets 400,000 square feet of virtually uninterrupted floor space. All 22 stories are left uncluttered, thanks to an external service tower that houses all elevators, mechanical and electrical equipment.

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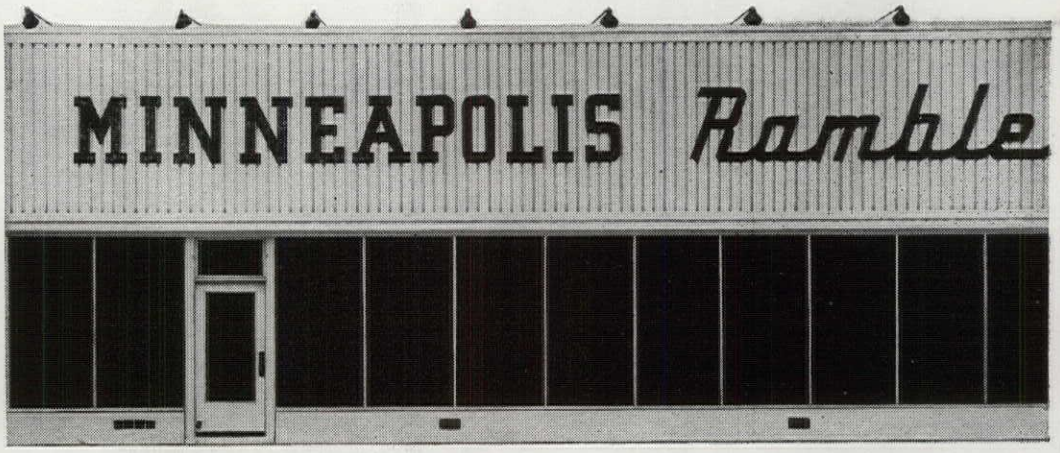
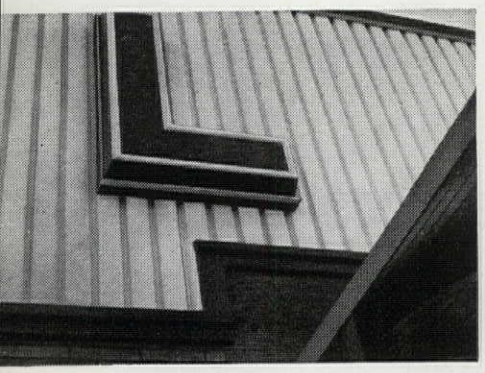
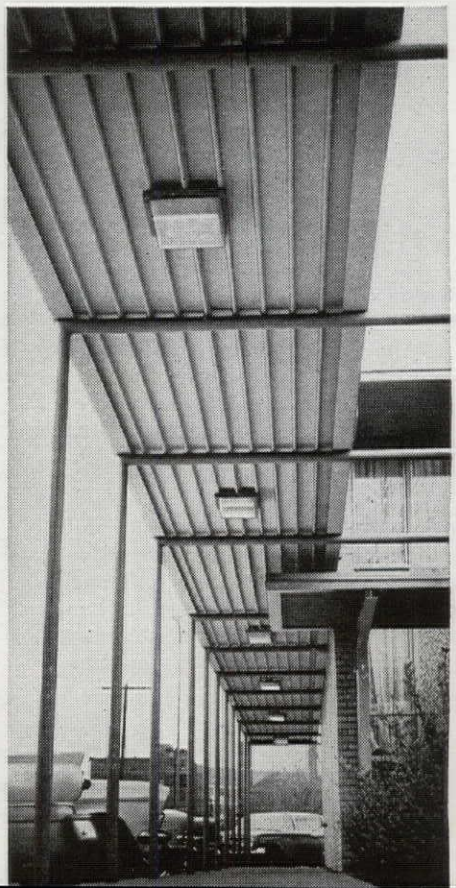


it's a crisp fascia or background for signs . . .

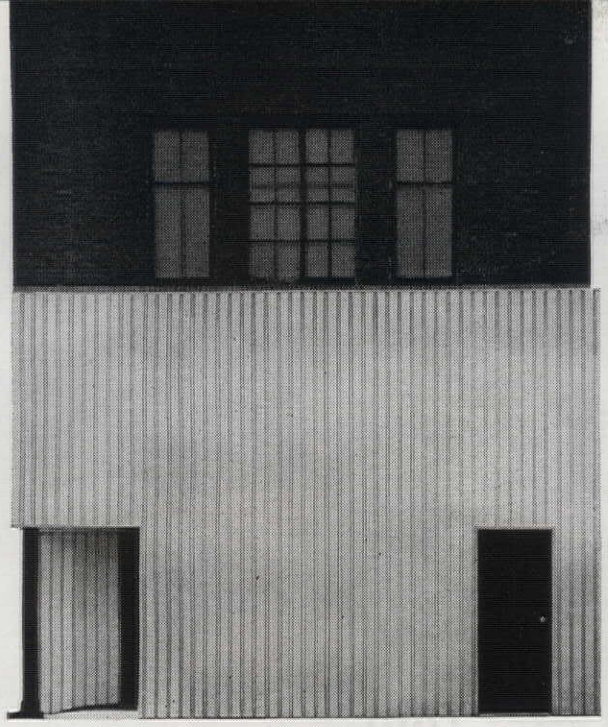


works well with a variety of building materials . . .

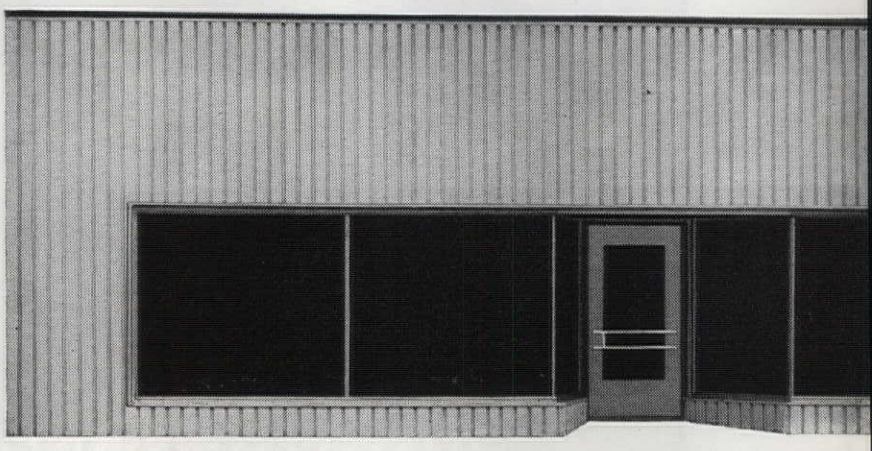
curve it or turn 90° corners . . .



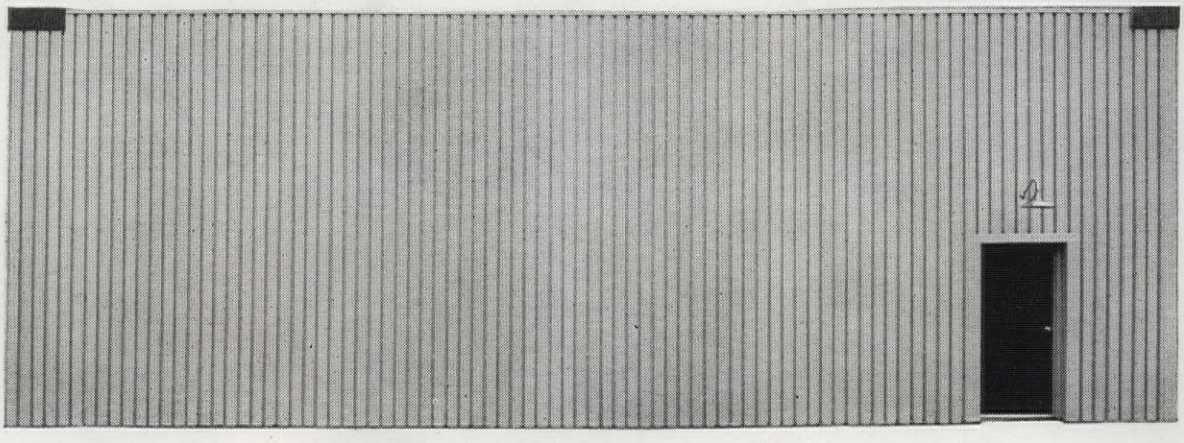
produces a clean, absolutely uniform texture for many design applications . . .



it refaces old buildings . . .



or finishes new store fronts . . .



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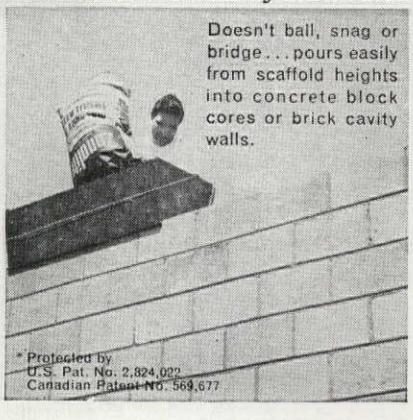

It showed that by insulating the walls of a two-story concrete block barracks, an $800 saving could be realized in the cost of the heating plant, thus paying more than half of the cost of the Zonolite Masonry Fill Insulation.

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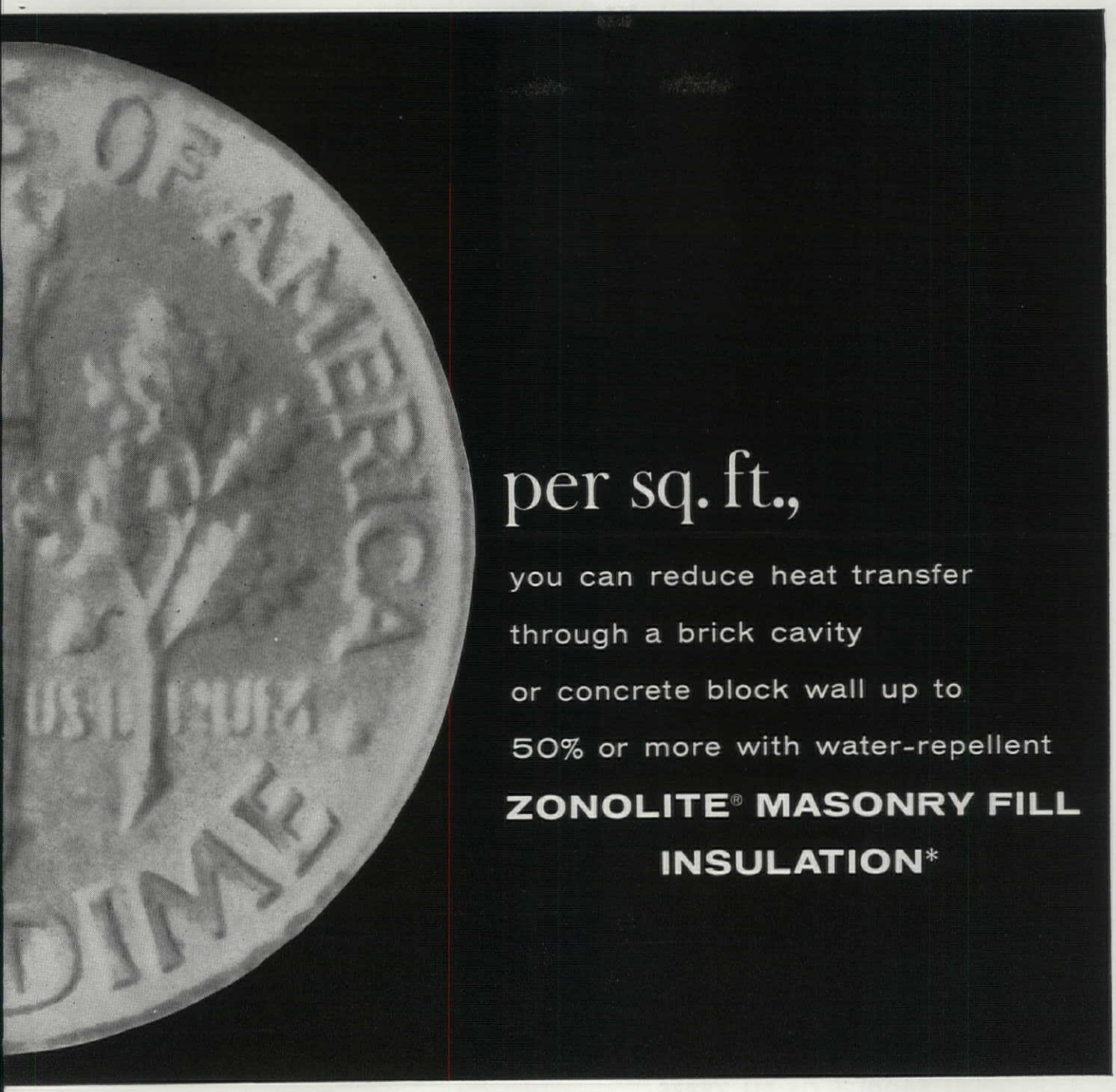

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Continued from page 198

grounds are discussed extensively: the small children's play space near home, the playground for all ages, and the community center for young and old.

On the values of recreation, Ledermann writes that "the Community Center with its manifold opportuniti s for play, hobbies, and active leisure for all age groups, its lawns for relaxing, its benches and footpaths, brings together the modern family, which is torn apart during the day through profession and school. A world of creative experience for the strengthening of family bonds and the spiritual side of 'the asphalt man' is the antidote to the nervous daily life of the city, the dissolution of family life, the enticements of the entertainment industry, and the passive wasting of time."

A plea is made for collaboration by town planners, architects, landscape architects, and educators to produce functional and appealing play spaces that will inspire active, creative, and spontaneous play. The authors suggest that designers themselves learn to play, in order to produce proper play spaces.

The main part of the book is devoted to a careful documentation, with scale drawings and excellent photographs, of playgrounds from 12 countries, mainly Switzerland, Scandinavia, and the United States. (The co-authors are internationally renowned for several outstanding playgrounds in Switzerland.)

The book's final section is devoted to details of play sculpture and playground equipment. This section reveals the extraordinary range of equipment currently available, and the manifold uses to which it can be put. It is clear from these pages that creative playground equipment is becoming internationally accepted.

The book was originally written in German and there are many instances where the original German sentence structure is only thinly veiled, making the text coarse and uneven. A more careful choice of words by the translator could have rendered the authors' intention more clearly and made the supporting text as perfect as the illustrations.

As a whole, however, the book is extremely valuable and should become a handbook for architects, landscape architects, town planners, and all others concerned with recreation. It will encourage those who have doubted the value of creative play spaces both in building them and in choosing equipment that has already stood the test of time.

CORNELIA HAHN OBERLANDER
Landscape Architect
Vancouver, B.C.

A Return to English Boston

The Book of Boston: Colonial Period. *Marjorie Drake Ross. Hastings House, Inc., 151 E. 50 St., New York 22, N. Y., 1960. 128 pp., illus. $3.50*

Hopefully, this is only the first of a series of books, all of which might include "A Suggested Tour" of Colonial buildings and sites "for the hurried, intelligent traveler" as this one does for Colonial Boston. The architecture of the 17th and 18th Centuries has almost completely disappeared in this country, but in this study by Mrs. Ross a fleeting picture is caught of English Boston. Perhaps it is best summed up in the words of a traveler named Edward Ward, who wrote, in 1699, of Boston: "The houses in some parts Joyn as in London—the Buildings, like their women being neat and handsome; their Streets, like the Hearts of the Male Inhabitants, are paved with Pebble. In the Chief High Street there are stately Edifices some of which have cost the owners two or three thousand pounds the raising. . . . To the Glory of

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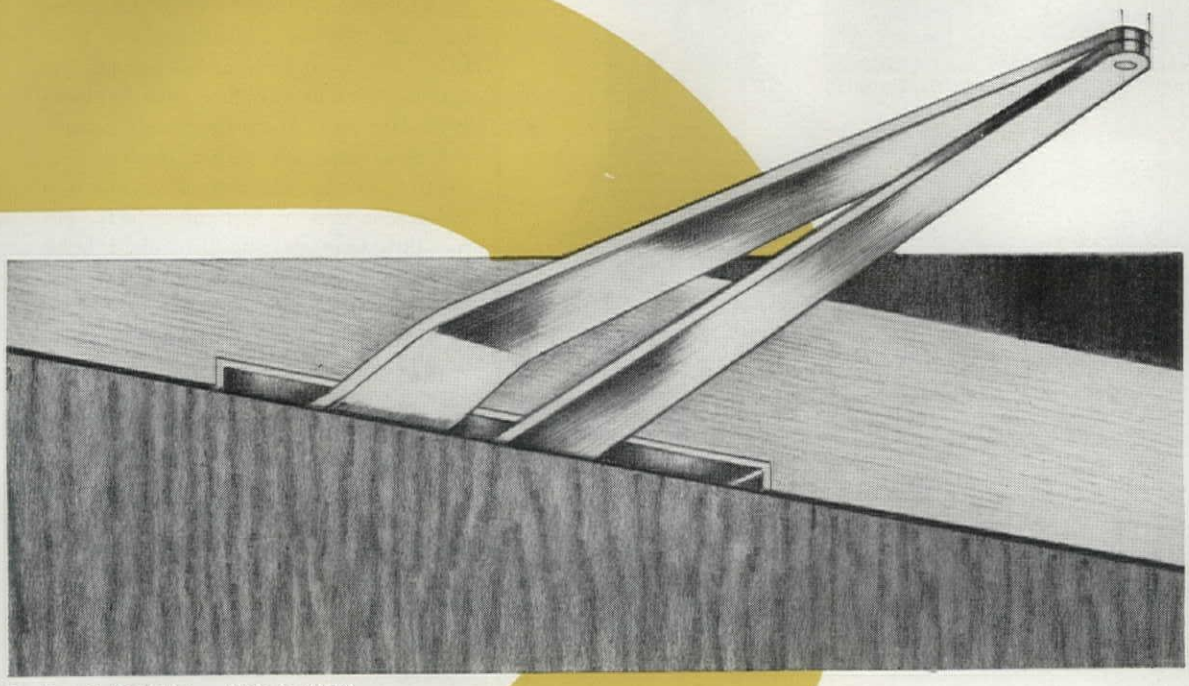

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RUSSWIN

Continued from page 204

Religion and the Credit of the Town, there are four Churches."

Those churches were built of wood, and none are now standing. In fact, there is no physical architectural survival of the 17th Century, because Joseph E. Chandler's restoration of the house built in 1681 by John Jeffs, and later lived in by Paul Revere, was so complete that the present structure must be dated 1908. However, where the buildings have not remained, the author quotes 17th-Century writing and reproduces maps, a watercolor sketch, and minor arts. For the 18th Century, she lists eight brick buildings, the stone King's Chapel, and the wood residence of Governor Shirley in Roxbury. Most of these structures have been altered or restored, as was the most famous of Colonial Boston's buildings, the Old State House, which was restored by George A. Clough in 1882.

There are a number of minor inaccuracies, which more careful proofreading would have eliminated. An example is the statement that the Bunch of Grapes Tavern "was the meeting place of the Grand Lodge of Masons founded in 1733 with Paul Revere as the first master." Paul Revere, the silversmith, lived from 1735 to 1818, however. There is an index, but not detailed enough to include all proper names; Edward Ward, quoted above, is missing from it. These are small defects, however, in an otherwise valuable publication, which is enhanced by photographs by the famous Samuel Chamberlain, whose work has made us all more aware of the diversity and scope of early American architecture. The preface is by Abbott Lowell Cummings, Assistant Director of the Society for the Preservation of New England Antiquities, of which Marjorie Drake Ross is a trustee.

AGNES ADDISON GILCHRIST
Mt. Vernon, N. Y.

An Old Art: New Techniques

Architectural Rendering: The Techniques of Contemporary Presentation. *Albert O. Halse. F. W. Dodge Corp., 119 W. 40 St., New York 18, N.Y., 1960. 277 pp., illus. $15.75*

If rendering can be considered the pictorial method of describing buildings, then this art began as early as 4400 B.C. Albert O. Halse, in a fine new volume, tells the history of rendering from its beginnings in the Ancient Kingdom of Egypt when architectural hieroglyphs were invented. In fact, the history of de-

Continued on page 222

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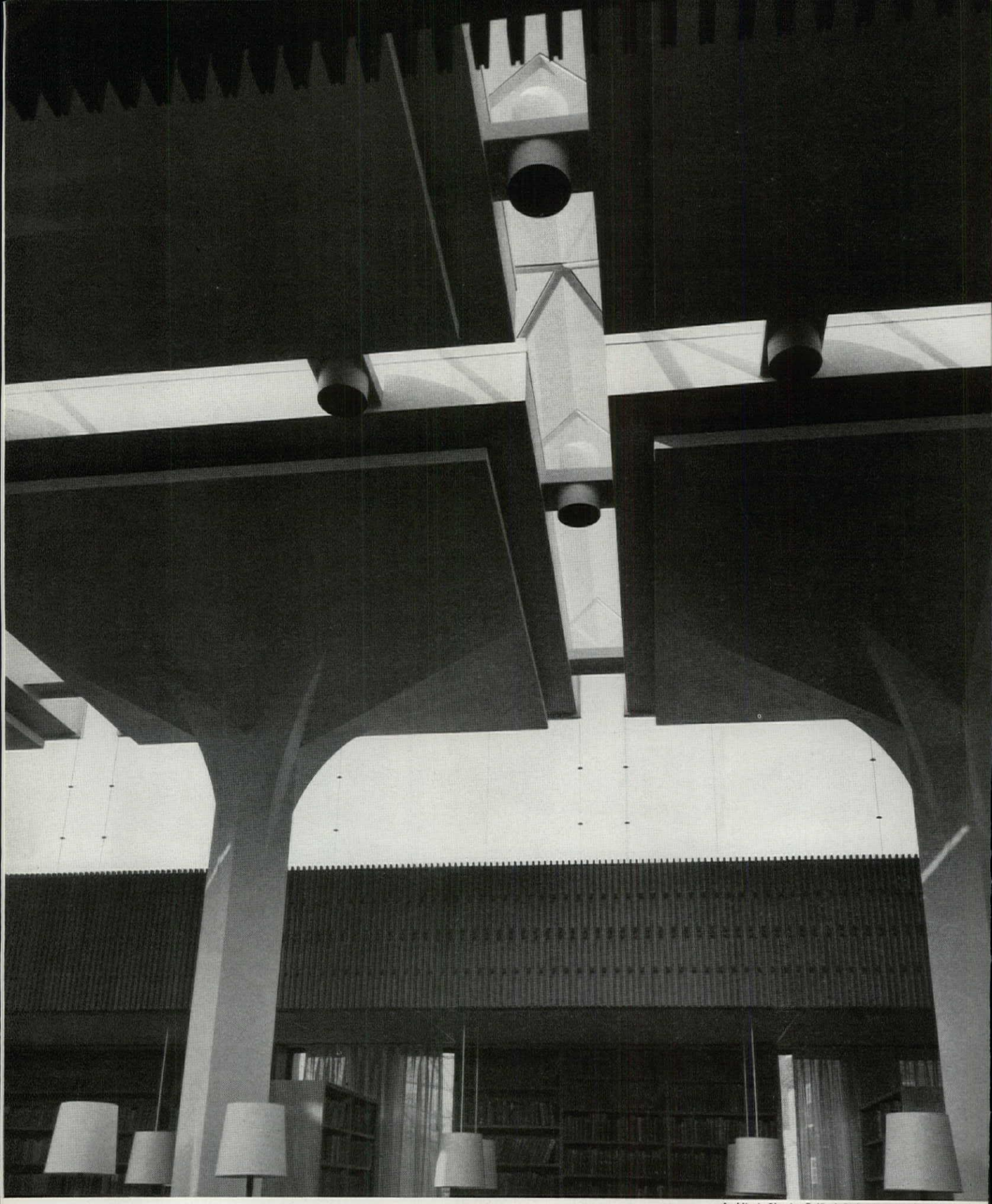

Architect: Shepley Bulfinch Richardson & Abbott, Boston, Ma

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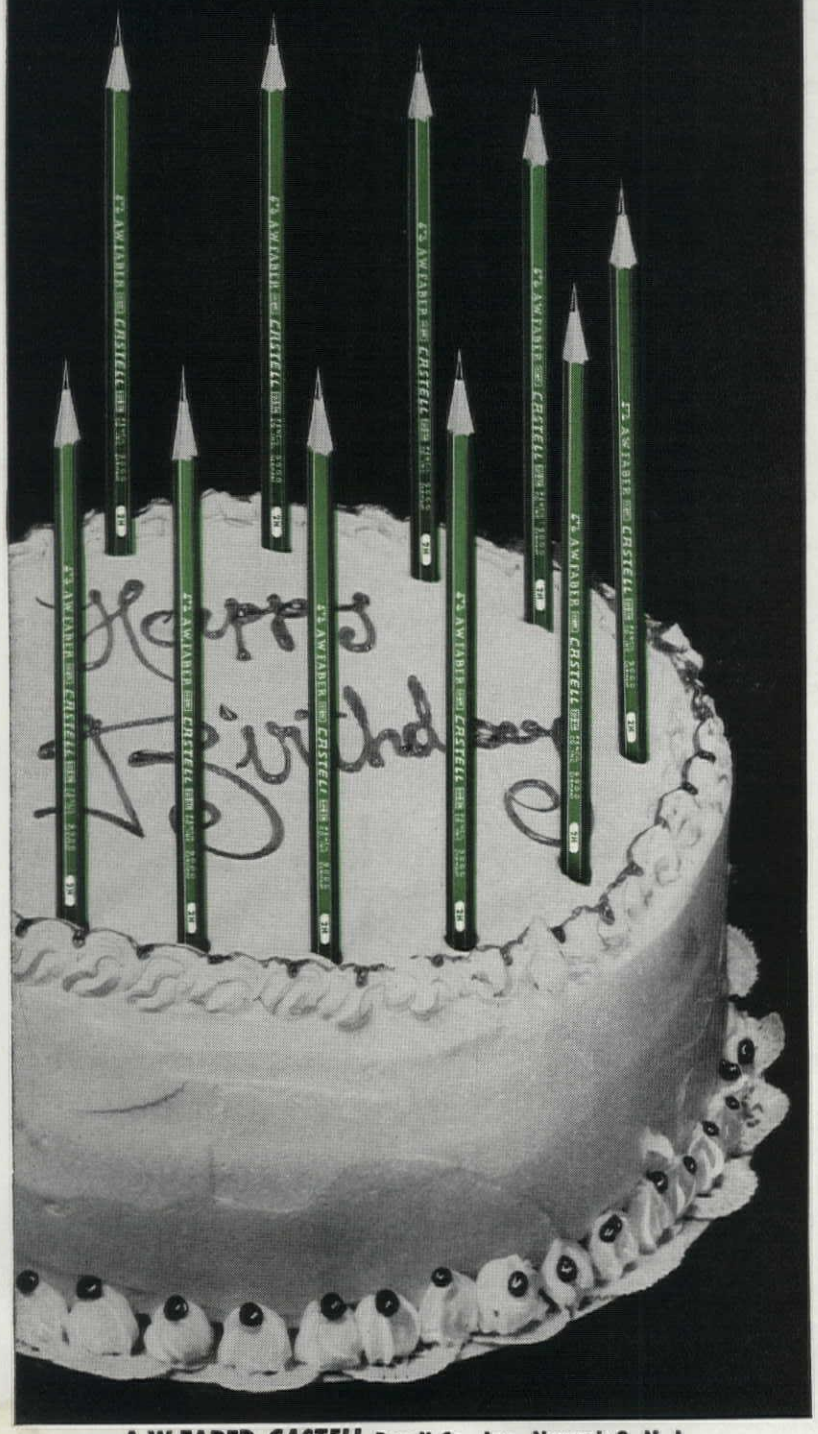

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Continued from page 218

lineation comprises the first 14 pages, which admittedly is hardly enough to comprise a study in itself but is nevertheless enough to inspire the reader with the various techniques used throughout the centuries.

What is the importance of rendering in architecture? Halse notes that few laymen can understand working drawings; hence a picture is a means of communicating the architect's ideas to others. Sometimes it will be used for study by the architect himself; sometimes it will help the owner obtain financial backing or mortgages.

Halse reviews techniques of presentation, then discusses the use of perspectives and how to set them up. Basic rules of composition and value studies are given separate chapters. The secrets of color are unfolded—the observations or systems of Boyle, Newton, Goethe, Munsell, and Ostwald are described in sequence, with color illustrations. Color wheels and their use are defined.

Did you know that the height of drafting stools should be five inches below the underside of a drawing board? This and the function of other ordinary drafting-room instruments are given considerable space. The book is thus probably quite useful for some architects, but is so complete in such elementary details (as well as more substantial commentary) that it seems to be directed more toward students than to the practicing members of our profession. The author is not only an architect but is also a lecturer at Columbia, so perhaps here is the reason for an academic approach.

Halse devotes separate chapters to the media of pencil, pen and ink, smudge charcoal, chinese ink, water color, tempera, airbrush, and pastels. In each he reviews the materials to be used, the subject choice, the technique, and the entourage of trees, scale figures, and so forth. He gives a number of tips—including the style of clothing to put on people so as not to date the drawing. There are ample illustrations by students and well-known professionals.

One basic omission in the book, which could have deserved a chapter, is a discussion of the media best suited for reproduction in brochures, newspapers, or magazines. What is successful in one respect (to show the client) may not be good in another (to show the public). When renderings are reduced, a halftone cut may blur the effect; also, different colors sometimes reproduce in black-and-white with intensities other than those

Continued on page 224

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Continued from page 222

desired. Should a future edition of this book be published, it would be worthwhile to consider the merits of a larger discussion of this topic.

JEFFREY ELLIS ARONIN, AIA
New York, N.Y.

20th Century Pioneers

Five California Architects. *Esther McCoy. Reinhold Publishing Corp., 430 Park Ave., New York 22, N.Y., 1960. 200 pp., illus. $10*

Between 1890 and 1894 in California, three things happened that were to bear heavily on the course of regional, and indeed national, architecture in the 20th Century. Bernard Maybeck began practicing and teaching in the Bay Area, Irving Gill arrived in San Diego fresh from the office of Louis Sullivan, and the brothers Charles Sumner Greene and Henry Mather Greene moved to Pasadena and set up an office. Thus began the five great influences that were not to diminish until the death of R. M. Schindler 60 years later.

The five architects each brought individual talents and curiosities to prepare for posterity a brew which has influenced design and construction—not always felicitously—the country over. Maybeck's inspired eclecticism and experimentation with materials (would Stanford White have built a religious building out of asbestos-cement panels?); Irving Gill's structural innovations and insistence on honest surfaces (which cost him grief at the Churrigueresque Pan Pacific Exposition of 1915 in San Diego); the Greenes' genius for the design of meticulously detailed, inviting residences; and Schindler's important uses of light, planes, and space must establish these men in the company of the "minor masters" of architecture. Some may disagree with this appellation; at the recent California Council AIA Convention, Philip Johnson said he finds Maybeck "much more interesting than Wright at the present time."

A fine new book has gathered the stories of the five adoptive Californians under one cover. Esther McCoy's book could not have been written any closer to the source. She worked in Schindler's office, was acquainted with Gill's architect-nephew, and interviewed Maybeck twice. The chapter on the Greenes is by Randell L. Makinson, a designer and instructor at the University of California (his style and Mrs. McCoy's coincide nicely, incidentally, so that there is no obvious "break" in the book).

The book pays solid tribute to the accomplishments of these pioneers, and provides interesting sidelights on their careers and the shape of architecture during those years in California. We learn that Gill was a co-worker with Wright in Sullivan's drafting room and later employed Lloyd Wright as a draftsman in his own office. We find that Schindler worked with Wright at Taliesin East and moved out to California about the time of the Imperial Hotel (over the credits of which they had a falling out). Neutra, we find out, started his own California practice "in Schindler's drafting room." In the tragic vein, Mrs. McCoy tells of the Pan Pacific Exposition of 1915 when, at the last minute, New Yorker Bertram Goodhue plucked the directing architect position from Irving Gill's grasp and proceeded to design a fair that ushered in the "Spanish Colonial" style that measled the region for decades thereafter.

Mrs. McCoy's book is an expert evaluation of the contributions of Maybeck, Gill, the Greenes, and Schindler. Her

Continued on page 228

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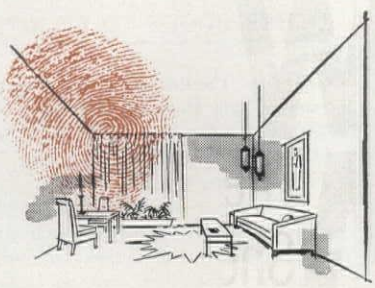

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one defect may lie in an apparent disinclination to comment critically on her subjects. This is, nevertheless, an obligatory book for anyone interested in 20th-Century American architecture. Photographs, plans, and details are handsomely reproduced in offset.

J.T.B., Jr.

OTHER BOOKS TO BE NOTED

Graphis Packaging: An International Survey of Package Design. Edited by Walter Herdeg. Frederick A. Praeger, Inc., 64 University Pl., New York 3, N.Y., 1960. 290 pp., illus. $17.50

First survey of entire field of package design, with discussions of such problems as design and construction of folding boxes. shipping containers, and packaging for display. Over 1000 illustrations supplement the text.

Modern Architecture in Mexico. Max L. Cetto. Frederick A. Praeger, Inc., 64 University Place, New York 3, N. Y., 1961. 224 pp., illus. $12.50

The Future Metropolis (Daedalus Winter 1961). Edited by Kevin Lynch and Lloyd Rodwin. Wesleyan University Press, 356 Washington St., Middletown, Conn., 1961. 216 pp. $1.50 (paperbound)

The World of Great Architecture: From the Greeks to the 19th Century. R. Furneaux Jordan and Bodo Cichy. The Viking Press, 625 Madison Ave., New York 22, N.Y., 1961. 452 pp., illus. $22.50

Full-page color plates reveal the vitality of the "most beautiful, most important, and most visited buildings of Europe."

Matisse: A Portrait of the Artist and the Man. Raymond Escholier. Frederick A. Praeger, Inc., 64 University Pl., New York 3, N.Y., 1960. 213 pp., illus. $12.50

A perceptive and authoritative work that includes much previously unpublished material. Author is an outstanding French art historian and long-time friend of Matisse.

Masterpieces of Greek Art. Raymond V. Schoder. New York Graphic Society, Greenwich, Conn., 1960. 224 pp., illus. $12.50

The most comprehensive work in color ever published on the entire 2000-year history of Greek civilization. 112 color plates, each with extensive description opposite, present minor arts and major works from every period. Volume also contains chronological tables, end-paper maps, bibliography, and introductory essay.

Classical Inspiration in Medieval Art. Walter Oakeshott. Frederick A. Praeger, Inc., 64 University Pl., New York 3, N.Y., 1960. 147 pp., illus. $20

Examples from the Northumbrian, Carolingian, Ottonian, and 12th-Century Renaissances (all of which anticipated the Italian Renaissance by 200 to 500 years) show how the antique classical styles were revived in the arts of the Dark and Middle Ages. Author is Rector of Lincoln College, Oxford.

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WOODWARD-CLYDE-SHERARD & ASSOCIATES, Consulting Soil & Foundation Engineers, 1584 Bayshore Rd., San Jose, Calif.

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JAMES R. BELL, appointed Director of Planning in firm of LUTES & AMUNDSON, Architects and Community Planners, Springfield, Ore.

DONALD L. DIMICK, RAYMOND J. MERCER, ROBERT H. WEATHERILL, admitted to firm of WADSWORTH & BOSTON, Architects-Engineers, Portland, Me.

ROBERT F. HASTINGS, elected President, JOHN J. ANDREWS named Associate, in firm of SMITH, HINCHMAN AND GRYLLS ASSOCIATES, INC., Detroit, Mich.

MARY J. HEALEY appointed Design Coordinator in firm of FREIDIN-STUDLEY ASSOCIATES, Architects-Designers-Planners, New York, N. Y.

JOHN R. KUBASEK, appointed Administrative Co-ordinator in firm of SAMUEL PAUL & SEYMOUR JARMUL, Architects, New York, N. Y.

WILLIAM S. LEWIS, JR., appointed Vice President in firm of DEEMS-MARTIN ASSOCIATES, Planners-Architects-Engineers, San Diego, Calif.

BEN H. O'CONNOR joins firm of CHARLES LUCKMAN ASSOCIATES, Los Angeles and New York, as Project Architect.

HAROLD R. WRIGHT appointed President, WILLIAM GILLETT made Office Manager, CALVIN J. SAARI made Manager of Structural Detailing, in firm of CUDDIE ENGINEERS, INC., Birmingham, Mich.

Name Changes

HARLEY, ELLINGTON, COWIN AND STIRTON, INC., Architects-Engineers, 153 E. Elizabeth St., Detroit, Mich. Formerly HARLEY, ELLINGTON AND DAY, INC.

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SVERDRUP & PARCEL AND ASSOCIATES, INC., Architects-Engineers, San Francisco, St. Louis, and Washington, D.C. Formerly SVERDRUP & PARCEL ENGINEERING CO.

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TERNSTROM & SKINNER, Architects, 290 N. La Cienega Blvd., Los Angeles, Calif. Formerly CAUGHEY & TERNSTROM, Architects.

BAYARD UNDERWOOD, made Partner in firm of LAWRENCE, SHANNON & UNDERWOOD, Architests & Engineers, 711 Boylston St., Boston, Mass. Formerly CHILD, LAWRENCE & SHANNON, Architects & Engineers. JOSIAH H. CHILD retains connection with firm as Consultant.

M. MILTON GLASS, Architect and Urban Planner, 630 Third Ave., New York 17, N. Y. Formerly MAYER, WHITTLESEY & GLASS, which has been dissolved.

ROBERT E. LANE AND ERNEST L. BRODIE, Architects, 16112 S. Clark Ave., Bellflower, Calif. Formerly ROBERT E. LANE, Architect.

HAMMOND, QUINLAN AND FOWLER, INC., Architects and Engineers, 1217 Griswold St., Detroit 26, Mich. Formerly MALCOMSON, FOWLER & HAMMOND, INC.

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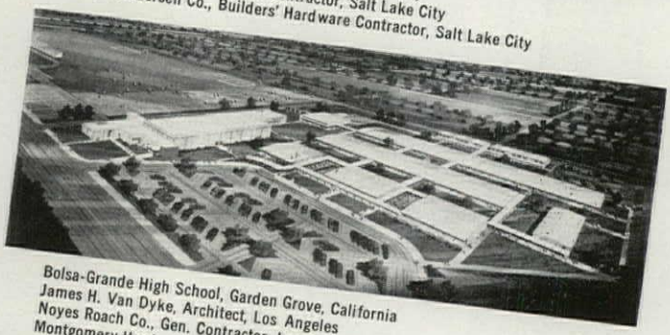

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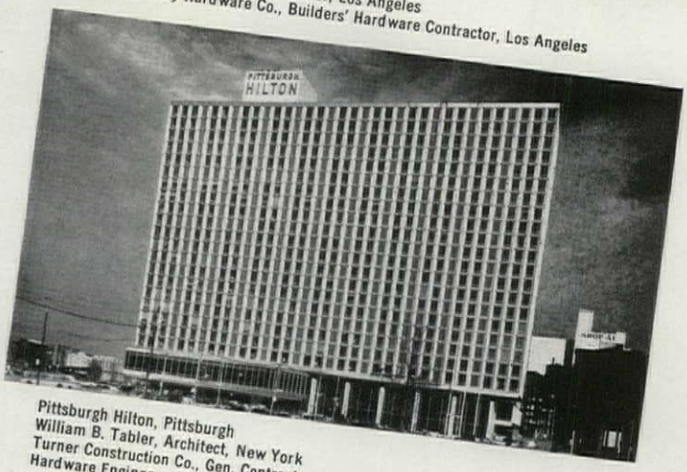

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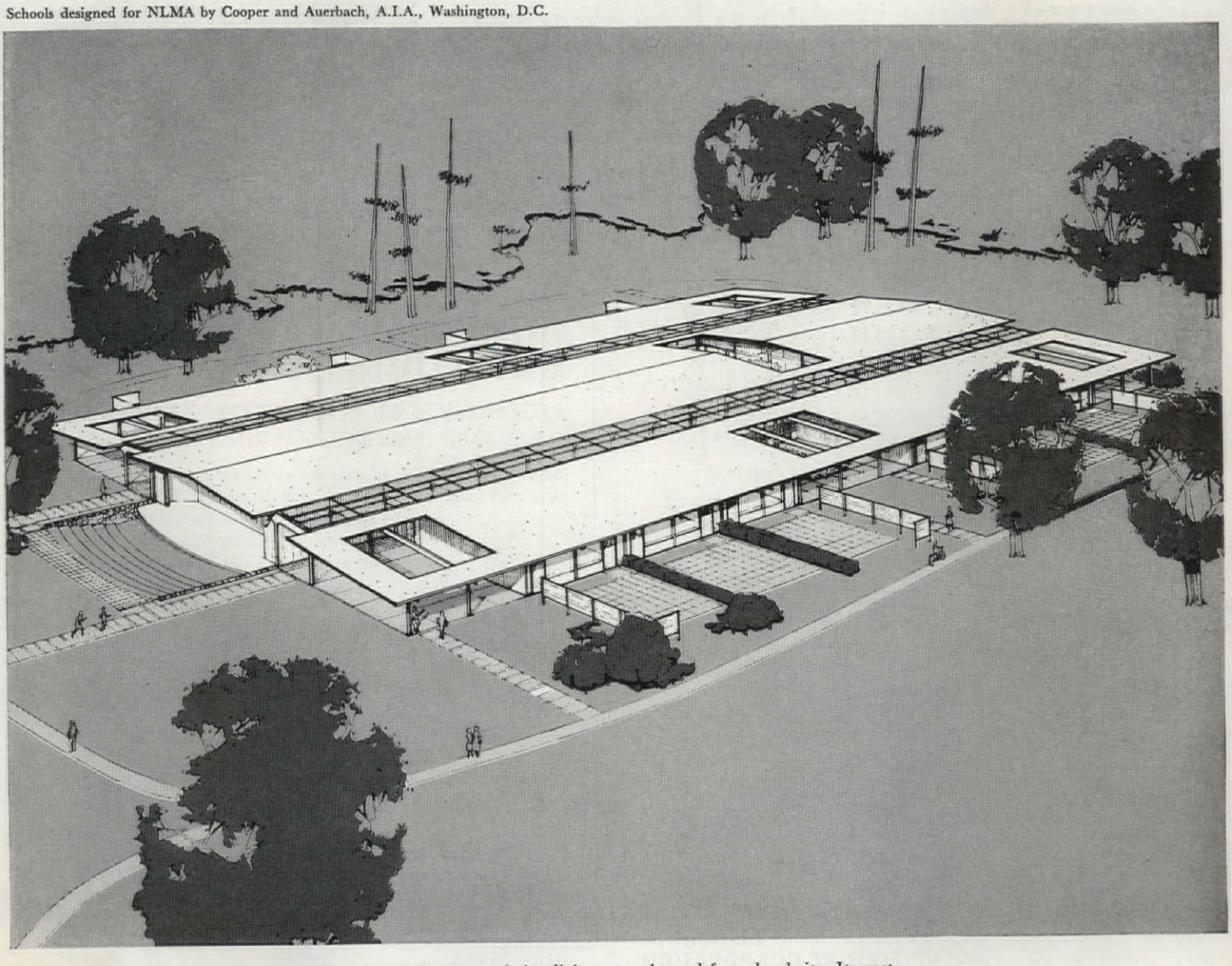

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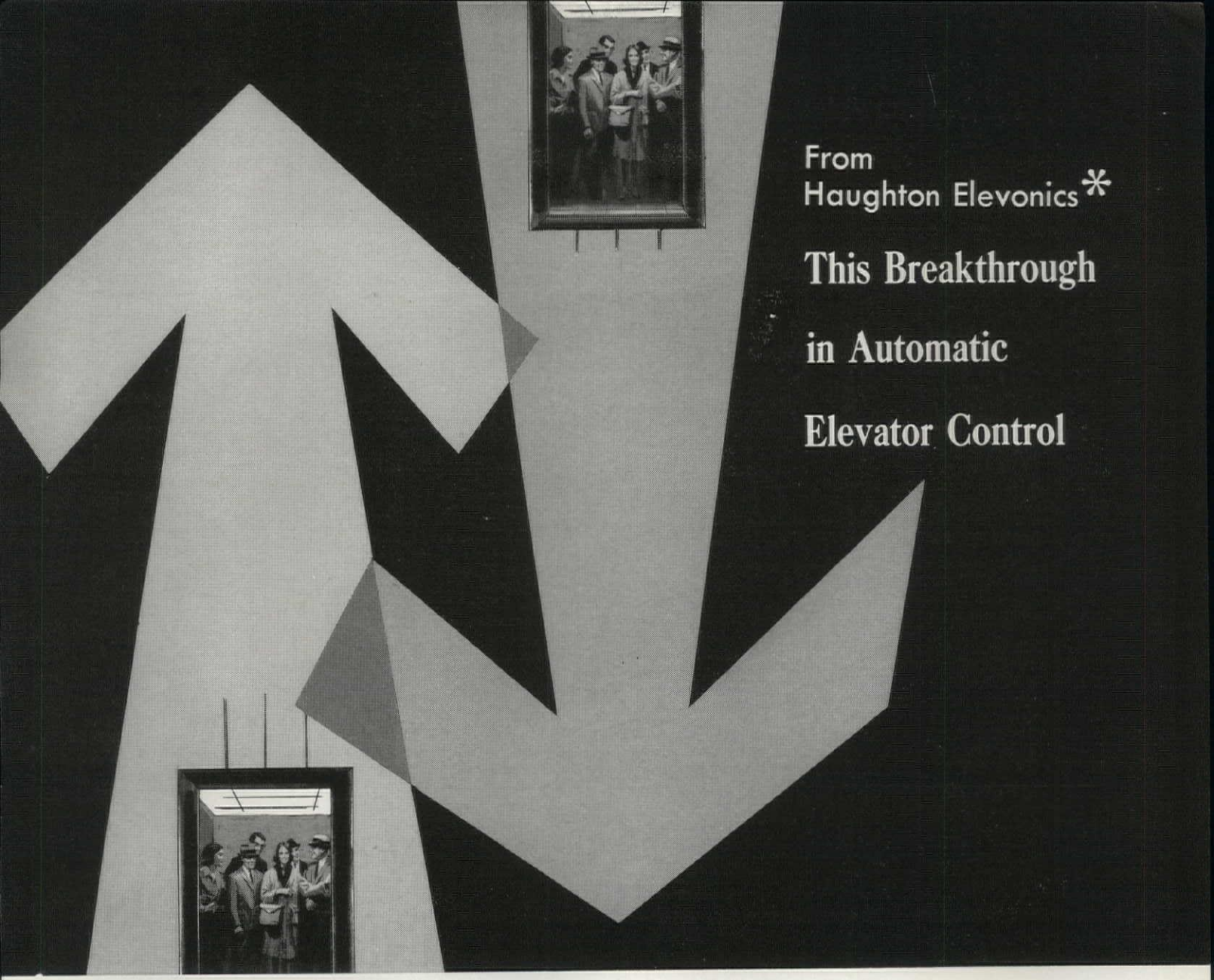

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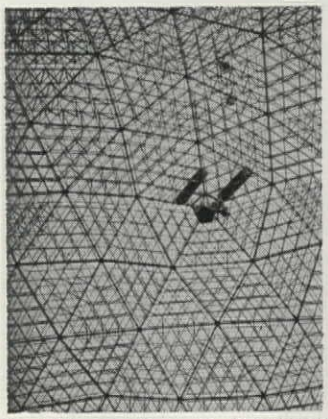
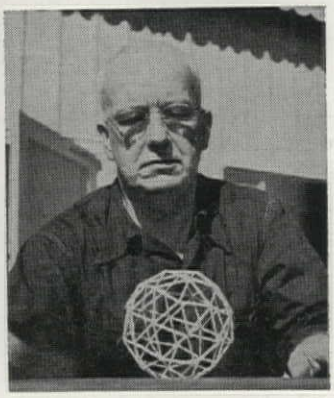
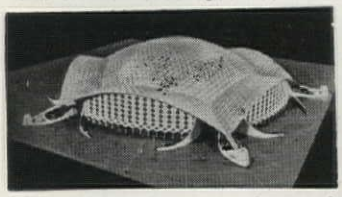


The bridge to this world of patterned abundance is what Fuller calls "Comprehensive Design." The book reviews this kind of design and what it means in terms of human advantage.

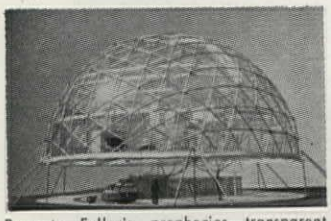


The book interprets the man responsible for the dymaxion world: his philosophy, background, and significance.

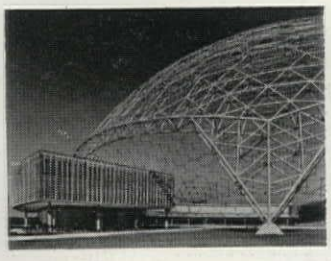


Thoroughly depicts the most famous of Fuller's creations, the dome. Includes those used by concert halls, sports palaces, industry, agriculture, banks, societies, to name just a few.

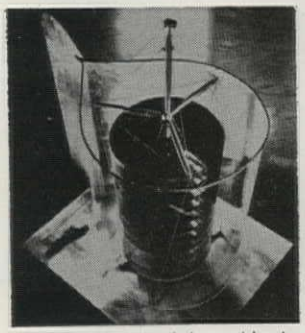
Includes all building types—their uses, design, materials, methods of construction, etc.



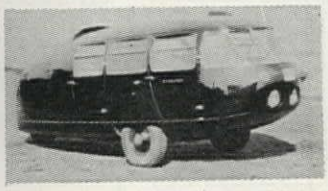
Presents Fuller's prophecies—transparent domes that cover entire cities for climate control; submarine islands; temporary, disposable dwellings.



Provides an incomparable visual record from earliest designs to current projects under construction.



Explains the Fuller vocabulary with pictorial examples: energetic-synergetic, tensegrity, geodesic, dymaxion, dwelling machine, octet truss, and 4D.



Covers the entire gamut of Fuller achievements—buildings, transports, geometry, cartography, deployment units, and many others.

Provides a complete, visual record of Fuller's work . . .
Over 350 photographs and drawings, fully annotated —
Here are just a few reduced samples of the exciting illustrations with which the book abounds. Each one is numbered and explained in corresponding paragraphs. These illustrations alone provide an important historical record of Fuller's work.

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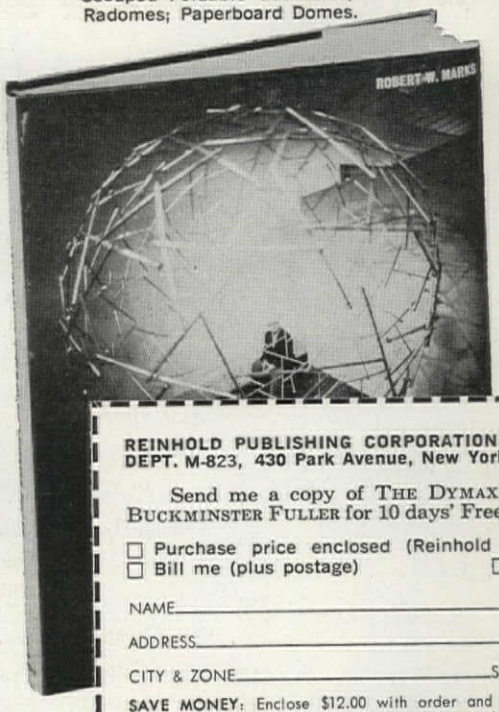
A major portion of the illustrations appear in their own sections. Here are the topics of these sections, many of which are several pages each.

ILLUSTRATION SECTIONS: Astor Plane; Stockade System; Multiple-Deck 4D House: Air Ocean World; Dymaxion House; Dymaxion Bathroom; Dymaxion Transport; Mechanical Wing; Dymaxion Deployment Unit; Dymaxion Dwelling Machine; Synergetic-Energetic Geometry; Maps and Charts; Tensegrity; Octet Truss; Minor Inventions; Autonomous Package; Geodesic Invention and Development; Skybreak Dwellings; Ford Dome; Seedpod Foldable Geodesics; U. S. Marine Corps Geodesics; Radomes; Paperboard Domes.



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P.S.

The desire to open an office and start an independent practice seems to be growing in many parts of the country. That urge to be independent, to be an *architect*, to have one's own problems and find one's own solutions to them, to be able to point to a finished job and say *I did that*, is a natural and an understandable one. It is also a dangerous one, which should be examined carefully before the leap is made. I have just come back from a region where a large number of new, young, hopeful offices have been opened in the last few years. Some of them show all the signs of being successful; others look shaky. Some are already turning out distinguished work, indicating a proud career ahead; others are slipping too quickly into the routine production of run-of-the-mill work and beginning to find the excuses and the rationalizations that are so easy to discover. In other words, some of these men *should* have taken the step they did; others should have stayed in the good positions they had in the organizations of larger firms.

How does one know which is the wise step: to make a career as an employee, an associate, perhaps ultimately a partner in an established practice; or to run the risks and hope for the satisfactions that come with one's own business? I was speculating about this recently at lunch with one of the fine, busy architects whose office has become sort of a training ground—a "finishing school," as one of his ex-employees puts it—and he suggested an interesting hypothesis. He thought that perhaps the decision to stay in the larger office or not to stay, to start practice or to plan to work up in another's office, should be made quite early. He reviewed a number of successful, capable younger firms; and he reviewed an equal number of failures (in the sense of simply hanging on, without building up either quantity or quality of work in the first years). He wondered if the successes were not people who had quite quickly taken the jump and gone out for themselves. And conversely, whether the "failures" were not people who had stayed too long in another's employ.

It's an interesting theory. It may well be that work with a *group*, and work with a capable critic-boss looking over one's shoulder, trains one to a certain sort of approach to architecture: the group approach, where decisions are reached after an office bull-session, where there is always someone to give a crit when it is needed, where the checks and balances make one's own decisions both less important and less risky. After too many years of this way of working, it may be very difficult to operate alone, to be fully responsible, both to yourself and your client, for every decision that is made.

In addition to the willingness to take financial risks and the ability to risk technical and aesthetic statements, another quality that seems to be helpful in a young practice is enthusiasm. Among the firms that I visited recently there were several where the architects were not afraid to show good old-fashioned excitement about what they were doing. This is a characteristic that all too often seems to be losing out to the less likeable qualities of self-consciousness and sophistication. I called on one office where the two young partners were so excited about what they were showing me that they kept interrupting one another. Then on the other hand, I saw several new firms where the attitude was sophisticatedly deprecatory: "Of course we are doing good work," they seemed to say, "how could you expect us to do anything else?"

The curve of sophistication is an interesting one. Starting from the wide-eyed naturalness of the "Oh boy, look!" reaction, it goes up through the feeling that enthusiasm is immature, that one must be blasé and give an impression of great experience (usually the result of unsureness), through the truly calloused and surfeited person (usually the result of experiences never really enjoyed) to the true sophisticate, the scholar of tastes and events who can again be modest and simple and once more have the "Wow, look at that" reaction to something fine he has seen or something he has created.

There are many other qualities needed to start in the business of architecture and to stay in it successfully. But natural self-assurance and the enthusiasm that goes with it—which apparently can be lost, in time, in a larger office—are certainly important ones.