

expo67



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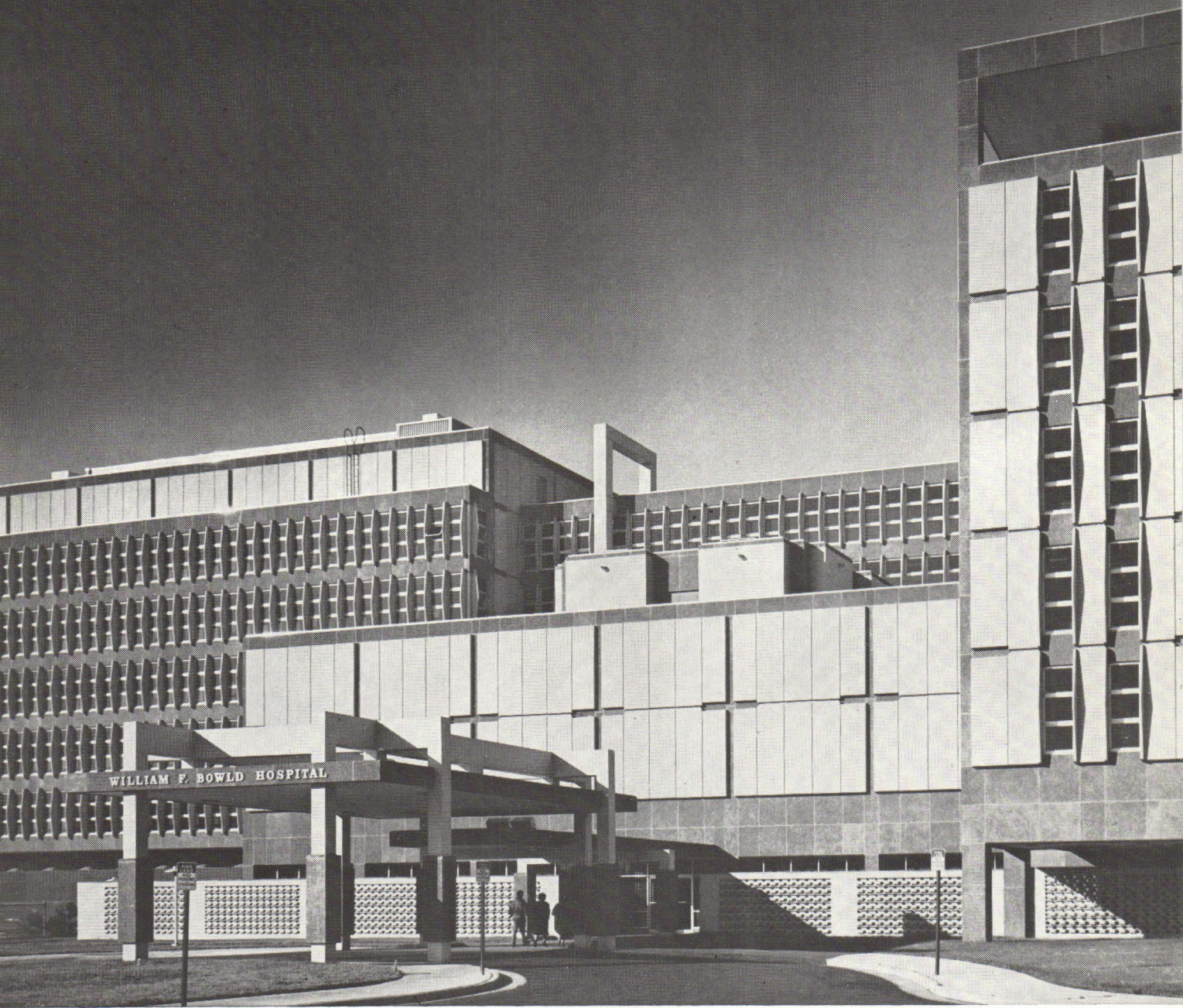
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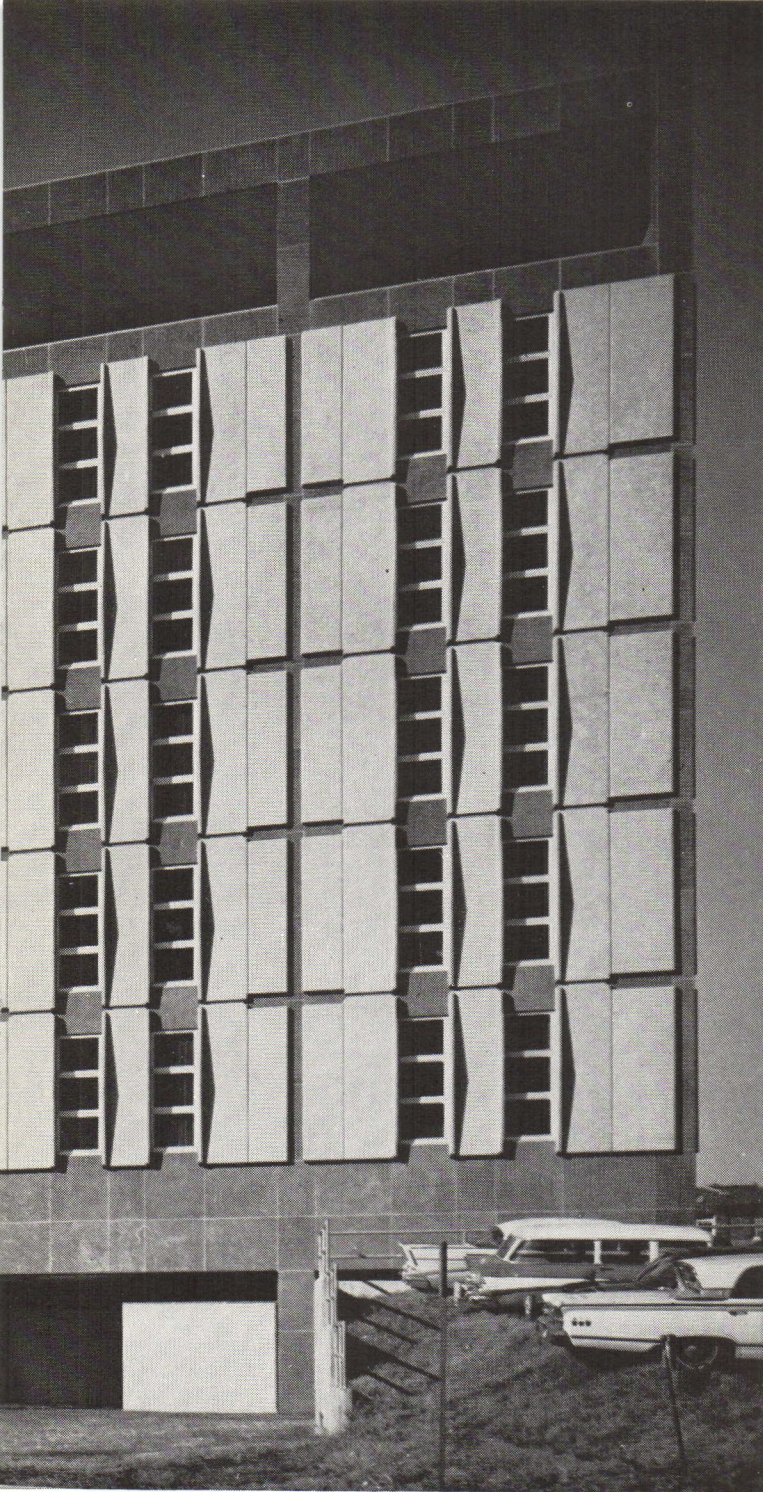




ABOVE: William F. Bowld Hospital and Dobbs Research Institute, Memphis, Tenn. *Architects:* Eason Anthony McKinnie and Cox, Memphis. *General Contractor:* J. A. Jones Construction Co. Seven Dover Geared Elevators, capacities to 4000 lbs., speeds to 350 FPM; one Oil-draulic freight elevator, capacity 5000 lbs.; installed by Dover Elevator Company.

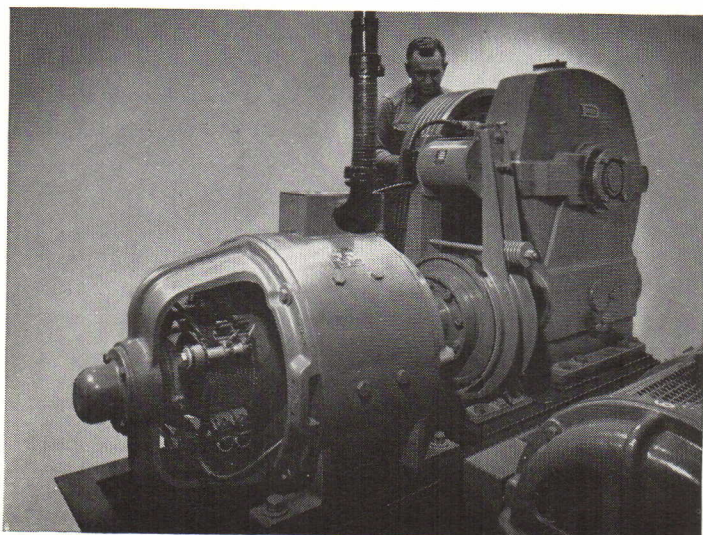
RIGHT: Holy Family Hospital, Atlanta, Ga. *Architects:* Aeck Associates, Inc. *General Contractor:* Beers Construction Co. One Dover Geared Elevator, 4000 lbs. capacity, 350 FPM; one Dover Oildraulic Elevator, 4000 lbs. capacity, 200 FPM; installed by Dover Elevator Company.





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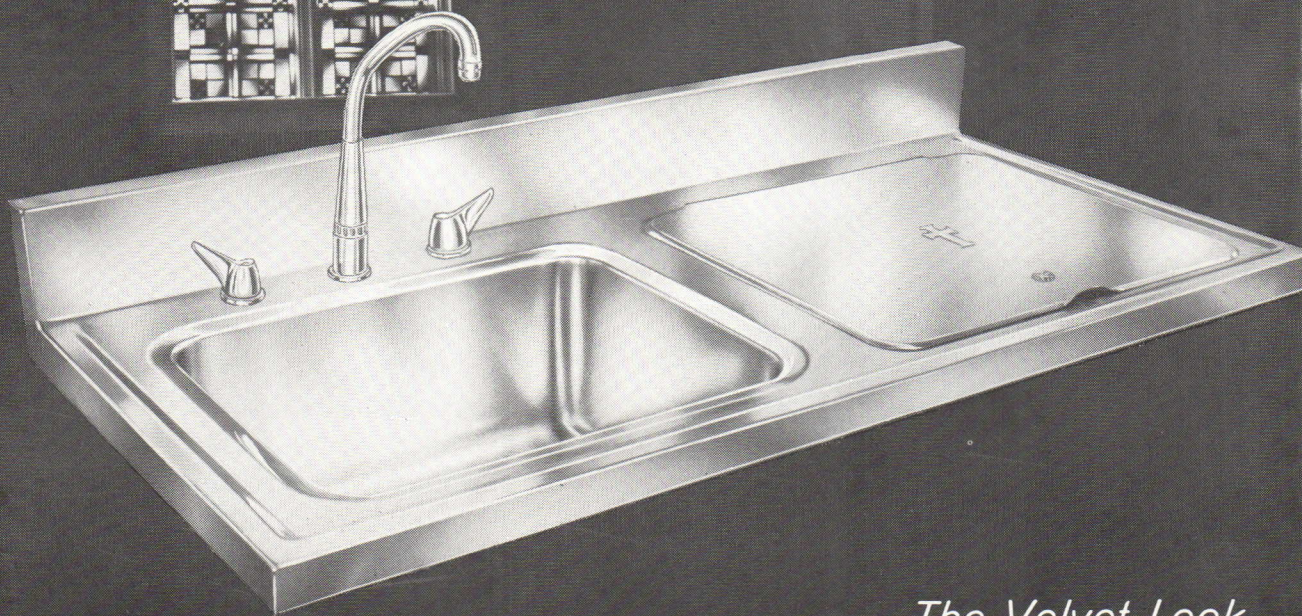
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VOL. XLVII, NO. 2

Comment & Opinion

Hi Ho, Come to the Fair: And a big one it promises to be, as the leadoff article on Expo 67 in this AIA JOURNAL indicates. US architects who are planning a trip to Montreal will be interested to learn that the Royal Architectural Institute of Canada is preparing to roll out the red carpet in order to make the exhibition experience as pleasurable and as meaningful as possible.

Expo's chief architect, Edouard Fiset, and members of his staff have offered to meet fellow professionals from all nations and to discuss personally the exhibition buildings; and specially guided tours—in English and in French—will be arranged each week, provided sufficient interest is shown.

In addition, architects are invited to utilize the facilities of Club Expo in the International Trade Centre (near the entrance gate), whose officers can also arrange introductions to Canadian practitioners.

Any of our readers who would like to avail themselves of this hospitality are urged to drop a line well in advance of their trip to the RAIC at 151 Slater, Ottawa 4, or to the Quebec Association of Architects, at 1825 Dorchester Blvd. W., Montreal 25. Dates: April 28-Oct. 27.

A Canadian Counterpart: It gives us great pleasure to introduce a new contributor to the JOURNAL: A. J. (Jack) Diamond, who has done the critique on Expo 67. He wears several hats as the head of the Gradu-

ate Design Studio, which he inaugurated, at the University of Toronto; as a private practitioner and consultant in architecture and urban design; and, finally, as associate editor of *Architecture Canada*. Formerly known as the *RAIC Journal*, the monthly has been experiencing a growth similar to ours, with a revamped format and editorial policy to match its change in title. Mr. Diamond spelled out the objectives back in January 1966 when he wrote in part:

"What is wanted is a lively presentation of professional views which should, like the best law or medical journals, command attention outside the profession as well as within. Our job is not that of a commercial glossy. It is to examine our subject matter in as great a breadth and depth as our contributors and readership will allow. Instead of pictorialism, we would

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Cover

Habitat, symbol of Expo 67

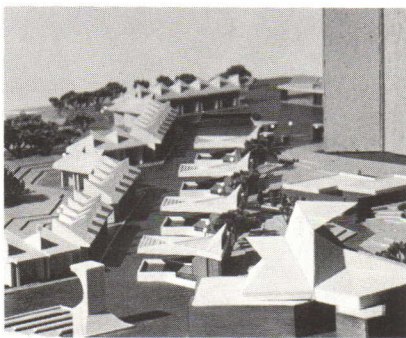
stress content; instead of novelty, profundity; instead of commercialism, economy; instead of isolated virtuosity, building in context. We wish to assist the establishment of high standards of architecture; we wish to seek out those principles that are a part of our environment and time, that lead to an architecture of service to the national community and, by example, contribute to universal architectural standards."

Architecture Canada

Journal RAC, Revue de l'ARAC, Juin/Julien 1966



As a result, *Architecture Canada* last year won the first award for the greatest improvement for editorial excellence for professional publications on the continent. Its policy, by the way, includes regular criticism, about which we will have something to say in a later issue.



More Than Just Words: It is appropriate to mention here that critic Diamond also has designed a project for Expo—Activity Area F (see cut above) for the official client, the Canadian Corporation for the World's Exposition.

The design "attempts to structure the space and movement of people between pavilions, and to make a place of arrival for people arriving on the Expo Express." It consists of snack bars, restaurants, boutiques and a performance area. John H. Andrews is associate architect. ROBERT E. KOEHLER

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AIA JOURNAL/FEBRUARY 1967 7

Newslines

Wallace Harrison Selected For Gold Medal; Lauded As Architect Times Require

The Institute will award its highest honor, the Gold Medal, to "the kind of architect required by today's American society, one who can cooperate with and satisfy today's clients; who can, through his tact, patience and skill as an organizer and designer, work successfully with private and public clients as the leader of complex design teams."

This was the way AIA President Charles M. Nes Jr., FAIA, described the medal winner, Wallace K. Harrison, FAIA.

Harrison, Nes continued, has worked "with the concept of urbanism, creating architecture as part of the fabric of the city, with great dedication and loyalty to the best interests of his own city, New York.

"It has been said that 'the contemporary architect is expected to be an artist, a scientist, a hard-headed businessman, a visionary, a shrewd psychologist, a wise philosopher, a skillful sociologist and, above all, a public-spirited citizen.' No one man can have all these talents, of course. But Wallace Harrison demonstrates these qualities magnificently and, through them, he has enriched the architecture of this country."

Harrison is the 33rd recipient of the medal which was established in 1907 to honor "most distinguished service to the profession or the Institute." The New Yorker, who was born in Worcester, Mass., 71 years ago, will receive the honor during the AIA convention in New York, May 14-18.

Among qualities for which he will be cited are "his demonstrated ability to lead a team in producing significant architectural works of high quality over a period of more than 30 years" and for "highest order of architectural statesmanship."

Harrison in 1916 went to work for McKim, Mead & White in New York, served in the Navy during World War I and, following study abroad, joined the firm of Bertram Goodhue, a 1925 winner of the Gold Medal.

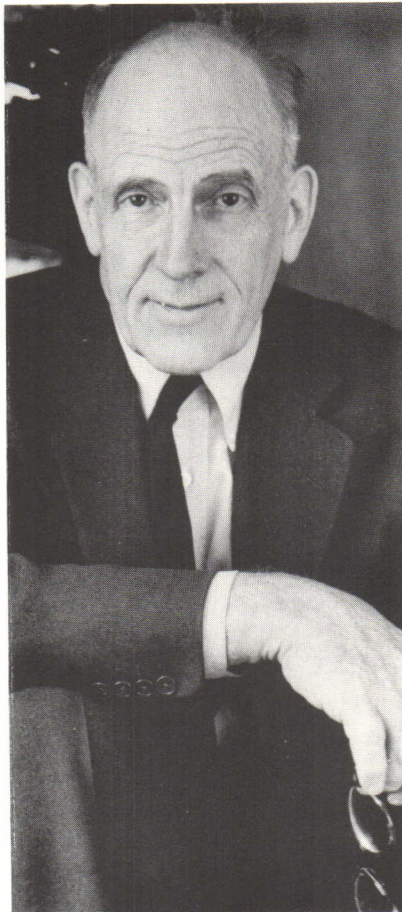
The firm, which later became Corbett, Harrison & MacMurray,

was one of four chosen in 1929 to design Rockefeller Center, which is among Harrison's most noted works and is still considered by many critics as an outstanding example of contemporary urban design.

In 1937 he formed a partnership with J. Andre Fouilhoux, and six years later Max Abramovitz, FAIA, was made a partner. Fouilhoux died in 1945, and the firm has continued as Harrison & Abramovitz.

As director of planning, Harrison headed an international team of consulting architects for the United Nations headquarters. Another of his works is the new Metropolitan Opera in New York's Lincoln Center.

He won AIA Honor Awards for the Corning Glass Center (1953), the Interfaith Center at Brandeis



University (1956) and the University of Illinois Assembly Hall (1964).

In 1945 Harrison was honored by a national AIA citation for a "most outstanding contribution through public service to the prestige of the profession."

Frank L. Codella Is Named Institute Administrator

Frank L. Codella, AIA, associate partner of A. M. Kinney Associates, Cincinnati, is the new administrator of the AIA's Department of Professional Services.

Codella, 40, was most recently architectural project manager for two Kinney jobs totaling more than \$20 million.

He received his Bachelor of Architecture degree from Cornell University in 1949, began his career with John C. Ehrlich, AIA, in Geneva, N.Y., and in 1951 joined the Clifton, N.J., firm of Arthur Rigolo, FAIA, where he remained for 14 years as an associate and project manager. He joined the Kinney firm in 1965.

Codella has been involved in the design and supervision of all major building types. He has been a project manager for complete architectural services and has conducted research in acoustics, concrete, supermarket design standards, architectural office practices and procedures, including maximum use of personnel and fallout shelters.

He served almost three years on active duty with the Naval Civil Engineer Corps Reserve. He is married and the father of four children and is active in civic and educational affairs.

Codella succeeds Robert J. Piper, AIA, who resigned to become coordinator of client services for the Perkins & Will Partnership in Chicago, a position he has assumed.

Contract Furniture Events Set for Chicago, New York

All of the extensive meeting facilities of Chicago's Merchandise Mart and McCormick Place, including the 5,000-seat Arie Crown Theater, will be necessary to contain next month's Intercon I.

Sponsored by the Mart, Intercon I is described as the first international exposition and congress for the contract furniture and furnishings industry.

The exposition side of the March 20-22 event will include what were described as the newest interior furnishings for commercial and institutional use and the greatest col-

Continued on page 15

Fred Bassetti projects
"Regent's Hall,"
a stately concept
in wood as an
appropriate setting
for occasions of
pomp and
circumstance.



One of a series of design innovations commissioned by Weyerhaeuser Company





Weyerhaeuser Company has commissioned a number of leading architectural firms to create design innovations which highlight the potential of wood in public and commercial buildings. This original design by Fred Bassetti, A.I.A., of Seattle, Washington is the eighth in the series.

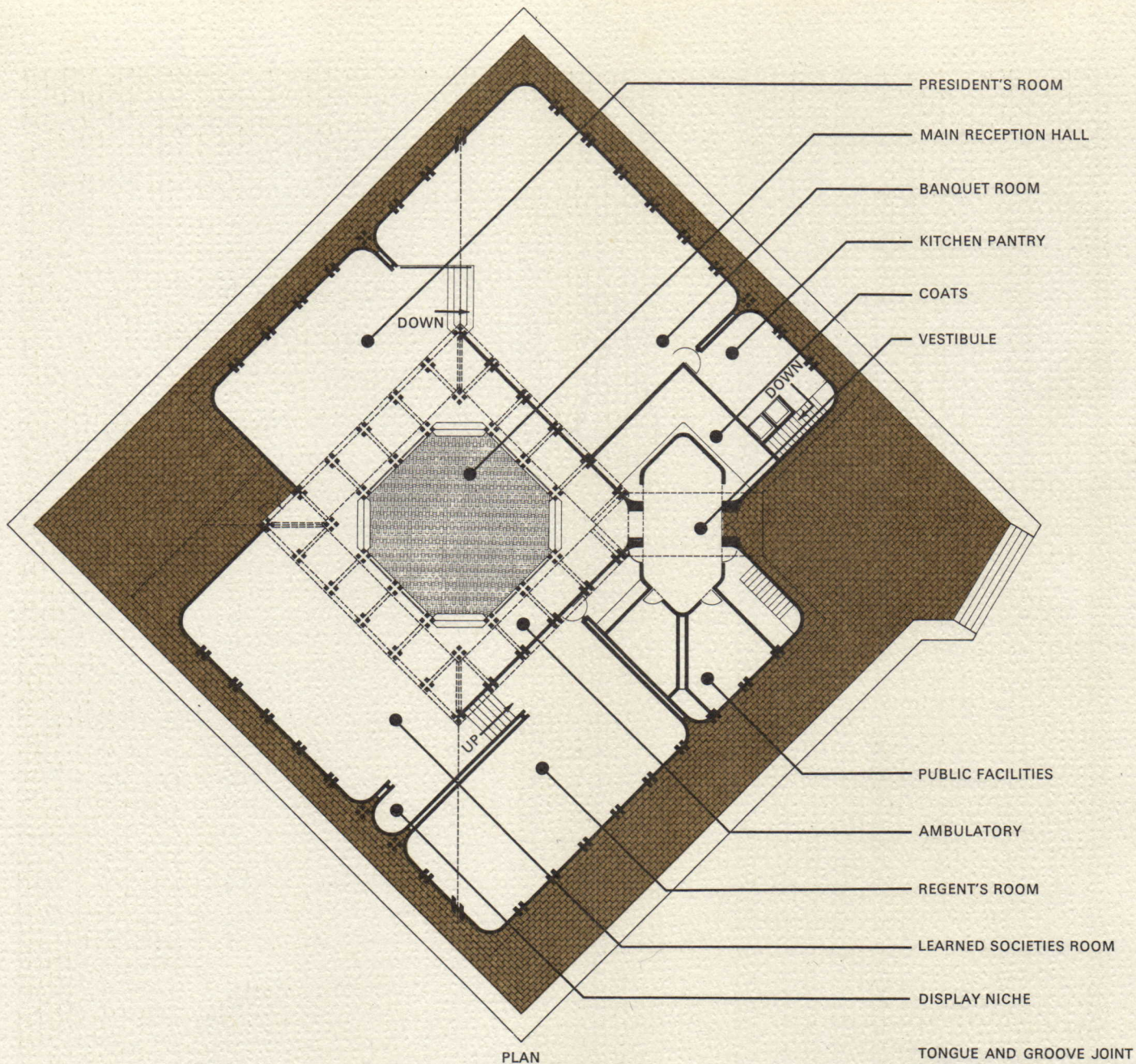
**“For Regent’s Hall,
a ceremonial building—
we propose a taut design
using one of nature’s
most versatile gifts—
wood.”**

Our egalitarian American society has grown so bland that today its texture for most of us is uniform; it lacks reference points. Its members can no longer find their identity or position. This leveling may sometimes be an advantage, but on special occasions it inhibits the very uniqueness of the event. This building is an attempt to serve these special occasions.

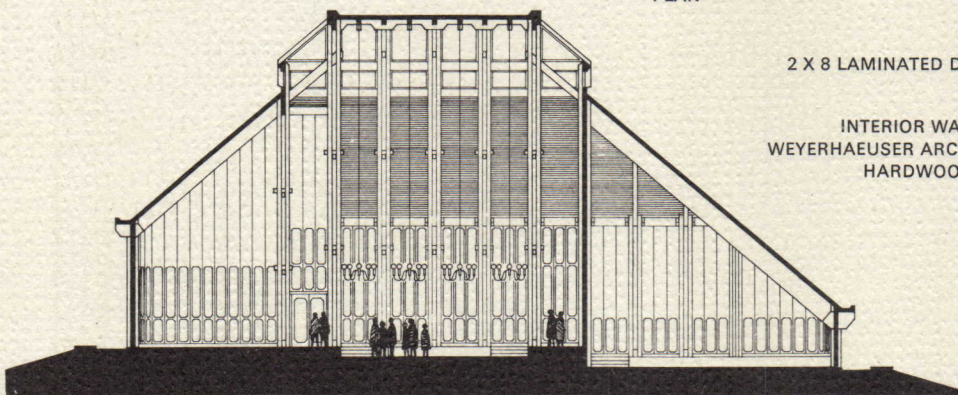
When a University President must receive the visiting Nobel Prize winner or other dignitary and present him to the Deans he will now be able to do so in an appropriate setting. When the Board of Regents faces the faculty after their annual meeting on tenure, the confrontation may now take place in properly dignified surroundings. The Learned Societies will have a place to meet and hold their teas, the President his reception, the University to display the Mace, the Sceptre and the Orb between yearly ceremonial parades.

To serve these needs we propose a taut design using one of nature’s most versatile gifts—wood. The design’s success will develop from taste in selection of materials, from care in detailing, from integrity and consistency in fashioning the whole out of its parts. We have used thick, specially surfaced wall construction, precisely modeled laminated columns and beams, custom doors, and architectural hardwood paneling inlaid in an attempt to create spaces with quiet strength and dignity. Wood, a remarkable material, friendly to man, is essential to this design.

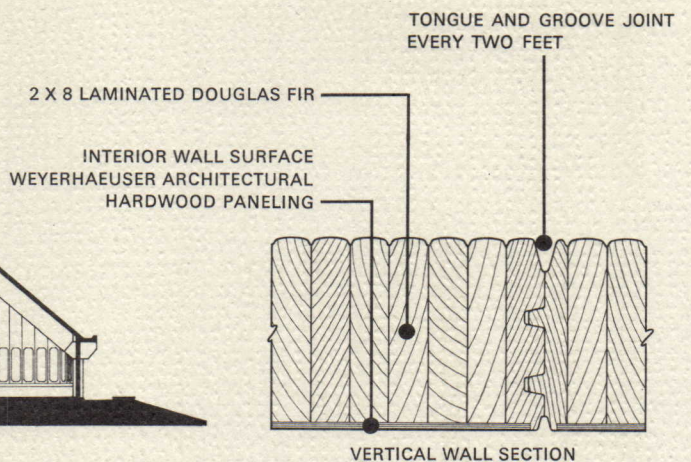
Fred Bassetti



PLAN



SECTION



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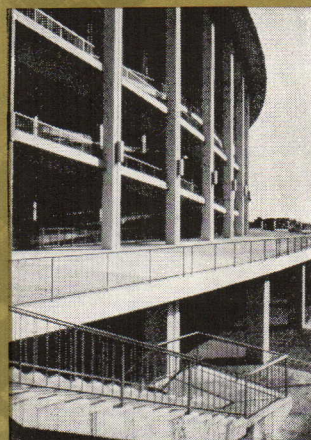
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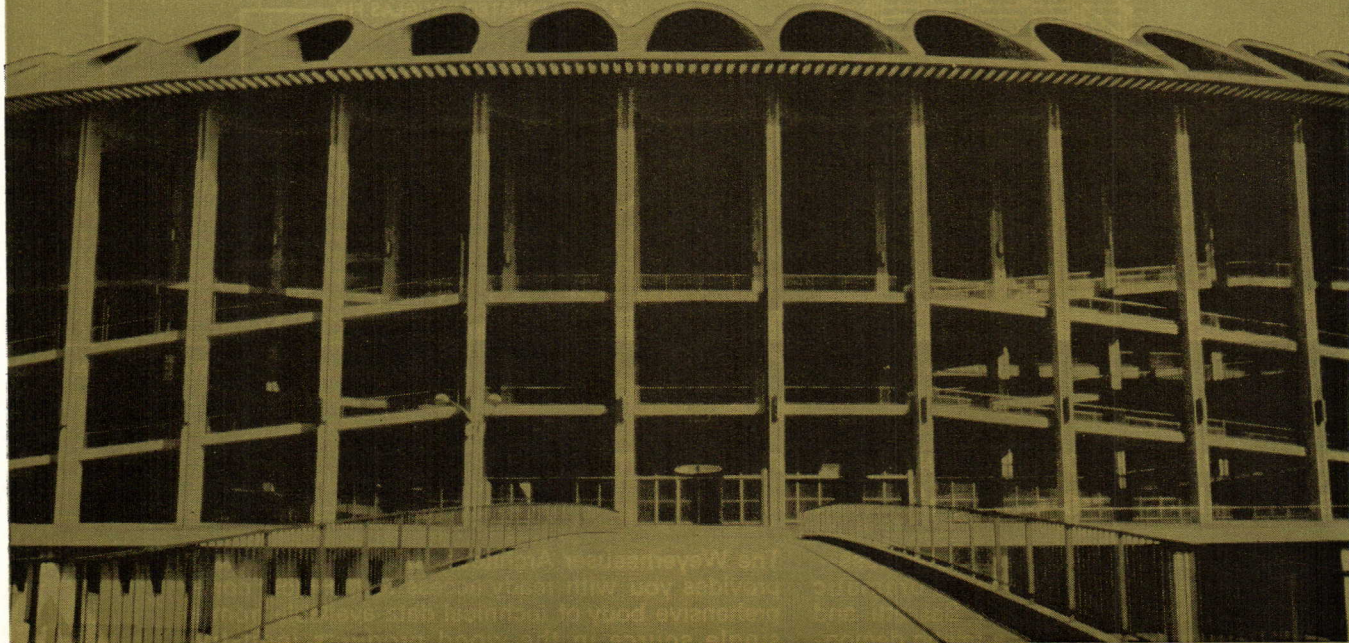


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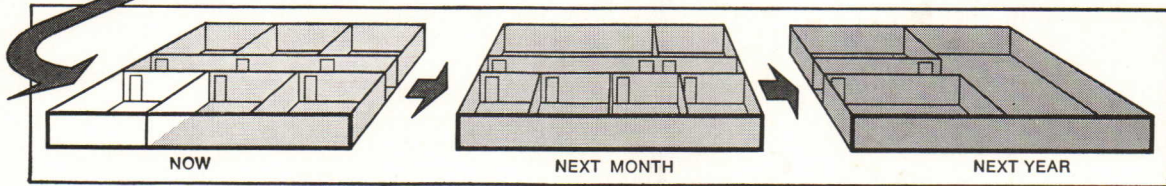
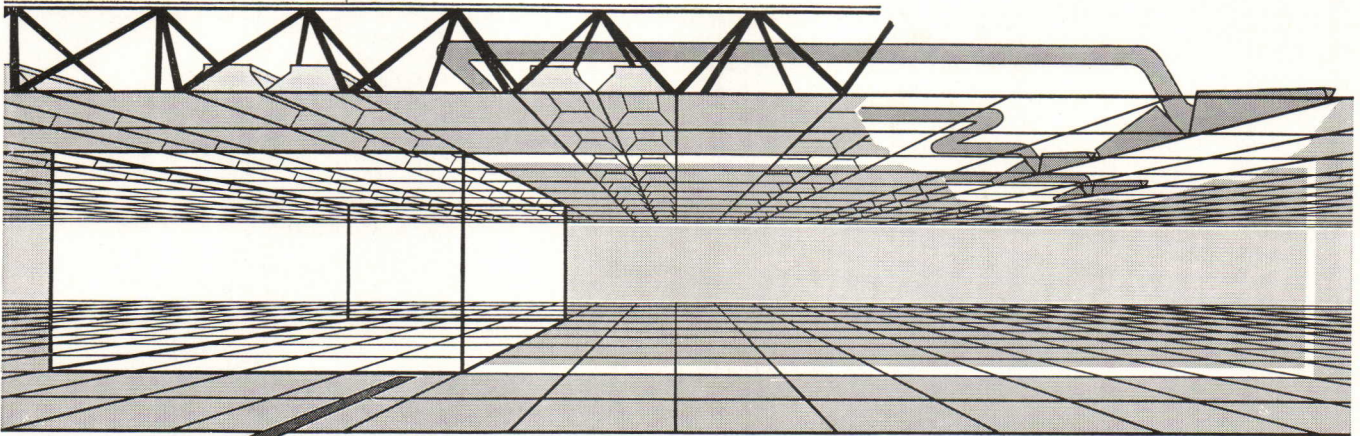
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**SCSD is the School Construction Systems Development project of the Educational Facilities Laboratories.

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SYSTEM**

lection of contract furnishings ever assembled, a collection occupying some 700,000 square feet.

The congress includes about 60 sessions over the three-day period and are intended to provide a means of intercommunication between what W. O. Ollman, general manager of the Mart, termed "all segments of this diverse industry."

"Many of the people whose concepts give strongest direction to the contract industry are unknown to those who work in it or are served by it," Ollman said. "Our programs will bring them together. They will see, hear and meet the distinguished architects, designers, industrialists and other leaders from many countries whose work and vision exert a major influence on environmental development."

In New York, meanwhile, preparations are underway for a contract industry show.

Called Contract '67, it will be held at the Coliseum, April 25-27, and is said to have a big advance registration of exhibitors.

In the United States alone, contract sales are nearing the \$5 billion mark, according to Ollman.

Morgan of USG Receives 'Urban Pioneer' Medal

Graham J. Morgan, president of United States Gypsum Co., is the nation's second urban hero.

Morgan, hailed for his leadership in pioneering the first urban rehabilitation effort backed by a major corporation, was awarded the



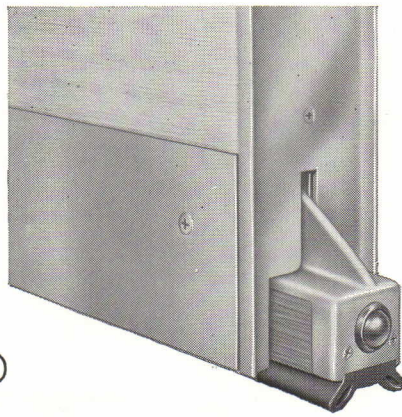
Weaver awards Morgan medal.

Housing and Urban Development Department's "Urban Pioneer" Medal.

The first such medal was presented last year to Robert S. Simon Jr. for his efforts in creating the new town of Reston, Va.

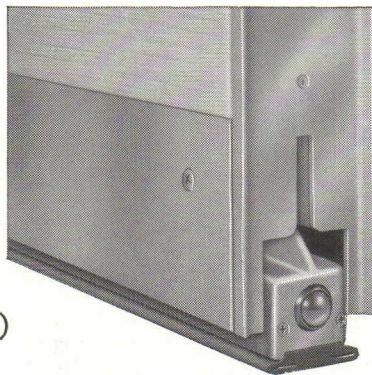
Morgan was cited for his "daring and perception to channel the expe-

Continued on page 20



(A)

Richards-Wilcox



(B)

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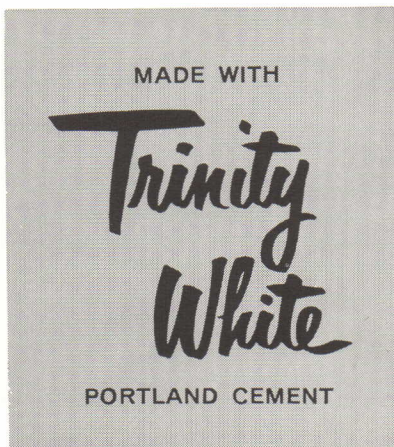
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TERRAZZO ... 12:17... sometime in 1975



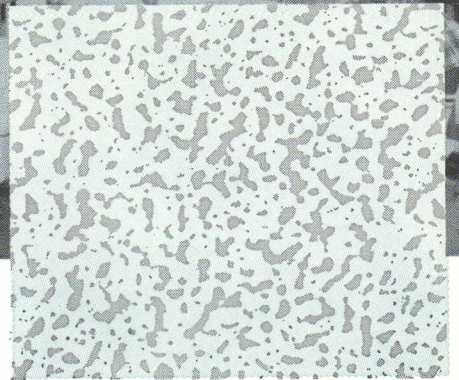
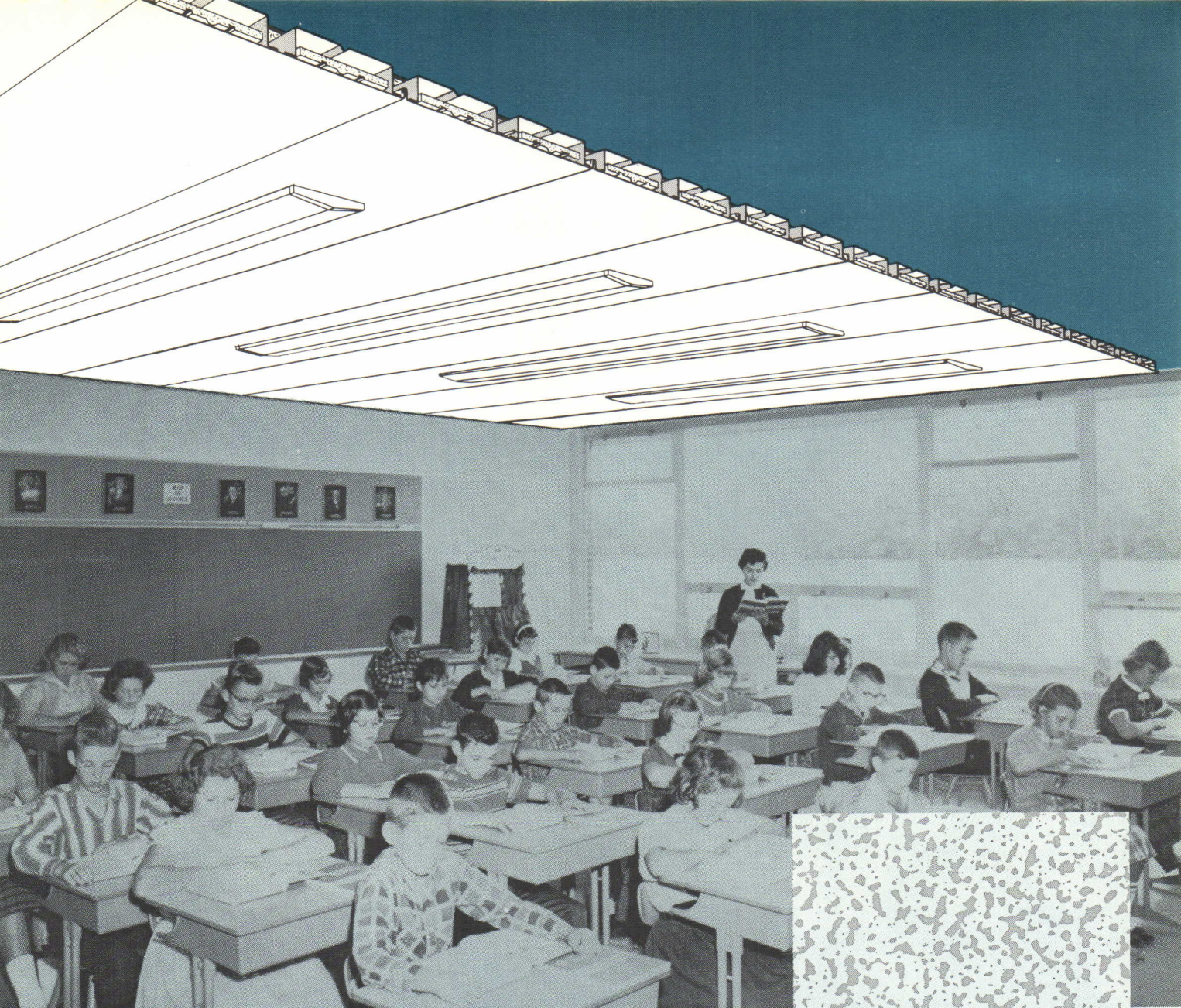
This picture of the terrazzo floors of the new Forsyth General Hospital in Winston-Salem was taken last Spring, just before they started admitting patients. In ten years, even twenty or more years, the floors will look the same... or better. There will have been tremendous traffic over them, but terrazzo can not only take it... it actually *improves with age*. Continuous traffic combined with simple basic maintenance have a mellowing effect that heightens terrazzo's basic natural beauty.

As is so frequently the case with fine terrazzo floors, the contractor chose Trinity White Portland Cement for the job.



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embossed ceiling surface

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Robertson Acoustical Decks are available in two styles and eleven types for varying load and span requirements. One style involves the flat perforated ceiling shown here. The other features a fluted ceiling with the perforations in the vertical webs. Troffer lighting can be installed easily in all types.

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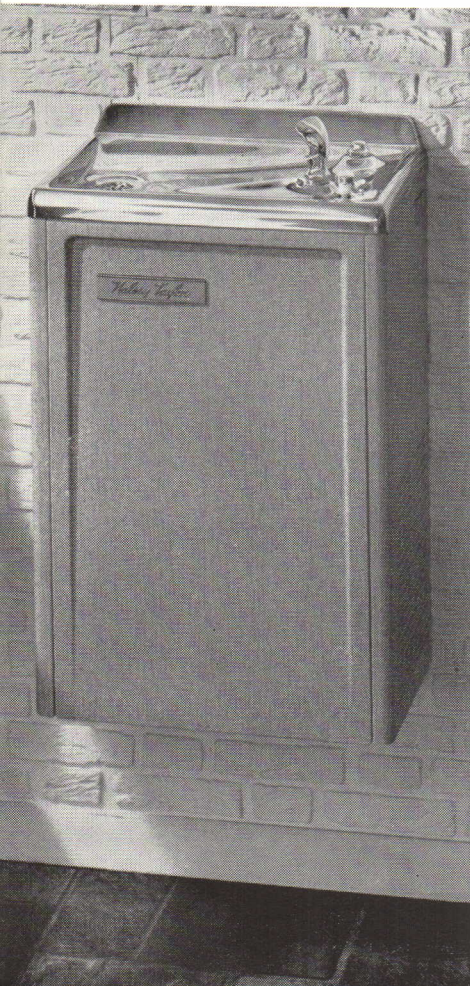
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We can think of six good reasons why you'd want to specify a Halsey Taylor water cooler.

WM SERIES WALL-MOUNTED WATER COOLERS — Designed for modern interiors. Contoured stainless steel top prevents splashing. Hot water dispenser (coffee bar) optional. Standard cabinet finish is handsome, baked gray enamel. Available also in stainless or vinyl-clad steel with choice of attractive colors and textures. Choose from 3 models. Capacities: 9.4, 16.4 or 19.9 gals. of 50° F water at 70° room temperature. Water-cooled condenser models also available.

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CP CLASSIC SERIES — Complete refreshment center provides cold drinking water and hot water for coffee and other hot beverages. Large refrigerated compartment for ice cubes and bottled drinks. Modern styling combines stainless steel with wood-grain finish. Ideal for executive suite, conference room, or employees' lounge. Coffee bar, optional equipment. Capacity: 3.5 gals. 50° F water at 70° room temperature.



A two-stream bubbler is one.



WT FLOOR MODEL SERIES — Can be installed free-standing or secured tightly against the wall. All plumbing connections are made through cabinet back. Equipped with both hand and foot controls and new anti-splash stainless steel top. Goose neck glass filler and water dispenser (coffee bar) are optional. Cabinet finished in standard gray enamel. Other attractive colors on special order basis. Choose from 4 models. Capacities: 9.4 to 24.6 gals. of 50° F water at 70° room temperature. Water-cooled condenser models also available.

BL-301 BI-LEVEL ACCESSORY FOUNTAIN — Safe, practical way to serve drinking water to adults and children. Designed for side mounting on any WM series water cooler. Gray baked enamel, stainless or vinyl-clad steel cabinets to match adjoining WM cooler. Waste outlet and water supply are integral with electric water cooler. Can also be installed as separate wall fountain.

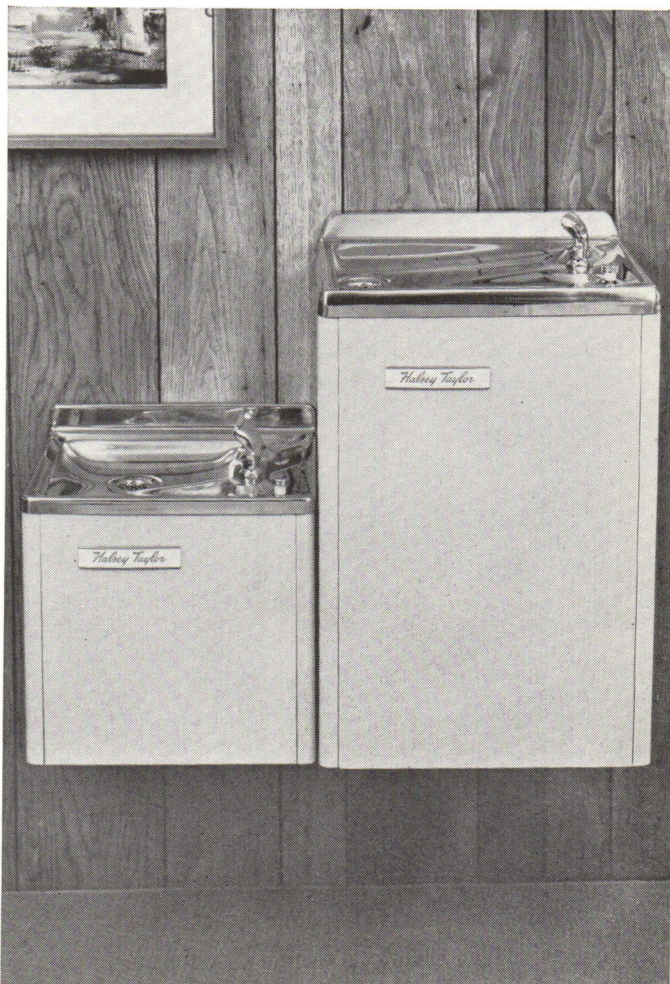
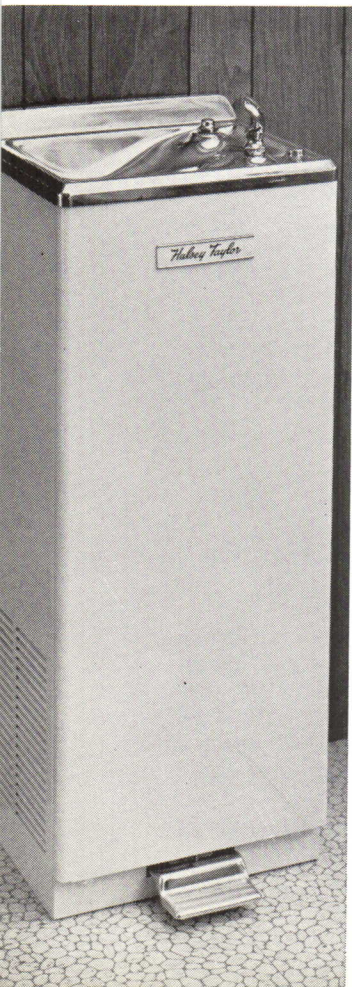
You provide a more satisfying drink of water with Halsey Taylor's exclusive, two-stream, mound-building, anti-squirt water projector. Two streams peak at a precise point to deliver a larger, more sanitary mouthful of cold water. And the unique overflow outlet in the hood guard makes this bubbler absolutely squirtproof. Guard and bubbler are a one-piece, heavy, chrome-plated forging. Constant stream height is maintained by an automatic stream regulator — never too high or too low, even though line pressure may vary as much as 50 pounds.

The five attractive water coolers shown here, with their clean, modern styling, are additional reasons why you should specify Halsey Taylor.

Before you buy or specify see the most complete line of electric water coolers and drinking fountain equipment available. Write today for new Halsey Taylor catalogs. Or look us up in Sweets or the Yellow Pages.

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circle 305 on information card



Newslines from page 15

rience, insights and efficiencies of private enterprise into the field of residential rehabilitation."

USG is rebuilding dilapidated structures on East 102nd Street in New York's Harlem. On accepting the award last month, Morgan announced that USG is broadening its New York experience by acquiring six more multifamily buildings to the rear of its present operation. The cost of buying and rehabilitating the buildings was placed at \$1.6 million.

Morgan also made known that USG early this year will buy six

multifamily buildings in the Hough section of Cleveland, and that the company is making preliminary studies for pilot projects in Philadelphia, Chicago, Atlanta, Los Angeles, San Francisco and Oakland.

In the New York work, results are already claimed in the form of new products and construction techniques as well as better use of existing materials and methods.

The medal was presented to Morgan by HUD Secretary Robert C. Weaver. Looking on in the National Housing Center were home building leaders and government officials.

Plight of Cities Pondered As Congress Convenes

The mood of much of the press and the political fraternity as the 90th Congress convened last month was one of speculation over the mood of the new Congress.

One columnist thought the Congressional mood would be one of "Stop, Look and Listen." Senate Majority Leader Mike Mansfield said he hoped to see "the beginning of a major re-examination of what we have done in legislation during the past few years."

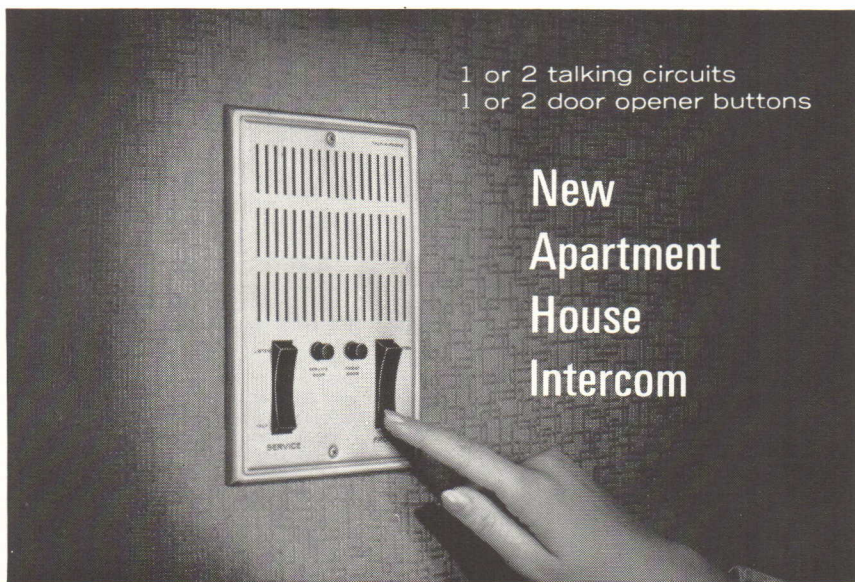
Several circumstances combined to portend a slowdown in new legislation, but perhaps the single most important factor was the changed complexion of the Congress itself.

The Republicans picked up only three additional seats in the Senate but came out of November's election with a 47-seat gain in the House. This cut the Democratic advantage to 248 vs. 187, giving the GOP its strongest House delegation in nearly a decade. And a survey by *Congressional Quarterly* showed that only 177 members-elect of the new House generally favored Great Society programs.

The question was, then, what will happen to measures that narrowly squeaked through the 89th Congress? Would the Department of Housing and Urban Development be strengthened through stepped-up Congressional oversight or would its efforts simply be curtailed? In short, what would happen to the programs aimed at aiding the ailing American city?

But as the newsletter *Housing and Urban Affairs Daily* suggested, all the cutback speculation was "subject to influence of the President's proposals and the way in which they are presented."

So everyone looked forward to what Mr. Johnson had to say in his three major addresses to the Congress.



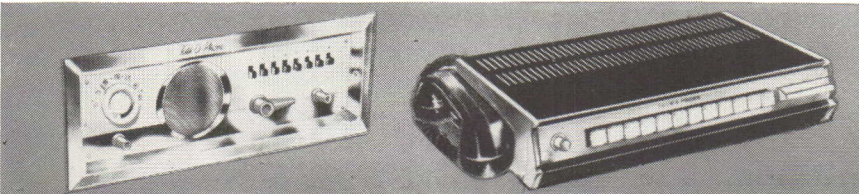
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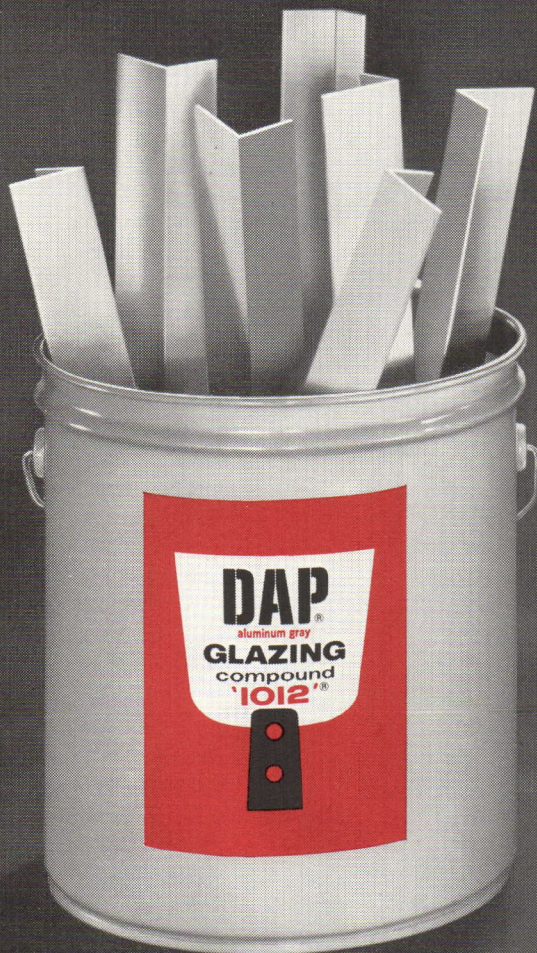
President Names Halprin Arts Council Member

Landscape architect Lawrence Halprin is one of eight new members named by President Johnson to the National Council on the Arts.

The San Franciscan will serve a six-year term. The council is made up of 26 members.

Continued on page 25

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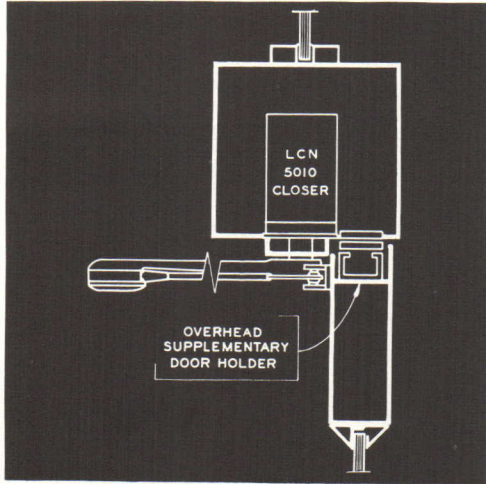


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Detail at head for LCN overhead concealed closer shown in photograph

Main points of the LCN 5010 door closer:

- 1 Principal mechanism is hidden in the head frame
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267

► Third-generation home builder Leon N. Weiner of Wilmington, Del., is the 1967 president of the National Association of Home Builders.

► Chester O. Root, FAIA, of Los Gatos, Calif., was elected president of the Montalvo Association, a non-profit corporation which conducts the Villa Montalvo cultural center at Saratoga, Calif.

► Los Angeles architect Craig Ellwood has been named program chairman for the International Design Conference in Aspen, June 18-23.

► Mexico's Felix Candela, Hon. FAIA, and Praeger-Kavanagh-Waterbury, Engineers-Architects, of New York, have formed an association that will specialize in institutional, industrial and municipal projects.

► Thomas F. Faires, AIA, is the new president of the Memphis Area Chamber of Commerce. He is a former president of the Memphis Chapter AIA and served the Institute nationally as chairman of the Committee on Public Housing Administration.

► G. K. Vetter, AIA, of the University of Colorado School of Architecture, has been elected chairman of the directors of the Architectural and Engineering Development Centers for the US Office of Civil Defense.

► Robert Marquis, president of the Northern California Chapter AIA, plays the role of the bearded Dr. Tugwell in the motion picture, "The Crazy Quilt."

► The works of Morris Lapidus, AIA, were shown in January at the Joe and Emily Lowe Art Gallery, University of Miami. About the same time, his book, "Architecture—A Profession a Business," came out, and Syracuse University established the Morris Lapidus Manuscript Collection "in recognition of his outstanding past and future achievements."

ASLA Assumes Neutrality In West Front Extension

A recommendation of the American Society of Landscape Architects' Committee on the National Capitol to take a neutral position on the extension of the West Front of the US Capitol building has been unanimously supported by the ASLA Board of Trustees.

An ASLA communication said a
Continued on page 28

The place:



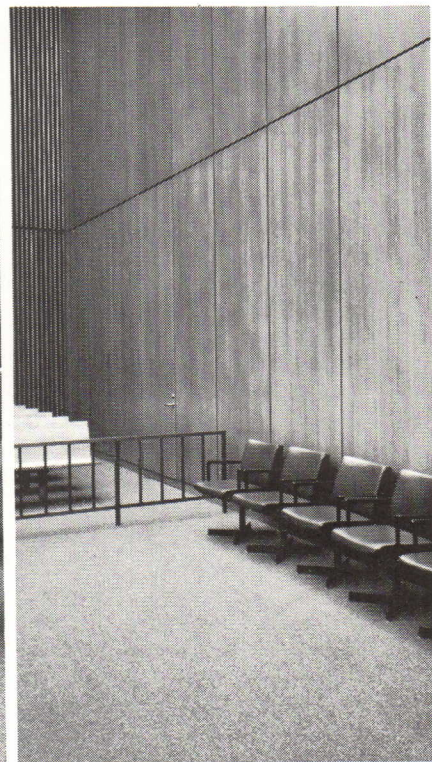
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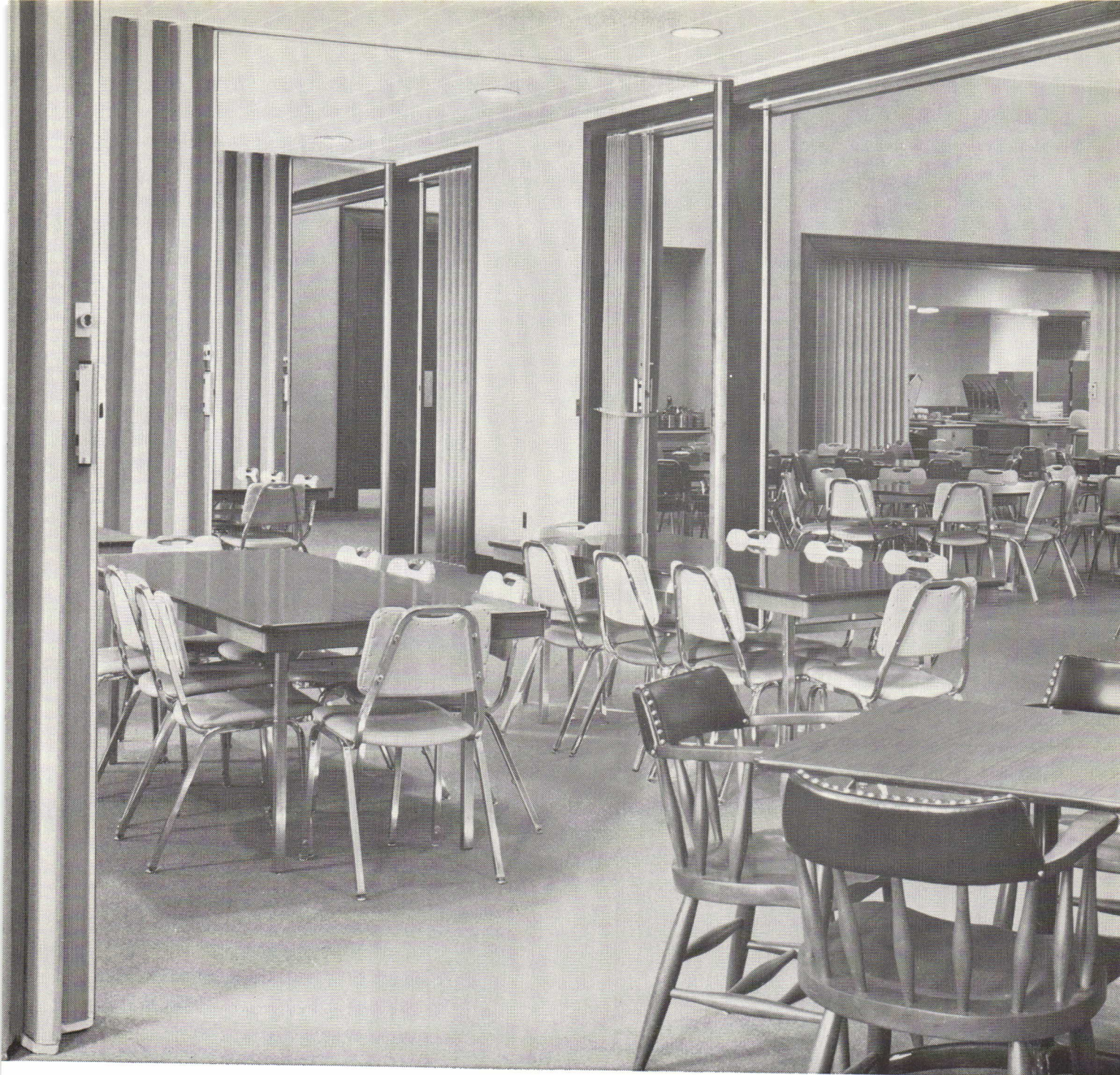
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position either for or against the extension was felt improper "in view of the fact that it has been in preparation for years with private and public knowledge and approval, and is in the hands of eminently qualified professional persons of high standing in their own organizations."

The proposed Commission on Architecture and Planning for the Capitol, which would review and advise on Capitol projects, has been endorsed by ASLA, however.

The proposal is in Congress'

hands. The ASLA committee, a representative of which inspected plans for the extension, said it took into consideration:

"The urgent need to overcome serious structural deficiencies due to design, age and material; the proposed improvement of access circulation and mechanical equipment and services for present-day demands and standards; the proposed removal of the fountain and relocation of the Olmstead-designed steps; and the fact that the plans call for no change in the original Olmstead park design and pedestrian approaches."

Weaver Names 17 Advisers In Model Cities Program

A committee to advise him on the Model Cities Program and related urban approaches has been named by Housing and Urban Development Secretary Robert C. Weaver.

The national group is composed of 17 members in public and private affairs. It includes one architect, Robert Montgomery, AIA, head of the Urban Renewal Design Center at Washington University in St. Louis.

The committee chairman is William L. Slayton, former urban renewal commissioner and now executive vice president of Urban America, Inc.

More Artists Join Guild And Trend Is Applauded

At the start of 1966 only two artists belonged to the Guild for Religious Architecture. By the year's end artist membership had risen to 13.

This, a Guild newsletter pointed out, "is a happy augury of growing recognition of the need for increased cooperation and communication between architects and artists." The Guild asked members to submit the names and addresses of artists working in any media of the religious arts so they can be invited to join.

College Housing Seminar's Topic: Private Financing

A seminar exploring the question of "Privately Financed Housing—Is It Right or Wrong for Your Campus?" will be held in Chicago's Palmer House Feb. 23 under the sponsorship of the Simmons Co.

President Grant G. Simmons Jr. said the seminar "is not intended to promote privately financed college housing or any associated commercial interest," but is to be "a platform for discussion and a means of exchanging meaningful information."

Newell Smith, director of housing at the University of Wisconsin, will serve as moderator. Among other scheduled participants is Trevor Thomas, director of the College Housing Division, Department of Housing and Urban Development.

Continued on page 30



for the ultimate in hat and coat racks

Illustrated below is the OV 1000, one of a series of racks manufactured and designed by Vogel-Peterson to meet the demand for a coat rack that complements today's beautiful interiors. These contemporary racks are not only decorative but are quality constructed for long trouble free service.



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The OV 1000's standards, and hanger rail are constructed of brushed chrome over heavy gauge steel. Black sculptured aluminum brackets are walnut inlaid as are the bases. Shelves are ribbed and perforated black enameled steel. Sculptured umbrella rack and molded drip tray as well as solid walnut hangers add to both the beauty and utility of this rack. Pat. Pend.

Write for complete information on these racks, catalog OV-920



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Bilco, that's who.

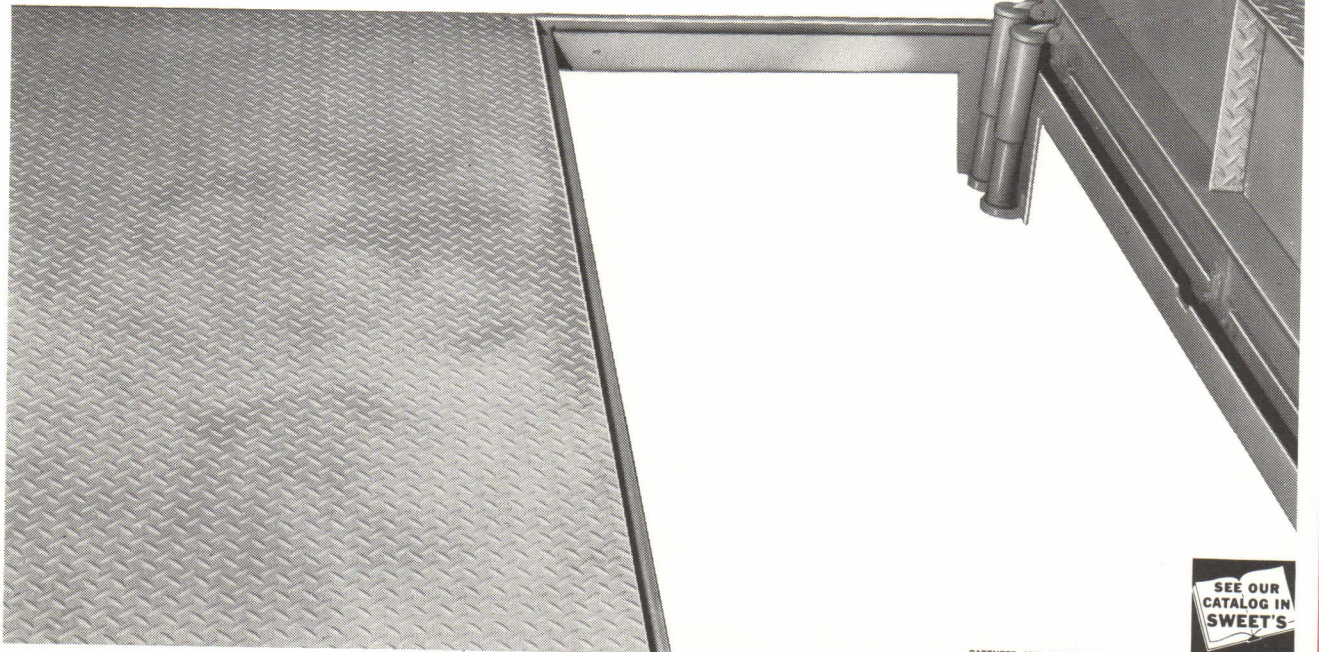
The new Bilco Type J design makes heavy plate floor, pit and sidewalk doors extremely easy to operate — even extra large special sizes or doors reinforced for highway loading. Unique, heavy duty lifting devices provide ease of operation and, for safety, act as a check in retarding downward motion of the doors.

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WHY GAMBLE WITH TIME?

Since the invention of Cheney all-metal thru-wall flashings in 1928, many products have come and gone, most of them using very thin metals covered on both sides with paper, fabrics or asphalt compounds. They were introduced to reduce costs. Time has taught that many asphalt fabrics and papers mould and disintegrate when buried in masonry joints where dampness is constantly present. Furthermore, these flashings, when set in a mortar joint, act as a gasket between the brick courses and prevent the seepage from draining to the outside of the wall unless weep holes are installed at regular intervals. These weep holes sometimes fill up, sometimes are never installed, and are not only a construction nuisance but are costly to build in.

Cheney firmly believes in all-metal thru-wall flashings and makes them in copper, stainless steel and Chinc. Since they are competitively priced with most of the short-lived types, why gamble?



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CORNELL
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ASSOCIATION BUILDINGS
Five miles of
Cheney Flashings
installed in 1930

Cheney THRU-WALL FLASHINGS

These time-proved, all-metal flashings cut off and drain out seepage moisture entering a building through porous masonry and imperfect mortar joints. Cheney Thru-Wall Flashings are factory-prefabricated in

COPPER

16 oz.; 10 oz.; 6 oz.

CHINC

No. 16 oz.; No. 10 oz.; 6 oz.

STAINLESS STEEL

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DOVETAIL DESIGN



The original metal interlocking thru-wall flashing pioneered and developed by Cheney. It bonds in all directions in the mortar bed and provides its own drainage weep holes at 3" intervals. For over 35 years Cheney Dovetail Flashing has been the standard in the building industry.

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This all-metal thru-wall flashing bonds in all lateral directions. In the lighter gauges it is hand formable to fit job conditions. The Spando Design is ideal for lintels, sills, cavity walls and spandrels. It is made in 100 ft. continuous rolls and is the most inexpensive of all metal thru-wall flashings.

Consult Section 8g/Che in Sweet's or write to us direct for comprehensive new catalog which illustrates and describes all Cheney prefabricated products including aluminum gravel stop and fascia panels in color.

CHENEY

FLASHING COMPANY Established 1928

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Newslines from page 28

La Crosse Turns Hole Into Downtown Asset

La Crosse, Wis., has learned to live with a hole in its downtown, thanks largely to Carl W. Schubert, AIA.

Schubert conceived of a plan to convert the hole at his city's busiest intersection to a sunken garden.

He designed the garden and, in fact, contacted most of the firms who contributed time and materials to the undertaking. He also supervised the work.

The Greater La Crosse Chamber of Commerce, which adopted the park idea as a project, labor organizations and even the Boy Scouts joined with Schubert in contributing services.

The owner of the hole—once the basement of a building which was destroyed by fire—leased the property to the city at \$1 a year.

Upgrade Use, Architect Tells Redwood Industry

An architect who made a study of redwood's use as a building material says the industry can realize more profit with less logging, improve its public image and at the same time meet the needs of the building industry.

Robert Martin Engelbrecht, AIA, of Princeton, N. J., believes California redwood, because of its unique color and grain pattern, could become the country's least expensive exotic wood.

But the companies would have to upgrade the product's use to veneers, trim, casework and accent materials, he says. Engelbrecht in the one-year study conferred with industry leaders and toured manufacturing facilities and timberlands.

Necrology

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New York, N.Y.

JOHN E. BOODON
Montoursville, Pa.

WM. ROGER GREELEY, FAIA
Boston, Mass.

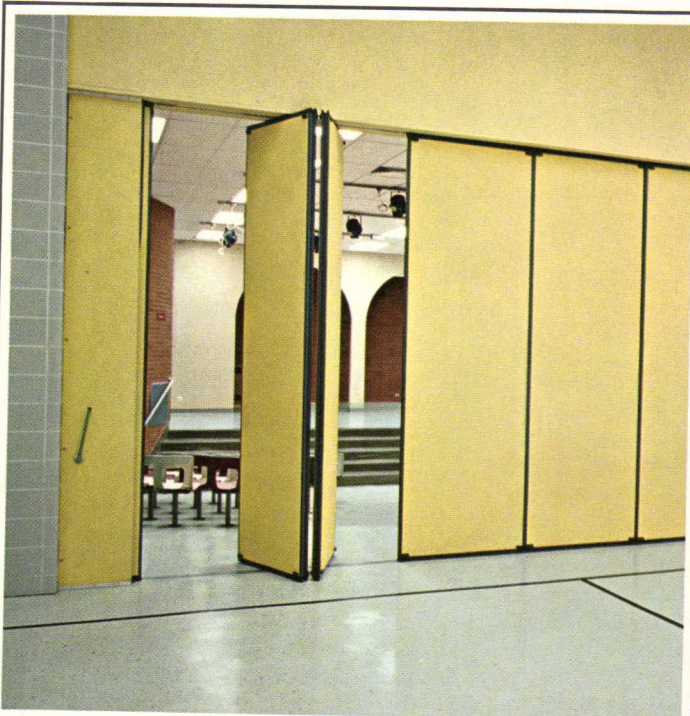
JOSEPH L. STEELE
Harrisburg, Pa.

Members Emeritus
EMERY J. LA LIBERTE
Brockton, Mass.

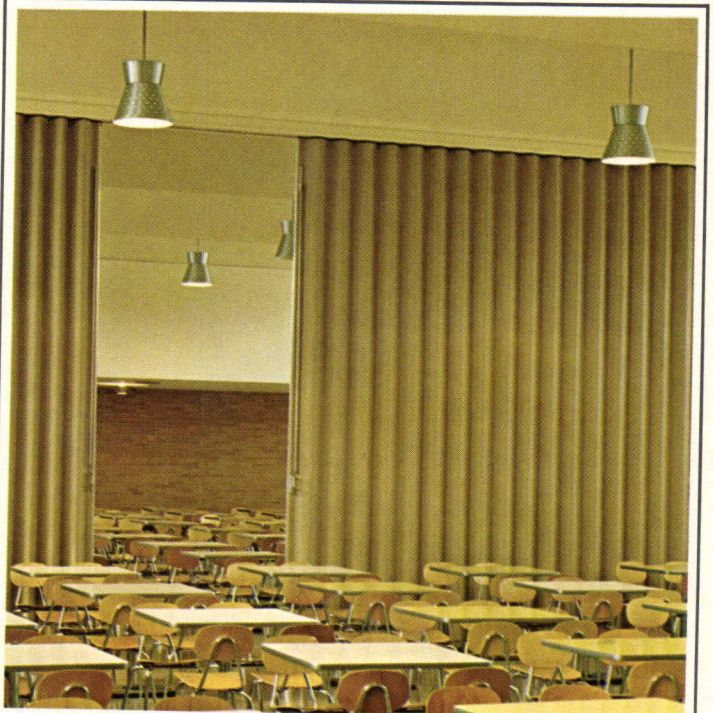
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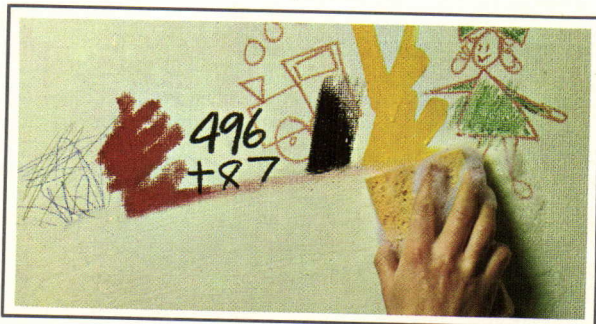


Acousti-Seal 51—for critical sound control requirements—maximum single width: 64'—maximum height: 18'—hanging weight: 7.5 lbs. per square foot of opening—S.T.C. of 51 in 14' x 9' test opening.



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BY WILLIAM H. SCHEICK, FAIA
Executive Director

Unfinished Business: Your Dues at Work

Just as the public wants to know where its taxes go, our members, we are sure, are interested in how their national dues are put to work for the profession. Your individual corporate member dues finance the continuing programs of the Institute, supplemented by income derived from the JOURNAL, documents, the convention and several other minor sources of income.

All of this is set forth annually in the treasurer's statement published each spring in the Report of the Board. For the moment, I want to discuss 1967 projects being financed by supplemental dues and a new special projects fund that you ought to know about.

This year will be the sixth of supplemental dues programs which enable extraordinary projects we could not undertake without this additional source of revenue. If you are one of those who is not required to pay supplemental dues, think a word of thanks for those who do. The funds are used for purposes conceived to benefit the entire membership.

October and November are the times for planning and decision-making on the project program for the next year. The master planning is done by the Executive Committee (way back in July) to define the most pressing needs of project work. The committee also makes tentative allocations of sums available for each sector of activity, keeping in mind a three-year balance to avoid overemphasis in any particular field of interest. You will note that the dollar emphasis in 1967 is in the area of architectural practice, rather than in design, education or public relations. In subsequent years the emphasis will be shifted as required by need.

In November, the Council of Commissioners, acting upon proposals originating with committees and with other sources, selects the projects to be started in the coming year and decides what existing projects are to be continued to completion. The council's selections fit into the Executive Committee's framework and give it substance.

So, you see, this special source of funds does indeed receive very special attention, for the purpose of realizing maximum return for each dollar spent.

This is a good point to mention the special projects fund, now in operation for its second year. In recent years the Institute has found a surplus as its fiscal affairs came to a close. Income greater than original budget projections and prudent management of expenses produce such surpluses. Supplemental dues are not a part of these figures because they are kept under a separate account where all unexpended balances are carried forward for reallocation to new or continuing projects. Until the end of 1965 all surpluses from regular operations were transferred to the general reserve fund.

The Finance Committee reasoned that dues are paid by our members to be put to work for them; consequently a year-end surplus represents a developed "bonus" that can also be put to work when it becomes a certainty at the close of each year's business.

Here's how it works: Let's say that a \$2 million annual budget actually performed to produce a \$60,000 surplus (3 percent of the gross). By a rule of the board, 10 percent of the \$60,000 is transferred to the general reserve fund as a prudent

contribution to the Institute's long-term financial stability. The remaining \$54,000 becomes a part of the special projects fund, which may accumulate such year-end transfers up to a net \$100,000 maximum after special projects have been financed from the fund by the board.

What kinds of projects can tap this fund? The latter is available to finance noncontinuing projects of such special costs or nature that they cannot be scheduled in the supplemental dues budget. A substantial part of the \$100,000 educational research project at Princeton University was financed from this fund. Otherwise the project could not have been undertaken.

In 1967, \$26,600 from the special projects fund will finance studies and conferences conducted by the new Committee on the Future of the Profession (see Structure & Services for its membership and duties). This committee will be meeting with leaders of industry and government — over several years if necessary — to determine as accurately as possible how the practice of architecture must respond to changes in society and the economy.

Such use of surplus represents another form of investment by the Institute in your future. The projects financed from this source have the common characteristic of exploring new fields and paving the way for progress in our continuing activities.

All of the foregoing is to help you understand the pertinent fiscal policies. The following describes the supplemental dues program for 1967, which includes projects of significance for every member:

Continued on page 34



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New Haven, Connecticut • Peterborough, Ontario*

New projects numbering 15 were selected for 1967 for a total of \$140,000 in allocations. Budget estimates projected \$116,000 in new supplemental dues income, the balance of \$24,000 was carried forward from 1966, representing savings on various completed projects and a few cancelled out as non-productive.

In addition, seven uncompleted projects were carried on into 1967 with previously committed allocations of \$42,500.

The following listing describes both new and continued projects which constitute the 1967 program. Subheadings indicate the sectors of activity which relate the projects to the Institute's overall goals in professional development.

FOR THE DEVELOPMENT OF ARCHITECTS

In Design

- \$3,000—*Urban Design Chapter Action Guide*: illustrated case studies to be prepared by AIA Committee on Urban Design to help chapters promote urban development with local civic and political groups.

- \$1,500—*Urban Design Assistance Team*: a pilot project to provide volunteer AIA consultants to give guidance upon chapter request during the start of local community urban design projects.

In Practice

- \$86,140—*Cost of Architectural Services*: a nationwide study by Case & Co., management consultants, to develop authentic data on the nature and magnitude of the cost components which make up the total expenditures paid out of the architect's fee. A \$16,000 pilot study preceded this national study. Expected result: a useful manual for architects' management of their business and data for dealing with fee problems with public agencies.
- \$8,000—*Emerging Techniques in Practice—Study of Design Programming*: continuation of the research which produced the first popular publication on "Emerging Techniques." This study will deal with new techniques in programming in architecture and other disciplines to define and help solve problems of developing and programming clients' requirements for building projects. Expected result: another report in a continuing series on this subject.

('66 projects continued for '67 completion)

- \$4,000—*Filing System Revision*:

assistance to manufacturers for filing classifications in the Uniform System of Indexing.

- \$1,000—*AIA Documents Revision*: final revisions of all pertinent documents to conform to the September 1966 revisions of A101, A201, B131.

- \$14,000—*Revision of Specification Worksheets (K series)*: updating of the series by specifications experts to include new data and to conform to the Uniform Index. Expected result: working documents for architectural specification writers.

In the Education of Architects

- \$2,000—*Internship and Continuing Education*: practical guidelines developed by the committee on this subject for an attainable program and its dissemination and implementation.

('66 project for '67 completion)

- \$15,600—*Architectural Technicians Training Program*: development and promotion of approved curricula for the training of architectural technicians in junior colleges and trade schools. Expected result: order out of chaos in training greatly needed supporting personnel.

FOR THE DEVELOPMENT OF PUBLIC SERVICES

For the General Public

- \$8,600—*Visual Aids Planning*: study and planning of movies and other visual aids for chapters for the War on Community Ugliness. Expected result: recommendations for productions.

- \$4,260—*Movie Escrow Fund*: funds not allocated for other projects set aside for future filmmaking using these and additional funds allocated later.

- \$1,500—*Historic Architecture Filmstrip*: development for sale of a three-part, 60-minute filmstrip with tapes and illustrated brochure for chapter use in preservation of historic architecture in contemporary settings.

- \$16,000—*Schoolchild Education Project*: a major new frontier for the Institute, with the goal of introducing material into primary and secondary schools that will create an understanding of architecture in tomorrow's citizens (\$6,000 is for the national committee on this subject to develop its program with experts in education; \$10,000 is to complete an experimental fourth-grade primer on environmental design developed by Dr. June McFee in consultation with the AIA Task Force in 1966). Five thousand cop-

Continued on page 36

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For more technical data, circle 234 on information card



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ies of the primer will be tested in 10 school systems in 1967. Expected result: guidelines for curricula to realize the long-term goal.

- ('66 projects for '67 completion)
- \$3,500—*Brochure on How to Select an Architect*: a greatly needed updated version of previous brochures on this subject. Expected result a publication for architects to use with prospective clients.
- \$2,900—*Movie on Signs*: film by Lewis Crutcher, AIA, for use by chapters in the War on Ugliness.
- \$1,500—*Booklet on Community Design for Chambers of Commerce*: Manuscript for one of the US Chamber of Commerce's Booklet series for local chambers. This booklet will introduce architecture into the series.

For the Government

- \$3,600 — *Federal Establishment Appraisal*: special studies of the new federal Departments of Housing and Urban Development and Transportation from the standpoint of urban planning and design. Expected result: better preparation to pursue the interests of the profession in legislation and programs originating with these agencies whose activities are highly significant for architects.
- \$400—*Task Force on West Front of the Capitol*: the performance of an advisory function by the Institute with respect to the controversial remodeling proposals for the nation's most prominent historic building.

FOR THE DEVELOPMENT OF THE PROFESSIONAL SOCIETY

- \$1,000—*Survey of Membership*: development of data pertinent to membership growth in the Institute, with studies of statistical sampling techniques useful for acquiring other data on the profession.
- \$4,000—*AIA Scholar Program*: a pilot program enabling a highly motivated student to work at the Octagon in the interest of developing guidelines for stronger rapport with architectural graduates and their early membership in the professional society.

SUMMARY

For the development of architects	\$135,240
For the development of public services	42,260
For the development of the professional society	5,000
	\$182,500


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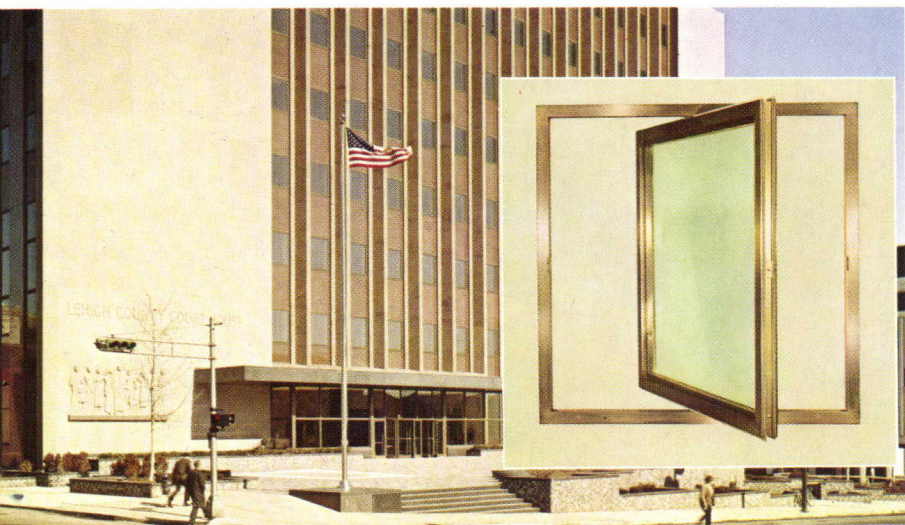
To see what imaginative designers can accomplish through the judicious use of coppermetals, turn page 

Here's why leading architects use the coppermetals in modern design

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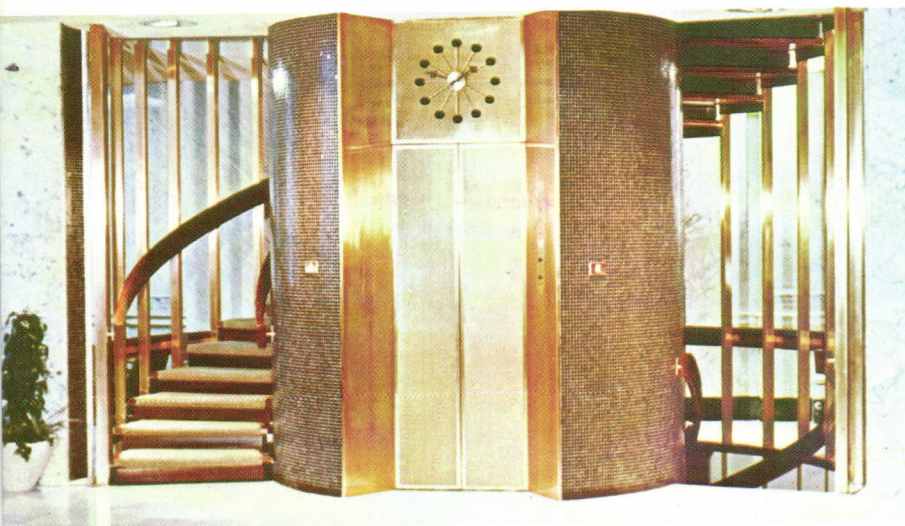
Consider these advantages when you are selecting metals and don't overlook the wide range of true, natural colors available in the copper alloys—from the

red of copper to the warm, rich golds of the brasses and bronzes to the soft, silvery white of the nickel silvers. And for the most economical use of these quality metals, consult with fabricators in the early planning stages. They can help you apply standard forms and sizes of sheet, rod, wire, tube, extruded and drawn shapes to your designs. Write for publication, "Architectural Metals by Anaconda," A.I.A. File No. 15. Anaconda American Brass Company, Waterbury, Connecticut 06720. In Canada, Anaconda American Brass, Ltd., Ontario.



*Lehigh County Courthouse, Allentown, Pa.
Architects: Wolf & Hahn, Allentown, Pa.
Fabricator: Trio Industries, Inc.,
Bridgeport, Conn.*

Window Frames and Reversible Sash are Everdur[®], an Anaconda high-strength engineering and architectural copper alloy. Tubular components are fabricated from strip by the economical roll-forming process.



*First National Bank, Wilkes-Barre, Pa.
Architects: Lacy, Atherton & Davis,
Wilkes-Barre, Pa.
Fabricator: J. W. Fiske Architectural
Metals Inc., Paterson, N.J.*

Here the rich beauty of bronze in sheet, rod and tube products accentuates the fine marble, ceramic tile and wood used in this circular stairway and elevator shaft. This is a typical example of architectural beauty with bronze.



*Bucks County Court House, Doylestown, Pa.
Architects: Carroll, Grisdale & Van Alen
Philadelphia, Pa.
Fabricator: George R. Habgood Company
Philadelphia, Pa.*

Bronze, brick and glass team up to form a striking curtain wall for this building. Muntz Metal sheet used for spandrels and fascia. Window frames—Architectural Bronze. For warm appearance, an oxidized finish was specified.

65-0733A

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Inspiration for new design freedom:

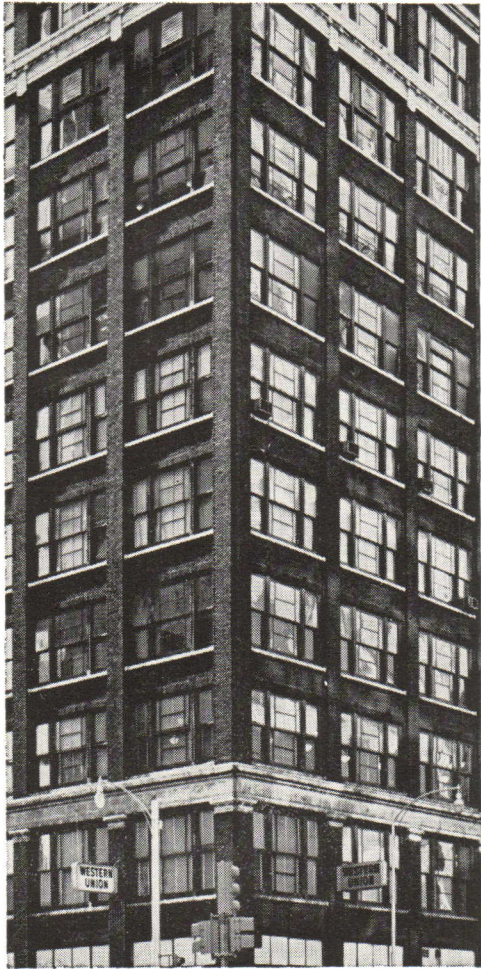
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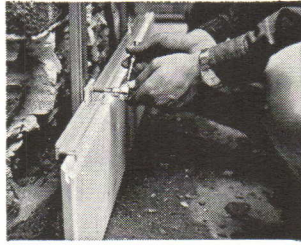


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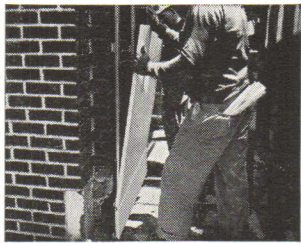
There's a new way to dress old buildings in Marble



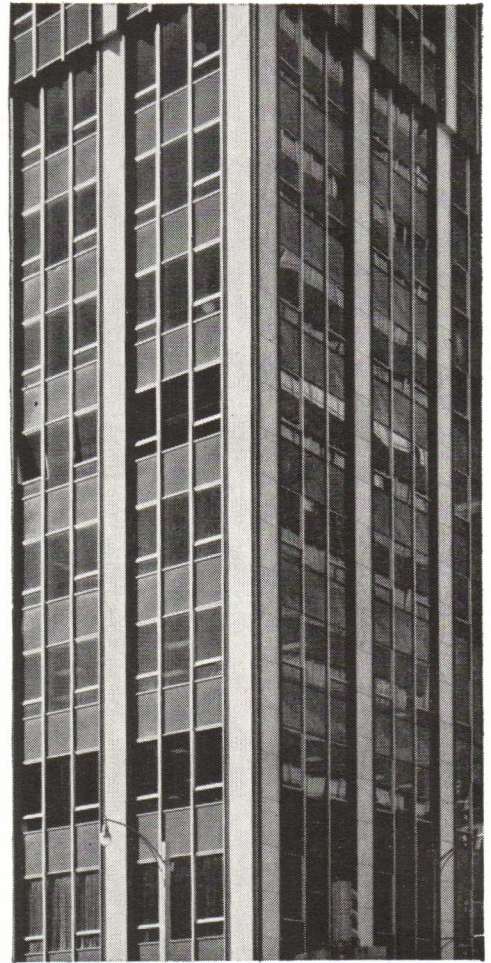
Vertical struts are anchored to existing facade.



Horizontal members fastened by special clamps.



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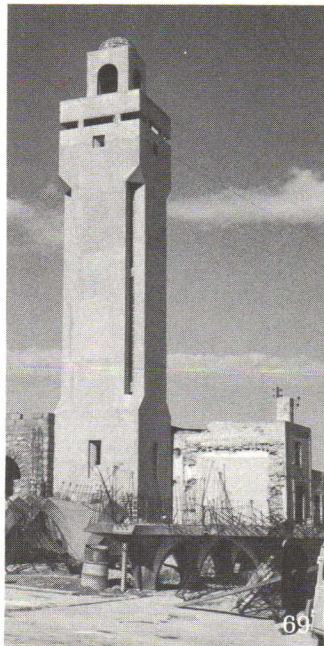
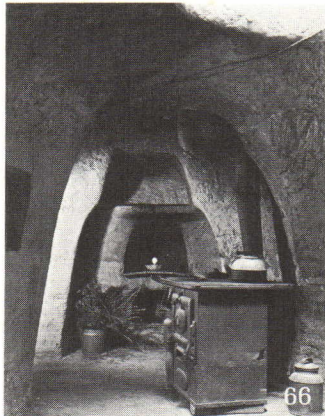
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For more technical data, circle 238 on information card

◀ For more technical data, circle 237 on information card



Expo 67 42
A Canadian architect critiques his country's great exposition including its hill-less hilltown

A Responsibility—and the Creative Process 57
The leadoff article of a series reviews the whys and ways of controlling costs in building

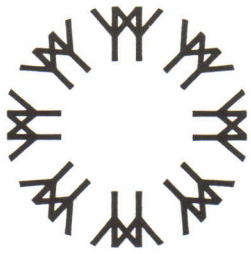
Theoretical Construction for Early Control 61
The second installment of the series, to be presented during the year under the title "Creative Cost Control," tells of one firm's methods

Seven Acres of Underground Shelter 66
An Italian carves delightful spaces in Fresno

Design Oasis in the Desert 69
Volunteer architects with the Peace Corps plan for nearly 500 Tunisian projects

The Big Ground Wave 72
Supersonic travel and other developments in air technology point to huge responsibilities and opportunities for architects and urban planners

"Let's Go Down to the Jail and See Andy Warhol" 77
Resourceful communities find room for the arts



expo67

By nature exhibition buildings are fantastic and showy. This creates the danger of confirming in the public mind that hopefully erroneous image of modern architecture as one of outrageous construction and wild forms. But it also has the virtue of focusing on the contemporary problem of ordering diversity while not suppressing it.

The city, too, has the problem of ordering diversity while coping with the essential 20th century problem—complexity. So it would not be unnatural for a world's fair to demonstrate the means to an ordered and noble urban life.

At least this would provide a *raison d'être*, so lacking in the curious phenomenon of large expositions, especially since their historic purpose of straight trade promotion becomes less and less important. And, after all, the theme of Expo 67 is "Man and His World."

At a certain level Expo has achieved a form of planning which structures a complex site and its uses in a comprehensive, yet permissive, way; it has accomplished this to a degree unmatched in any city.

At the operations level, too, sophisticated systems management methods have been used to control the complexity of organizing so many projects in the short time span available for programming, design and construction. One hundred and fifty systems models were run simultaneously.

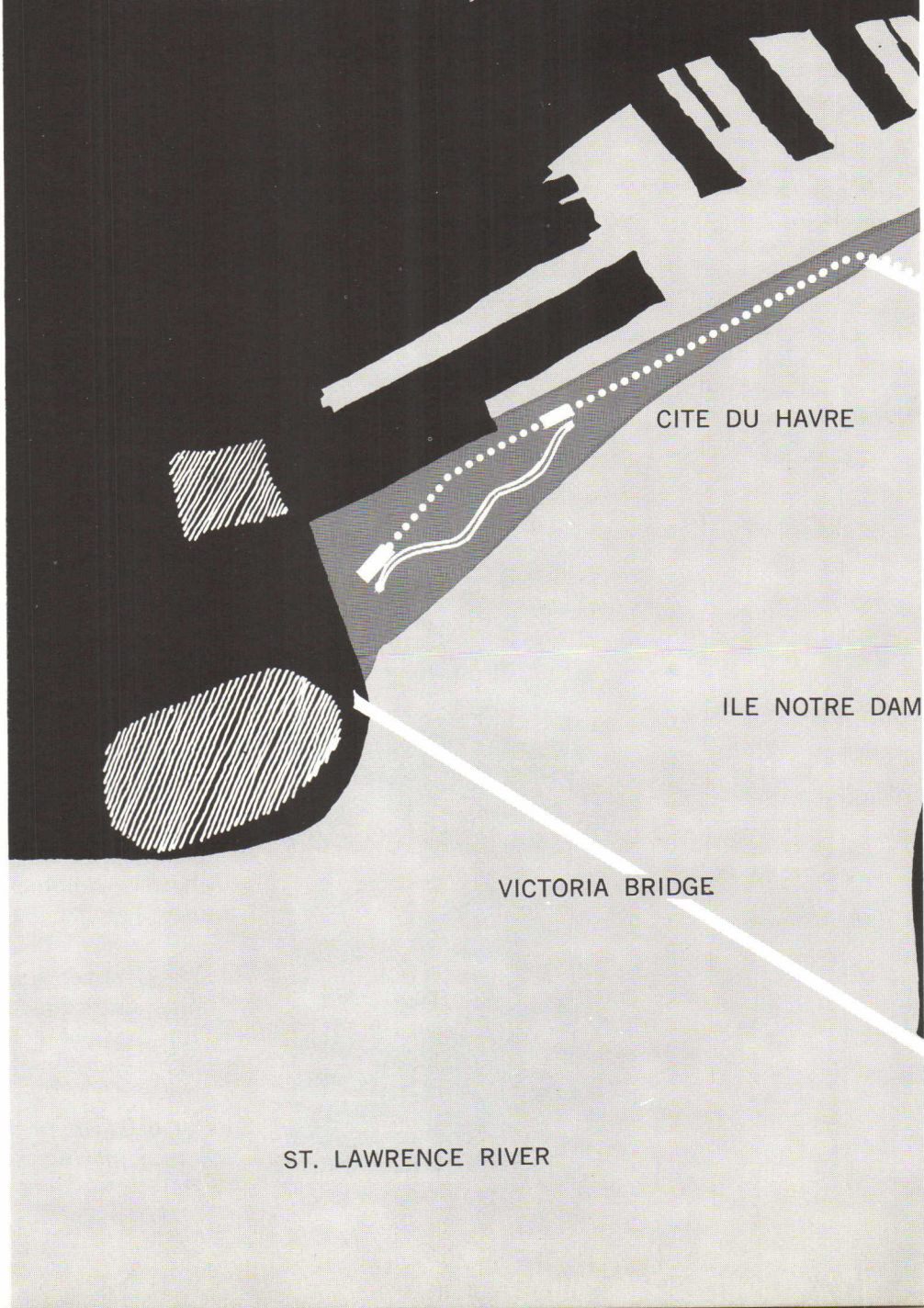
But at another level Expo fails to demonstrate the means to an ordered life. It has neither fully realized the potential of the systems it has employed nor used systems which would eventually do more than merely satisfy the demands of the exposition. For Expo stands on one of the finest urban sites in North America, a site that must eventually become a permanent part of Montreal, its Ile de la Cité.

The transportation system and the permanent structures could, and should have become, the framework for future development, once the impermanent pavilions are cleared away. So the siting and relationship of these elements become crucial.

The great obstacle to assuming a position of advocacy in planning is

A critique of Canada's monumental world's fair by a Canadian practitioner and consultant in architecture and urban design who is also associate editor of *Architecture Canada*. In addition, the author runs the University of Toronto's Graduate Design Studio which studies architecture in the urban context.

BY A. J. DIAMOND



MONTREAL

LA RONDE

JACQUES CARTIER BRIDGE

ILE SAINTE-HELENE

SOUTH SHORE



EXPO SITES



PARKING



SKY RIDE



MINIRAIL



PARK



METRO



EXPO EXPRESS



TRACKLESS TRAILER

the lack of finance and power to invest in public works ahead of development in the private sector. In Expo there was an opportunity to do this, thereby deriving double use from the \$330 million expenditure.

The exposition covers a site of some 1,000 acres, larger than any previous world's fair. Moreover, it is fragmented into four distinct areas by two channels of the St. Lawrence River and an existing 140-acre park. As a result, great attention has been paid to the transportation system, not only to provide easy access to these four areas but to use the transportation system as a means of achieving cohesiveness and continuity. The latter objectives have been met by providing views of the whole site from tracks which are often elevated and, in turn, views of the tracks from points on the site.

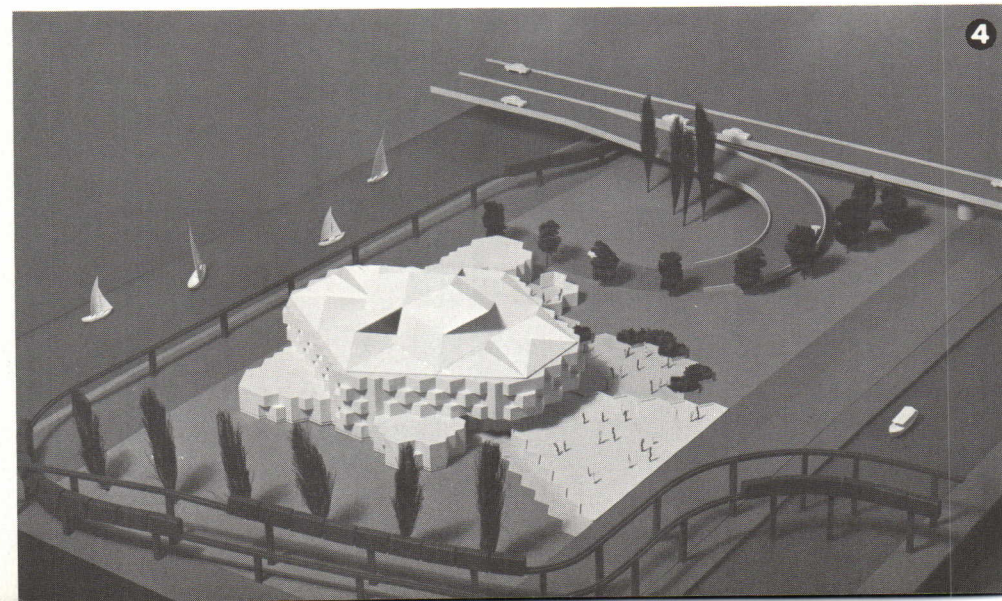
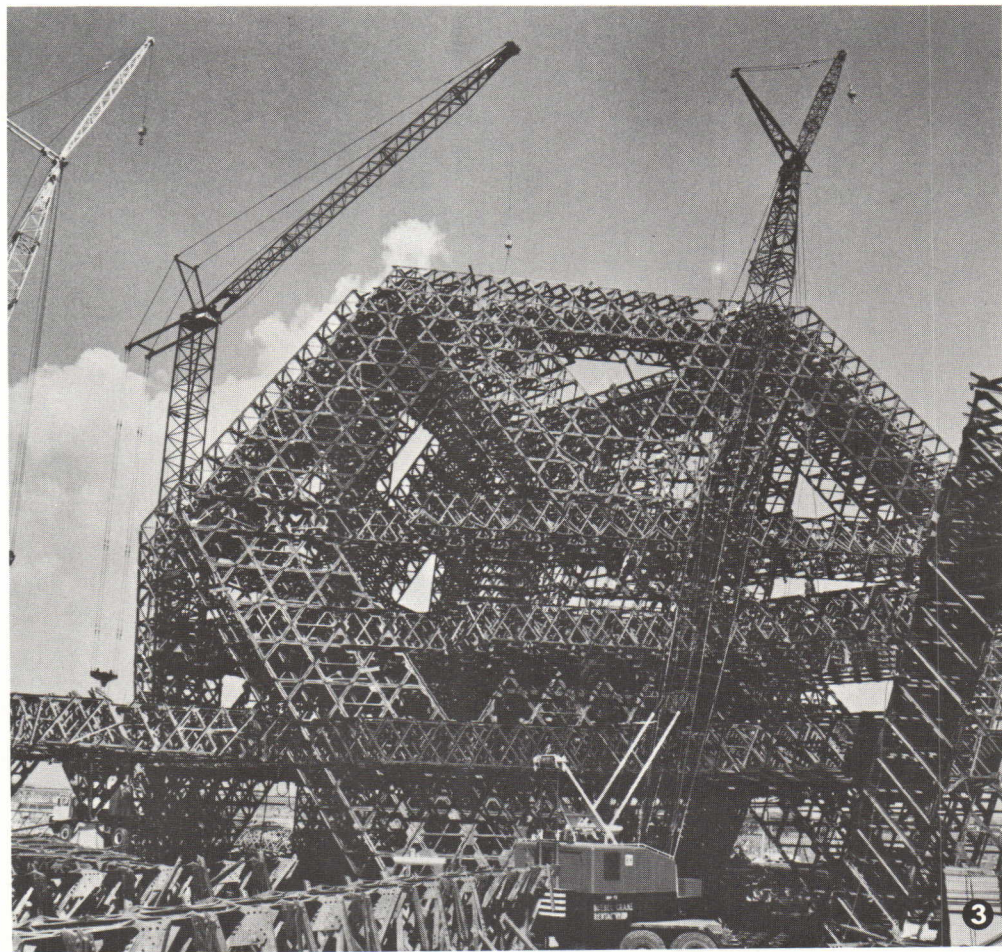
The main system, the Expo Express which connects the extremities of the site, is free to riders. There are three intermediate stations between the main gateway, Place d'Accueil, and the most distant point, the amusement area called La Ronde. The intermediate stations have adjacent to them the theme pavilions built by the Canadian Corporation for the World's Fair (CCWE). These major structures, together with the Expo Express stations, provide the focus of the different areas in which they are situated.

Near each of these focal points is access to the secondary transportation systems, and between them are "activity" areas—service areas provided by the CCWE and leased to private concessionaires. They consist of restaurants, snack bars, boutiques and washrooms.

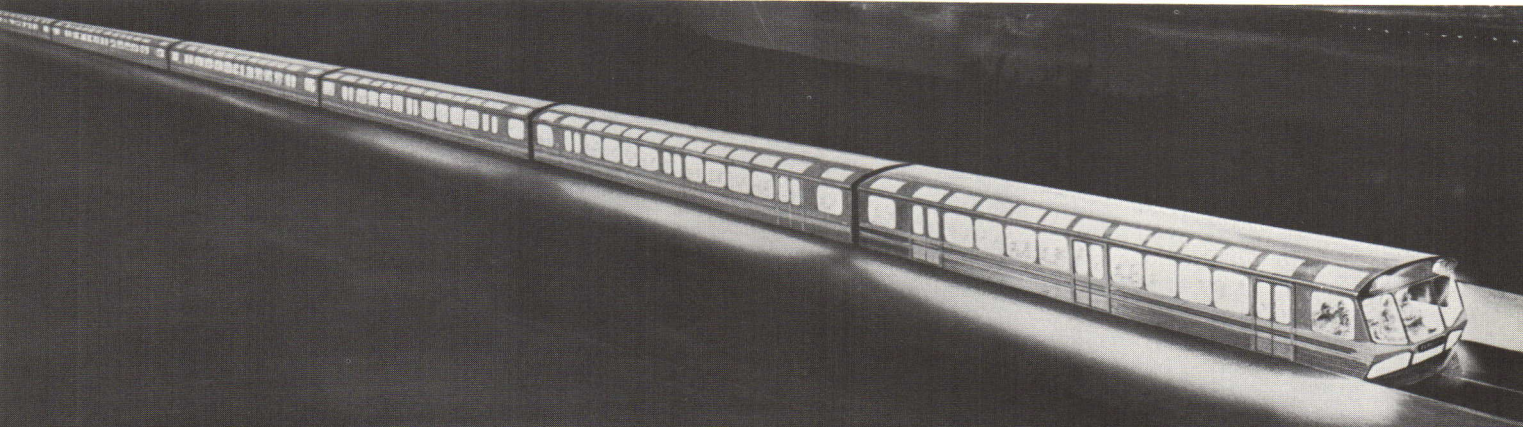
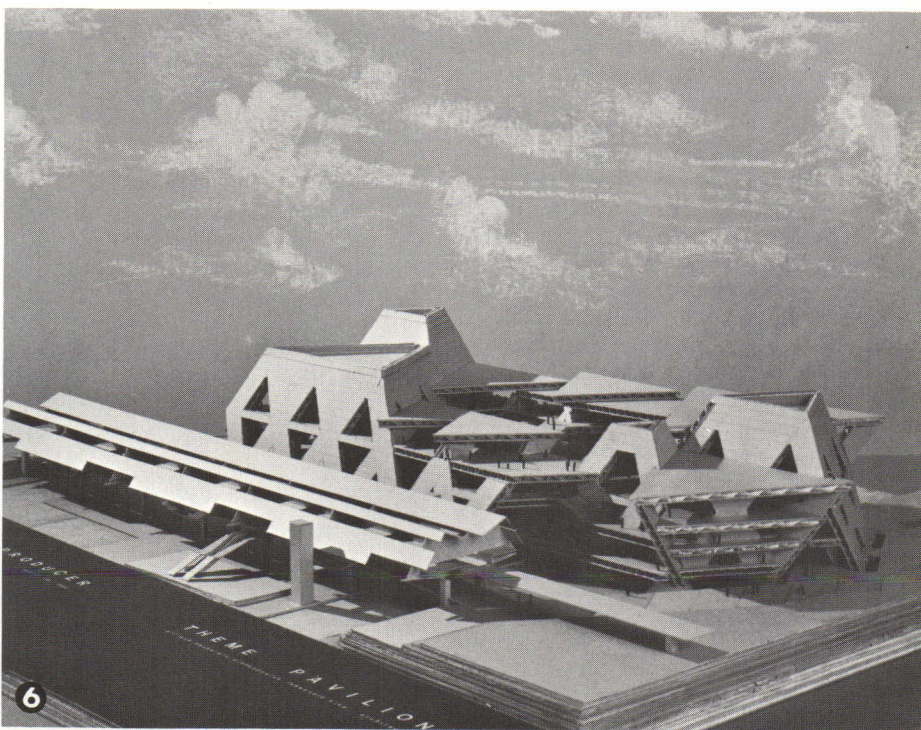
The theme pavilions are temporary structures built by CCWE and thus were within its control in use, form and location. Since their purpose is also to act as functional and visual foci, their designs should have made them distinctive and closely tied to movement channels. In fact, it is only their position that distinguishes them from the diverse collection of other pavilions. And even then it is only a matter of their proximity to, and not integration with, the train stations.

To have used these as permanent points for the future, utilizing them as potent linkages to other structures and activities, would have been a lesson in both short- and long-range strategy and in civic architecture of a new order.

The secondary systems are geared down in speed from the primary



A theme pavilion, Man and His Community (1) under construction along with Habitat 67 in the background. Place d'Accueil (2) is Expo's main box office, and theme building (3) is but one of the fair's complex space-frame structures. Model of Israel's Pavilion (4) shows relationship with transportation means. Other models are of an Expo service restaurant (5) and another theme pavilion, Man the Explorer(6). The sleek train (7) is Expo Express.



express line and provide varying modes of movement for further exploration of the site. There is a minirail system on Ile Notre Dame and on Ile Verte, a trackless trailer in Cité du Havre, a skyride in La Ronde and a canal boat system.

Clearly the last speed is that of the pedestrian, who, after seeing the whole site from the free ride on the "A" system, the Expo Express, and moving around an area at low cost and speed on the "B" system, can walk about the places that interest him. The transportation network, although geared down in speed and capacity and connected at points, is open-ended and theoretically could expand or contract without affecting the operation of other lines.

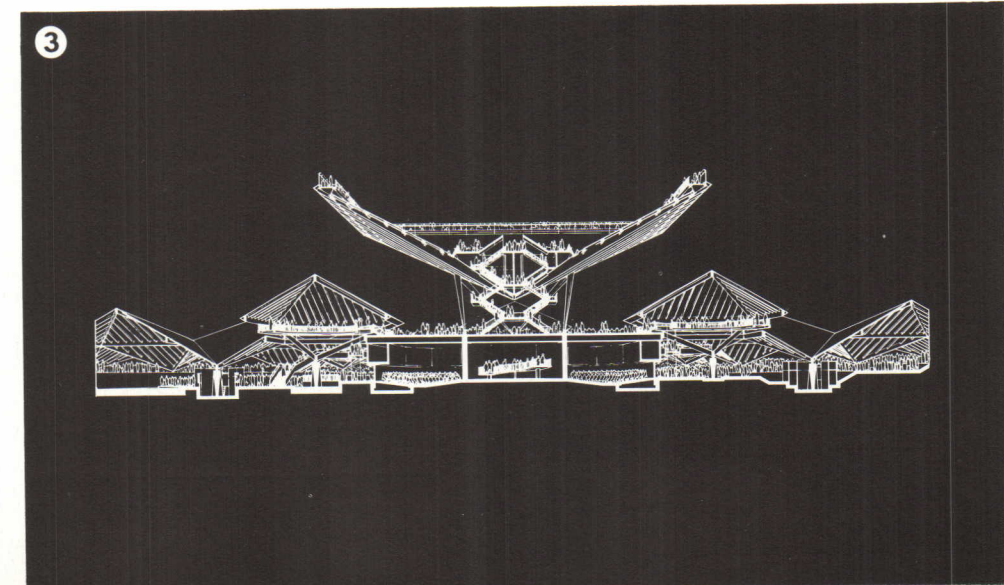
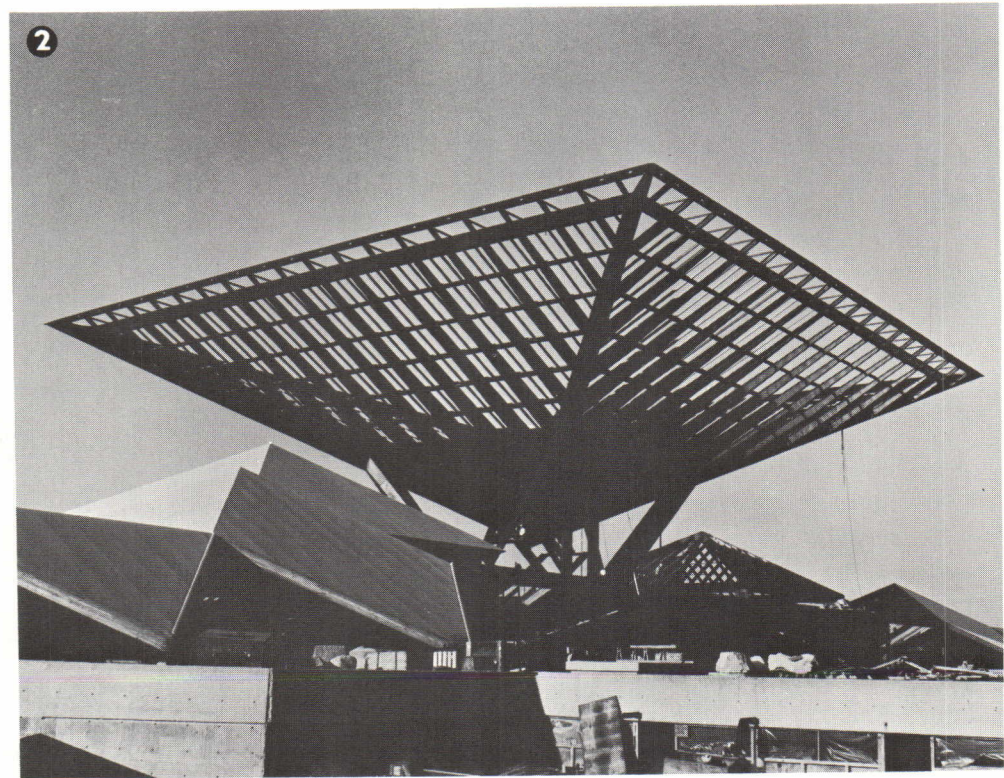
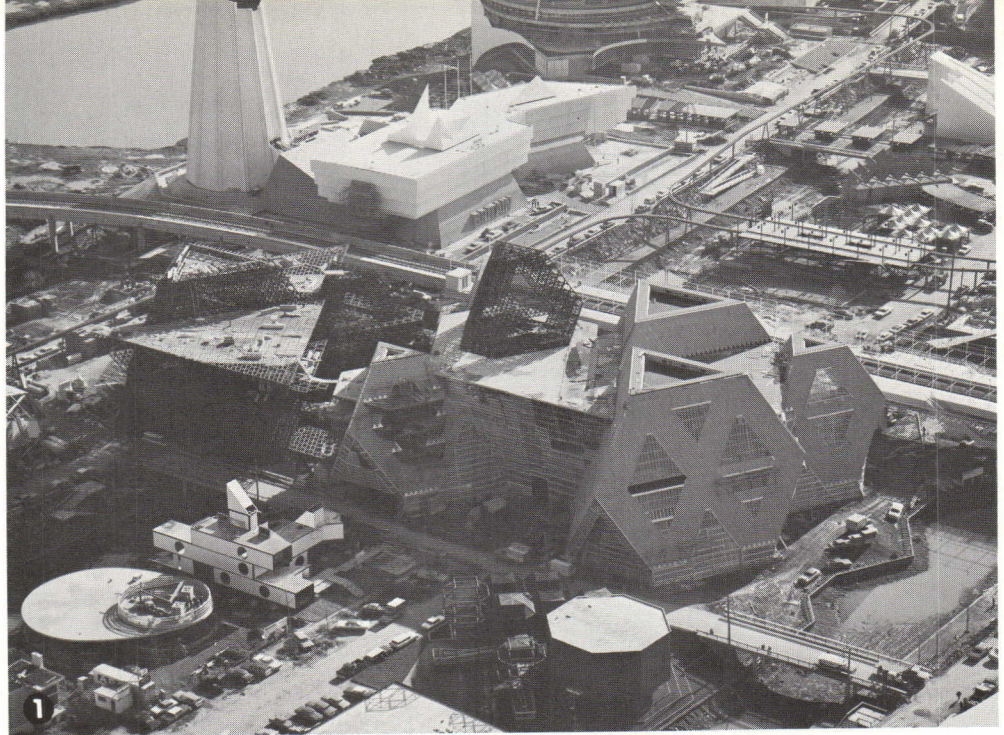
Besides the intrafair transportation system, the site is fed by intercity and intracity buses which have three termini adjacent to the site and by automobiles which have three large parking areas also outside the site. The parking lots and bus termini have direct access to movement systems that traverse the site—the Expo Express from Place d'Accueil and the new Montreal Metro from Longueuil.

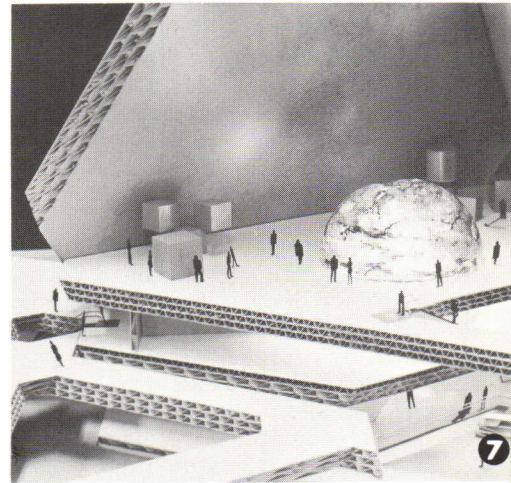
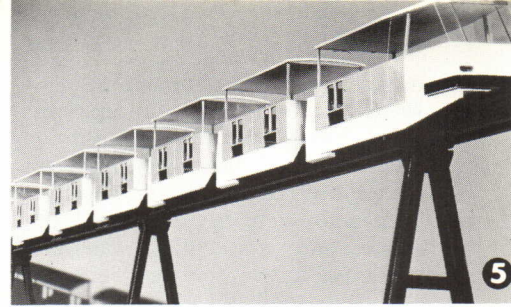
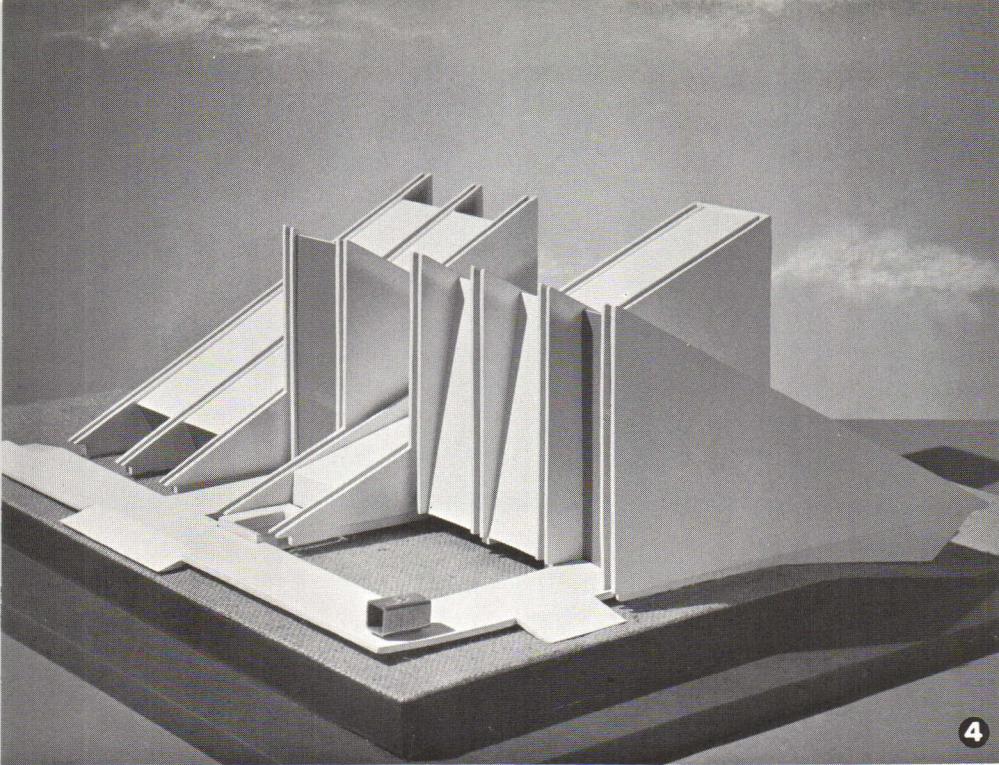
The rubber-tired Metro subway serves Expo from Montreal with two stations, one on Ile Ste-Hélène and the other at Longueuil. A heliport will connect the site to Montreal's International Airport.

Two North American inland waterway systems originate on the St. Lawrence near Montreal: the St. Lawrence Seaway and the Richelieu-Hudson River Canal, both of which extend great distances into the United States. A permanent feature will be a 250-boat harbor at La Ronde to receive visits during and after 1967.

To mitigate the desolate quality of tract development and to provide an amenity for increased recreational activity, enterprising developers have become more and more attracted to sites having access to water. This, in a sense, while improving the quality of the contrived environment, begs the question of improving the architecture. For the same reasons Expo has used water as an element of the physical environment, both by the choice of site and the introduction of canals into the site.

But as with the transportation system, this has not served to affect qualitatively the designs of adjacent structures. It is still an exhibition which happens to be near water as tract housing may happen to stand by a lake; it is not condi-





A scene of varied shapes and sizes (1) with British Pavilion, upper left; Man the Producer Pavilion, center; and the Cuban Pavilion, lower left, looking somewhat like a tugboat flanking an ocean liner. Canada's Pavilion (2), also in sectional perspective (3), is called "katimavik," Eskimo word for gathering place. Fabricated

mostly of steel plate, it is 192 feet wide at the top and 55 feet deep at the center. Yugoslavia's Pavilion (4) has been dubbed "club sandwich"; (5) the minirail; (6) inside a "cell" of a truncated tetrahedron theme building; (7) the human cell in life sciences exhibit; and (8) the multipyramidic Ontario Pavilion.



tioned by that circumstance. And as with tract housing, the juxtaposition and relationship of buildings do not demonstrate any material advance in design. Expo is essentially a low-density project with the space and connection between buildings left largely unstructured and improved by only remedial landscaping.

The quality of the street furniture, on the other hand, is of exceptionally high standard. It is designed in components which can be combined in many different ways and still provide some conformity.

The bugaboo that industrialized building must of necessity produce a monotony by the repetition of standard components is clearly dispelled at Expo. The variety of structure and form of buildings made up of small repetitive elements is wide. "Man the Producer" and "Man the Explorer" are made up of truncated tetrahedrons, formed by bolting standard parts together. While the sides are inclined to 70 degrees, the geometry still provides horizontal planes.

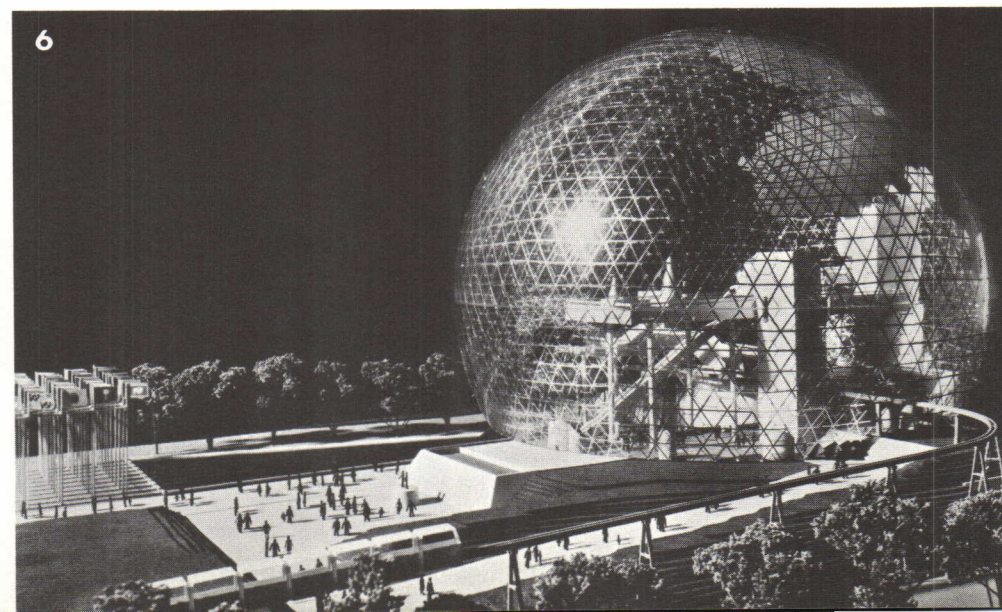
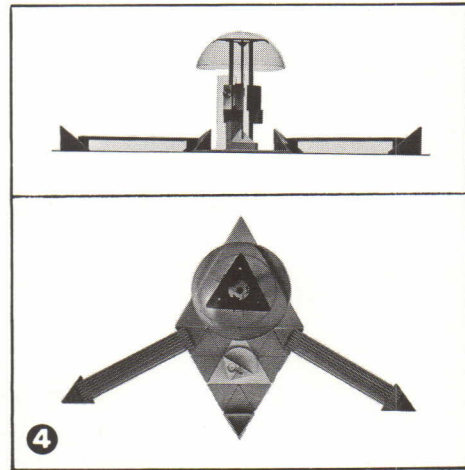
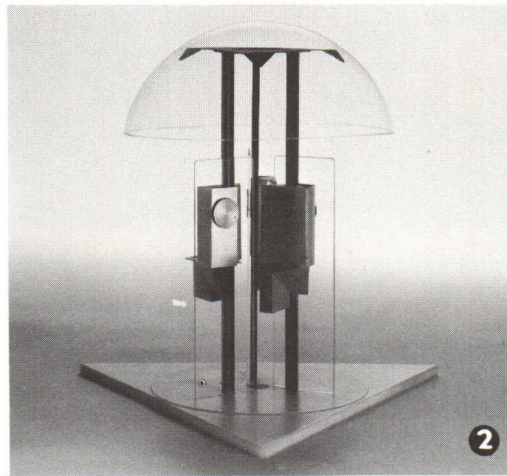
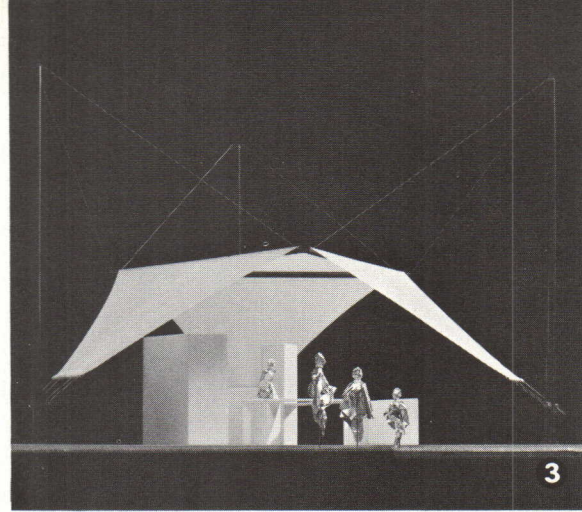
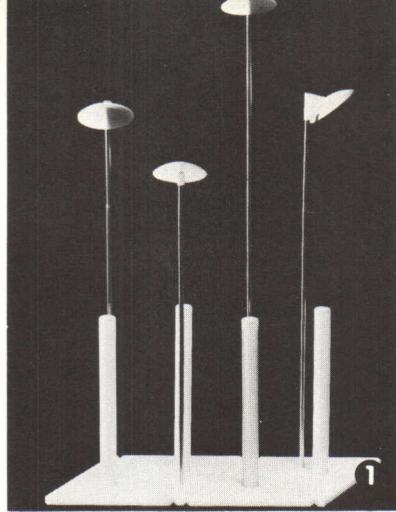
The US Pavilion (Buckminster Fuller and Cambridge Seven) is enclosed by a 195-foot-high geodesic dome constructed from steel rods that are crimped, welded into sections and lifted by crane into place. The geodesic system is, however, employed in the upper hemisphere only; below, the structural system is based on a Mercator projection to resolve joint with ground and make efficient use of rectangular plastic panels fastened to the dome.

It is in this pavilion that a measure of integration between movement systems and structures is achieved with the minirail's passage through the enclosure.

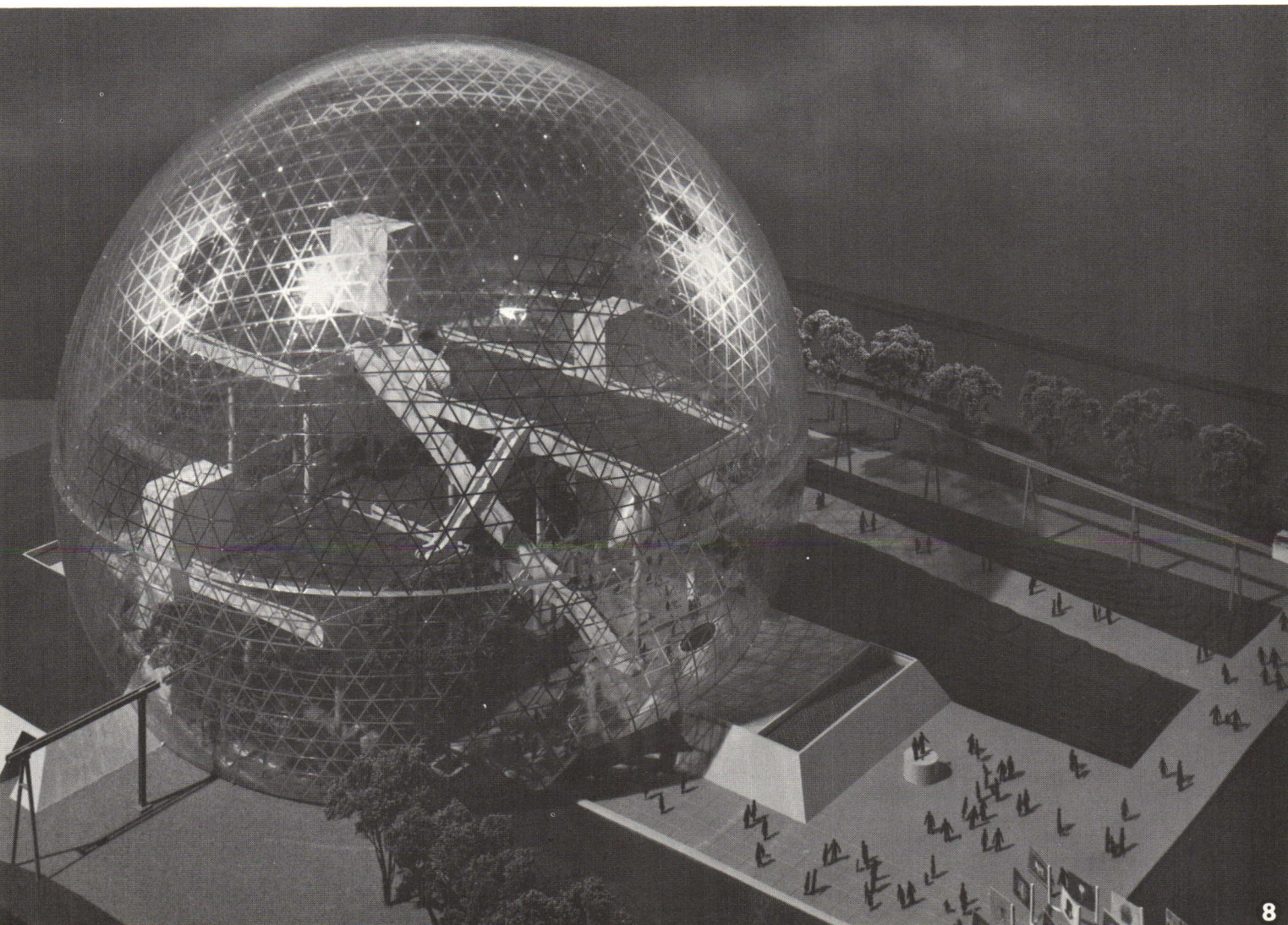
Among other light buildings are the Netherlands Pavilion, a tri-otic structure used for all enclosing elements, and a space frame that is used for a thrill ride in La Ronde (Sean Kenny's Gyroton).

The most elegant of all the light structures is the German Pavilion (Otto Frei and Rolf Gutbrot). A mesh of steel is suspended tentlike from compression pole supports, and a membrane of polyester plastic is hung under the mesh covering 110,000 square feet of exhibit space. The "eyes" for lacing the membrane to the steel cable mesh are filled with transparent plastic. The whole suspended membrane covers an island and one of the canals in the waterway system.

The manufacture and erection of this diaphonous structure is a les-



Expo's trim street furniture is used singly or in numerous combinations—(1) lighting fixtures; (2) a telephone booth; (3) an information kiosk; and (4) two views of a telephone booth with benches. The US Pavilion already has attracted considerable attention. Upper hemisphere progresses toward topping (5) as Russians ready their building across channel. Integration with transportation (6) is one of many features of the pavilion, which, like the circus tent, is rife with drama in the going-up stage (7). Model of Buckminster Fuller's "skybreak bubble" and human-scale figures in plaza (8) convey enormous dimensions of the sphere, which in height is 20 stories.



son in prefabrication and construction specialization. The cables were manufactured in the Ruhr, the net fabricated in Konstanz, rolled and shipped to Montreal in 40x120-foot sections and finally erected on the Expo site. The masts, placed by cranes, were temporarily guyed, while edge cables, which had been fixed to the net, were gradually tensioned. Before the Montreal assembly a test model was erected in Stuttgart.

The advantages of space structures have been known for many years, but their analysis has been extremely tedious and time-consuming. Design in the past has been based on high factors of safety because of the many approximations and simplifications used in analysis.

The introduction of the electronic computer has changed this; hence the rapid development within the last decade of space frame design.

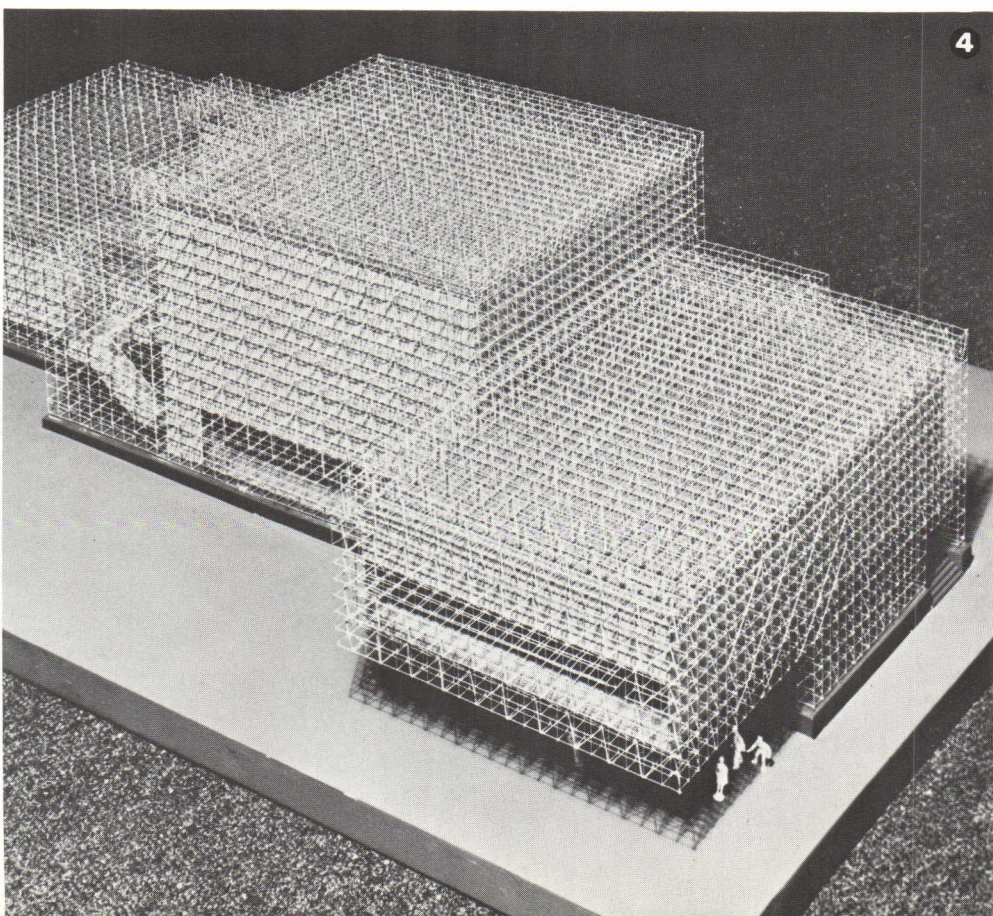
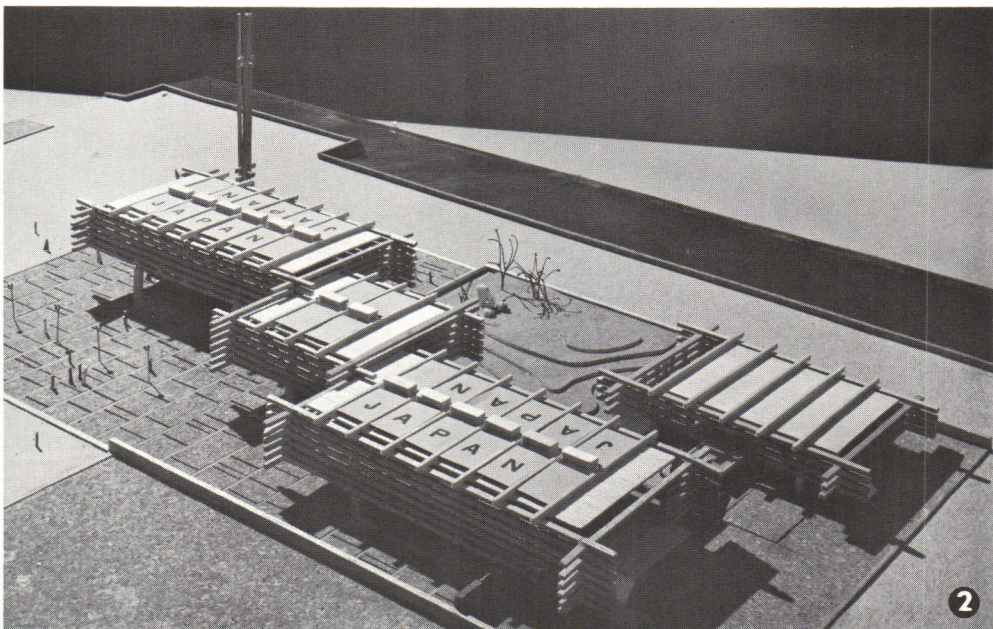
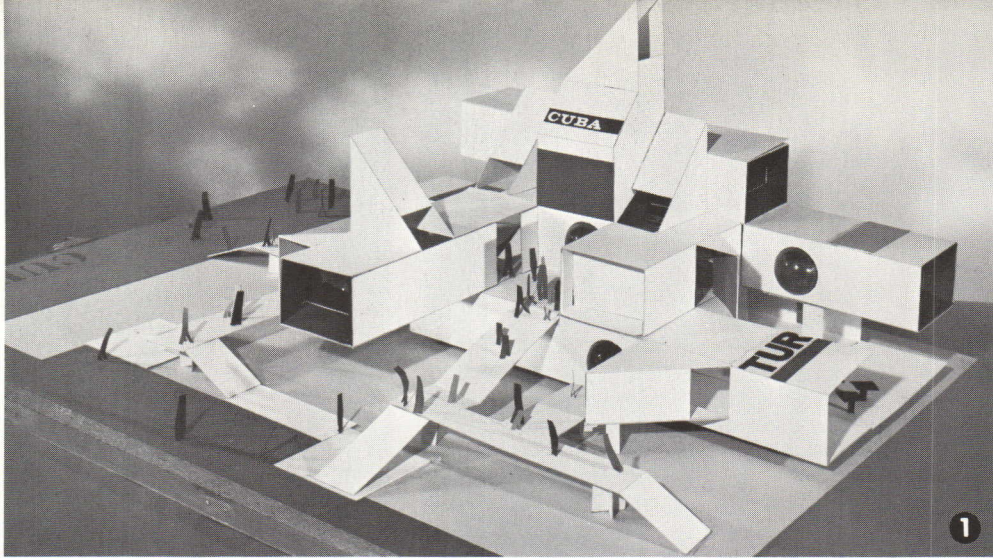
The swift assembly and dismantling possible with this form of structure introduces another dimension to change in the contrived environment. While we are correctly concerned with identifying and thereby catering to different rates of change in sectors and elements of cities, we can also, at the detail scale of building, render change more rapid and convenient.

Besides the approximations made in structural design, many approximations in spatial use are often forced on us by the obstacle of structures which are too permanent. It is therefore conceivable that much closer approximations of generic spatial categories may be affected by the use of potentially changeable forms. While this might qualitatively improve spatial appropriateness, quantitatively it does not reduce the amount of diversity of buildings. In fact, it might increase it. Therefore, the postulates to order diversity are still of crucial importance.

Among the diverse collection of pavilions, there are some, judging by plans, models and incomplete structures, that promise to be of value. The Cuban Pavilion does not have the chauvinistic overtones or folksiness characteristic of those of developing nations. Instead it is a sophisticated manipulation of structure and space.

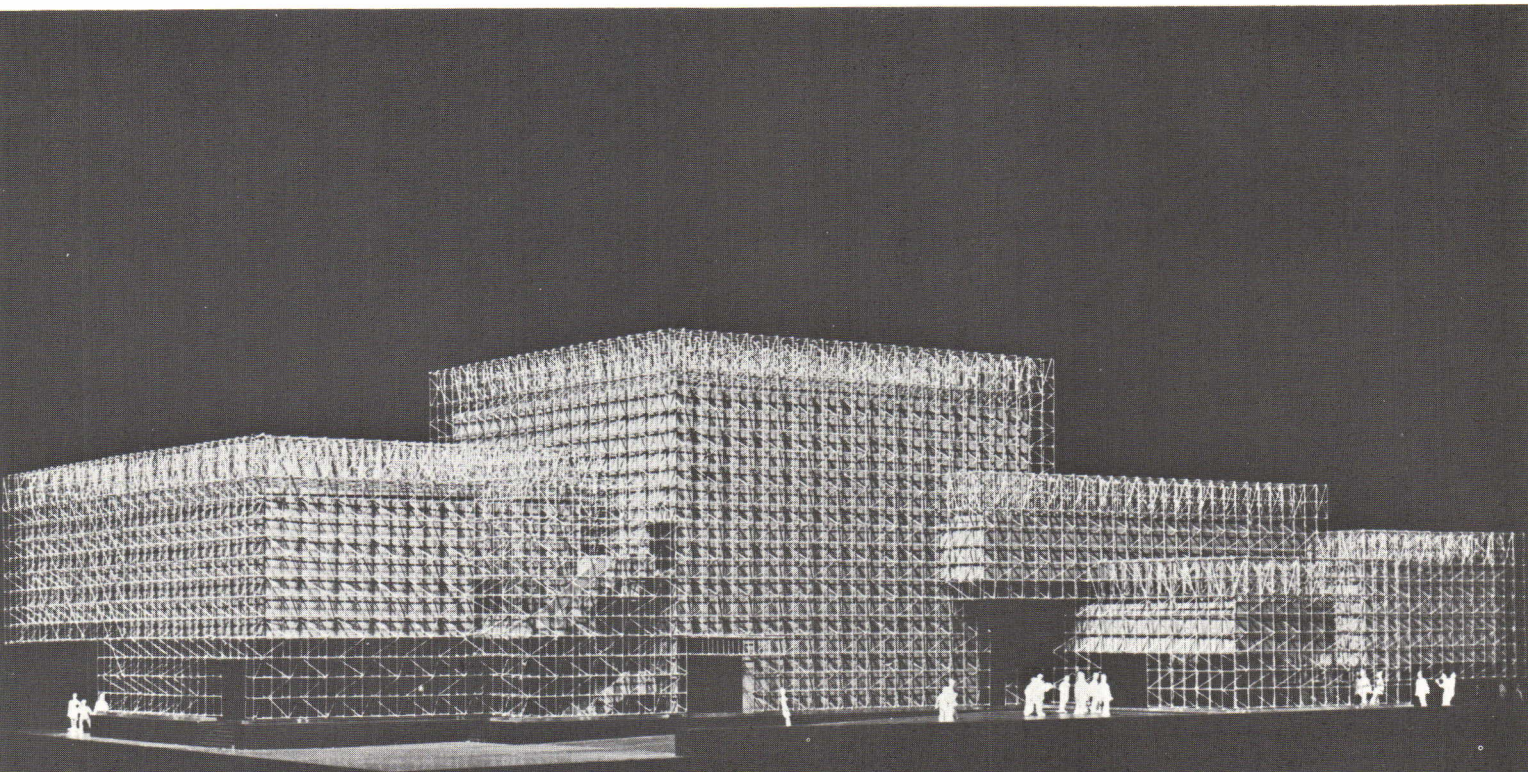
The Japanese Pavilion, intricately constructed by native workmen brought over for the project, displays despite its use of concrete a fine delicacy.

It is difficult to assess the pavilions as works of architecture since





National pavilions—
the Cuban (1) and the
Japanese's (2). West
Germany's is made of
steel mesh supported
by a number of trussed
masts from which a
skin of heavy fabric
is suspended (3). The
Netherlands (4, 5), is
texturally-rich alumi-
num space - frame
with cantilevering.



they are for the most part incomplete. Yet it is surprising how many countries satisfy the typecasting of caricature. The French Pavilion (Sir Basil Spence) pompous, the Russian quaintly "modern," the Scandinavian clichéd and smug.

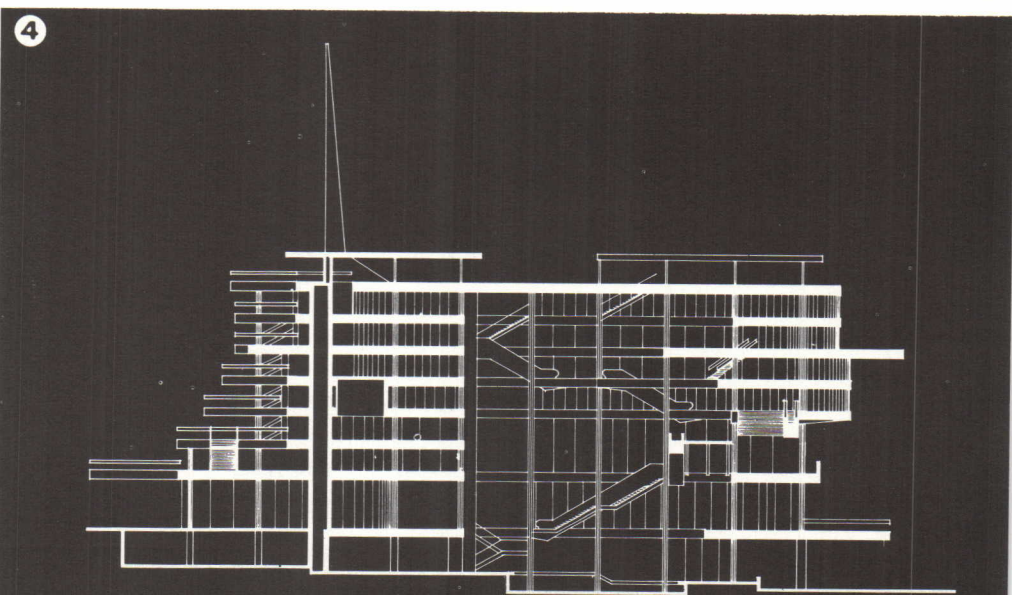
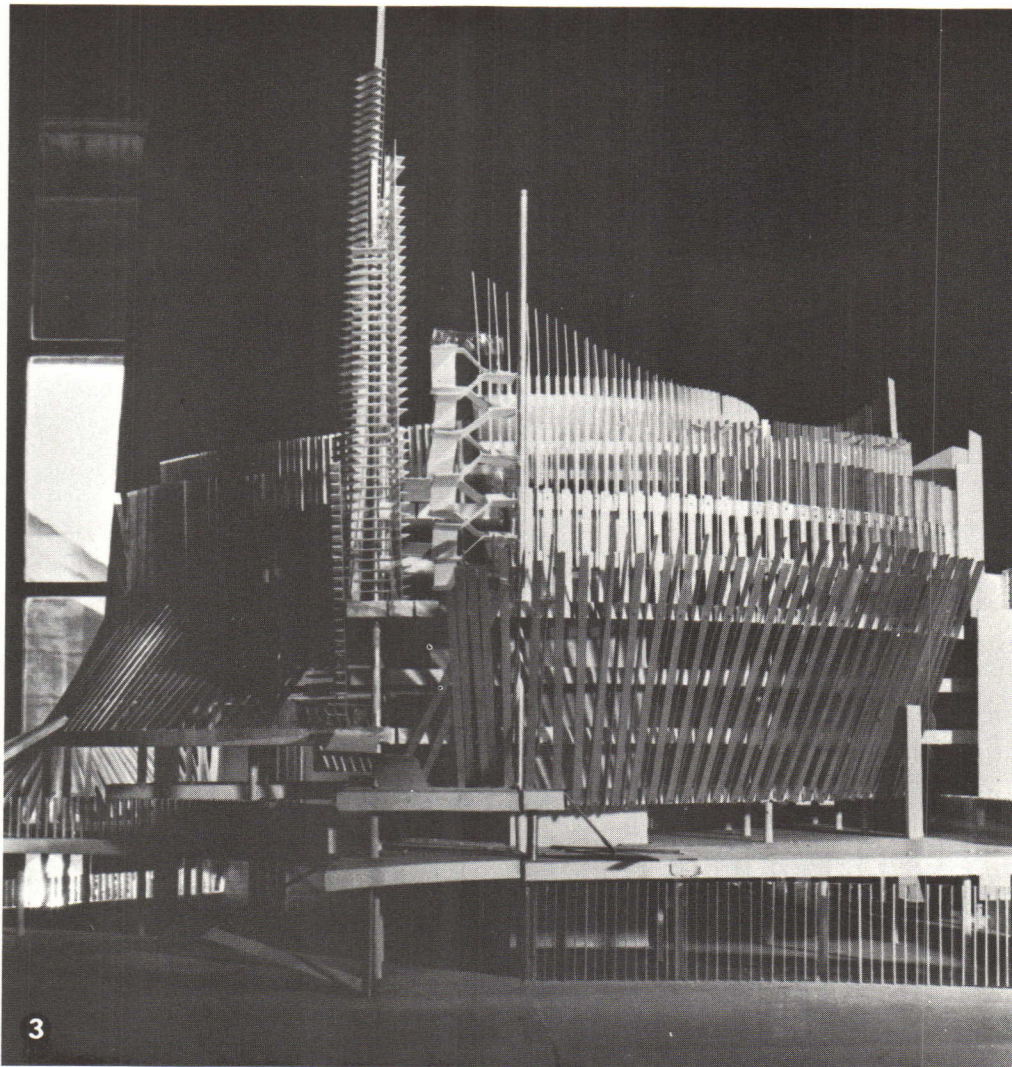
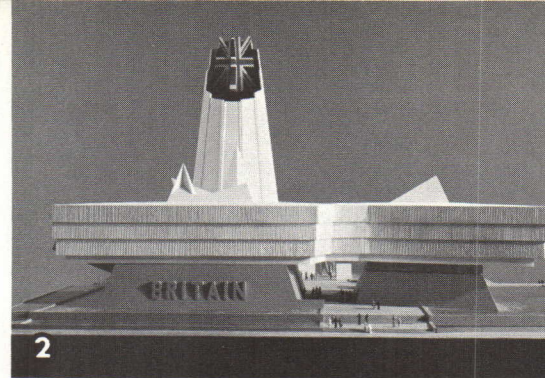
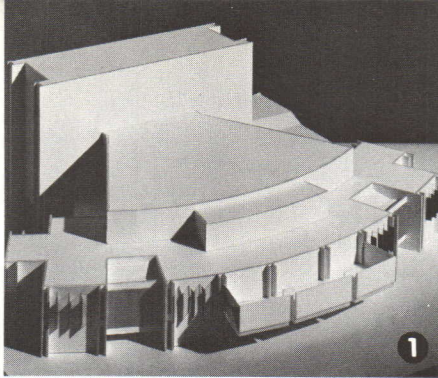
What of the "heavies" at Expo? Clearly one which has attracted and warranted much attention is Habitat 67 (Safdie and Komedant). If it invites criticism it also merits recognition for having achieved much of what was theoretically posed in the socially conscious architecture of the '30s. It also utilizes a seldom exploited contemporary industrial potential.

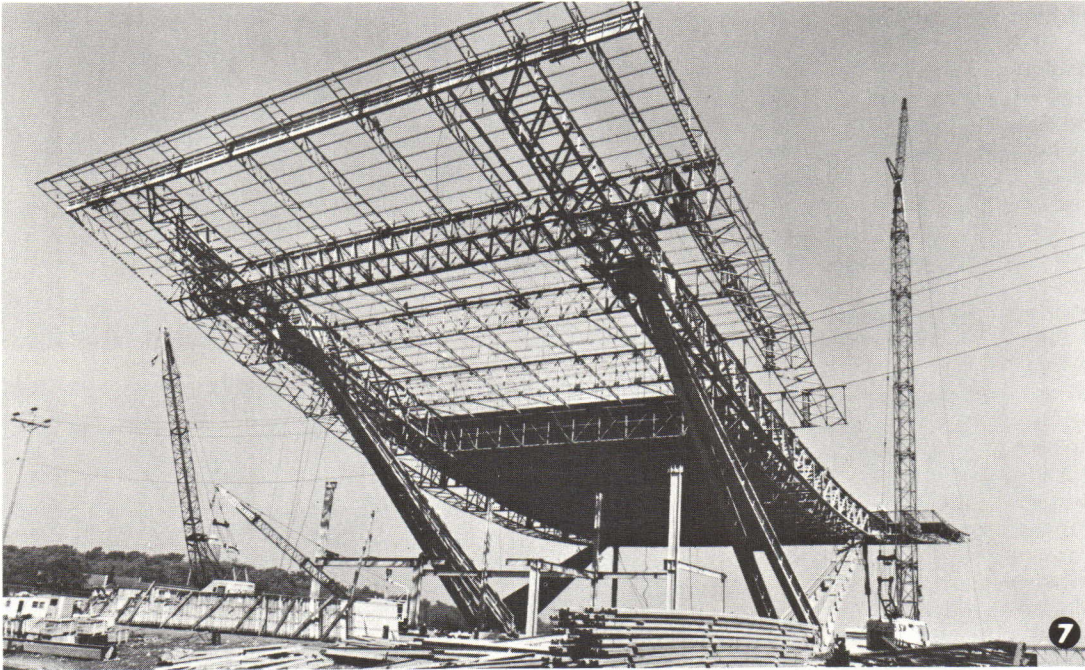
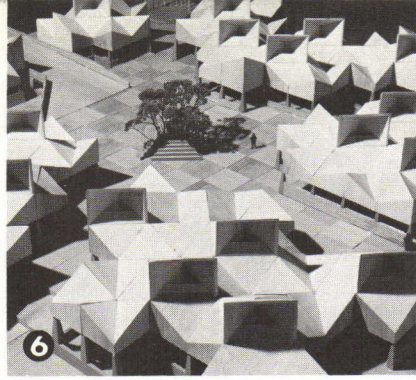
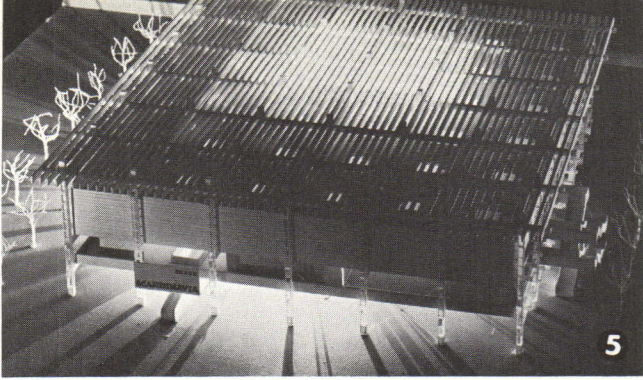
Habitat is housing that attempts to retain the suburban amenities of privacy and outdoor space, provide separation between pedestrian and vehicular traffic and integrate parking. This is achieved at a density somewhat higher than the suburb.

It is a density not significantly higher than that of the suburb, to which it seeks to provide an alternative mode of living. This is not necessarily a fault of the concept but of circumstance. The CCWE, which must be applauded for sponsoring this enterprising experiment, originally intended to build a much more extensive complex but only 158 units are being made. Along with lowered density, the result is a raised unit cost since these units have to bear the high first cost of the manufacturing plant. The crane alone that was built for this project cost \$1 million, I have been told.

Other features originally a part of the scheme, such as inclined elevators, have also been abandoned. Nonetheless there remain significant accomplishments: the totally prefabricated concrete box unit as well as a totally molded plastic bathroom unit. Besides the facetious remarks that have been made ("You can't build a hill town without a hill," "The first student thesis ever built"), serious questions must be asked.

While a cardinal cost factor in conventional construction is the number and size of units used, is there a point beyond which the reduction of the number of separate building elements no longer provides time and cost benefits? Does the increase in density (relatively slight) warrant such effort and cost? Can this form of building, even at gigantic scale, ever be cheap? And accepting a possible high cost factor, are there bene-





Models of Expo Theater and Great Britain Pavilion (1, 2), the incomplete stack of latter standing for the "unfinished work" of Britain. The French Pavilion (3, 4) has seven levels, and the Scandinavian Pavilion (5), like Africa's complex, represents an exercise in international cooperation. It is jointly sponsored by Denmark, Finland, Iceland, Norway and Sweden. As many as 25 countries will occupy the African Pavilion (6). The USSR Pavilion (7, 8) sits on two large V-shaped pylons. Hangers from the roof edges support window walls forming an expanse of glass five stories high.



ficial social advantages, at any scale?

Are there not, in any event, inherent ineconomies in a system that can be universally applied, i.e., making a unit capable of all performances (insulation, structure, finish) in any situation?

The other permanent structures most of them on Mackay Pier (Cité du Havre) are of no special merit, either individually or collectively. The Administration Building is quite extraordinarily difficult to negotiate; the arbitrary planning leaves the user disoriented. An excuse for a contorted form might have been that the architect elected to provide views of the St. Lawrence or the city at the expense of internal clarity, not that these are problems necessarily in conflict.

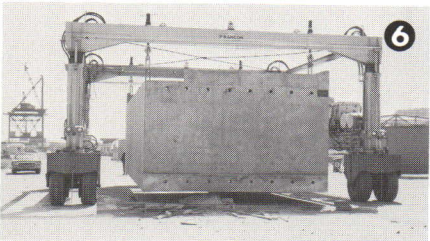
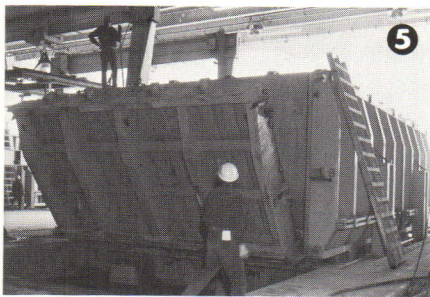
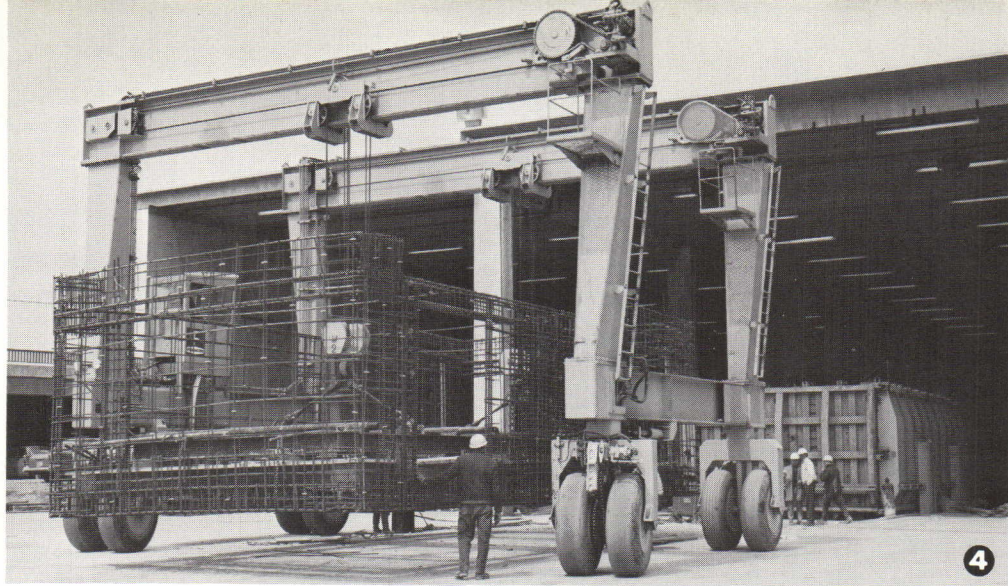
But alas, the views too are ignored. The National Film Board's "Labyrinth," though not a permanent structure, is included in this category because it is a brilliant exercise in camouflage. The heavy concrete enclosure which uses escape stairs as the most prominent visual feature, clearly masks the auditoriums and galleries that presumably suggest the main functions.

The criticisms of the architectural merit of individual buildings are of small significance in comparison with the larger problems of their collective relationships and their position and role in the future development of the site. The argument that the horizons of an exposition should not extend beyond the limits of the period of the exposition are refuted, besides by the huge expenditures, by the construction of these permanent structures. What has the city planned for Cité du Havre after Expo? What has determined the position of the art gallery, the stadium and Habitat? Will they stand as lonely wall flowers waiting for companionship?

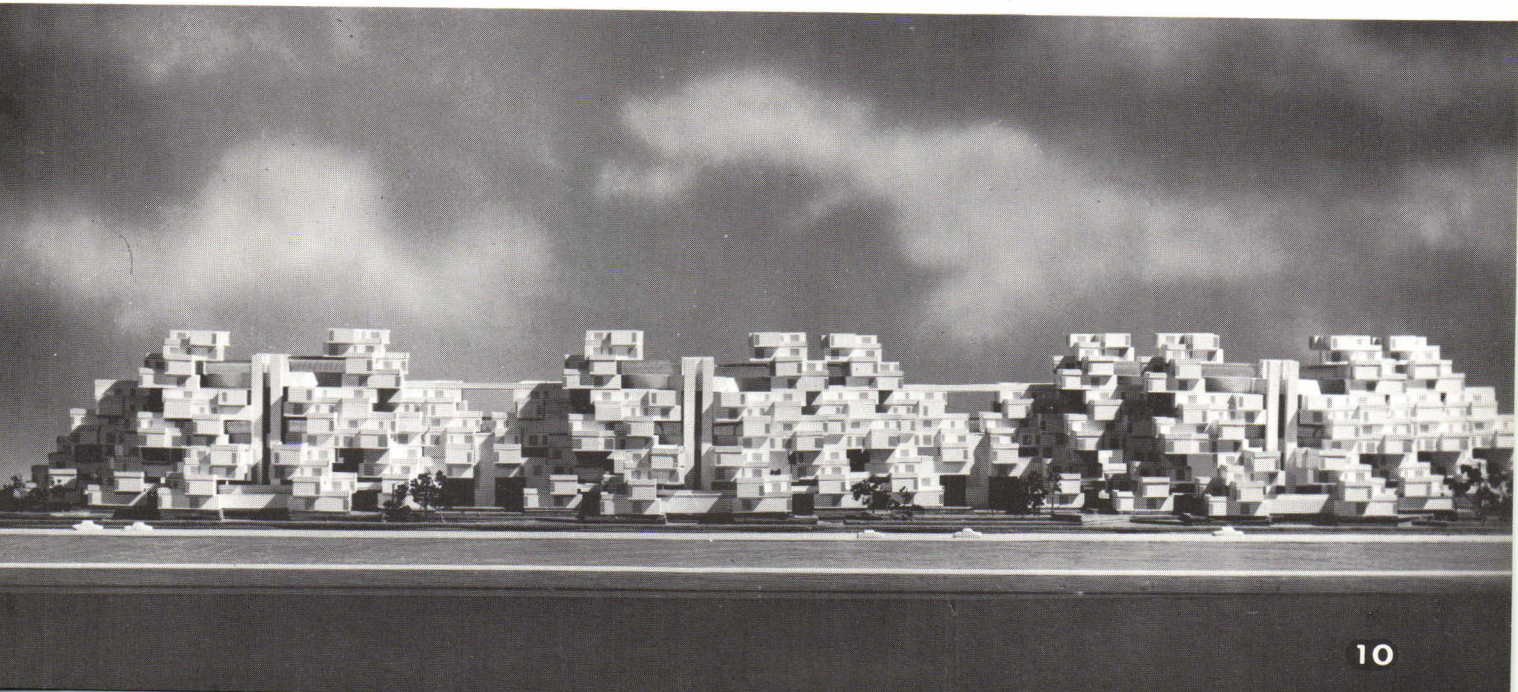
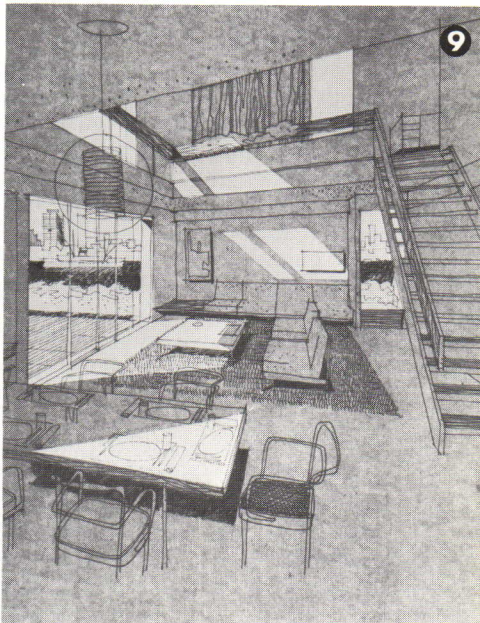
It would seem wise to have tied Habitat at least to the Metro system. Mass transit systems, which we all recognize as efficient but the use of which we cannot seem to increase at a rate commensurate with the growth of automobile usage, depend on high densities. Had the buildings which could have become a part of the transportation modal interchanges been permanent, these could have formed the nuclei for future coordinated development.

Medieval cities had a high degree of integration between movement channels and buildings. Streets went under, over and through build-





At Cite du Havre (1) grows Habitat, its boxes arranged rather than contained as in the shafts forming Montreal's cityscape. A closer view (2) and a detail view (3). In the prefabrication process, a reinforcing network (4) is taken by travel-lift to a unit mold. When the poured concrete sets, the mold is removed (5) and the unit moves down the "production line" (6). As it does, workmen (7) finish the interior and, when readied, the unit (8) is hoisted to its resting place. The interior of a two-story living unit as conceived by an artist (9), and a model (10) of the finished "hill-town." Expo officials decided against having a symbol such as a space needle or unisphere as used in this country's most recent expositions. Habitat has become the symbol of Expo 67.



ings; the Ponte Vecchio was lined with houses and shops. In later centuries the converse became true—specific and clear separation was maintained between streets and squares and their adjacent buildings.

If we are to provide a framework for the city which is more or less permanent and one which, by its service and form, can provide comprehensibility as well as predicate land uses of the city and intensities of action, it is conceivable that channels of movement and their termini and modal changes could become a part of architecture again.

Exhibitions have exerted lasting influences. Like wars, they can accelerate progress. The Festival of Britain did much to increase modern architecture's acceptance among a public that prior to the event had encountered only isolated examples of modern architecture.

The Festival enabled the public to experience an environment wholly modern in spirit. Much of the concern in Britain on the part of both layman and professional for standards of artifact and space, especially that between buildings, can be attributed to the impetus the Festival provided for these concerns.

In almost every world's fair, however, the overall sense of orientation has been provided by some easily visible and identifiable symbol: the Atomium at Brussels, the Skylon in London, the Eiffel Tower in Paris. This syndrome of medieval planning is significantly absent in Montreal.

Instead there has been a serious attempt at the organization and planning of a large-scale and diverse physical phenomenon. Perhaps this is achievement enough, although it is hard to resist the reservations expressed here and the sense of disappointment that once this excellent start was made it did not in the end yield all it might have.

These reservations tend to be forgotten during a visit to the site. It is an experience of great excitement for any architect; it is a scene of intense building activity in the midst of apparent chaos. Gigantic pieces of equipment—earthmovers, cranes and trucks—roar about, and workmen swarm over the site and cling to the frames rising out of the foot-sucking mud. It is hard to believe so immense an effort can be mounted for an event of a single summer's duration.





CREATIVE COST CONTROL

Presented here are the first two of a series of articles the AIA JOURNAL will carry during 1967 on the subject of building cost control. The series is being adapted from the book *Creative Control of Building Costs*, to be published by McGraw-Hill Book Company in the first half of this year. The book was edited by Mr. Hunt and its chapters were prepared by 15 authors, one of whom is Mr. Kassabaum, writer of the second article.

A Responsibility—and a Part of the Creative Process

BY WM. DUDLEY HUNT JR., AIA

As part of the creative process, costs should be controlled from the project's very beginning through to its completion. Businesslike systems for handling costs, the principles of which are discussed here, can enhance the architect's buildings and his professional stature.

When asked what he knows about architects and their services, the man in the street will mention the name of Frank Lloyd Wright and reveal, all too often, an impression that architects cause buildings to cost more than they should. If this were not bad enough, owners of buildings, when queried about the architectural services they received, often agree that architects do indeed cause buildings to cost more—and that the only return, at best is better looking buildings.

It should be quickly said over the howls of indignation from architects who do keep the costs of their buildings in line that their suc-

cesses, though very real, are certainly unsung among their publics and clients.

Better dissemination of information about architects' handling of the costs of construction is needed. At the same time, there is a need for better cost control by architects. And even architectural offices whose cost performance is high are not above benefiting from new and improved methods.

There are offices with highly developed systems for estimating costs; those that use CPM scheduling and cost systems; those that have developed quantities of information about costs; and those that habitually employ quantity surveying or similar methods for accurate takeoffs. There are even a few offices with sophisticated and complete systems of cost control. But in many offices, cost control is a sometime thing. In some the handling of costs starts too late—often when working drawings are either complete or nearly so, and in oth-

ers it is less a matter of control than of estimating.

In any case, the handling of the costs of construction in most offices is rudimentary when compared with methods of, say, the manufacturing industries. It is common practice in such industries for highly paid, imaginative and talented people to be deeply involved in the costs structure of the products produced. Exceptions aside, this is not true in architecture. Among successful manufacturing companies it would be difficult to find a case in which budgeting, estimating, projections, record-keeping and analyses of costs are not highly developed, considered of utmost importance and handled in a manner consistent with their importance. For the most part, this is not currently true in architecture.

Stepchild Treatment

Whatever the reason, the control of costs in architecture often gets stepchild treatment up until the



bidding or construction phase. This is a state of affairs that can have far-reaching and sometimes disastrous results as is well recognized. That the costs of construction should be shunted into a position of less than deserved importance, forced to fold before design and other considerations and made to take a back seat to the qualitative and quantitative decisions is shortsighted—and unnecessary.

The control of the costs of construction can be made into a major, creative factor in architectural services that are intended to produce good buildings.

To start with, "control" is the key word. It should be pointed out that bringing in jobs within their budgets is only one aspect of cost control. This is to say that construction costs should not just be estimated after the fact but should be controlled in the same way materials or structures or sites are controlled. In this way, the control of costs rises from a bookkeeping level to become an intrinsic part of the total architectural process. In this way, knowledge of costs as they develop and the actions taken to relate the costs to other architectural actions can be brought to bear on the complete problem in a manner that contributes meaningfully to the whole architectural process.

The results of such a process can be better design, better planning, more efficient professional services and more satisfied clients. In a phrase, better buildings—that come within their budgets not through often arbitrary decisions made just before or after bidding, but because of the application of creative cost control from the very beginning of services right through to the end.

Principles of Cost Control

Maybe the best way to get at cost control principles is to look at some of the requirements upon which it must be built. There are perhaps others, but the major requisites would seem to be these:

1. The talents of trained, intelligent cost experts who understand the whole architectural and construction process and who approach their work creatively.
2. A body of data and knowledge of costs developed within the office

itself and based on its own methods of design and practice.

3. Together with this private knowledge, access to, and understanding of, published cost data such as indexes.

4. Knowledge and understanding of the tools and processes available to the cost controller to aid in analyses, calculations and estimates.

5. Finally, cost controllers who are full-fledged members of the architectural team, working closely and on a par with other members, the project architects, designers and others.

A Cost Control System

Before pursuing the principles of cost control, it should be cautioned that sufficient knowledge, talent and proper attitudes toward costs are not enough. What is also necessary if a positive contribution is to be made to architecture is a system of cost control. The rudimentary ideas behind such a system might be enumerated in this way:

1. Cost control must start at the beginning of architectural services, at the time of programming or budget estimating, even before the architect begins his regular services in some cases.
2. Cost control must continue throughout the architectural process, threading from phase to phase.
3. In the early phases, estimates of costs must be made without drawings or other means of determining what the building will be; these estimates will be based on assumptions, upon past experience and upon creative visualization of the direction in which the design will probably go.
4. In the early phases, estimates will ordinarily be approximations; as the work goes on techniques for estimating and the estimates themselves will be refined more and more to reflect decisions made along the way.
5. Before the bidding phase, the estimates will have been refined to a very high degree of accuracy.
6. Cost control must continue during the construction phase in order to ensure that changes, additions and the like do not get out of hand and negate the good work done in preceding phases.
7. Cost control ends only with the completion of the building, maybe not even then, since much of what has been done before that time will determine later costs of maintenance and repair.

Determinants of Building Costs

A widespread notion held by even clients with considerable ex-

perience in construction is that the only things which increase a building's cost are enlarging its size or upgrading the quality of its materials. If this were so, cost control would be considerably easier. But these in fact are only two of the important determinants of costs. Others include the number of people who will use the building and what they will do in it, the location of the building, its site, its shape along with its size, the time allowable for architectural services and for construction, the construction market, building financing — it would be easy to extend this list even further.

Suffice it to say for now that there are numerous determinants of costs of construction; what is important, here, is that they are also just as surely determinants of design and other architectural processes that ultimately produce incompetent, competent or great architecture. The point is that cost control is inextricably a part of the process and can be made to play a creative role throughout the process.

Responsibility for Costs

The total responsibility for the costs of construction is usually shared by many who participate in the design and construction process, the engineers, draftsmen, estimators and others. Yet there is little doubt that the prime responsibility in most cases rests with the architect. While the architect may delegate to others many of his functions, including that of controlling costs, the fact remains he ordinarily has the final word, the overall responsibility and, in event of trouble, the prime liability for costs as well as for all other aspects of the building.

The legal implications of the architect's position are discussed in detail and guidelines are established for realistic appraisal of his position and for safeguards to the extent possible. It should be noted, however, that the current trend seems to be for owners of buildings—and the courts—to hold the architect liable for performance in the area of costs as well as in those of safety and welfare.

One indication that architects have faced up to this responsibility and the trend of court decisions is in the current edition of the Architect's Handbook of Professional Practice of The American Institute of Architects. This code since 1964 has required the architect, as an ethical obligation, to "maintain an understanding with his

client regarding the project . . . and its estimated probable costs." Further, the standards say this about costs:

Where a fixed limit of cost is established in advance of design, the architect must determine the character of design construction so as to meet as nearly as feasible the cost limit established. He shall keep his client informed with competent estimates of probable costs.

To some this may seem to say little more than what should be expected of any architect or other construction professional. Nonetheless, the inclusion of these requirements as an ethical obligation in the standards of the architect's own professional organization is a giant step in the direction of improved architectural performance in the area of construction—and toward renewed confidence among the public and clients.

In a way, the ethical obligations discussed are thought by some to be considerably weakened by the remainder of the paragraph in the standards which states:

He [the architect] shall not guarantee the final costs, which will be determined not only by the architect's solution of the owner's requirements, but by the fluctuating conditions of the competitive construction market.

It should be noted that while the first part of the quoted standards established an ethical obligation of architects to their client and is new with this version of the standards, the latter part has been the posture of the profession for many years, and with good cause. The key consideration in this is that while the architect controls the work up to a point, he has little or no control over the construction market and other related factors at the time of bidding and during construction.

A Word About Ethics

Very carefully described are implications of the AIA standard contracts which reflect the ethics cited above. However, it is to be remembered that some people, including architects, believe that the architect has an ethical or professional obligation that goes beyond either the ethical code or the standard contracts. They believe a competent architect should be prepared, if the bids come in higher than the maximum amount budgeted, to redesign the building at no cost to the owner if the reasons for high costs are attributable to the architect's actions rather than those of the owner.

In addition, there are those, especially architects, who believe that architects will never be able to control the costs of construction absolutely unless they direct the actual construction. Since it is considered unethical for an architect to act as a building contractor, such proposals usually take the form of the architect serving as the agent of the owner to direct the work of the contractors, rather than in the more limited and usual role of supervisor or observer of the construction.

Objections to Cost Control

Even among architects who sincerely believe that design within their owners' budgets is an integral part of architectural services, doubt exists over truly complete cost control systems. Most misgivings seem to be of the "either-or" variety; they take the form of design versus costs—or creativity versus businesslike practices—as if these processes were self-exclusive. Without the one, the other becomes very difficult or even impossible. The fears, while possibly very real, are ill-founded when genuine cost control systems are employed, staffed with top people and practiced in the right way.

What could be worse than being forced by high bids into redesign of a project that was carefully nurtured to a high degree of perfection? What architect, or anyone else involved in building design, can forget being forced by high bids to reduce to the minimum all of the elements he so carefully designed into his building? Who could enjoy the fragmentation process that must take place at such a time, the process which must tend to reduce the design effort expended to something that may little resemble what was intended?

As a creative function of the design process, cost control reduces such occasions to the minimum while giving the designer and others involved a firm grip on all parts of the design process. With such a method the costs are developed concurrent with other decisions. The professionals are in control rather than at the mercy of costs, when it is too late to bend them to the will of the design team.

Another fear or question often voiced takes the form of a dilemma composed of numbers on the one hand versus judgment on the other. This is easily disposed of: The numbers besides being the basic informational structure of cost control make it possible to use judgment based on facts as well as on

creative ability or intuition. Cost control systems make this possible; without them the facts, or at least some facts, are not available.

Methods of Control

It is probably safe to generalize that of the widely used methods of cost control the best known, among both clients and architects, are the least refined and the least dependable.

Far and away the best known cost control method, although it scarcely deserves the title, is the area, or square foot, method. This and others are discussed later but a few warnings should be hoisted here, and a few principles emphasized.

The area method, widely known among the less initiated in architectural processes and the building industry, is dangerous, unreliable and should be shunned whenever possible. This is not always possible, and, moreover, the method is easy, quick and usable for very rough approximations when few decisions have been made concerning the building. Thus the area method probably has a place in the early phases of the architectural process and a continuing life as a check on other methods, or as a quick way of comparing costs between locations, building types, etc. When used in the latter way, care must be taken to translate each area cost into terms equivalent to those of the building with which comparison is made.

The volume method, and there may be some disagreement about this, is probably considered by most professionals as just a cut above the area method. What has been said about the area method applies about equally to the volume approach. Another device that really should be termed "rule-of-thumb," as should the area and volume methods, is the unit of use, or unit use, method.

Unit of use is almost as widely known and applied as area and volume, and just as their names define their approaches, i.e., cost per square foot and cost per cubic foot, the unit of use method is based on cost per item—cost per hospital bed, cost per school pupil, etc. This, too, is neither a refined nor reliable method but it is useful for checks, early predictions and comparisons. Perhaps, in some cases, it does draw a better cost picture than the aforementioned since it is tied to the building's functions.

The in-place unit method is widely used and is more accurate than the other three. It is more refined



since its basis is in the unit cost of materials or systems, such as the complete cost of units of a window-wall system, of a square of roofing or the like. The estimated unit costs of all the elements when added up give a cost picture far more accurate than that presented by other methods.

Another method of cost control that is much less used is the unit of enclosure method. This method, far more sophisticated than any of the others, is so important that an entire article of the series will be devoted to it.

Of course, the best of all available methods is that of taking off the quantities and pricing them, adding up the costs, assuming the contractor's overhead and profit, tempering all this with a knowledge of the construction market and with intuition, and then arriving at a figure for the work. This is not much of a trick, at least in the beginning phases (more of a trick in the construction market and intuition departments), when the building is designed and the working drawings and specifications prepared. But the sad fact is that it is too late for effective cost control, and *creative* control at this juncture is out of the question.

Can cost estimates based on quantity take-offs be made early in the architectural process, even before any drawings are prepared? The authors of these articles think they can. Furthermore, there is considerable agreement among them that this is the *only* way creative cost control can be effectively applied to buildings and that a complete cost control system must be founded on such a process, together with provision for use of the area, volume and other methods as required for spot checks, etc.

Tools, Techniques and Aids

One of the "dilemmas" architects and others pose when speaking of cost control is that of estimating versus control. But it is no dilemma at all. Estimating is an important technique of cost control, maybe the most important of all. Thus cost control embraces estimating, in all of its ramifications including quantity surveying. The consensus of the authors seems to be that esti-

ating is *the one all-important* facet of a cost control system—not the *whole* system but the most prominent tool within the system.

Among other of the more important and better known tools, techniques and aids available are CPM and its related systems, computer analysis and its relationships with CPM and the rest of the cost control system, quantity surveying in its pure, British form and its modified, American form—and also in its more widely used sense, all-American quantity take-off and pricing.

Also, there is that virtually unknown—to architecture—system of value engineering. Well established in other fields, value engineering appears to hold considerable promise in architecture. Two other advanced devices worth looking into by those of such bent are the techniques of nomographs, also widely used in other fields, and the building of cost models. They, too, hold promise and might well be worth investigation.

A final word on the subject of tools, techniques and aids that might be in order is simply that the final word has yet to be written. New techniques emerge almost daily. The computer becomes more useful as time goes on. And so it goes.

For the moment, though, a tentative final word might be that the earnest cost controller needs to know all he can about all tools, techniques and aids available and emerging so he can better *define* his cost system, *refine* his estimates and *design* his costs.

Sources of Information

Much information from numerous sources is available to the conscientious cost controller and much of it can be valuable to him. None of it can replace records of the experience of his own firm; nothing can take the place of his personal experience; nothing can substitute for the creative approach to this very important facet of the whole architectural and construction process.

The list of data available starts with the widely disseminated cost indexes. The most available and probably most important of these include the cost index published periodically by *Engineering News-Record*, the US Department of Commerce indexes and similar readily available data. Others published regularly but not so well known include the index of the Turner Construction Company which takes into account the current productivity of labor, the efficiency of plant

and management of construction, competitive conditions and a forecast of price trends—for the most part information other cost indexes do not include. At least one architectural office publishes cost indexes; Smith, Hinchman & Grylls Associates, Inc., of Detroit has done so for more than 50 years. It is difficult to see how the energy, talent and know-how that goes into the preparation of such an index can do anything but give the office preparing it a considerable advantage over those doing less.

Available along with the cost indexes that are published regularly and disseminated more or less widely are other systems of cost control or cost estimating. Among the more important ones are the Dow Cost Calculator of the Dodge Division of McGraw-Hill, Inc., the Boeck Building Cost Data Sheets, Means Building Construction Cost Data, the Marshall Valuation Service and others. Each is available for a fee and each has positive and negative attributes. All are worthy of investigation.

None of the cost indexes or other information or systems can possibly take the place of scrupulously maintained records and files on the jobs that go through an office and any other information of salience to the firm. The cost indexes and commercial cost systems are meant to be used in partnership with private records, not in place of them.

A Last (Introductory) Word

Most of the important facets of creative cost control are discussed, in some depth, without full agreement among the authors. There is no "party line." Some of the authors tend to overlap one another, but this is probably permissible since they come from differing backgrounds, sets of circumstances and offices. In the main, however, all agree on the major principles although none had access to the work of any other, either in practice or in the preparation of his manuscript. These principles hold that creative cost control:

- is a system that uses every technique, talent and tool available to it
- starts with the budgeting phase, or before
- functions as an integral part of the total architectural process
- keeps the architects, and other design professionals, in control of the total process
- makes it possible for decisions to be made, through full disclosure of the facts, by architect, owner, and all others involved with the process of creating buildings. □



Theoretical Construction for Early and Continuing Control

BY GEORGE KASSABAUM, AIA

An example of estimating that is anything but after the fact, estimating that begins early—by means of theoretical construction of the building—as part of the continuing control method of the firm of Hellmuth, Obata & Kassabaum of which the author, an Institute vice president, is principal.

No criticism of the profession is heard more often than the charge that architects have too little regard for the client's dollar. Too many architects, say the critics, are generally incapable or careless in the matter of adhering to budgets; they are not able to predict with reasonable accuracy the cost of a building which they design, and they have a generally casual attitude about money. Because of this, many consider architectural services a luxury item. Use an architect, they say, if money is no object. But if the project must be built on a strict budget and handled in a businesslike way, then others who offer speed, certainty and convenience may be the answer.

This criticism literally hits us where we live, and the reasons for it are many. The public press and remarks made in private conversation contribute to the persistence of the image.

Advertising by interests which are trying to undermine the profession also contributes to the bad impression.

Unfortunately, there is a more valid reason for the frequent repetition of this criticism: It contains a considerable core of truth. The profession as a whole is vulnerable on this point. We often fail to consider carefully enough the potential

costs of a project, or we simply don't take seriously enough our responsibility for predicting and controlling construction costs.

Cost considerations are among the most basic the architect must deal with. He has a profound responsibility to see that the client's budget is adhered to and that the project is built within the cost forecast.

The Architect's Responsibility

Practically, this is the only way that the architect can be sure the building will be built. Cost has the final control over virtually every project. The client who gives the architect a free hand with money is rare, if he exists at all. I suspect that the client who has endless faith in the architect, and a bottomless purse, is more a creature of historical imagination than experience. Certainly today's corporate client is more sophisticated in matters of building costs than ever before. He is likely to have a staff architect, and he certainly will want to go over cost estimates with a fine-tooth slide rule. If the estimates are unrealistic, the project will be in trouble before it starts.

In addition to these immediate and practical considerations, there is a basic professional responsibility at issue. Accurate cost analysis and control form a very definite part of the professional service that the architect must render his client; failure to perform carefully in this area is no more excusable than providing inadequate mechanical facilities or not putting hardware on doors.

Each time the architect accepts a commission, he puts the reputation of the profession on the line along with his own. Any embarrassment

he causes himself through careless or incapable cost control rubs off on *all* architects. Conversely, credit reflects on all.

Architects are often inclined to seek cost information from a general contractor, who may be knowledgeable about the cost of concrete and carpentry but dependent on the advice of other specialists for the many other prices he needs. The so-called "general" contractor is more and more becoming a specialist, and as the construction field becomes more and more specialized, the need for a generalist is more and more apparent. This great opportunity should be seized by the architect.

Qualifications of the Estimator

The qualifications of the estimator can be, in theory, those of a Solomon. In practice, the basic requirements for the job are fairly straightforward.

It is essential that an estimator know the construction process. He should probably have worked on construction projects, so that he has some concept of, for example, the amount of labor involved in hanging a door or installing a window. This knowledge is important because labor prices are the most significant variables in the construction business, and among the most difficult to forecast.

The estimator must be able to read drawings, both sketches and details. His effectiveness will be greatly increased by having actually spent time on the drafting board. This gives him an insight into the complexities of the details and helps him give better estimates on such things as flashing and sash requirements, which may not show on the sketches.



All of the standard estimating references and textbooks are at the estimator's disposal. He undoubtedly finds them valuable as check-points, references and guides, especially in the use of unfamiliar materials. But they should be used only as guides. While these references are accurate within broad ranges, they are not geographically or chronologically specific enough for precise estimating.

Our own firm has established an estimating department, but any good architect who has a respect for his client's budget should be able to perform, in one way or another, the same task. It can be done through arrangement with a person hired on a consultant basis, or one of the staff architects can assume this responsibility.

Factors in Good Estimating

First, in a time when most architects have projects outside their own communities, regional differences in availability and productivity of labor and prices of materials can be a difficult factor to compute. If all architects were experts and were willing to share their information and experiences, the telephone would suffice to feed the proper factors into the formulas. Meanwhile, publications such as *Engineering News-Record* regularly publish labor rates, costs of materials and indexes. These, used with judgment, can be most helpful in overcoming a lack of familiarity with practices in another place.

Second, there is the problem of evaluating new techniques and materials. Too often, new ideas are presented to persons in an architect's office who never get around to sharing their information with the man who eventually must predict the cost. This knowledge must be shared.

Another problem connected with new techniques and materials is that of conservatism on the part of bidders. We have found it unsafe to assume that the low bidder will evaluate the convenience or other potential savings of "the latest thing" as enthusiastically as the salesman did. When a bidder puts his own money on the line, he tends to become highly conservative in his experiments with new

practices; and since the bidder's figure is the one that will be used in determining the accuracy of the architect's estimate, we must be equally realistic in our analysis.

Newness can cause other problems. The various trades respond to new techniques differently in different areas. Local jurisdictional rules may significantly alter the economy of certain practices—for example, setting of precast concrete panels. In one area, this work may be performed by one class of labor at a given cost; in another area, control by a different union or disputes between the trades may result in participation of more than one trade in the setting process, and any of these conditions may substantially alter the cost.

Differences in building codes may also exert a great influence. It is too much to expect the estimator to be aware of all code provisions for all areas, but he should be aware of possible influences which these regional differences may have on cost. Even if it is not possible to check on all of these details at the time of the initial estimate, assumptions should be reviewed carefully as the job moves through the office and more information is obtained.

Even such things as bidding practices can affect the final cost and should, therefore, be taken into consideration in the preparation of an estimate. There is dispute over single contract versus separate bids, and this is not the place to debate either side. However, depending upon local practices and on the distribution of work among the trades, as much as 3 percent of the building cost can be involved.

Now that we have the desire, the estimator and an awareness of the variations, how does one go about making the estimate? As too many have found out, the "easy" way can prove fatal.

Rules of Thumb for Estimating

Despite the practical and professional importance of cost estimating, many architects rely on inadequate cost estimating and control methods. The most widely used and frequently mentioned of these are the so-called "rules of thumb." They include "unit cost," "volume cost," "cost per square foot" and others. Their advantage is that they are so easy and convenient. Their disadvantage is that no easy method will do the job properly.

However, such methods can be useful early in a project, before

there is a program or drawings, and when there is a minimum of information. But any architect who continues to put his faith in these methods throughout the preparation of drawings is on shaky ground.

Cost per square foot, often used and widely quoted as an indication of building cost, is one of the most vague of these rules of thumb, and one of the riskiest to employ. It is not usually as indicative of building value as many believe it to be. And even if it were, individual architects have so many different ways of computing square footage that the cost figures can vary widely on a single project, depending on the system used.

Even though The American Institute of Architects has established a procedure for this computation, the number of methods actually used is probably nearly as great as the number of architectural practices. Of course, this makes any cost per square foot figure obtained from others essentially unreliable, and, unfortunately, most clients' figures come from "others."

In our office, we have developed a square foot method which we think is fairly sophisticated, and we adhere religiously to it. Although this method may partially reflect the sort of buildings that we design, it is reproduced here for whatever value it may have for others.

A. Areas must be figured on basis of both enclosed area and total area.

B. All areas must be figured from exterior face of wall to exterior face of wall.

C. Special areas as listed below must be figured on the basis of the following factors as applied to the actual area:

Attic areas, unfinished . . .	0
Balconies	1/6
Basements, finished	full
Basements, unfinished . . .	1/2
Carports	1/3
Crawl spaces	1/8
Courts, enclosed on	
3 or 4 sides	1/2
Garages, heated	2/3
Overhangs, building above	1/4
Overhangs, with sunscreen	1/4
Overhangs, roof	1/8
Penthouses	1/2
Porches, covered	1/3
Porches, enclosed	2/3
Terraces	0
Tunnels	1/8
Walkways, covered	1/3
Walkways, enclosed	2/3

Let me make it clear at this point that while we do not regard the cost per square foot index as accurate enough for cost estimating, we do not reject it as a tool for discussion purposes. We have to be able to respond very quickly to cost inquiries made on a cost per square foot basis. But we use it gingerly. As soon as possible, we make it clear to the client that this method should serve only as a general guide and a check on more precise methods of cost estimating.

If a client wants a building with, for example, 100,000 square feet of rentable office space, we must be able to tell him, very early, approximately how much it will cost.

Net Area—Not Total

Other things must be understood as well. In preparing such preliminary cost approximations, remember that a client's program often is expressed in terms of net areas; both architect and client should be aware that the net rentable space in a structure is not the same as the total square feet.

The client should be weaned away from cost per square foot estimates as soon as possible. The variables should be explained to him—the availability of utilities, the quality and amount of mechanical equipment, the quality of finishes, for example. But we are certainly prepared in initial discussions to give the owner a price range within which we can design a building.

For our own purposes, we use square foot costs as a basis for determining whether the owner's preliminary budget is reasonable. And we always keep cost per square foot figures as a check on our other estimates.

One sure way of helping the client understand the hazards of reliance on cost per square foot, is to explain how such calculations can put a premium on inefficient design. If the building is poorly planned, with lots of wasted space, the costs of its more expensive areas—toilets, kitchens, bathrooms, other high-finish areas—are spread over a larger base and the average cost per square foot will be lower. But the project cost, or other unit costs, may be high and the job will be expensive, though the square foot cost will be low. On the other hand, in an efficiently planned building with a minimum of waste space, the cost per square foot will be higher, but the total cost will be less.

Many of the same hazards occur

if volume computations are used as a rule of thumb. Volume computations may be more difficult to make and may sound more impressive, but most of the problems and shortcomings inherent in the cost per square foot computation are also present in the volume cost system. In our office, we do compute and record volume costs. However, we do this for additional guidance in the early planning stages. These are the factors that we use:

A. Areas are computed on the same basis as is used in calculating square footage;

B. Vertical measurements are from the bottom of the floor slab, if the slab is on grade, or from the surface of the crawl space, to the top of the roof deck on buildings with flat roofs and to the two-thirds point between lowest and highest points on buildings with pitched roofs;

C. Other volumes are computed on the basis of the following figures as applied to the actual volume:

Areaways	1/2
Balconies	1

Another rule-of-thumb method widely used is the unit of use method—the cost per bed, per student, per desk, or some way of expressing the cost not in terms of area but in terms of use. This method has obvious advantages. However, if a building is inefficiently designed to house 100 students, the cost per square foot could be very low, while the cost per unit of use could be extremely high.

There are hazards involved in using any of these rules in client conferences. Your client will always have heard, through one or another of those channels of inaccurate information, about a building very nearly like the one he wants, that was built at a cost of so much per square foot—almost certainly a low cost per square foot—and he wants you to assure him that you can match that figure.

The architect's personal judgment is simply not adequate to the job of cost estimating. More scientific methods must be used. Fortunately, these are available. But, as might be expected, they are not easy.

Quantity Survey Is Best

We are convinced that the only estimating method accurate and reliable enough for good architect-

tural practice is the quantity survey method. The architect must employ the services of a skillful estimator and have him take off from drawings the quantities of the various materials needed for the project. The estimator must then determine the in-place cost of those materials. As the end result of this fairly long and detailed process, he will produce an accurate determination of the cost of the building.

Quantity survey cost estimating need not be, nor should it be, confined to large architectural practices. Every office which hopes to fulfill its professional and client responsibilities must do much the same thing.

The quantity survey estimate work begins with the designer. In his early studies of the program, and in preparation of his early concepts, the designer does not check, in detail, the probable cost of every concept. But he should have a good idea of the probable costs if he uses, for example, steel framing structure, reinforced concrete, brick bearing walls or wood frame. The more mature the designer, the better his judgment will be. Ideally, he develops a "sixth sense" for cost. These unmeasured judgments represent all the cost control feasible until some drawings have been produced. Then these preliminary designs may be checked with the estimator.

The designer draws up the building, showing the functional layout, usually in single line diagrams, showing partitions, windows, sizes of rooms. An elevation drawing is made that shows heights of stories, configuration of windows and exterior materials. The greater the number of dimensions that can be indicated on these drawings, the more accurately the estimator can work. The basic requirement of these drawings is that they define the building in terms of area and volume, basic structural system and finishes. The drawings need not be in finished form at this stage. Simple prints should suffice. The basic requirement is that the scope of the work be clearly defined.

This is where the creative quality of the estimator's work first becomes apparent. He must be able to convert these rather simple drawings into information that will enable him to forecast, accurately, what the construction costs will be after the design has been developed in much greater detail.

Good communication between the project architect or designer and the estimator is extremely im-



portant at this time. The estimator must clearly understand what the building is going to be. All of his questions must be answered.

Many intangibles come into play. The estimator must be aware of cost trends, for instance. He must be familiar with the tradition within the office, knowing that certain kinds and quality of hardware are likely to be used on certain buildings. Anything unique or even unusual must be discussed.

Soon after the owner approves the preliminary package, the project architect, the designer, the mechanical engineers and the specifications writers meet to discuss the building in great detail. This meeting is intended to insure that everyone knows what the building is to be like, and what the estimate should include.

"Building the Building"

On the basis of this understanding and these drawings, the estimator goes to work. He begins to "build the building," in a sense, working on the basis of his calculations.

If possible, the estimator should visit the site early in his work. Unusual site characteristics may have a significant influence on his estimate. A heavily wooded site that must be cleared, a place that is difficult to reach or has complicated terrain will have great influence on the estimate.

If the estimator cannot actually go to the site, topographic surveys and aerial photographs should be provided.

Because the cost of the structure may be as much as one-third the cost of the finished building, most of our estimates begin by calculating its cost. On simple structures, spacing and sizing of members may be determined by the use of handbooks. Structures of most conventional buildings can be computed in terms of weights and volumes of materials needed to support live and dead loads. On the basis of these calculations, and upon general assumptions about the probable bearing capacity of the soils, the estimator can arrive at a reasonably accurate prediction about the cost of foundation and structure.

Often this work is done in cooperation with manufacturers and fabricators, but figures obtained in this way must be carefully checked, for the architect is professionally responsible for the figures he uses, regardless of their source.

Later, a structural engineer, armed with findings of test borings and more detailed studies of loads, will determine structural requirements in greater detail and with more precision. The estimator should be able, at this stage, to arrive at a figure within 3 to 5 percent of the final cost of the structure. Since the structure represents roughly one-third of the building costs, this is an important accomplishment.

With foundation, site and structural cost compiled, the estimator theoretically encloses the building. Costs of exterior walls, including sash and glazing, etc., are determined. Roofing and insulation costs are estimated. Quantities of wall materials, flooring and similar material requirements are computed.

We attempt to estimate such job expenses as protection of the project during construction, cost of temporary facilities including heat, electricity and other utilities. The price of the necessary earth moving is calculated. Demolition costs are estimated.

Outside the building, but still part of the project, are such potential expenses as site preparation and improvements, roads and parking area, sidewalks, railroad trackage, sewers, water distribution lines, hot water or steam lines, electrical installations and fire alarm system.

Mechanical, Electrical Estimates

Mechanical and electrical work will also represent about one-third or more of the building cost. Rules of thumb in this area are no better at providing an accurate estimate for this portion of the work than they are in arriving at the total cost. Again, the quantity survey method must be used to determine the amount of electrical wiring and plumbing, the number of outlets, amount of duct required for air-conditioning system and heating plant, lighting fixtures, etc.

It is virtually impossible for mechanical and electrical engineers to make a precise estimate of the costs of the materials on the basis of the preliminary drawings. So, for their first estimate, they rely on a less sophisticated way of measuring—using average number of

wire per outlet, tonnage of air-conditioning, for example—and employ this data to come up with an estimate. Again, more exact estimates are made as soon as possible.

The philosophy of architectural design within a firm can cause cost to vary by 10 percent, say the engineers. If the architect (or owner) is willing to leave pipes or wiring exposed, for example, the cost will probably be less than if all utilities were concealed. If an architect is particularly adept at providing ample spaces for ducts and piping and conduit, the engineer can install the equipment at a lower cost than if these spaces are tight, or adapting the mechanical equipment to them is difficult.

Even though estimating this phase of the work is, in the early stages of the project, less precise than desirable, one thing that keeps architects out of more serious trouble at the end is the tremendous range of selectivity available in cost of equipment. Pumping equipment, for example, can vary in cost by as much as 100 percent. Refrigeration equipment can be provided for anywhere from \$90 to \$200 a ton, depending on type, quality, durability and operating expense. The most expensive is often cheaper in the long run, due to differences in operating and maintenance cost, but availability of lower-cost equipment can help the mechanical engineer work within a budget.

It is, of course, the responsibility of the mechanical engineer or the architect to explain to the client this variation in equipment cost. It would be improper to install lower-cost equipment, with its attendant high operating and replacement cost, without informing the client.

Many other variables exist in mechanical equipment. Complicated controls may add to the comfort of heating and cooling in a building but they raise construction costs.

Quality of ductwork, wiring and plumbing can also be varied, but the total saving available in this area is much less than that which can be obtained by varying the basic quality of equipment.

Availability of Utilities

Utility costs are often difficult to determine in preliminary stages of planning. A large laboratory installation, for example, requires extensive electric, gas and disposal facilities. If an adequate electric substation is convenient, a large gas pipe line nearby and an adequate

sewage system available, costs will be far lower than if these utilities must be provided by the owner. The resulting variable in a building cost estimate can amount to \$100,000 or more on a major project. For various reasons, early estimates may be required without full investigation of the availability of such services. And the engineer is likely to find himself in a position where he simply will have to make a guess. If he is skillful, that guess can be reasonably accurate. But this portion of the estimate should be reviewed when detailed information becomes available.

The architect must provide the engineer with certain basic information, including the following:

1. Volume and area of the building. This will enable him to determine the number of BTU's of heating and cooling required.

2. Type of occupancy. A building with a large number of active occupants will have different heating and cooling requirements than a less heavily occupied building.

3. Type of equipment. Some machines produce considerable excess heat; this must be compensated for both in winter and in summer. Ideally, the owner will provide a list of equipment with its heat-generating factor and the power required.

4. Glass and insulation. Structures with double pane, heat-resisting glass and heavy insulation elsewhere have far different requirements than those with less costly windows and walls.

5. Lighting. The choice of incandescent or fluorescent lighting can have a startling effect on heat requirements; the recent interest in heating office buildings through light fixtures is an example of the possible variations in this area.

6. Air change. High-velocity systems that change air often, either for comfort or to expel air from laboratories, are more expensive than the systems with lower air-change requirements.

7. Power requirements. Simple offices and classroom buildings have much lower power requirements than laboratory, or even residential, structures. The difference is reflected in utility costs.

In view of all these variables, perhaps we should be glad that an experienced engineer can make estimates as accurately as he does. But the real professional responsibility is to devise a system that will provide the engineer with the sort of information he needs for more accuracy, as soon as possible and in the greatest amount possible.

There was a time when mechanical and electrical requirements were relatively simple—a heating plant, wiring for electric lights and telephone wiring. Now, the building is generally airconditioned* as well as heated; electrical requirements include not only lighting but power for additional office or commercial equipment; and the telephone system must often be supplemented with additional communications systems.

We once calculated that 30 percent of the building dollar was spent for these components; now it is often 50 percent. Thus if these calculations are inaccurate, the overall estimate is certain to be in error.

Growth and Improvement Factor

All buildings tend to grow in complexity and size as design moves from preliminaries to working drawings. Compliance with codes may widen a stair, add a toilet or require additional fireproofing. Probably the biggest factor is the architect's own desire to have everything exactly right. Because of this tendency, every preliminary estimate should include a "growth and improvement" factor of about 3 percent. Unless the project architect is unusually alert, failing to provide this factor may result in the sort of inaccurate estimate that has often been attributed to architects by the public.

On the other hand, obviously an architect cannot overestimate. A client has just as much right to feel cheated if his bids come in too low. He feels that he could have had more building for his budget, and he may well ask why he didn't get it. This is especially true in the case where bond issue money or government appropriations are involved, for public bodies are obligated by law to make the best use of money entrusted to their keeping.

Finally, all of the pieces are ready to be put together in a complete estimate. The estimator must then evaluate the conditions that will most likely prevail at the time bids are received and add sums to cover the contractor's overhead and profit. This is largely where the low bidder and high bidder separate; since the percentage for these items used in the bid will vary depending on the work load in each bidder's office and other unpredictable considerations, an estimator should use an average.

Even then, the figures used will vary depending upon the size of the job. In our office, we adjust for

this, but the base from which we deviate is 8 percent for profit. A hungry bidder will settle for less, but sound judgment in applying these factors should produce the desired result—neither the lowest nor the highest figure, but one within the bidding range.

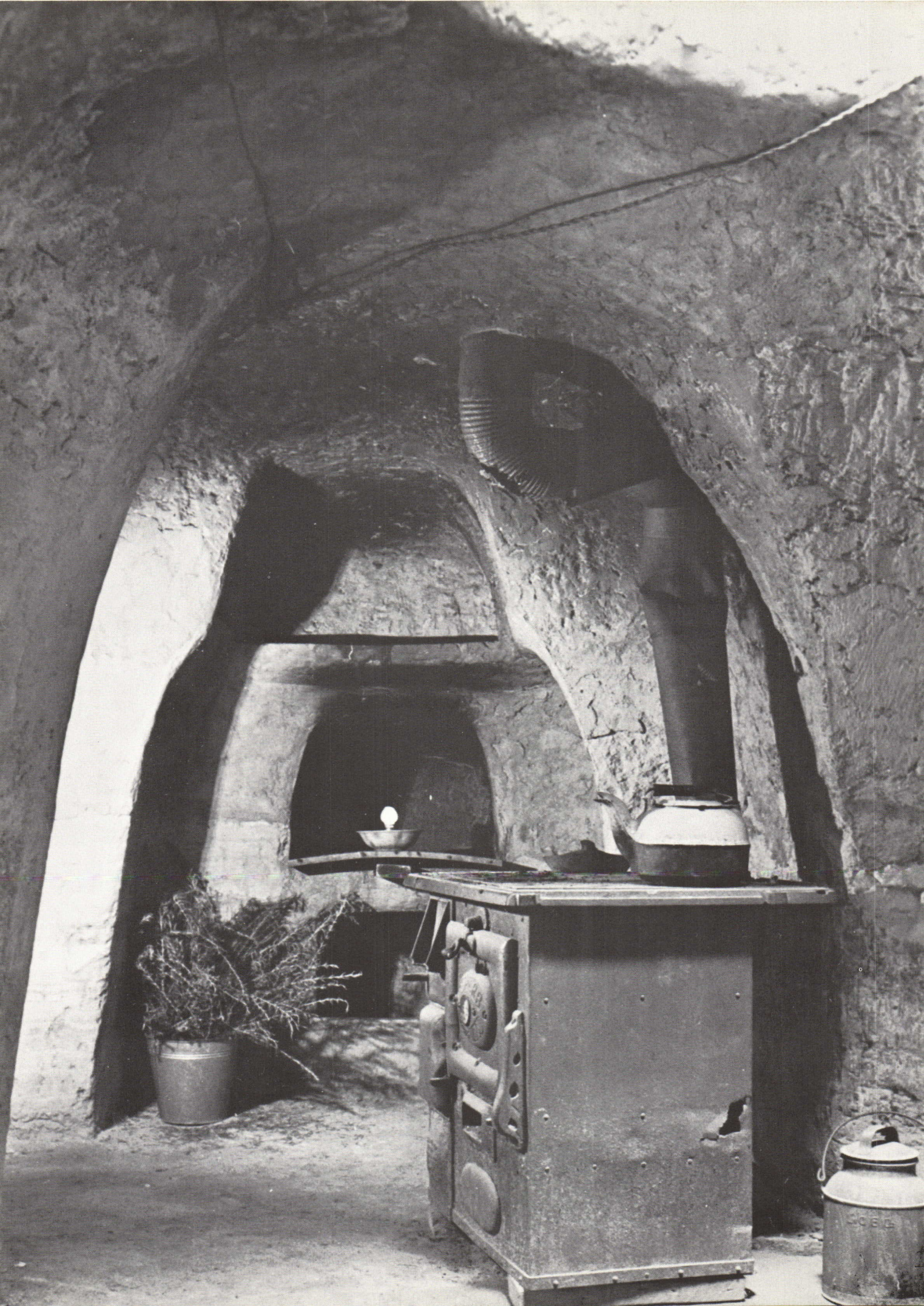
After the Estimate

After the project has been approved by the owner, the estimate must be constantly reviewed to insure that it remains valid.

Such responsibility cannot be shared; therefore, in our office, it is the responsibility of the project architect to be as certain as possible that the project is presented for bid in a form that will meet the budget. It is his judgment which determines whether any changes carried out are critical enough to require additional estimates. Many changes may be made in a plan after the preliminary design is approved. Basements can be added, expanded or taken away; crawl spaces can be added or supplemented. The client may order changes that could add to the expense. If so, the project architect must prepare him for a possible cost-increase. The client or the project architect tends to make small changes as the project moves along. These changes always seem to add to the total cost—a few more electric outlets or wires, a better-labeled door, another utility closet or even an additional couple of feet in size.

Since a bad estimate is as serious a defect as a leaky roof, the project architect must be alert to the effect of today's decisions on yesterday's estimate. Even during the bidding, items on an addendum can affect the price, so that no one can relax until the bids are in. Even then, the relaxation will be short-lived, for costs must be kept under control until the construction of the building has reached the stage of completion.

At that point, if all of those involved have done their jobs, everyone will be happy, the profession's prestige will have been increased, and its reputation for overall competence strengthened. I cannot state too strongly how important I think it is to improve our competence in the areas in which we already practice, and to expand our abilities to meet changing conditions. It is not fashionable to be vague because it is not economic. Every time we yield an area of competence to another part of the building industry, we cut a piece from the foundation of our profession. □





Seven Acres of Underground Shelter

An Italian tunneler, in Fresno
of all places, invents
an ingenious
response to climate.

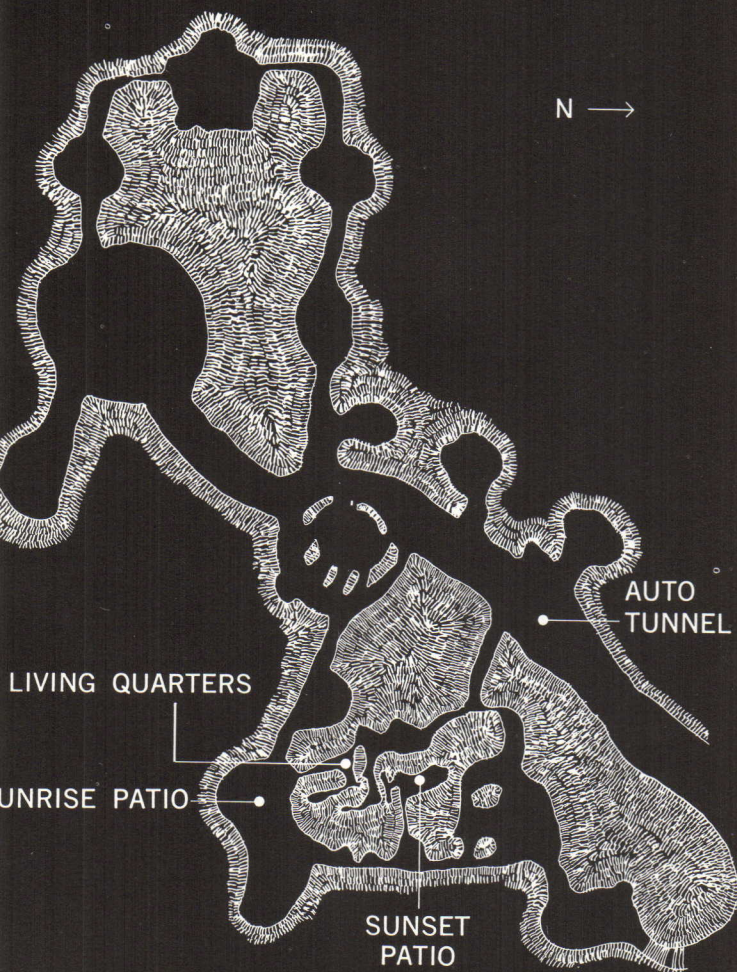
BY HENRY SANOFF, AIA

In our quest for meaningful contributions to our architectural heritage, we should not let go unheralded iconoclastic attempts at the creation of physical environments which challenge natural environmental constraints.

For 38 years, starting in 1908, an Italian tunneler named Baldasare Forestiere, living in Fresno, California, labored to create a subterranean labyrinth in an almost barren desert where temperatures were not uncommon at 120 degrees F or higher. The need to achieve protection against the severe climate pre-empted this underground phenomenon where Forestiere carved and shaped space, exhibiting extraordinary skills as an architect, engineer and stonemason.

Since temperatures below ground vary minimally, a constant 70 degrees F could be maintained throughout the year affording greater cooling through natural means; however, fireplaces furnished additional heat during the occasional winter imbalance in temperature.

Forestiere began construction with his own living quarters and then burrowed out tunnels, rooms and passageways until he had developed a honeycomb of seven acres below the surface of the earth, quite similar to the early Christian catacombs. This subterranean labyrinth was constructed 10 feet below the surface and in some areas as much as 20 feet. The structural principles underlying this construction were uncomplicated. To support the massive earth weight, hardpan which lies 2 feet below the earth's surface was formed into domical roofs with arched openings and barrel vaults over the passageways, involving complicated shoring. The hardpan was hewn into manageable sizes





to form the arches and walls, with cement fill between the masonry joints. Due to the archaic method of building, employing a pick and shovel, there is a noticeable and welcome irregularity in the shaping of spaces, yet the total structure is homogeneous in character.

All of the spaces were illuminated with natural sunlight through circular glass skylights, with grape vines planted around the rims to filter the summer sunlight and permit the winter light to enter. Open court spaces were located to receive the morning light (sunrise patio) and afternoon light (sunset patio) and to transmit this light to each of the adjoining living spaces. There are some 65 rooms, gardens and grottos, each differing from the other, all underground with broad verandas sheltering the interior spaces from the sunlight.

The living quarters consisted of a living room, kitchen, wine cellar, summer and winter bedrooms with a private chapel and dressing room.

Some of the unusual characteristics were a recessed dining table, sliding glass windows in the kitchen overlooking the sunrise patio, with a large glass wall in the summer bedroom overlooking the sunset patio. The walls in the living quarters were cement coated, contrasted to the exposed course rock of the other surfaces. The planning and spatial relationships appear to have developed from a need and a desire for their existence rather than by chance. Rooms flow into passageways which ease through the subterranean strata forming a network of plastic spaces which change their shape as the quantity and quality of light changes both daily and seasonally.

Forestiere also triumphed as a horticulturist, supporting the notion that plant life would grow better below ground than above, with controlled sunlight at moderate temperatures. Through grafting, he achieved various combinations of lemons, grapefruits and orange blossoms all attached to a single tree. His classic specimen grows 22 feet below the surface and grafted to bear seven different citrus fruits: navel oranges, sweet lemon, tangerines, sour lemon, grapefruit and cheedro (a Sicilian lemon that weighs as much as 7 pounds). All the citrus trees were grown in circular planters located in the center of the spaces, laid up of hardpan and smoothed with a mixture of clay and cement wash.

There has always been speculation as to Forestiere's purpose in creating this labyrinth. The most plausible answer was that he was creating an underground retreat that the public would someday share; however, since this vision was terminated by his death in 1946, his intentions will never be known.

This phenomenon displays cognitive evidence of certain qualities achieved that transcend the functional base of architecture. Bold conceptions of this type continue to be unfolded and historically recorded as evidence of man's de-

The author: Mr. Sanoff is assistant professor of architecture, College of Environmental Design, University of California, Berkeley.

termination to protect himself against hostile climates. It is important that they are recognized for what they attempted to achieve and in the context in which they were created, since the lessons of the past are for all of us to use in spite of our efforts to disregard them or avoid them under the guise of originality. Due to cultural and temporal differences we extract different observations from the same phenomenon, which is evidence of the endless variety and expression there was in man's inevitable movement toward the creation of shelter for survival. □

DESIGN OASIS IN THE DESERT

BY NATHANIEL FIRESTONE

Young US architects working with the Peace Corps in Tunisia discover that volunteer service pays dividends in personal satisfaction and professional development.

Architects from Memphis and Wichita are hunched over drafting-boards in Kef and Bizerte, Tunis and El-Djem. The Americans are Peace Corps volunteers, helping with the planning and construction of modern Tunisia.

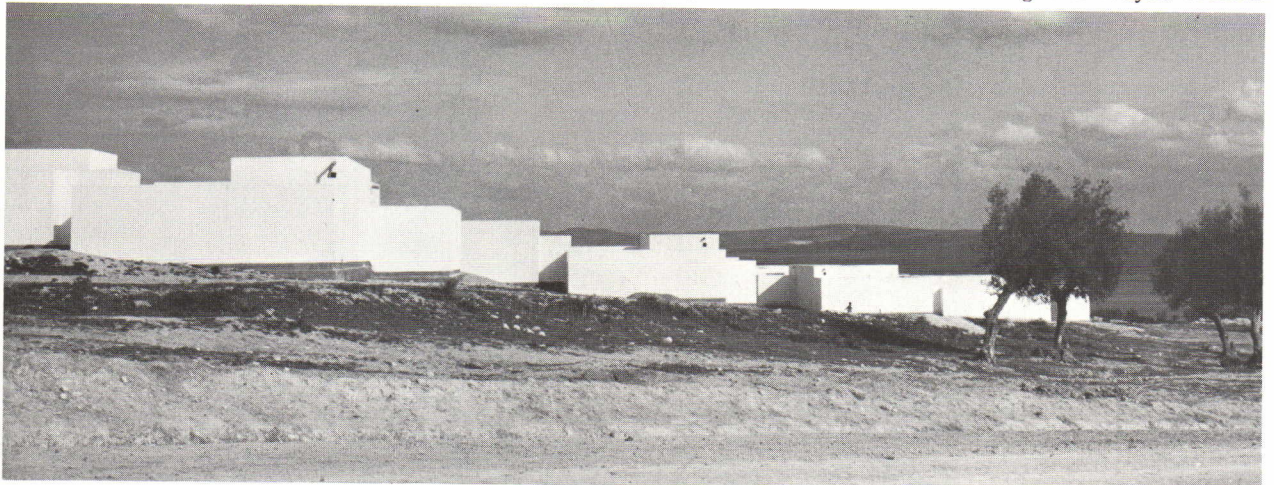
As a French protectorate, Tunisia had a well-organized Public Works Ministry, staffed with French engineers and architects, carrying out a limited construction program dictated by post-war economy and political uncertainty. When independence came in 1956, the French professionals left in great numbers, and the few who remained were unable to cope with the new nation's ambitious plans for modernization and development. Tunisia first hired Italian city planners and Bulgarian architects and engineers to provide needed technical manpower; then, when the Peace Corps became a reality in 1961,

requested the assistance of volunteer architects to help in the planning and the construction program.

Among the first group of Peace Corps men to arrive in Tunisia were 13 young architects. After a slow start, during which their capabilities were tested by dubious officials, they were soon working at full speed on housing, schools, community buildings, markets and other projects.

The volunteers felt the need for an experienced American architect to help them with technical advice and criticism, and to help them correlate their Tunisian experience with American professional practice. He would also provide supervision and evaluation of their work to be submitted to state licensing boards as practical experience. Peace Corps headquarters asked The

After a slow start, results such as this low-cost housing in Kef by volunteer architects Neil Lang and Wayne Wedell.



American Institute of Architects to appoint a supervising architect; I was picked for the job.

By 1964, when the original 13 finished their tour, the Tunisian Government had come to value them so highly that 40 volunteer replacements were requested. From among the thousands of Peace Corps applicants, about 50, who had completed their architectural studies and were otherwise acceptable for Peace Corps service, were selected. They were invited to participate in a three-month training program, prior to final selection and departure for Tunisia.

The story of another Peace Corps architect, Carl Awsumb of Memphis, and his work in housing in Africa's Cameroon was reported in the *Peace Corps Volunteer* for August 1966.

Training started in June 1964 on the campus of the University of Utah at Salt Lake City. Technical training was organized by the university's department of architecture, and consisted of the study of Tunisian building practices and materials, design for hot dry climates, architectural and planning requirements for developing countries, etc.

In addition to professional training, the program included French, study of Tunisia's culture, history, geography and political institutions, a review of world affairs and American history, physical education and preventive medicine.

The 40 architects who successfully completed their training and passed the rigorous evaluation and selection process arrived in Tunisia at the end of September 1964. After a brief orientation and sightseeing tour, the volunteers left for their assignments all over the country. Public Works and Peace Corps officials matched people to jobs, taking into account Tunisia's most pressing needs and the volunteers' special qualifications and interests. Having been with the trainees at the University of Utah, I was able to help.

Eleven volunteers were assigned to the six regional planning offices of the Public Works Ministry and, under the direction of Italian planners, were entrusted with the planning of all urban and rural centers, tourist areas and the development of Tunisia's beautiful, unspoiled coastline.

Seventeen were assigned as architects to 10 regional construction and housing offices of Public Works, under the direction of Tunisian engineers. There they worked side by side with Bulgarian architects on design and construction of houses, schools, community centers, mosques, markets, baths, libraries and meeting halls.

The remaining volunteers were assigned to special offices, such as the Tourism Bureau, where they designed hotels, motels and tourist centers; the Ministry of Education, to standardize and supervise school design and construction; and the roads and bridges section of the Public Works Ministry, to design the buildings required for port and airport development.

Thanks to the good will earned by their predecessors, the new group of volunteers were received with open arms and entrusted with important projects from the start. The language barrier and unfamiliarity with local conditions slowed them down, but only temporarily.

They soon learned some of the peculiarities of professional practice in a developing country. Program requirements given to an architect in Tunisia are often sketchy, and the preliminary design frequently involves a lot of guessing. Preliminary designs and cost estimates are presented to the "client"—usually a local government official—for approval. Then, if funds are available, working drawings are started. These are far simpler than their American counterparts, containing only dimensional architectural plans, woodworking details and structural plans. The architect also supervises the stakeout of the building on the site and inspects construction progress—the inspection consisting mostly of explaining the blueprints to semitrained field superintendents.

Building materials are largely limited to those readily available—concrete, stone, clay tile, concrete block. Walls and ceilings are plastered and whitewashed; floors are finished with terrazzo tiles; doors and windows are made of imported wood. The designer must compose his building from these few materials, using form and texture to allow the sun to play its lights and shadows. Our volunteers incorporated the local age-old forms into their designs with great sympathy, understanding and restraint. Ironically, this respect for local form and tradition does not meet unanimous approval from Tunisians; they would like to break completely with tradition in the hope of thus speeding up the nation's development. Even the more conservative clients request the application of superficial, eclectic decoration, dignified by the



name "Tunisian Style." Good design is as hard to sell in Tunisia as it is in the United States. My admiration for the volunteers' imaginative design talent, and their willingness to argue for it, is boundless.

Volunteers were frequently frustrated by the tendency of clients to make changes without prior consultation or architectural advice. These changes were due mainly to the client's inability to visualize the building from the drawings and therefore to issue change orders during the construction process rather than in the design stage.

These and other minor difficulties, however, are dwarfed by the positive results of the volunteer architects' work: During their 21 months in Tunisia, they prepared plans for 492 projects, 45 percent of which were finished or under construction by the time they left. On these projects they bore full responsibility from design to construction supervision—far more responsibility than they would have had in the US at a comparable stage of their careers.

The planners' work consisted of development and detail plans for all communities in Tunisia. This farsighted concern with planned growth is to be commended. The picture is less perfect, though, in the practical application of these plans; many remain only a wall decoration in the mayor's office, and never become fact.

Here, too, local officials do not fully share the planners' concern for preserving as much as possible of the old, traditional town—the *medina*—with its narrow streets lined with shops and teeming with life and activity. Many Tunisians would prefer indiscriminate demolition and reconstruction in the "modern" style, again in the name of progress. The planners are also responsible for residential neighborhood design, including the architectural design of houses and community centers.



From left (opposite page), youth hostel in Chebba by Robert M. Immerman; seaside hotel in Hammamet by Alan L. Appel and Stanley I. Hallett; coffeehouse in Ain-Draham by Herman L. Orcutt; children's shelter in Nabeul by Roger K. Lewis; mosque in Hamman-Sousse by Gustaaf Brest van Kempen; and a meeting hall in Tazarka by Roger K. Lewis. All serve as Peace Corps volunteers.



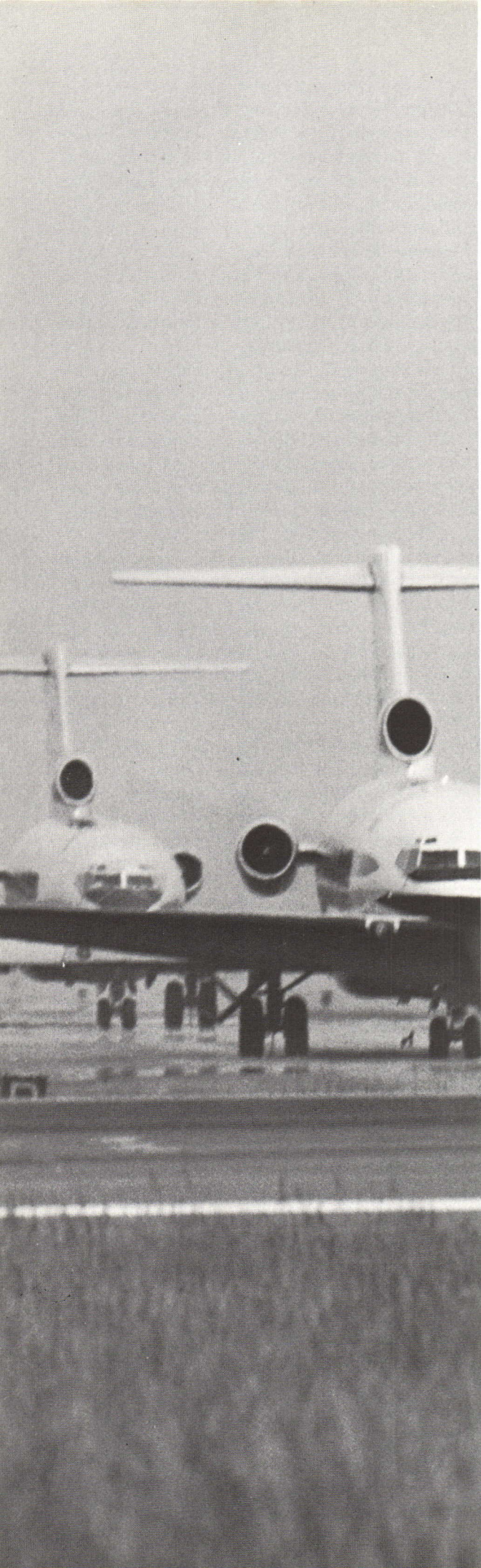
Impressive and satisfying as the volunteers' professional experience may be, it is heightened by their opportunity to get acquainted with Tunisia and its people and culture, and at the same time to represent and explain our country to Tunisians. This cultural exchange is the primary objective of the American Peace Corps volunteer service abroad: to increase mutual understanding and appreciation, and to establish ties of friendship and respect. Technical assistance is only one means of furthering the fundamental mission of the Peace Corps—peace.

For his service the volunteer does not receive a salary but only a living allowance, enough for a simple standard of living, similar to that of his Tunisian counterpart. But limited means are not an obstacle to enjoying life there. Tunisia is a small country, and it costs little to visit its beautiful beaches, well-preserved Phoenician and Roman archaeological sites, Berber and Arab villages and monuments, deserts and oases. For the price of a cup of coffee one can sit for hours in a local coffeehouse, gossiping or playing cards or dominoes. It costs nothing to teach English, coach basketball or play on the local soccer team. During his 45 days' paid vacation, the volunteer can visit Egypt, Jordan, Turkey or other nearby countries.

How much longer will Peace Corps architects be needed in Tunisia? For a few more years, certainly. While Tunisians are currently being trained as architects in France and Belgium, the returning graduates will enter the private sector of practice to replace the few and aging foreign architects now practicing there. The need for architects in the Public Works positions will continue. The Peace Corps is now sending architects annually in small groups, rather than every two years in large groups. Newly arrived volunteers work side by side with those who have been there for at least a year, thus easing the transition and adjustment.

Peace Corps architects have met on many occasions with Tunisia's dynamic President Habib Bourguiba and other high government officials, who appreciate their competence, energy and idealism. Other architects will be welcomed to Tunisia with open arms. It is gratifying that our architectural graduates are volunteering in large numbers for this service which is so rewarding to themselves, to developing countries and to their own. □





**The jumbo job
implicit in the coming air age—
hundreds of
new jetports alone—
is both “rich with opportunity
if we rise to meet it;
ripe for disaster
if we fail.”**

BY MORRIS KETCHUM JR., FAIA

Superlatives are common parlance in describing an industry with an annual growth rate of some 15 percent. And there are sound indications the aviation industry will exceed even this phenomenal expansion in just a few years.

SSTs (supersonic transports) and jumbo jets are firmly implanted in our lexicon five or ten years before their arrival. Less widely known are the massive problems such superplanes will present in airport design and in ground or air access between central cities and airports. It may not be too much to say that never have architects and planners had such a challenge to work together in the public interest.

From the professional point of view, it is my belief that architects must become involved now in coordinated planning and design of facilities required by three basic types of airports of the future:

- “Superairports” which also will accommodate our present subsonic jets.
- “General aviation” airports to encircle major cities for vastly increasing numbers of corporate and other private small planes.
- Newly conceived within-city STOLports for use by Short Take Off and Landing planes, to be used 10 years or so by STOL and Vertical Take Off and Landing planes (VTOL).

Perhaps some general background would set the stage for consideration of these concepts, for a new era in commercial aviation is about to burst upon the American scene. As far as airport planning is concerned, that era is already here.

Before this decade’s end, jumbo jets capable of transporting up to 900 passengers or mixed passenger/cargo loads are scheduled to enter commercial service. Not long after, the US supersonic transports will begin transporting businessmen, tourists and cargo at cruising speeds of around 1,800 miles an hour. Distance and time will be telescoped.

THE BIG

These two new types of aircraft of radical design are creating new opportunities for architects in the planning, modernization and expansion of airport terminals.

At the very least, the jumbo jets will necessitate redesign of terminal "fingers" or jetways in order to be compatible with the aircraft doors which will be situated at different points along the fuselage and at different deck levels. The jetways must also have a much greater traffic capacity than existing versions to accommodate hundreds of passengers traveling en masse.

Jetways of the future may be double- or triple-decked and equipped with moving sidewalks to expedite passenger movement. The unprecedented volumes of cargo each of these aircraft will carry create an immediate need for expansion of cargo storage facilities in the terminal area.

Although the SSTs will carry fewer passengers than the jumbo jets—about 250 to 300 in the first commercial entries—the dimension of these craft will dwarf existing facilities for passenger and cargo loading. There is an immediate need to develop new design concepts for safe, expeditious traffic movement at the interface between the aircraft and the terminal. For instance, it is easy to visualize jetways that pivot (or telescope) out to the side of the aircraft, with passengers transported at various levels via seats mounted on moving platforms. Terminal baggage and cargo facilities must also be redesigned to conform with new conveyance systems such as proposed luggage bins that would be transported or rolled directly into the aircraft, flown to the destination and with equal efficiency moved to a luggage claim area. Certainly there is need for inputs and innovation, functional as well as esthetic, on the part of the architect, and especially so since the historical development of these aircraft has been toward capacities that are successively larger.

But the potential effects of the jumbo jets and SSTs are so far-reaching that airport planning officials are approaching their task with a special sense of urgency. In the first place, the onrushing growth of commercial aviation has exceeded the expectations of the industry's most optimistic planners. No one could possibly have foreseen this astonishing growth. Now, however, the officials have a new concern: What will be the effect on terminal needs when the new aircraft make low-cost air travel a reality for the first time—when, say, the price of a ticket to fly between New York City and Los Angeles may drop to \$50?

The aviation industry is entitled to take pride in the fact that in 1966 for the first time the total number of passengers flown by US airlines in one year—and handled by the airports—is expected to top 100 million. Nevertheless, only 15 to 20 percent of the American public has ever flown in an airplane, and with this in mind it is to be noted that many of the nation's airports already suffer from aircraft congestion problems in terminals, parking and road access.

When another 25 or 30 percent of the public begins to fly, how big will air terminals have to grow, and how many new airports will have to be built to meet entirely new planning and design criteria?

When the jumbos begin to carry upwards of 50 tons of cargo each at one-third or even less of present freight rates, how many new air cargo terminals will have to be developed to handle the inevitable air freight boom (actually, a boom on top of the present boom)?

When the SSTs enter service, how big will be the market they tap for passengers and cargo—now an unknown quantity—and how many new terminals will be needed to keep pace with this development alone?

And what will be the terminal needs of growing numbers of subsonic jets which will continue to perform useful functions?

William F. McKee, head of the Federal Aviation Administration, said recently, "We now have 107 airports offering jet services. By 1970, we shall need at least 300 airports for jet service. Personally, I think the number will be nearer 400."

The number one task at present, however, is to convert existing airports to handle the new planes. At stake is the tremendous financial investment which has been made in terminal facilities to date, but the architectural problems are immense. All airports are different, so that modification of each terminal would have to be on a custom basis as matters now stand. Moreover, there is a growing variety of design criteria. For instance, some airlines will prefer to nose their aircraft into the terminal building, while others will prefer side loading. Terminals may also be single- or double-decked. As one airline executive put it, "The architect who can come up with a broadly effective solution to the problem of airport conversion will be the most wanted man in aviation."

The potential effects are not limited to the airport environment. As a case in point, industries seeking to situate new plants near conven-

GROUND WAVE

tional transportation systems—rails, highways, water—may find that jumbo jets can meet all their cargo transportation needs, permitting establishment of plants in areas not now industrialized. The result is sure to be new movements of industry, of satellite businesses, supporting services, people—and new needs for architects.

With such a prospect, it is understandable that no responsible official claims to foresee all the changes that lie ahead, but changes there will be wrought largely by the jumbo jets and SSTs that promise at the very least to revolutionize traditional modes of passenger travel and cargo distribution, and may ultimately affect where and how the American people work and live.

In coming to terms with this anticipated growth, the basic concept to which many airport officials appear to subscribe is development of a nationwide system of major airports to handle the big jets. Each city core would also be ringed by smaller airports to serve the needs of general aviation, now numbering close to 100,000 aircraft (compared with somewhat less than 2,500 public carriers operated by all the US airlines together). The satellite airports would act as magnets to draw small planes away from the congested major airports, as has already been demonstrated in the Minneapolis-St. Paul airport complex, Los Angeles, Pittsburgh and elsewhere.

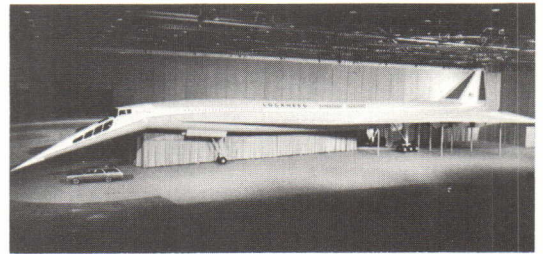
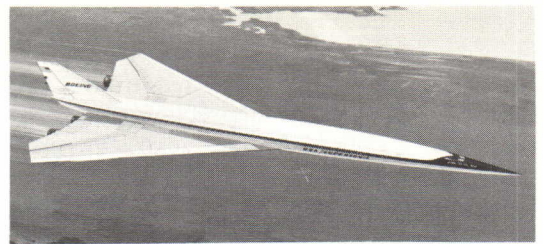
The author: Mr. Ketchum believes airports are "vital elements" in urban design, a subject of top concern to his practice as it was in his presidency of the AIA.

In the New York City complex, which handles fully 25 percent of all the nation's passenger traffic, a similar approach is advocated by the Metropolitan Airlines Committee, representing nine major domestic carriers. MAC points out that a fourth jetport, while needed for public air traffic, is not a solution for general aviation. The airlines feel that with small plane traffic accounting for 27 percent of the capacity of Kennedy, LaGuardia and Newark in 1965, the addition of small, well-equipped general aviation airports near the Manhattan core area soon will become mandatory.

In addition, it is expected that helicopter and other air taxi services will continue to grow and that more terminals will be needed for this purpose in downtown areas.

There is little need to elaborate on the vital interest of architects in contributing to these developments during the early planning stage, but it may be well to consider some of the factors involved.

In the nation's aviation industry, routes and rates for public air carriers are regulated by the Civil Aeronautics Board while the airways are



The race between these two aircraft—Boeing's (upper) and Lockheed's—ended last month with the government's selection of Boeing as the builder of America's version of the SST. Besides the intense, 30-month airframe competition, two other companies vied for the US nod to build the engines. The winner: General Electric. But even with the resolution of this air industry struggle, prototype development was moving ahead at a less-than-air-age pace. Vast sums are needed and the government, which is to bear most of the cost, was withholding funds. Boeing was itching to get airborne with its B-2707 in the international race for the SST market. Now it was up to the White house—and Congress.

operated and regulated by the Federal Aviation Agency. But airport planning is largely in the hands of local government officials except for the small private air fields.

It is obvious that development of major airport terminals requires a high order of coordination among the different agencies concerned, a situation in which the architect, by training and experience, is equipped to perform a key role to help influence the total planning effort for optimum results.

Since air travel between cities begins with ground transportation between nearby urban centers and the airport, it is essential that overall planning encompass ground access to airports. In fact, planners are beginning to study how air access may be provided in 10 years or more by an entirely new family of aircraft. As matters now stand in many urban centers, getting to the airport on traffic-clogged highways can be a harrowing experience—and often the longest lap of the journey. It will simply make no sense to have to catch an SST when ground access still is in the DC3 age.

There is an urgent need to bring fresh thinking to the problems of ground transportation to airports to keep pace with growing passenger volume. Along with exclusive arterial rights-of-way, mass transit extensions to airports, the introduction of combination bus-rail cars and the possible use of monorail systems are examples of future opportunities for innovation.

Certainly if airports are to be "good neighbors" to adjacent communities, land use around them must be compatible with the factor of aircraft noise. Instead of housing, planners should consider the use of such land for industrial parks and community service structures. It is interesting to note in this respect that the SSTs are being designed to meet specific reduced noise criteria and the expectation is that the new aircraft will be less noisy than present-day jets when operating at the subsonic speeds used for takeoffs and landings.

But if there is much work for architects in the foreseeable future in expanding the number, size and scope of jetport and general aviation terminals, there is also a high creative standard to live up to, thanks to previous contributions by members of the profession. Some of the nation's larger air terminals already offer all the amenities of a small city, with luxurious surroundings designed to enhance the appeal of aviation as a glamorous mode of travel. Passengers have come to expect attractive terminal buildings where they can check in for flights with a minimum of red tape, drop off their luggage, relax or stroll in a landscaped garden, visit a chapel, find food and refreshment, cash a check, shop for necessities or gifts, get a good night's sleep.

The long-term prospects are more hazy—and here we are in the realm of speculation—but a variety of imaginative concepts have been advanced and more can be expected toward an eventual solution of one of the air transportation industry's big headaches: ground transportation.

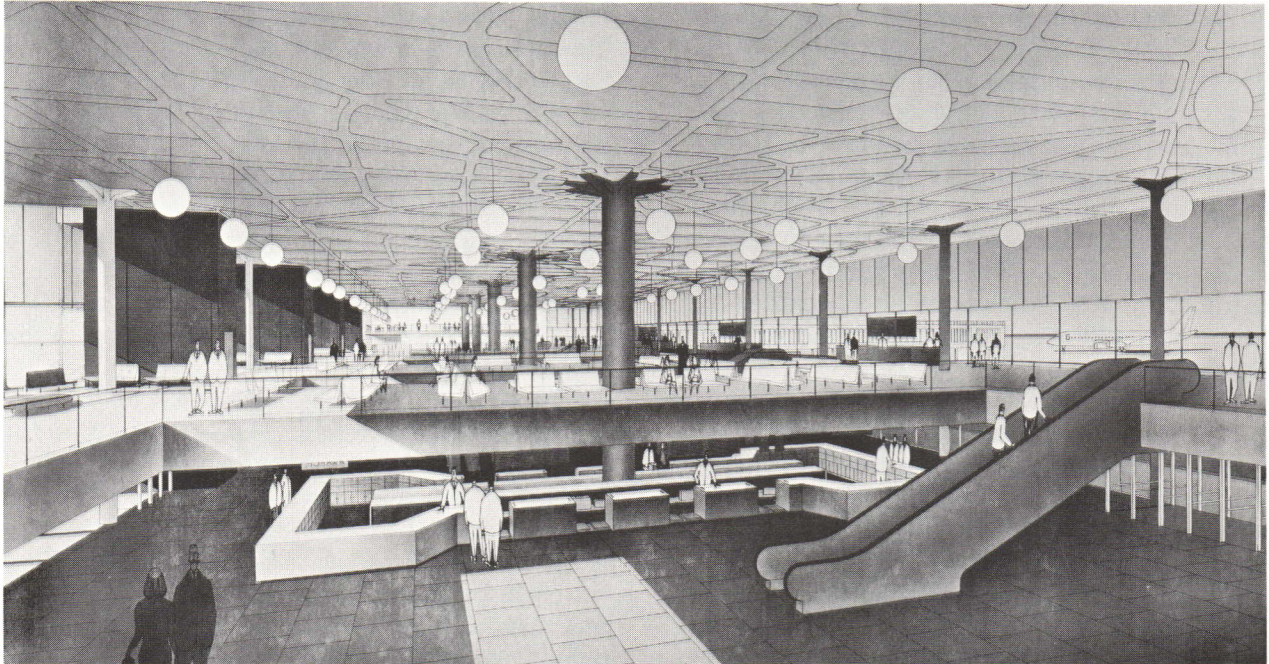
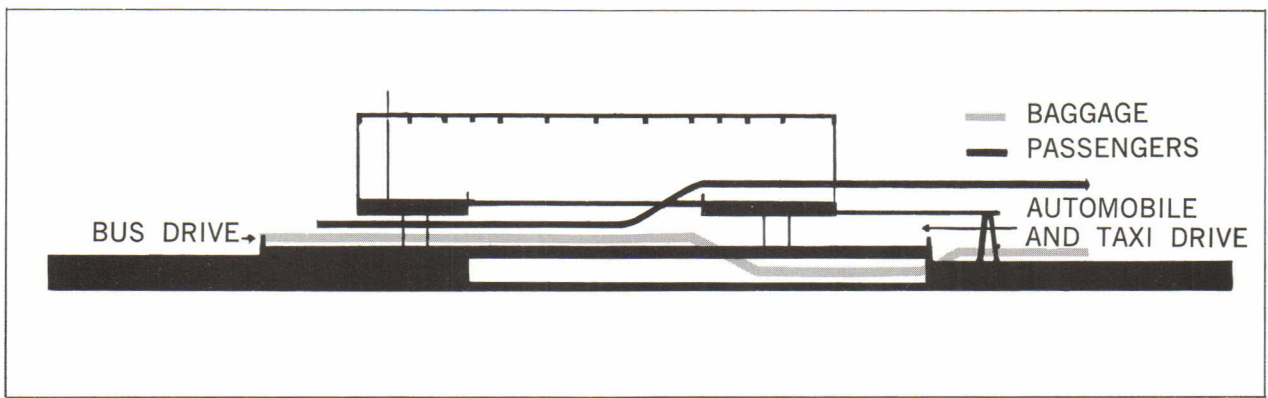
Oscar Bakke, eastern regional director for the FAA, has come forward with a revolutionary proposal: Develop over the obsolete and unused New York City piers special small STOLports from which travelers would be whisked by STOL or VTOL planes to out-of-town jetports for inter-city travel in a matter of minutes. Larger V/STOL planes would also be used for local commutation traffic within an area of several hundred miles from city cores, thereby helping to ease the crush on mass transit facilities. While VTOLcraft will not reach optimum design configurations until the mid-'70s, the feasibility of using such craft in densely populated areas was demonstrated in New York City just this past November in an exercise called Metro Air Support '66, when STOLcraft and VTOL planes landed and took off in the heart of Manhattan.

But what most concerns planners now is the scarcity of land available near major cities for development of such superconvenient STOLports, and much of what remains has already been committed to other uses. As this concern becomes better known, it can be expected that land will be set aside for use of STOLcraft and that architects will be needed to design the terminals, whether on cleared lots, abandoned piers, atop railroad stations or over railroad tracks (there is a trend among railroads to sell their air rights in city areas for other commercial uses).

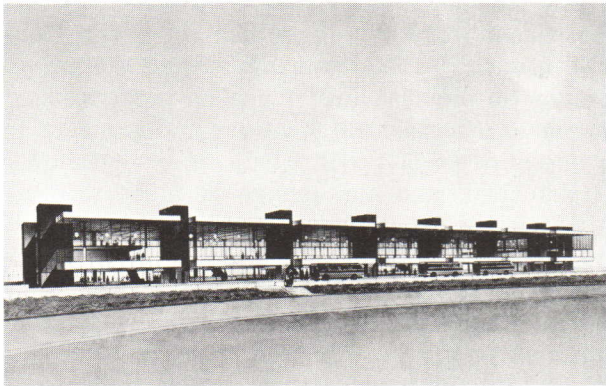
Another use of STOLcraft is projected by Los Angeles in its Skylounge project, backed by federal funds. The Skylounge, mounted on a prime mover (in effect, a bus) picks up passengers at hotels or other central locations and proceeds to a downtown STOLport. There the prime mover is detached, and the lounge is picked up by a STOL "flying crane" and airlifted to the jetport, where it is attached to another prime mover which delivers passengers directly to their planes. Passengers disembarking from the aircraft enter the Skylounge and are bussed and flown to downtown Los Angeles.

Other concepts are also being advanced which suggest that commercial aviation will have a major role in integrated transportation systems of the future. For instance, cargoes of the future may be sealed in giant containers which could be transferred as necessary from one mode of transport to another—road, rail, water, air. This is a logical outgrowth of present advances being made in containerization.

Evident in all of these concepts, however, is a need for architectural services to create new ter-



Author's concept of splitting traffic to avert snarls yet using single level for passengers and luggage whether arriving by car, bus or plane. Below, an exterior view.



terminal and transit facilities keyed not only to modern passenger and cargo-handling techniques but to basic urban and regional design.

Given sound-deadening for future airplanes, the satellite airports which will ring our major metropolises can also be the focal areas of new satellite cities.

Around these airports can be grouped every facility for business, industry and shopping. Both airport and community can be served by the same intercity air transportation terminals for both

short-range air taxis and ground transportation by private auto and truck. Residential and recreational areas will encircle these air-age urban cores and will themselves be framed by interurban green belts. Thus a whole new pattern of urban and suburban living will emerge.

If we are to avoid duplicating all the horrors of unplanned, haphazard development generated over the last 50 years by the misuse of the automobile, then we must act now to control the impact of the new air age on our cities and our countryside.

The Departments of Transportation and of Housing and Urban Development should work together on this problem. They can and should call to their aid business and industry including the airline companies, local government, the business and industry including the airline companies, local government, the architectural profession and its allies. Only a grand alliance of this type can cope with the tremendous problems and opportunities which will soon confront us.

The physical shape, form and character of our country and the lives we lead are at stake. The challenge is rich with opportunity if we rise to meet it; ripe with disaster if we fail. □

“LET’S ALL GO DOWN TO THE JAIL AND SEE ANDY WARHOL”

BY ARTHUR C. RISSER, AIA

Sunday afternoon is cold but sunny. Since about noon, popcorn, fruit and candy vendors have been stationing their little carts along the street in front of the museum. A stranger in town might wonder why they picked this particular location. If he will wait until around two, he will have his answer. People begin arriving by automobile, on foot and by bus. There are single men and women, young and older couples, and, most astonishing, a great number of entire families—fathers

The author: Mr. Risser is a member of the AIA Committee on Auditorium and Theater Architecture.

and mothers escorting their children. Their destination is the museum and art gallery, which will be crowded all afternoon by people who appear interested in the works of art on display. The refreshment vendors do a thriving business as people return to the street from the galleries.

During the next decade, the concern for the quality of life in the community will deepen. The social transformation facing our generation is even greater than that created by the industrial revolution. This transformation is being brought about by automation as well as other powerful forces. We are living in an age of affluence: Poverty is still present, and probably always will be, but the great masses of people no longer are deeply concerned with food, shelter and lodging. They have money and leisure, which can lead to boredom, with its inherent dangers, or into forms of creative self-expression. Many in this “comfort” stratum of society are to be found in the museums and art galleries: They are purchasing books, records and paintings; enrolling in extension and adult education classes; participating in amateur arts and crafts; queuing up in front of theaters and concert halls; and working actively in community theater programs.

Status-seeking is not the motivating force behind this surge of interest in the arts. It is the need

... or take in
an Arthur Miller
play at the
pumping station.

More and
more American
communities,
in need of
an arts center,
are remodeling
abandoned
buildings, with
amazing results.



Railroad pumping station and water reservoir has been transformed into the Rocky Mount Arts and Crafts Center.

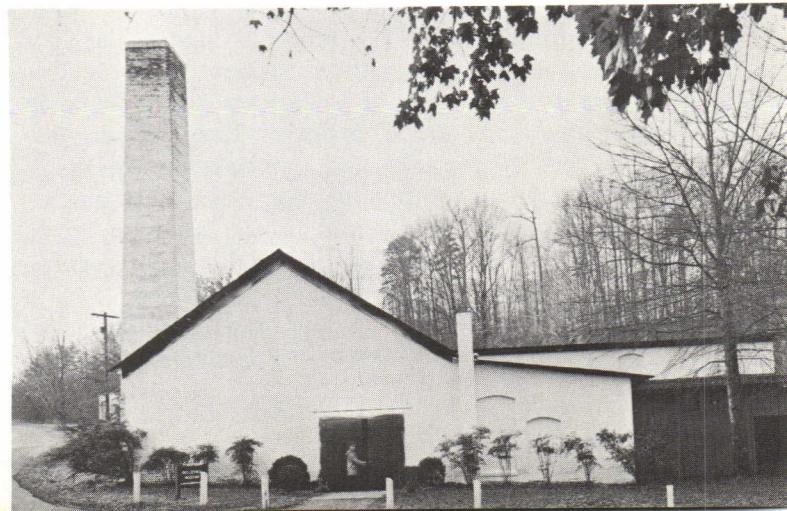
of a person to individualize himself in a mass society. Art offers a means by which the desire for psychic gratification brought about by standardization, mobility and increased income, leisure and education may be satisfied. People will ask and are expecting the city to bring the arts within their grasp. This interest in the arts is certain to increase the sensitivity of people to the environment in which they live, and they will hopefully then become concerned for the character of the cities in which they dwell.

The growing interest in the arts is evidenced by such organizations as the Arts Councils of America, Community Arts Councils and by the construction of civic cultural centers (although often, the real but unvoiced purpose is the achievement of political status, not cultural betterment). Even the federal government has added its support to the upsurge of participation in the arts. One of the most interesting evidences is the appearance, in many communities, of art centers and theaters which have been created by the remodeling of old buildings. This has not been confined to large communities—although in Baltimore, the Maryland Institute, College of Art, recently bought a 69-year-old landmark, the Baltimore and Ohio Railroad Station, and converted

it into an art center. When completed it will include a flexible 250-seat lecture hall, a library, two galleries, student lounge, cafeteria, studios, offices, photographic lab, a bookstore and an 80 x 80-foot glass-front studio for the Rinehart School of Sculpture. Similar projects in other communities, small as well as large, have been completed.

In Rocky Mount, North Carolina, a town of 32,000, an abandoned railroad pumping station and water reservoir was turned into an art center by means of donations from municipal and private funds. The Rocky Mount Arts and Crafts Center is the result of community endeavor and the ingenuity in design of architect Ryland Edwards of the firm of Edwards, Parker, Dove & Associates. When the project is complete, there will be three floors. The first, already completed, houses a circular gallery, two offices and public restrooms. The second floor will consist of a large "multi-purpose" auditorium suitable for theater-in-the-round productions, film lectures, and other activities. The third-floor plan calls for several painting studios, classrooms and a dark-room for photography. Entrance to the building

Another North Carolina pumping station becomes an Arts and Science Museum, with a storeroom theater.



will be through a lobby of brick and plate glass extending to the top floor. The riverside location provides an ideal setting for a surrounding park.

The remarkable aspect of this project is the city's willing financial participation. The city has assumed the full support of the arts center. The pumping station was first renovated at a cost of approximately \$5,000. The water tank transformation, when completed, will cost approximately \$68,000, with the city footing the bills. To date, only the first floor and stairway have been completed at a cost of \$27,784.

In Statesville, North Carolina, a community east of Rocky Mount, a group of citizens assumed the initiative in securing a building for an Arts and Science Museum. The aims for such a center were set forth in the following statement which expresses the motives behind the establishment of all the art centers described in this article: "Statesville needs some kind of umbrella, such as the Arts and Science Museum, under which the various cultural aspects of life can be brought together for the benefit of all. The need is as old as the recognition that man cannot live by bread alone. It is as new as the latest juvenile court

case, autocide or social breakdown. It is as real as the loss of an industry to a neighboring community—and as expensive."

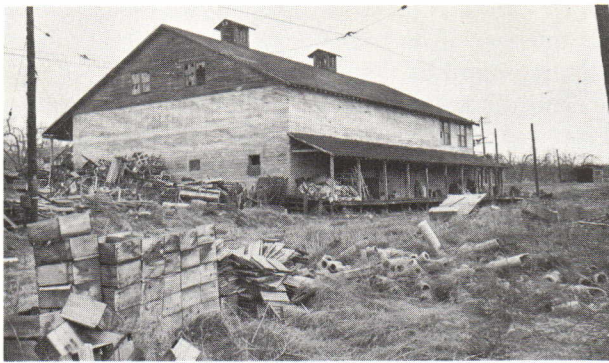
The purposes and objectives of the organization responsible for initiating the project are quoted because they express the concerns of all such groups:

1. To establish a permanent Arts and Science Museum
2. To promote an interest in and enthusiasm for all phases of art and science
3. To secure speakers, lecturers of recognized ability in subjects pertaining to science, art, drama, literature, music, the dance, etc.
4. To bring to the community loan exhibits shown in the most reputable galleries in the country
5. To secure by gift, loan or purchase, objects of art and science to form a permanent collection.

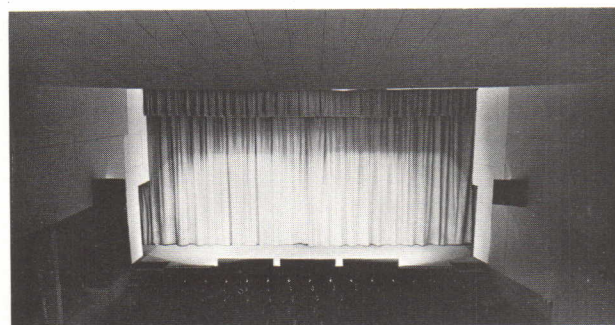
The Arts and Science Museum is housed in an old pumping station, abandoned by the City of Statesville, and leased by the organizing group for 20 years at a dollar a year. Museum members donated their Saturday afternoons, tearing out plumbing, bricking up windows, scrubbing old

The gate at the right indicates the entrance to the Yellowstone County Arts Center in Billings, Montana, after its conversion from the old county jail. The gallery which is shown originally was a cell block.





The Allied Arts Council of Yakima Valley in Washington State has put an abandoned fruit-handling warehouse to good use. It now houses a theater and art galleries which surround the auditorium and function as a lobby.



paint from brick walls and painting, until one room of the picturesque old building was in usable condition.

Through a gift from C. V. Henkel and his family, it became possible to convert the largest room in the pumping station into the Henkel Little Theater.

The museum operates without tax funds and is a nonprofit corporation. It is dependent on donations and membership for its operating and capital funds.

Renovation of old buildings for use as arts centers has not been confined to eastern US. In Calgary, Alberta, Canada, an old tractor factory was remodeled. Old jails at Billings, Montana, and Tacoma, Washington, have become arts centers.

At Tacoma the plans are to build a theater on the third floor where the cell blocks were. In Yakima, Washington, an old fruit-handling warehouse has been converted into an art center and theater. Plans for this project were prepared by the architectural firm of Cowan-Paddock-Hollingberg.

The Yellowstone County Fine Arts Center is the result of a dream by architect Robert E. Fehlberg and the contributions from local citizens of both time and money. Individuals, organizations and business firms contributed \$25,500 for materials needed to convert the former county jail into a fine arts center. Three hundred eighty people scrubbed, built, painted and repaired their way through 5,900 volunteer hours. Although the county retains ownership of the building, no tax money has been available either for renovation or maintenance. The center will function under the Yellowstone County Fine Arts Commission, but money for its operation will have to come from individual patrons. The illustrations show an interior view of one of the galleries and an exterior view before and after remodeling. Landscape architect Ted Worth laid out the plans for the grounds and courtyard.

It is encouraging to observe that many communities are taking it upon themselves to provide art centers and theaters without asking help from the federal government. One cannot help having reservations about governments as patrons of the arts. Usually the most successful works of art are created by individuals working outside the confines of organizations and institutions. Similarly, the art centers which will provide the inspiration and facilities most useful to their immediate patrons will be those which are created by these same patrons and designed to meet their particular needs. The fact that many old, sometimes picturesque, and even historically significant buildings have been converted to art centers indicates a cultural growth in the attitudes of the citizenry toward its community. □

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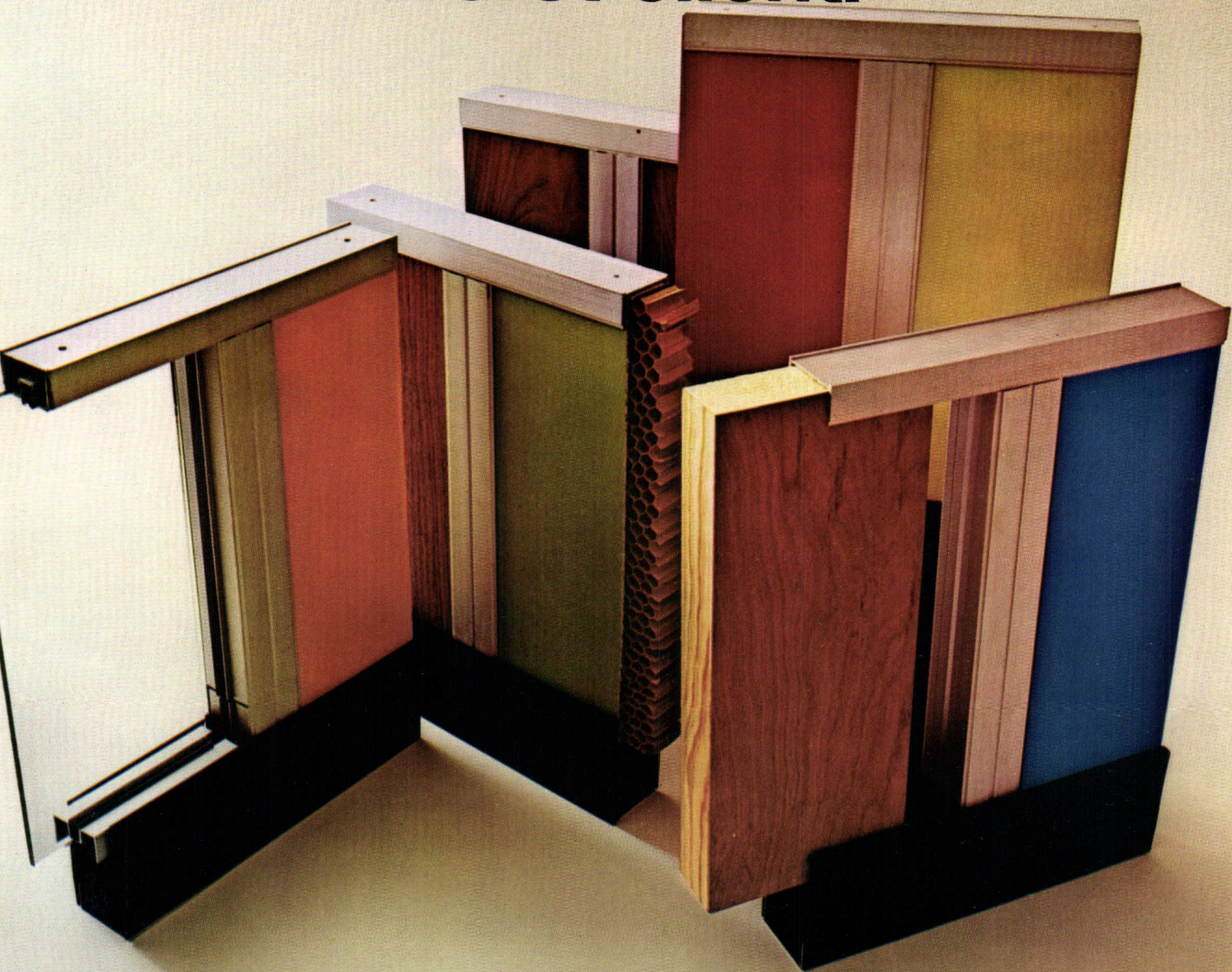
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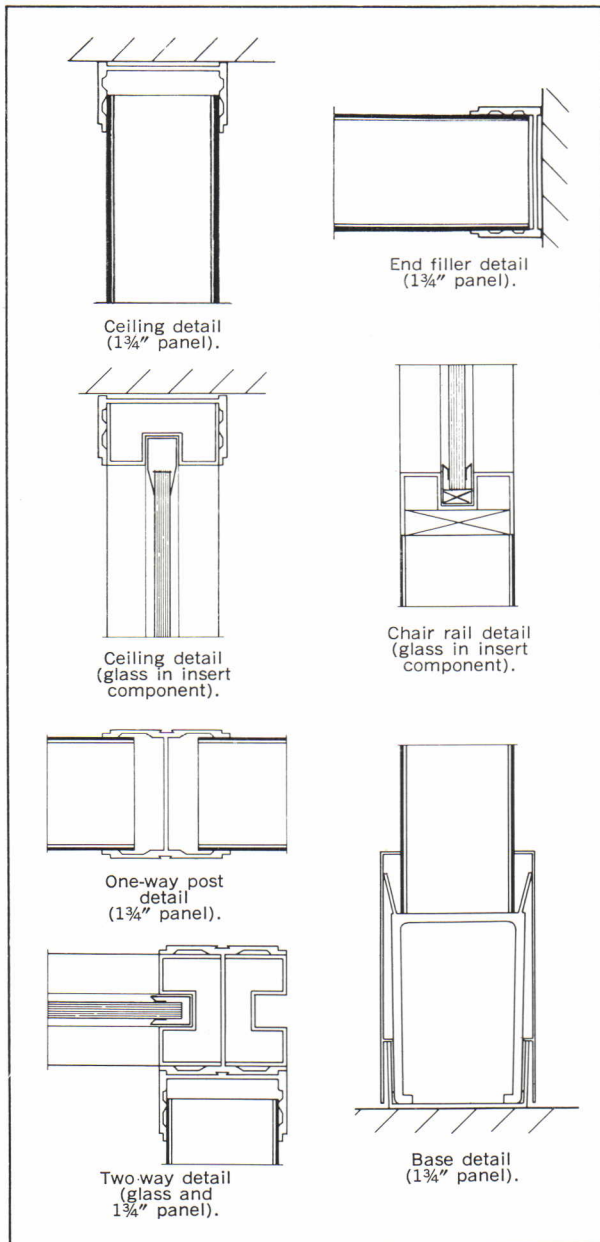
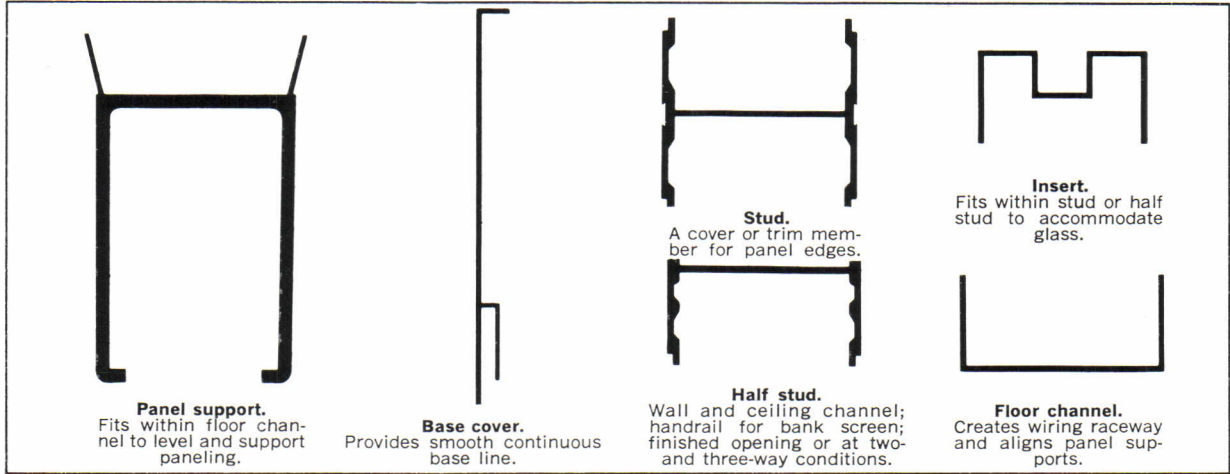
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Gleanings from the Top

The following are excerpts from speeches by Charles M. Nes Jr., FAIA, president of The American Institute of Architects.

► Let architecture and community become mutually exclusive as we have done for decades, and design becomes recognizable chiefly by an isolated gem in an amorphous mass of mediocrity.

► We began as a hardworking pioneer people, and many will say that we have lost much of our former heritage of industry and individualism. Perhaps, but the popular portrait of the rugged individualist of early America has been used to damage another and equally important portion of our heritage.

Our forefathers were indeed tough-minded and individualistic, but they were also quite willing, particularly in the planning of the New England towns, to subordinate personal desires in the use of land to the best interests of the community.

► It is irony that, with our vaunted technology, higher mathematics, building machinery and vast resources, we cannot quite yet match the livability and human appeal of the towns our forefathers created more than 200 years ago. This, indeed, is a heritage lost and gone astray.

► That there is a malady in the American society is perfectly obvious. The question of defining it is complex. It involves racial complications, poverty, municipal administration, physical relationships at the different levels of government, and the residential and transport arrangements of the auto age.

This list of problems is made more complex by the growing realization that the traditional form of our cities, as we think of them, may be no longer relevant for today's age and that a new form of urban living will have to be invented that takes into account the changed role of communications, the changing patterns of industry, the increased mobility of the American people due in large measure to automobiles and road systems, and the traditional longing of the American people for space and the country.

► Many talents are required to handle today's complex tasks. Yet the fact remains that the architect, despite all his shortcomings, flaws and imperfections, is still the only

professional who is trained (often poorly and inadequately, it is true) in the three-dimensional planning of the environment for human use.

Because he has this special training, he also has a special responsibility to play a leading role in the remaking of the environment.

► It is quite true that the profession, particularly in the past century, turned in other directions, became preoccupied with styles and the fight for the acceptance of modernity. This is behind us now. We face, and are in, a new era and what, in a sense, is a very old task—the application of competent design to the social, economic and political demands of urban society.

► I think we must investigate thoroughly the new requirements of projects so large as to be beyond the scope of our small profession as we work today. We must first determine what knowledge architects need to have to do this job and then develop the programs from which architects can acquire and use this knowledge.

We must commit ourselves to the changes needed to participate in the revolution underway.

► I submit that we must change in order to retain, much less increase, our influence in design decisions. Our profession is not growing nearly so fast as the need for our services; the proportion of buildings and urban complexes in which design decisions are on at least an equal priority with economic ones is bound to drop sharply if we fail to increase our understanding of future needs and our capability to meet them.

► It may be that we will, in the near future, have to assume much of the role and responsibility of the entrepreneur in order to assure the needed voice of the architect in decision making. We will need to be involved in the origin of development, in the feasibility studies, in design and in the securing of financing.

We will need to understand land and building values, income potential, tax implications and the basics of mortgage financing. It also may well be that we should restudy the entire role of professionalism as it relates to architects and, more particularly, our standards which tend to discourage the involvement of the architect as the owner and promoter.

I suggest the design of buildings of which he is owner offers the architect an activity of great potential usefulness.

► I believe we will need bold measures to restore the vital parts of our old cities and that this will be the hardest job of all. It is not easy to make a bed when someone is sleeping in it or to straighten out the circulation in a house that has already been built. I maintain that new cities created by industrial relocation, a variety of incentives and the promise of a better life may ultimately be easier to achieve. I also believe that the very large centers which are so created will spawn, in turn, a host of small satellite communities which may yet give us a delightful revival of small-town America.

► The right course (to meet future demands on architects), as most of us realize, lies in the very important changes now beginning in architectural education. These changes will give the student as broad and flexible a training as possible with a wide awareness of the changes in American society and of all that should go into the design of the towns and cities for this society.

We might hope that he will then achieve the vision and means of turning it into reality. If this sort of education leads to the breakdown of professional labels, so much the better. Names matter little compared with the importance of training experts who are capable of controlling the relationship of men and their physical man-built environment.

If we cannot do this, it will not just be the experts who will have failed—it will be our community and our country.

► We must persuade every articulate member of our profession to immerse himself in the political and social life of his community.

If we are serious about being of genuine value to society, everyone of us must place himself in the most advantageous position possible to influence community sentiment, establish genuine planning goals, demand a transportation system which is compatible with community design, reform zoning and building laws, find solutions to the gnawing problem of the ghetto, and to do the many, many things that will make his community more livable, beautiful and prosperous. □



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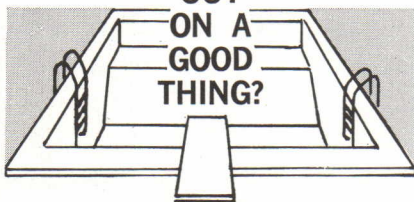
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86 AIA JOURNAL/FEBRUARY 1967

When Chapter Serves

The author, Robert J. Piper, AIA, was an Institute administrator before joining the Perkins & Will Partnership last month.

When the public stirs over the state of its physical environment, architects react approvingly and frequently join in campaigns to upgrade the community.

The architects' cooperation is generally channeled through their AIA chapter which, in fact, may be called upon to serve the community in a consulting capacity. Such requests have been made of many chapters, and they have responded with enthusiastic acceptances.

This public-spirited willingness to contribute professional services is admirable. At the same time, it is a willingness that contains the seeds of practical and ethical difficulties.

The first question a chapter should weigh is whether the proposed project is truly in the public interest. Whether the agency submitting the proposal is public or private makes no difference; the test is whether the proposal is aimed at serving the best interests of the community.

A second question should be addressed to the ethical parameters of such chapter activity. To stay in bounds ethically, the chapter should not go beyond that which is necessary to stimulate the agency toward concrete action.

Conceivably the agency's purpose might be the retention of the entire chapter, thus evading the "political" difficulties that sometimes ensue from naming an individual firm or person as consultant. On the other hand, the solicitation could represent a genuine attempt to tap the full design talent of the community.

Whatever the motives, the chapter is out of bounds when it agrees to perform services which the local agency is able and willing to obtain from a private practitioner.

The route, then, is to stimulate the agency to action, action which leads to the retention of a private practitioner.

How does a chapter encourage retention of a private practitioner? The effort can take one of several forms:

1. The chapter might offer to appoint two or three of its mem-

bers to serve as a consulting committee without remuneration. It should be clearly understood, however, that the committee is temporary—that it has been set up "to see how the process works." The intent here is to develop criteria for future consulting services for which a fee would be paid.

2. The chapter could promote the appointment of one or more of its members to the local planning commission, Urban Renewal Authority or other agency having jurisdiction over the project in question.

As public servants with official status, these architects would review projects in terms of esthetic qualities, site planning and harmony with surrounding areas, just as they normally review projects for their effect on plans for land use, transportation, community facilities, zoning, urban renewal, etc.

3. After thorough discussion and decision, the chapter might in propriety suggest to the agency that it is willing to offer consultation on a project's overall esthetic qualities, site planning and harmony with surrounding areas.

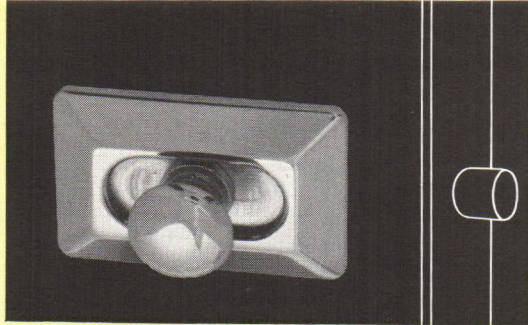
Any compensation for such service should be as reimbursement for expenses; it should not take the form of a fee for professional services.



It must be borne in mind, however, that this kind of arrangement threatens to establish a precedent under which the local body may tend to expect professional services for something less than professional fees.

In summary, it is for the chapter to decide whether to insist on the retention of an individual professional consultant, appoint a temporary committee to establish consulting criteria, promote the appointment of one or more members to an official body or offer its services on a reimbursable basis. □

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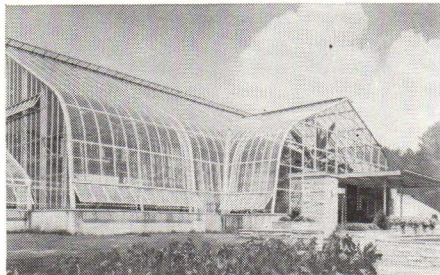


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- ★ Domed display areas ★ Greenhouses
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- ★ Pool enclosures ★ Atria ★ Solaria
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Books

The Puzzle of Architecture.

Robin Boyd. Melbourne University Press; New York: Cambridge University Press, 1966. 188 pp. \$12.50

Puzzling at all levels, architecture is perhaps the greatest enigma of all to the millions who want no more from architecture than shelter, writes Boyd, an Australian architect who is also well known as a writer and lecturer. At this level people ask *why*. Why all the bother? Why all the thousands and thousands of attempts to make a structure beautiful? Didn't the Greeks achieve this aim over 2,000 years ago? Are architects even necessary today?

At the next level the fanciers of architecture and people of taste don't ask *why*. They ask *what*. What is architecture seeking? The 20th century educated architectural enthusiast has seen much he regarded as important in architecture discarded. During the first half of the century he became accustomed to the glass box and learned to derive some enjoyment from it. But then the unemotional glass box passed from the control of architects to "the boys of technology," as Boyd terms them, and the glass box is no longer the whole of modern architecture.

The second half of the century has witnessed the development of as many styles in architecture as in painting and music, and there aren't many rules left for the man of taste to mull over. In all this rabble what is considered valid? What is architecture?

Boyd says any reasonably sensitive and experienced architect knows what architecture is. He knows the eternal principle of good design is integrity—wholeness, unity. And so at the highest level the question is not *why* nor *what*. It is *how*. Writes Boyd: "Puzzle—Use the sternly practical business of providing bodily shelter as a medium of artistic expression." How can the architect build with the conviction of the Greeks and be honest in this modern, practical world? The major portion of the book goes on from here to an exploration of *how*.

The author writes both optimistically and humorously. He believes that in the midst of all the chaos in the evolution of modern architecture an essentially "good" form is emerging. After what he calls "a silly season," he detects a

returning discipline and a regrowth of conviction, artistically and intellectually.

This is a stimulating book, and a provocative one. It is pleasing to read, not only for the ideas and the pungent prose but also for the boldly generous margins, the exceedingly legible type and the author's really delightful line drawings. All add to the pleasure and the profit. MARY E. OSMAN

Intentions in Architecture.

Christian Norberg-Schulz. Cambridge, Mass.: MIT Press, 1965. 242 pp. \$8.50

This book, first published in 1963 by Allen and Unwin in London and Universitetsforlaget in Oslo, is now made available in an American edition. It well deserves to be brought to the attention of the American architect because it is a singularly provocative book.

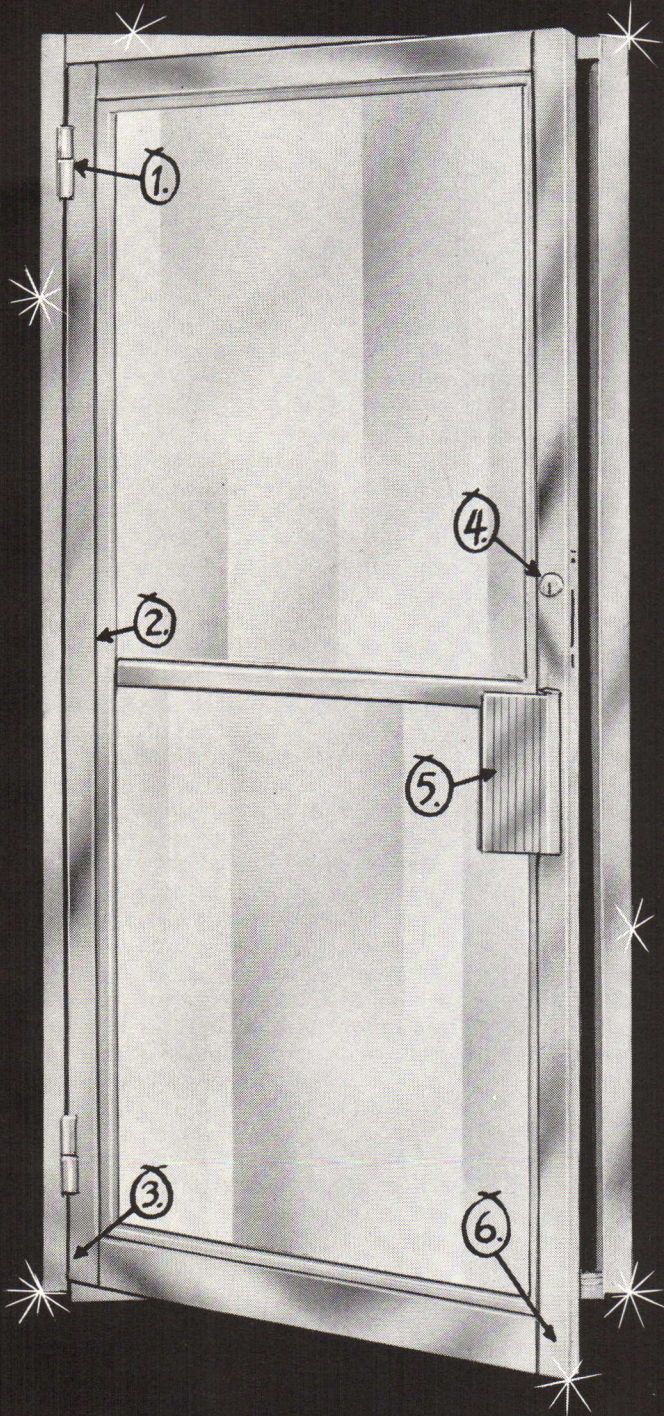
Briefly, Norberg-Schulz sets forth a theoretical framework for architecture. Other professions, he reminds the reader, have had to develop comprehensive theoretical "tools," but the architect has been reluctant to do so because he thinks theory stifles the creative faculty. The intention of Norberg-Schulz is to prove that this prejudice is erroneous.

After an examination of the present situation in architecture and a discussion of perception and symbolization, the author outlines a conceptual scheme whereby subject matter is organized in such a way that it aims to be useful both in the analysis of building tasks and of finished works. This effort represents the main body of the book.

The author concludes with an application of the theory to experience, production, analysis and education. It is in the final chapter on education that Norberg-Schulz makes some of his more provocative remarks. Building, he states, means "the solution of social and cultural problems rather than the erection of houses of a certain number of square metres," and he would educate the architect so that he develops the faculties of integration, analysis, and experience and also acquires a general cultural background "to give the intentions an adequate depth."

In conclusion he writes: "It seems natural to take *architecture* Continued on page 90

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as the point of departure for architectural education. But as far as we know, this has never really been done. Instead, one has taught abstract formal ideals or fragmentary aspects of planning and technics. The reason, without doubt, has been the lack of an integrated theory of architecture which defines and coordinates problems."

This is a scholarly and significant document in which Norberg-Schulz makes a genuine contribution toward the development of an integrated theory of architecture.

Twentieth-Century Architecture: The Middle Years 1940-65.

John Jacobus. New York: Praeger, 1966. 215 pp. \$18.50

Jacobus states that there are several ways one could write a history of the 25 years he has under scrutiny. He has chosen a history of style, beginning with an exploration of the genealogy of modern architecture and concluding with what he terms as "the dawn of what may prove to be a new age of fulfillment and creative expansion."

The author writes in detail of Wright, Gropius, Mies van der

Rohe and Le Corbusier, and then turns to survey the work of such men as Saarinen, Nervi, Johnson, Breuer, Rudolph, Kahn and others. Perhaps he has omitted some contributors to the architecture of the '60s, as at least one reviewer has complained, but he certainly seems to have considered the major influences and to have made a distinct contribution to the study of contemporary architecture. There are 318 plates and 84 plans and diagrams which serve to augment the text.

Park Guell de A. Gaudi. C. Giedion-Welcker. New York: Wittenborn, 1966. 64 pp. \$15

Surely there is no park anywhere that gives one a sense of joyousness such as the Guell Park in Barcelona inspires. This brief critique, in Spanish, English and French, indicates the park's sculptural qualities. Through color and form Gaudi demonstrated a seemingly unending invention of happy improvisations. There are nearly 70 photographs, many in color, which are credited to Joaquin Gomis. They are, perhaps, more important than the text.

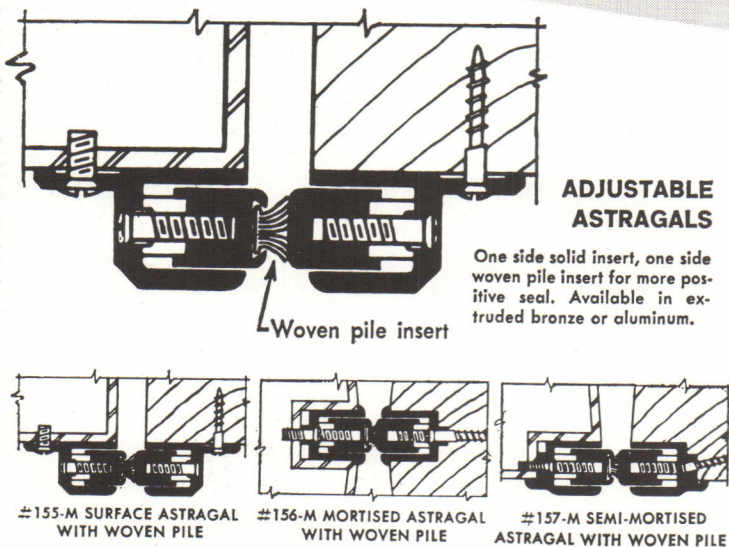
Architectural Photography. Joachim Giebelhausen. English language edition by E. F. Linssen. Munich: Nikolaus Karpf, Verlag Grossbild-Technik (distributed in the US by Kling Photo Corp., New York), 1965. 256 pp. \$22.50

If you don't think a camera is important equipment for the architect, you should read this book. It may change your mind, and it will certainly give you a great deal of helpful information about how to build a photographic library to suit your own purposes. There is much advice in nontechnical prose on the photography of exteriors and interiors of buildings, building materials and architectural models and on architectonic aerial photography and photographic equipment.

One of the interesting chapters is on "Photography, Architecture and the Law," which summarizes American and German copyright, and includes also brief comments on laws in other countries. In the United States a photographer has few problems "with legal inhibitions," but in some countries the photographing of an architectural structure may be an infringement of the architect's copyright. The photographic examples throughout the book, many in color, are striking.

Continued on page 94

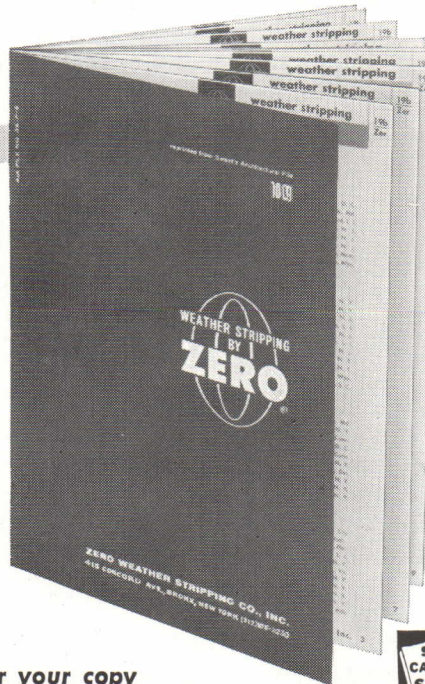
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HAWLEY, PENNSYLVANIA—In recent years, more and more school districts throughout the country have discovered that in building new schools, there are certain sizable advantages to be gained by pooling their financial resources with those of neighboring districts, and with the bigger bank roll, building one large centralized school to serve all districts instead of building several small schools to serve each district separately. Broader curriculums are made possible this way, as well as bigger buildings capable of accommodating greater student growth. Such schools can also be better equipped. Consortiums of this type are called “jointures” and in this area the first jointure school is the Wallenpaupack (Indian for “fast and slow waters”) Junior-Senior High School. Wallenpaupack was completed in 1964 and now serves some 800 seventh to twelfth grade students from nine school districts in this northeastern section of Pennsylvania.

Wallenpaupack has a “Time and Space” course in its curriculum which it plans one day to implement with its own planetarium. Neither the course nor the planetarium would have been possible except for the jointure effort. It also has a vocational agriculture course made possible the same way. “And all of our courses, standard and new,” says

William Blewett, President of the Jointure District, “are better equipped. No more typing classes with four kids to one typewriter.”

Wallenpaupack was built to accommodate normal student growth for at least five years to come. It is a one-story masonry building with 120,333 square feet of exposed wall area, including 8,182 square feet of glass area.

It is electrically heated with unit ventilators. In the design stage of construction, the architects—Everett Associates of Allentown—conducted an extensive cost analysis to compare the buying, owning and operating costs of electricity with oil and gas heating systems. In each regard, electricity came to less. Less expensive to buy and install, less expensive to maintain and less expensive to operate. Because of these findings, and because of the inherent cleanliness, safety and comfort of electric systems, Everett Associates recommended, and the Jointure Board accepted, the electric unit ventilator heating system. “And we haven’t been sorry a minute,” says President Blewett. “We have no maintenance problems, and we’ve got a system that will be modern for 20 or 30 years. Electric heating is part of the whole package of which we’re very proud.”

SEE REVERSE SIDE FOR DETAIL INFORMATION

1 CATEGORY OF STRUCTURE:
Educational—Junior/Senior High School

2 GENERAL DESCRIPTION:
Area: 122,246 sq ft
Volume: 1,542,239 cu ft
Number of floors: one
Number of occupants: 847
Number of rooms: 39
Types of rooms: classrooms, offices, laboratories, cafeteria, gymnasium, auditorium, science rooms, storage areas

3 CONSTRUCTION DETAILS:
Glass: double
Exterior walls: masonry with 2" glass foam (R/5) plaster interior. U-factor: .11
Roof or ceilings: built-up roof with 3" insulating concrete, 1" urethane (R/7). U-factor: .09
Floors: concrete, 2" perimeter insulation
Gross exposed wall area: 120,333 sq ft
Glass area: 8,182 sq ft

4 ENVIRONMENTAL DESIGN CONDITIONS:
Heating:
Heat loss Btuh: 3,456,000
Normal degree days: 7,000
Ventilation requirements: 22,000 cfm
Design conditions: 0°F outdoors; 70°F indoors
Cooling:
Offices only

5 LIGHTING:
Levels in footcandles: 55-70
Levels in watts/sq ft: 4.4
Type: fluorescent and incandescent

6 HEATING AND COOLING SYSTEM:
The classrooms and cafeteria are heated by electric cabinet unit ventilators located at exterior walls. The auditorium has two large electric heating-ventilating units with an extensive supply-duct distribution system. The gym is heated the same way but has concealed supply ducts. The shops have suspended unit heaters. The offices are equipped with self-contained, through-the-wall electric heating-cooling units.

7 ELECTRICAL SERVICE:
Type: underground
Voltage: 265/460v
Metering: secondary

8 CONNECTED LOADS:

Heating & Cooling (5 tons)	1412 kw
Lighting	450 kw
Cooking	246 kw
Water Heating	368 kw
Other	48 kw
TOTAL	2524 kw

9 INSTALLED COST:*

General Work	\$1,205,940	\$ 9.92/sq ft
Plumbing	147,788	1.23/sq ft
Electrical	201,150	1.73/sq ft
Heating & Vent.	181,093	1.55/sq ft
TOTAL	\$1,735,971	\$15.09/sq ft

*Building was completed January 1964

10 HOURS AND METHODS OF OPERATION:
Usual nine-month school year. Estimated average occupancy of 70 hours per week.

11 OPERATING COST:
Period: 7/12/65 through 7/13/66
Actual degree days: 6,287
Actual kwh: 1,490,000*
Actual cost: \$18,786.40*
Avg. cost per kwh: 1.26 cents*
*For total electrical usage

Billing Date	Demand	Kwh	Amount
8/12/65	76	14,600	\$ 177.20
9/13/65	805	28,700	855.00
10/12/65	894	79,400	954.80
11/10/65	1,105	118,100	1,419.20
12/10/65	1,216	169,700	2,038.40
1/12/66	1,216	204,800	2,459.60
2/09/66	1,116	234,600	2,817.20
3/11/66	1,227	212,700	2,554.40
4/12/66	1,238	186,200	2,236.40
5/12/66	1,016	142,100	1,707.20
6/13/66	1,027	78,600	1,077.00
7/13/66	440	20,500	490.00
TOTAL		1,490,000	\$18,786.40

12 UNUSUAL FEATURES:
The school is divided into seven zones for optimum efficiency and flexibility. A time clock automatically programs temperatures in each zone during occupied and unoccupied periods. The temperature in each classroom can also be manually controlled.

13 REASONS FOR INSTALLING ELECTRIC HEAT:
Electric heat offered the lowest total owning and operating costs. It also provided flexibility, cleanliness, comfort and convenience. In addition, there was a saving on construction costs because the electric system didn't require a boiler room, chimney, flues, piping, etc., as would have a central flame fuel system.

14 PERSONNEL:
Owner: Wayne-Pike Joint School Authority
Architects & Engineers: Everett Associates
Consulting Engineers: Lehigh Associates
General Contractor: Sutler Corp.
Electrical Contractor: George F. DeLallo, Inc.
Utility: Pennsylvania Power & Light Company

15 PREPARED BY:
James A. Burke, Industrial and Commercial Space Heating Specialist, Pennsylvania Power & Light Company.

16 VERIFIED BY:

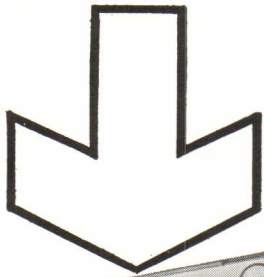
Lee Everett, AIA

The Consulting Engineers Council USA, has confirmed the above categories of information as being adequate to provide a comprehensive evaluation of the building project reviewed.

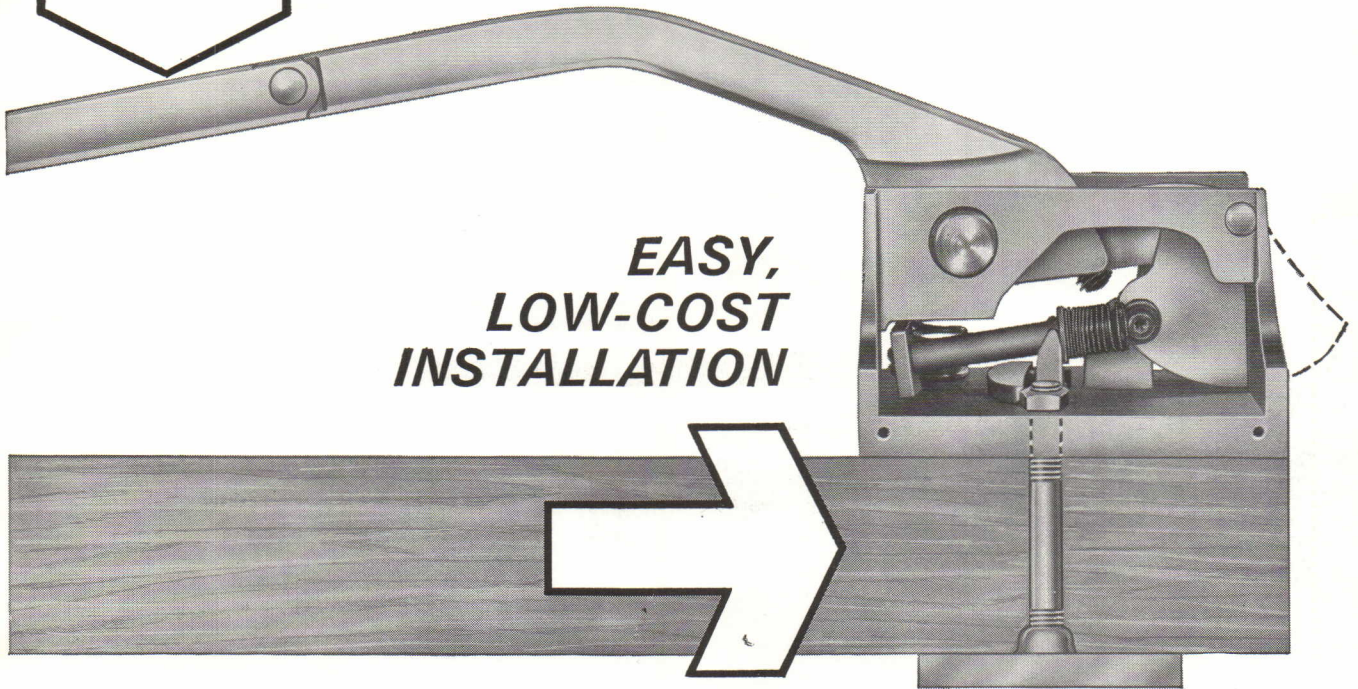
NOTICE: This is one of a series of case histories of buildings in all structural categories. If you are an architect or consulting engineer; an architectural or engineering student; an educator; a government employee in the struc-

tural field; a builder or owner, you may receive the complete series free by filling out the strip coupon at the left and mailing it to EHA. If you are not in one of the above categories, you may receive the series at nominal cost.

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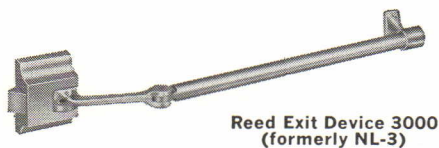


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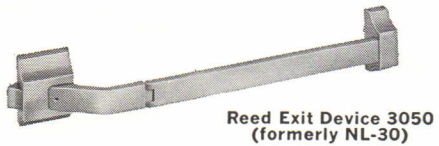


**EASY,
LOW-COST
INSTALLATION**

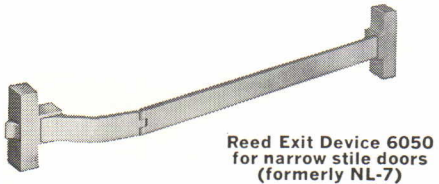
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AIA JOURNAL/FEBRUARY 1967 93

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Books from page 90

Historic Preservation Today. Essays Presented to the Seminar on Preservation and Restoration, Williamsburg, Va., Sept. 8-11, 1963. Charlottesville, University Press of Virginia, 1966. 265 pp. \$4

Sponsored by the National Trust for Historic Preservation and Colonial Williamsburg, the seminar was designed to review the history of American preservation, to analyze its philosophical basis, to examine its present state and to consider ways to shape its future. Nine papers are included with comments upon them—a stimulating and provocative group, which should be helpful to those concerned with problems of preservation.

The Metropolitan Transportation Problem. Wilfred Owen. Revised edition. New York: Doubleday, 1966. 266 pp. \$1.45

The first edition of this work appeared in 1956 and received due praise from many scholarly journals. Vast changes in the urban scene have since occurred, and, as Owen states, "The results have raised the question whether it is possible to be urbanized and motorized and at the same time civilized."

The author, eminently qualified to write on the subject, explores the transportation problems of metropolitan areas and relates urban mobility to urban finance, administration and renewal. He calls for a new approach to the transportation crisis and makes clear and specific recommendations for solutions. He emphasizes that transportation resources can be used in order to achieve better communities and that community planning techniques can be utilized to achieve better transportation. "The combination could launch a revolutionary attack on urban congestion that is long overdue." This is a well-written, important and timely study, and now inexpensive enough for anyone concerned with urban America to have for bus or subway reading.

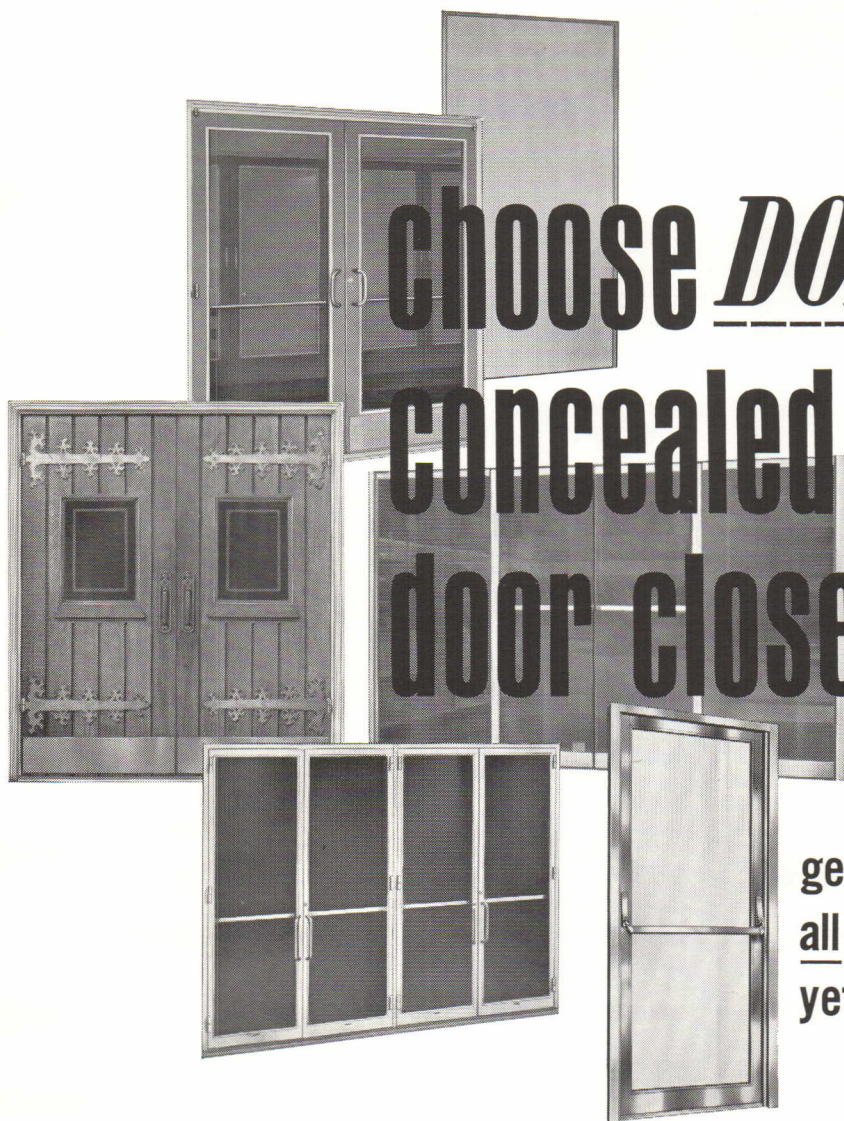
The Theory and Practice of Reinforced Concrete. Clarence W. Dunham. New York: McGraw-Hill, 1966. 629 pp. \$14.75

This fourth edition is extensively revised to conform to the latest ACI Standard Building Code Requirements for Reinforced Concrete.

Plastics in Building Structures: Proceedings of a conference held in London, 14-16, June 1965. Oxford, New York: Pergamon Press, 1966. 320 pp. \$15

There is fast-growing recognition that plastics are not simply cheap substitutes but are materials in their own right with infinite possibilities for architecture. In 1965 the Plastics Institute, in association with the Institution of Structural Engineers and the Royal Institute of British Architects, sponsored a conference to consider the applicability of plastic materials in buildings.

This volume contains the text of the papers presented at the conference, as well as the edited record of discussions which followed each paper's presentation. The volume provides a great deal of information on the present structural use of plastics, and it points up the necessity for research and study in a number of areas, particularly the performance of plastics in fires.



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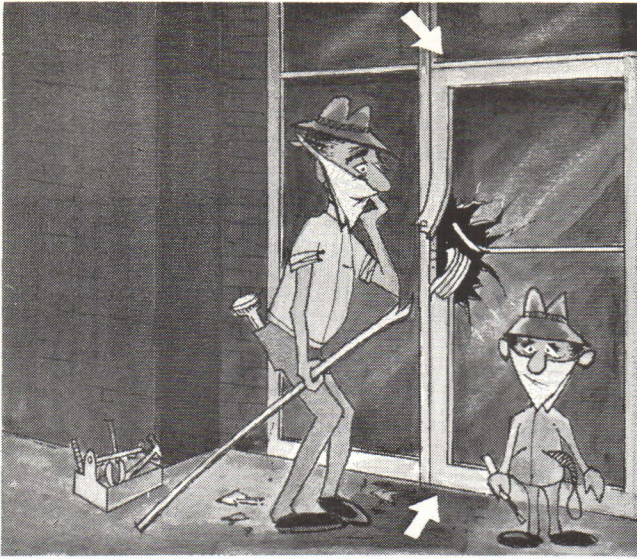


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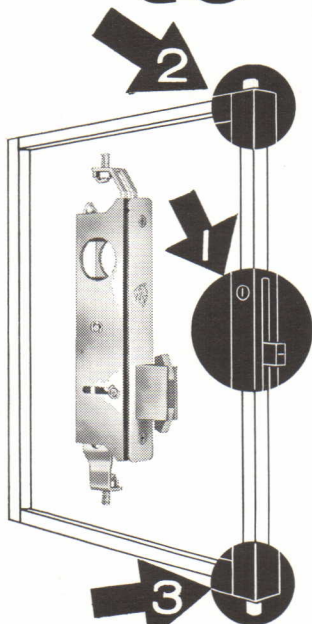
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96 AIA JOURNAL/FEBRUARY 1967

Calendar

Feb. 12-15: American Society of Concrete Constructors Annual Convention, Royal Orleans Hotel, New Orleans

March 20-22: Intercom I International Contract Exposition and Congress, Merchandise Mart, Chicago

April 1-7: American Society of Planning Officials National Planning Conference, Shamrock Hilton Hotel, Houston

April 1-7: American Concrete Institute Annual Convention, Royal York Hotel, Toronto

April 25-27: Contract '67 Contract Industry Trade Show, the Coliseum, New York

May 12-14: Association of Collegiate Schools of Architecture Annual Meeting, Barbizon-Plaza Hotel, New York

May 14-16: Illuminating Engineering Society Annual Theater, Television and Film Lighting Symposium, Hollywood Roosevelt Hotel, Hollywood, Calif.

May 14-18: AIA Annual Convention, New York Hilton Hotel, New York

May 29-31: Construction Specifications Institute Annual Convention, Hotel Fontainebleau, Miami

June 18-23: International Design Conference, Aspen, Colo.

AIA Regional and State Conventions

April 5-7: North Central States Region, Sheraton-Schroeder Hotel, Milwaukee

April 20-22: Gulf States Regional Convention, Roosevelt Hotel, New Orleans

Oct. 3-7: Florida Association of Architects, Diplomat Hotel, Hollywood-by-the-Sea

AIA Committees and Related Meetings

(At the Octagon unless otherwise noted)

Feb. 15-17: Honor Awards Jury

Feb. 17-18: Urban Design Committee

March 1-2: Reynolds Memorial Award Jury

March 6-10: Jury of Fellows

March 13-15: Board of Directors, Carefree Inn, Carefree, Ariz.

International

June 19-28: International Commission on Illumination Session, Shoreham Hotel, Washington, D.C. (attendance by application only, to US National Committee of CIE, Secretary, L. E. Barbrow, c/o National Bureau of Standards, Washington, D.C.)

July 3-8: UIA Congress, Prague

Aug. 28-Sept. 2: 1967 International Ecumenical Congress on Religion, Architecture and the Visual Arts, Hilton Hotel, New York

Tours

- Architects Grand Air Treks of Treasures of Egypt, the Middle East and Baghdad, 22 days each, departing New York and Washington, D.C., Feb. 24 and March 31. Arranged for AIA members, their families and friends by United States Travel Agency, Inc., 807 15th St. N.W., Washington, D.C.

- Mexican Architecture and Interior Design Seminar-Tour, meeting Mexico City, Sept. 30, 14 days. Reservations accepted in order received with deposit of \$50 per person toward cost of \$358, airmailed to T. H. Hewitt, Apartado Postal 5-251, Mexico 5, D.F. □

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Letters

A Plug for Porcelain Enamel

EDITOR:

Regarding "An Oilman Talks Esthetics" in the August issue, we believe beautification problems exist in service station marketing as you do, but we look at them in a much different way. They have always existed and will continue to do so with the overuse of one type of design or proliferation of just a few materials.

I want to speak out for porcelain enamel on steel, which some consider gaudy. It must be remembered that oil companies have fathered its use going back 30 years, since maintenance is their responsibility and porcelain is unmatched from the standpoint of its ability to be easily cleaned.

After the birth of architectural porcelain and its early growth, architects, in cooperation with manufacturers, expanded its application and accomplished designs that are beautiful. All in all, it is a relatively young industry when compared with other products.

Any material, no matter how good or bad, can be utilized too much. Take the curtain wall as an example.

The best design and use for porcelain enamel has yet to be produced; it is only restricted by the minds of men to create and then apply ideas.

A. L. JEFFERY
Sales Engineer

Davidson Enamel Products
Lima, Ohio

A Plea from a Constructor

EDITOR:

Between now and the year 2000 the United States will experience an unprecedented building boom, calling for as much additional construction as has been put in place since the Pilgrims landed.

This monumental task calls for a drastic revision of our current procedures. Independent actions on the parts of the architect, engineer and constructor must be phased out and, instead, there must be a coordinated construction effort with these three professions working as smooth-functioning teams. Past experiences in this industry have shown, with few exceptions, an appalling lack of communications among these groups, with resultant expenditures of excessive time, energy and money.

Since the architect is the first man to come in contact with the owner, he is the logical leader of the team. Working as a cohesive unit, the architect, engineer and constructor can do much to eliminate possible bottlenecks before they are encountered.

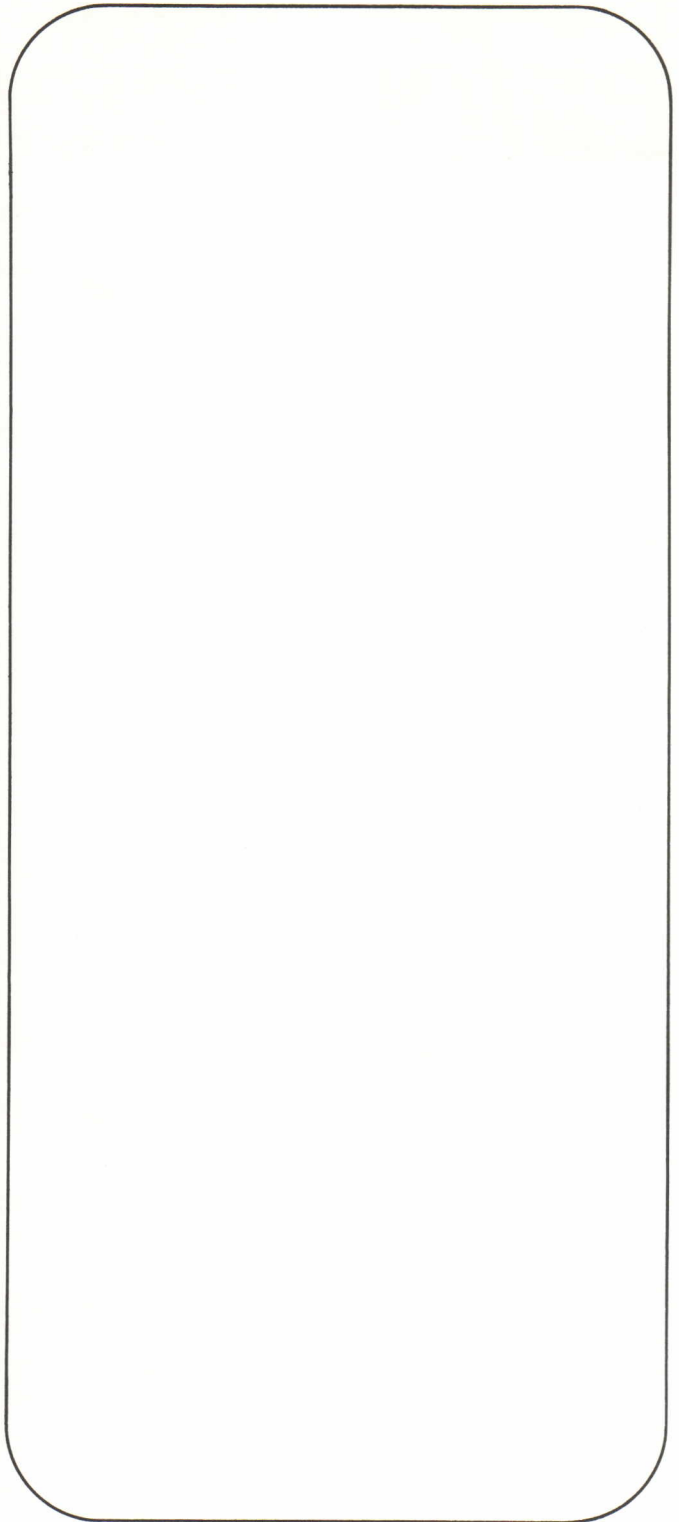
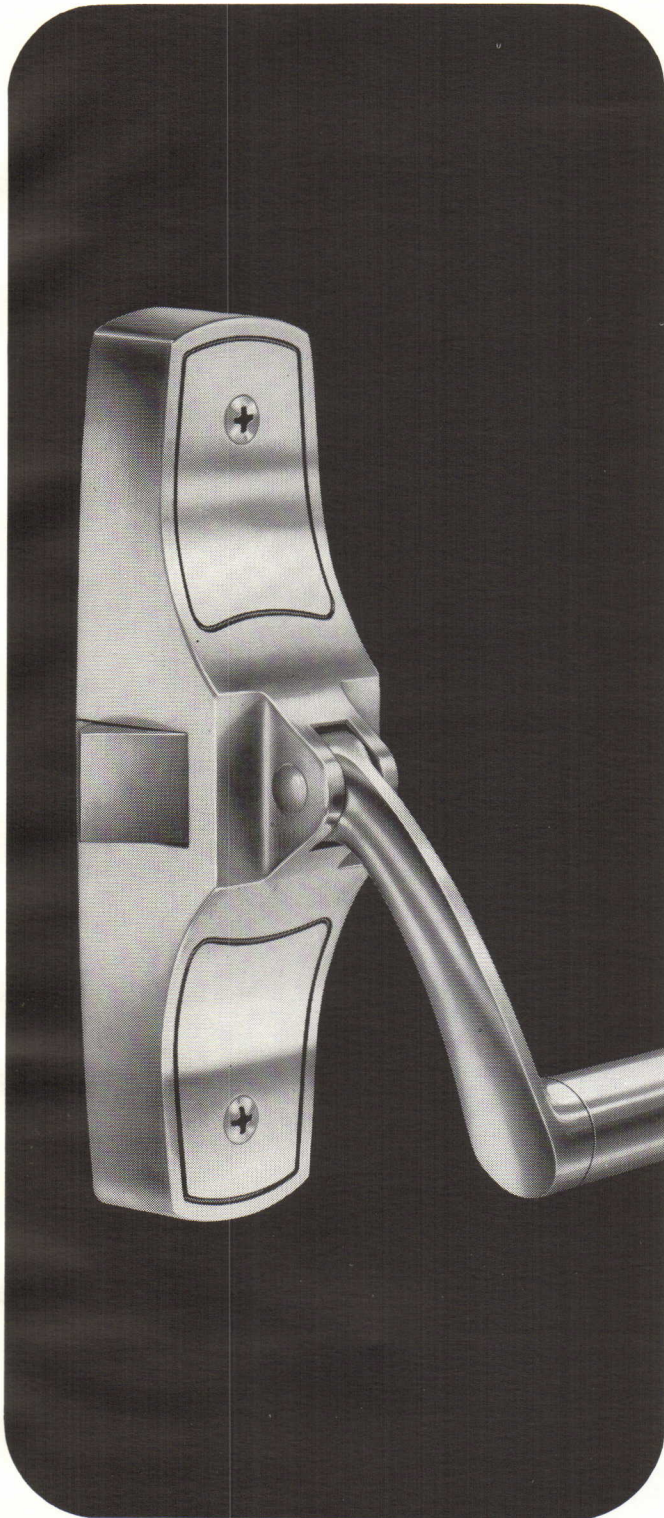
As an important adjunct we would recommend the adoption of a practice that has already received favorable comment from parties using it: prebid conferences. Records bear out that such meetings, with the suppliers included, lead to smoother functioning at the jobsite and more realistic bidding. Once the bids have been awarded we urge that frequent, personalized meetings be held. Thus the general and specialty contractors will have a concise, up-to-the-minute understanding of the architect's desires as well as those of the engineers.

As constructors, we feel that most architects and engineers do not avail themselves of the inventiveness and ingenuity of the men who do the actual construction.

None of us is foolhardy enough to believe that the architect, the engineer or the constructor alone can erect a building. Yet the failure of these three professions to perform as a unit has created a poor image for the entire construction industry—so much so that the public tends to view it as a bumbling, inept giant, too involved with its personal squabbles to compare favorably with "better-organized" industries in the nation. Only teamwork can supply the right product at the right time at the right price. Cost controls must be planned and adhered to and, coincident with this, there must be adequate control of quality in materials, equipment and workmanship.

As a concluding thought we would recommend the adoption of one additional procedure which, where tried, has proven eminently successful: use of preliminary plans and specifications. By spending \$5,000 to \$10,00 at the outset, before guessing at a budget or project schedule, better planning and programming along with a more orderly procedure will result. Thus would evolve more realistic costs and a more accurate timetable, all of which would better serve the owner.

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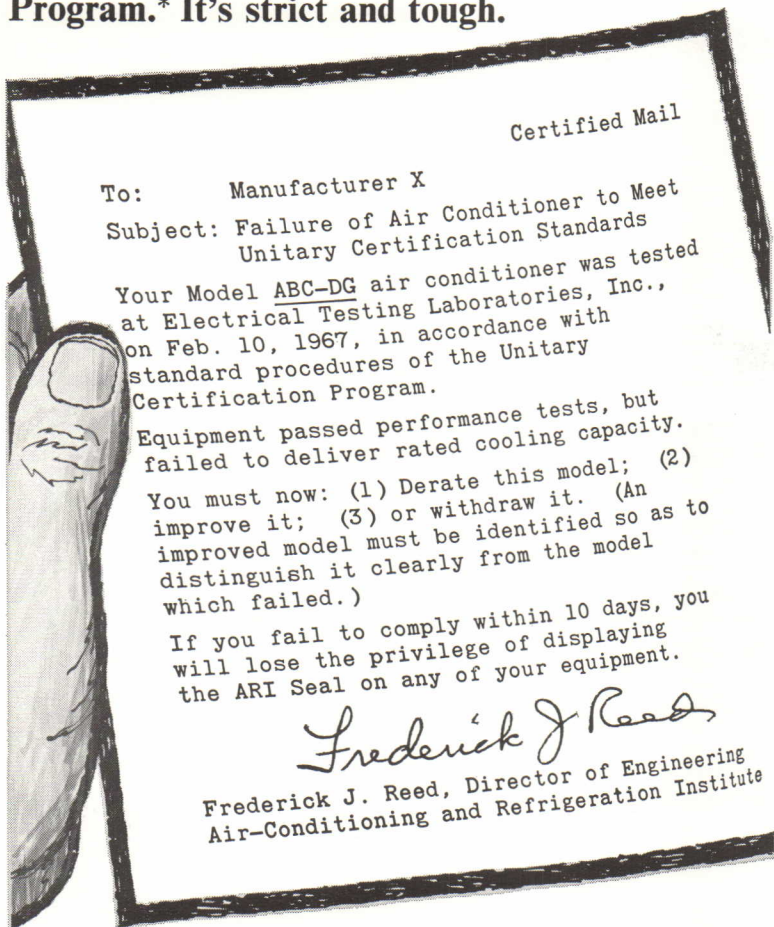
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Next Month

The Mall and the People: The first attempt to "humanize" Washington's Mall—Andrew Jackson Downing's plan of 1851—has been lost in the mists of history. Its telling today could not be more appropriate as architects and planners seek "to bring a vision of life to this great ceremonial focus of American democracy."

The author, who can make daily firsthand observations from his office in the Smithsonian Institution, brings the story of the Mall up to date with a commentary on Nathaniel Owings' master plan.

Practice Profile: How the firm Pancoast/Ferendino/Grafton combines general practice with an unusual consulting venture is the topic of the next article in this continuing series. Charts and graphs are among the visual aids which plot the development of the 63-member office.

An Act of Risk: Designing a church, warns the dean of the School of Architecture at Tennessee, is no easy task; and while he maintains that "Gothic cathedrals, Greek temple, Colonial meeting houses and Mayan shrines are not appropriate symbols" for today's religion, he likewise acknowledges that "contemporary" should not be equated with the novel and the bizarre.

An Architect's Sketchbook: The profession now and then has to be reminded that some of its young practitioners can still draw. A case in point: the recipient of a traveling scholarship who not only sketched during a nine-month tour of Japan and India among other countries but also made notes of what he saw.

To Save or Not to Save: While a good many preservation efforts have been concentrated in the East, even areas with relatively new buildings are taking a look at saving the older buildings. A current example is found in the Pacific Northwest where a controversy is brewing over Tacoma's old City Hall. Among the participants are two architects who agree on preservation but differ on the method.

PHOTO CREDITS: Henry Sanoff—pp. 26-28; Killebrew—p. 38 (upper, lower left); Jim Keith—p. 38 (bottom right); J. F. Bechan—p. 39 (upper right).

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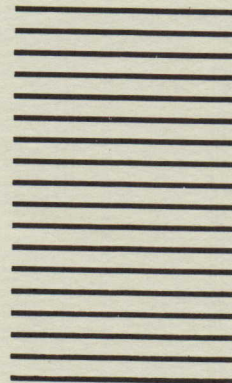
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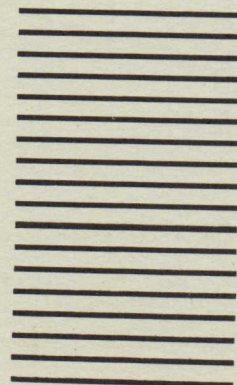
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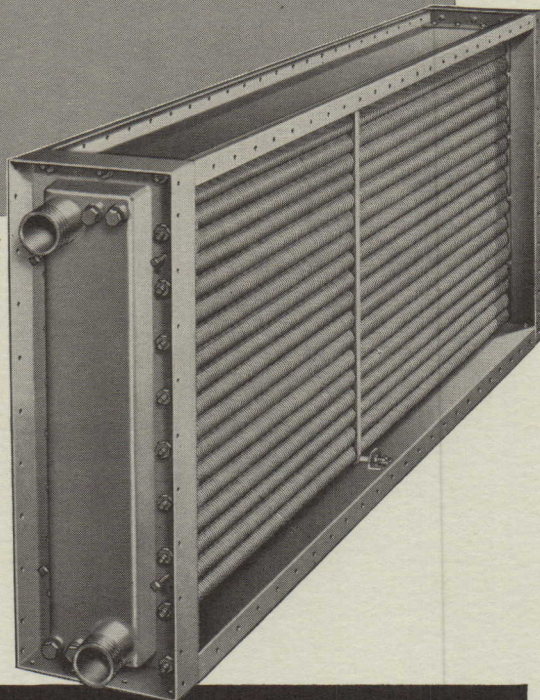
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