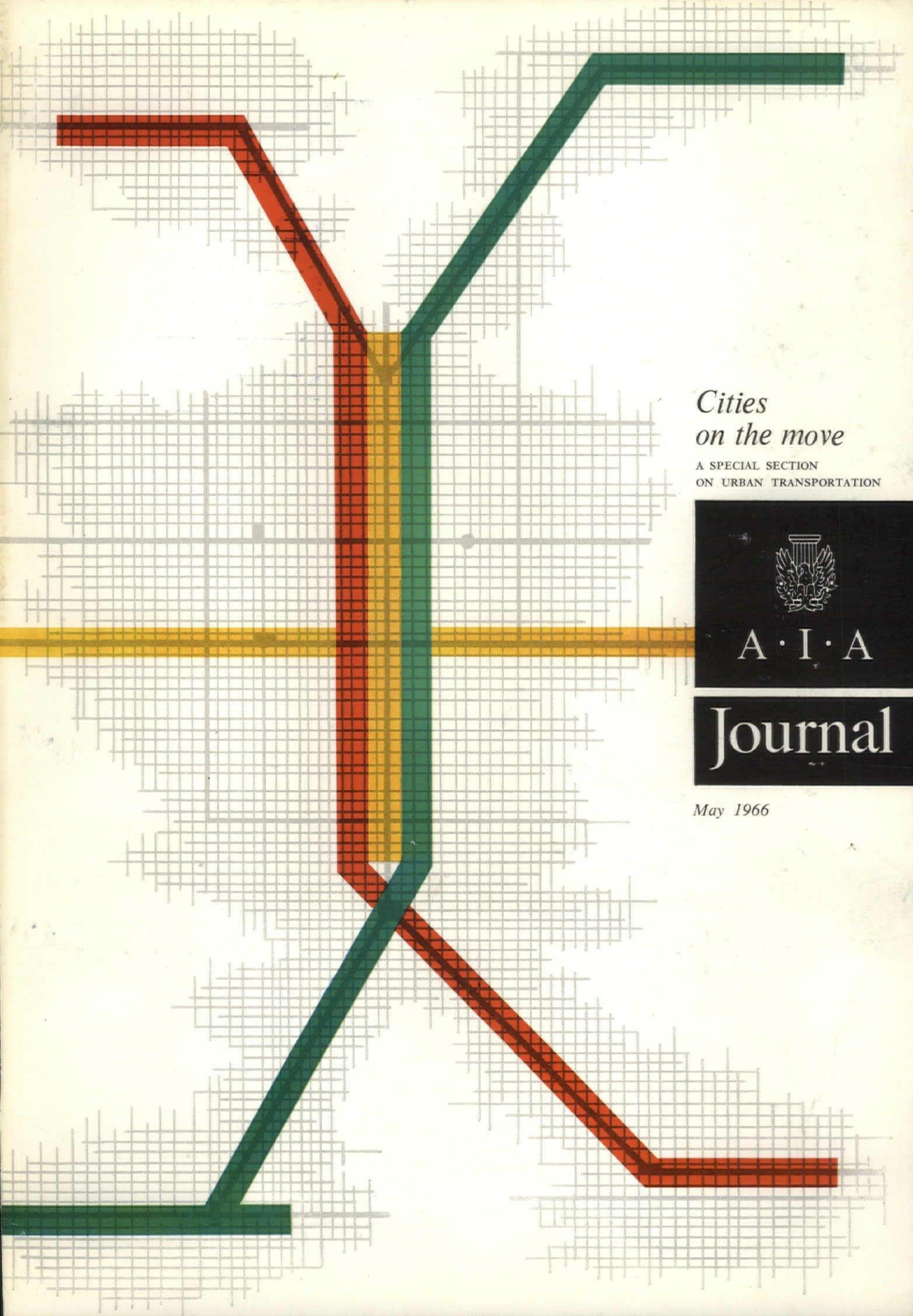

Cities on the move

A SPECIAL SECTION
ON URBAN TRANSPORTATION

A·I·A
Journal

May 1966

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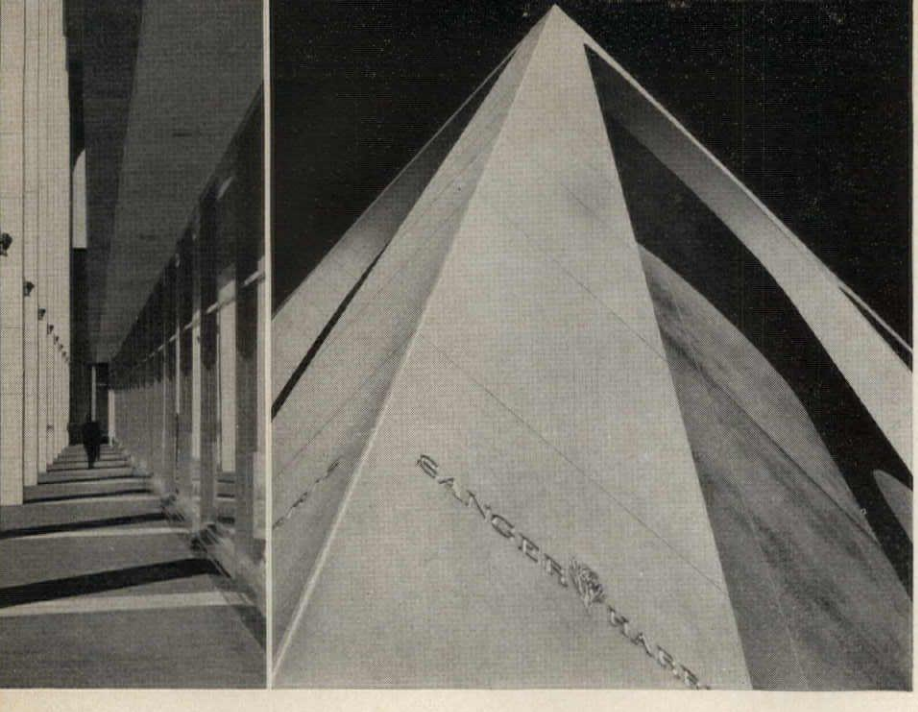

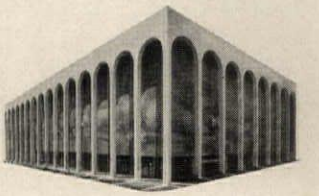

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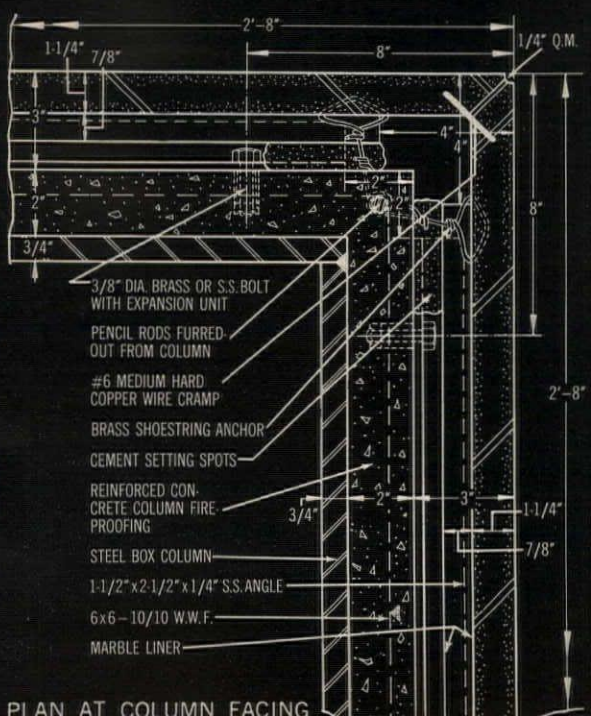
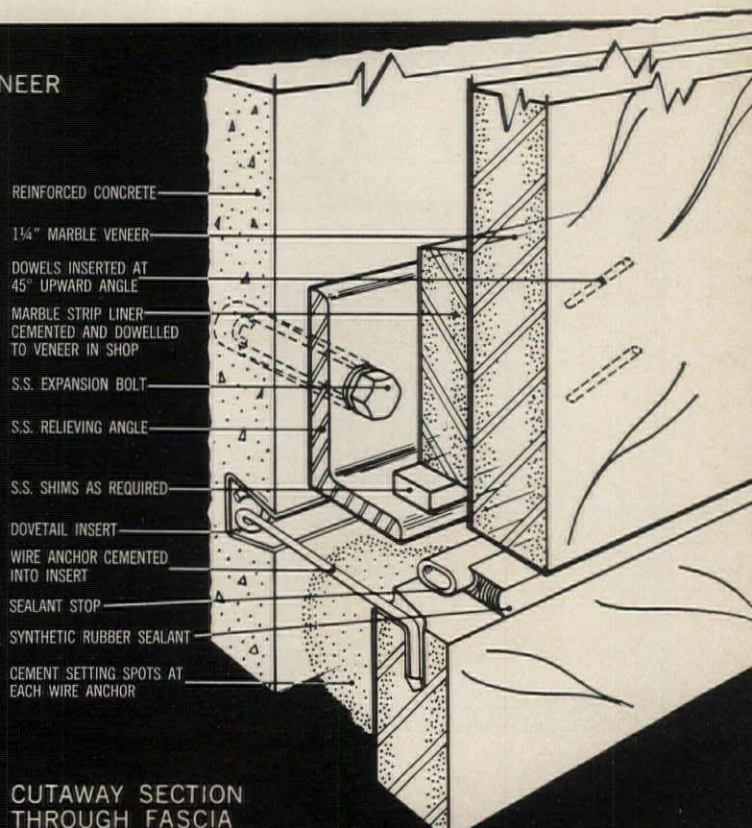


PLAN AT COLUMN FACING



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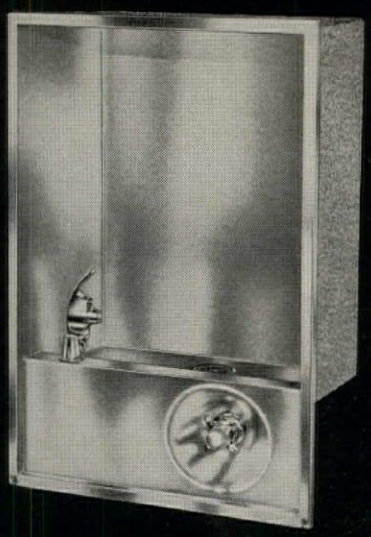

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A·I·A
Journal

MAY 1966

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BPA

VOL. XLV, NO. 5

Cities on the Move

General Articles

ACSA

News Feature

Departments

Cover: Frank C. Huseman's design introduces a transit section (p. 41)

LOOKING AHEAD TO JUNE

Mile-High Aspirations: "We have taken as the convention theme 'Technology, Environment and Man' in order to explore the interrelationships of our scientific and technological achievement, our challenging environment and the needs of mankind," in the words of President Morris Ketchum Jr. FAIA. To help in that exploration, the Official Convention Guide will present an editorial package highlighted by an analysis of irradiated wood and its implications for the profession; a thoughtful essay on the architect's role in preserving the natural environment; and a sensitive appraisal of this year's Gold Medalist (officially announced next month) along with a portfolio of his work.

Men to Match its Mountains: To further set the stage, the June issue will include two articles dealing with Colorado's history and mining-town architecture and two others covering Denver's metropolitan planning and urban renwal programs. A convention-goers guidebook has become an AIA JOURNAL tradition, and this year will be no exception. An architect's wife, who points out that the state's fame rests on three things—the climate, the scenery and the outdoor life—will offer some tips to assist visitors in getting the most out of their stay. Finally, all the last-minute developments concerning the professional program, social activities and product exhibit will round out the issue.

Architects' Information Service: Making its debut in the Official Convention Guide will be a monthly practice aid geared to the busy practitioner. The Architects' Information Service will feature a consolidated listing—reprints, technical data, documents, books, etc—to enable JOURNAL architect-readers to obtain information with a single, prepaid card. More about this new service next month.

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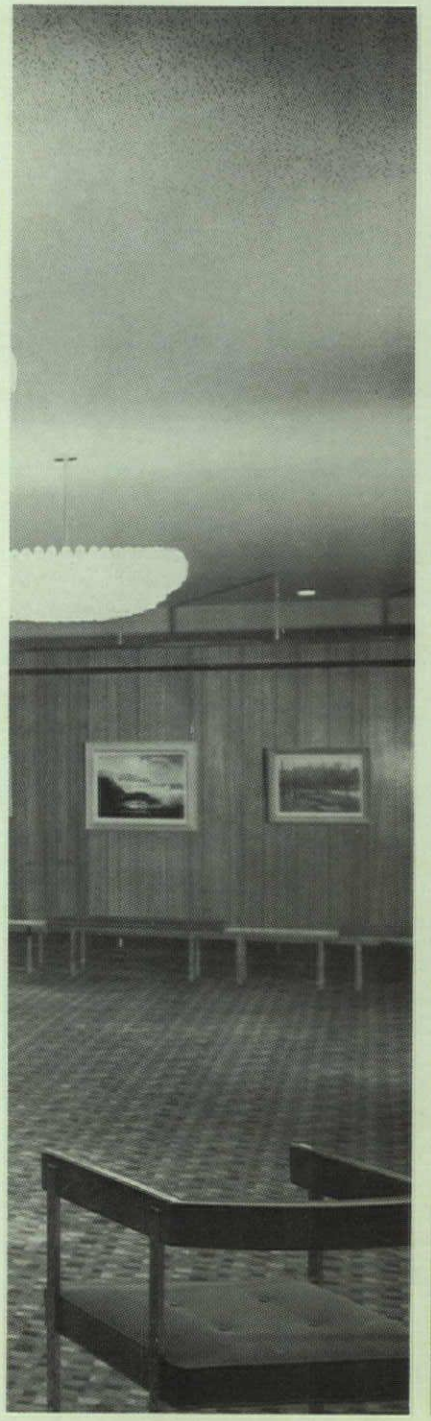
**Consider International Testing Laboratory, a subsidiary of Wood Conversion Company, for any acoustical evaluations you may require. Write for details of equipment, testing facilities and rates.*



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COMMENT & OPINION

A Transportation Sampler: Whenever a magazine pursues a particular topic, the published results, generally speaking, represent only a fraction of the material assembled for review and finally edited. Such has been the case with the AIA JOURNAL in preparing our current "Cities on the Move: A Special Section on Urban Transportation."

It might be appropriate, therefore, to devote this page to some facets of this most complex subject that are not particularly within the province of an architectural publication but are of ambient significance.

Guidelines & Methods: First question: When does a city need rapid transit? Two-pronged answer: When the metropolitan population exceeds 500,000 and the daytime core-area concentration is 80,000 or more; and when it takes more than 30 minutes to get home from work. These guidelines are suggested by George L. DeMent, president of the Institute of Rapid Transit.

Next question: How does a city go about getting rapid transit? Dement, who is also chairman of the Chicago Transit Board, again answers with this four-point program:

1) The local and state governments establish an areawide authority or district, with funds for planning and engineering.

2) Transportation planning is undertaken by professionals in conjunction with regional land-use planning.

3) A comprehensive information program is set up to continually alert the public to how a balanced transportation system will save tax dollars and make the community a better place in which to live, work and play.

4) An acceptable, balanced and broad-based method of financing the system is developed.

Friendly Persuasion: The consensus of the Pittsburgh transportation conference in February seemed to be that if the financial hurdle facing public transit from coast to coast is to be overcome, everyone—users and nonusers alike—must be convinced of the necessity of paying for it. But how to convince?

In his down-to-earth appraisal of the situation, Harvard's Lewis M. Schneider noted that the public is told it should patronize mass transit systems because of crowded expressways. So one fine day the confirmed motorist tries transit, only to be confronted with crowded—and uncomfortable—vehicles. Such a "campaign of persuasion" is doomed to failure.

Professor Schneider, who has done marketing studies in the transit field, would give consideration to those factors which keep the driver in his automobile, including "the ability to have a seat, to smoke, to choose one's traveling companions," although he has not elaborated on how transit would accommodate the latter objective.

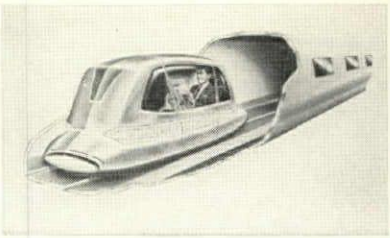
A Look in the Crystal Ball: Among those daring to predict what facilities might be like by the year 2000 is Walter S. Douglas, partner in a civil engineering firm engaged in transportation studies. He foresees "mainline systems with stations conveniently located within the highway network and the service extended by motor vehicle. . . . It is possible and perhaps likely that the mass transportation system itself will provide and rent small electric-powered vehicles for door-to-station service. One can visualize, for example, something like today's golf carts which can be rented or leased by the operators."

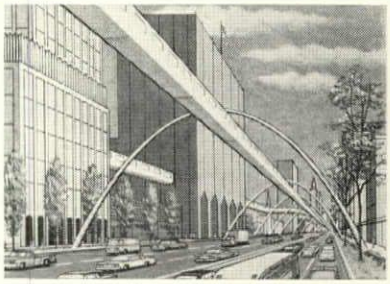
As for the nature of the vehicle traversing the grade-separated and segregated right-of-way, Douglas hopes for "an on-board electric power unit; a battery or cell fuel of some type not now known or dreamed of. From such an on-board power supply, energy will be restored when the vehicles decelerate."

Test Run for a Tube: Predictions by transportation experts such as Douglas are by no means flights of fantasy. Detroit's Common Council, as a case in point, has authorized a one-mile demonstration project bound to get the attention of the transit world, provided financing negotiations are successful.

Under consideration is Teletrans, a computer-controlled system moving passengers through tubes in private cars to preselected destinations. The proposed $3 million system would be tested on Woodward Avenue from Seven Mile Road to the State Fairgrounds—a total of 11,000 feet including loading stations and temporary return loops.

As architectural adviser for Teletrans Corp., Tarapata-McMahon Associates, Inc., of Bloomfield Hills, Mich., is designing a prototype station and related public spaces.





The federal government is expected to pick up two-thirds of the check for the demonstration project, while construction suppliers hopefully will come across with the remaining third.

Further Reading: Joining the flood of recently published books on the subject is Wilfred Owen's *The Metropolitan Transportation Problem,* to be reviewed in an early JOURNAL. Originally issued by the Brookings Institution 10 years ago, Anchor (New York) has brought out the 280-page revision. Another work by Owen, *Cities in the Motor Age* (New York: Viking, 1959, 176 pp.), is a good one too.

Other books on transportation and closely related topics found on the AIA Library shelves include:

- Appleyard, Donald, Kevin Lynch and J. R. Myer. *The View from the Road.* Cambridge: MIT Press, 1963. 64 pp.
- Gruen, Victor. *The Heart of Our Cities—The Urban Crisis: Diagnosis and Cure.* New York: Simon & Shuster, 1964, 368 pp. (Note especially chapter 16, "The Taming of the Motorcar," and chapter 17, "Pedestrianism and Other Future Modes of Transportation.")
- Jellocoe, G. A. *Motopia: A Study in the Evolution of Urban Landscape.* New York: Praeger, 1961. 165 pp.
- Lewis, David, ed. *The Pedestrian in the City.* London, Elek Books, 1965. 298 pp. (Architects' Year Book, XI)
- Williams, T. E. H., ed. *Urban Survival and Traffic: The Proceedings of a Symposium . . . 1961.* London: Spon, 1962. 257 pp.

ROBERT E. KOEHLER
Editor

What are the ugliest products in the world?

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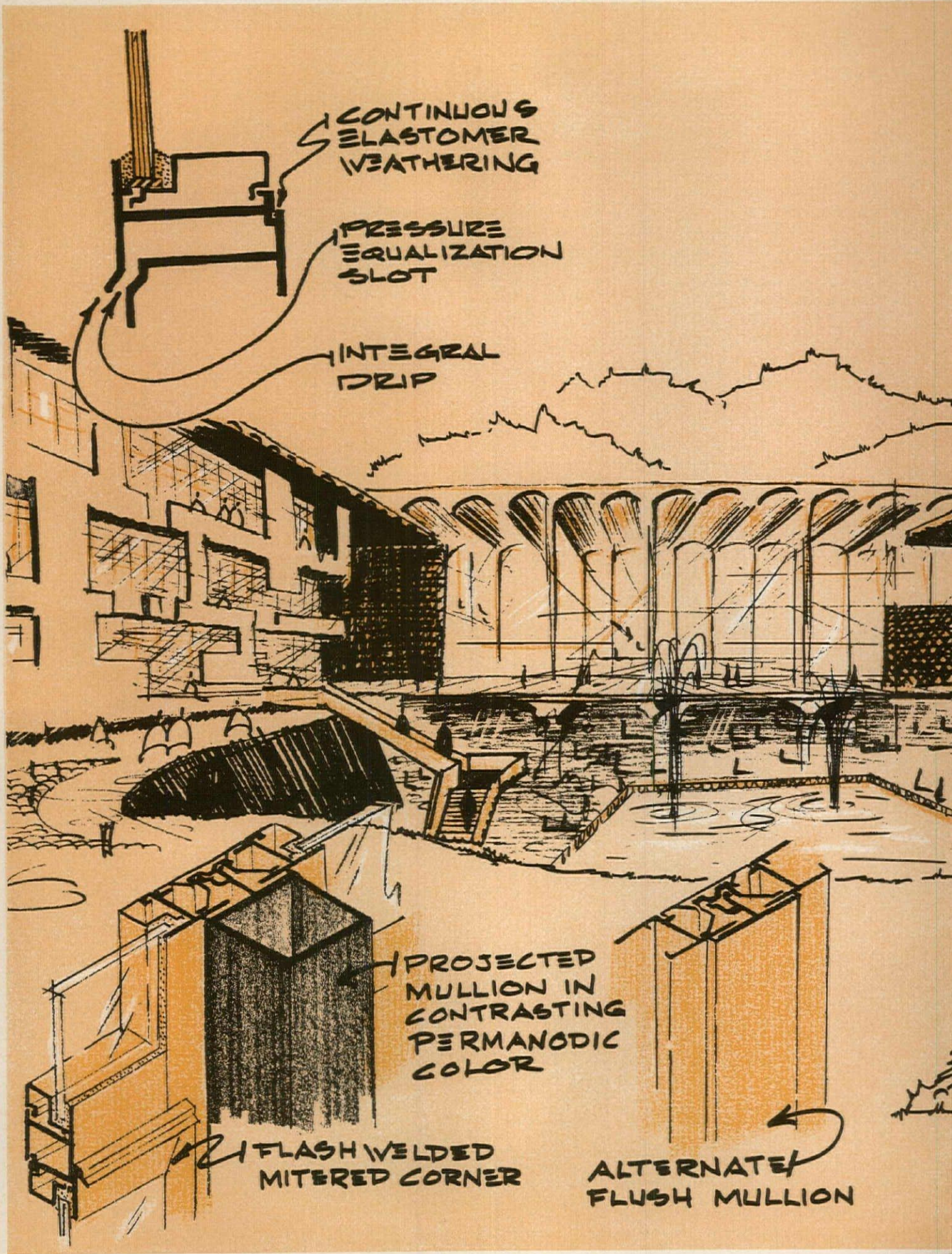
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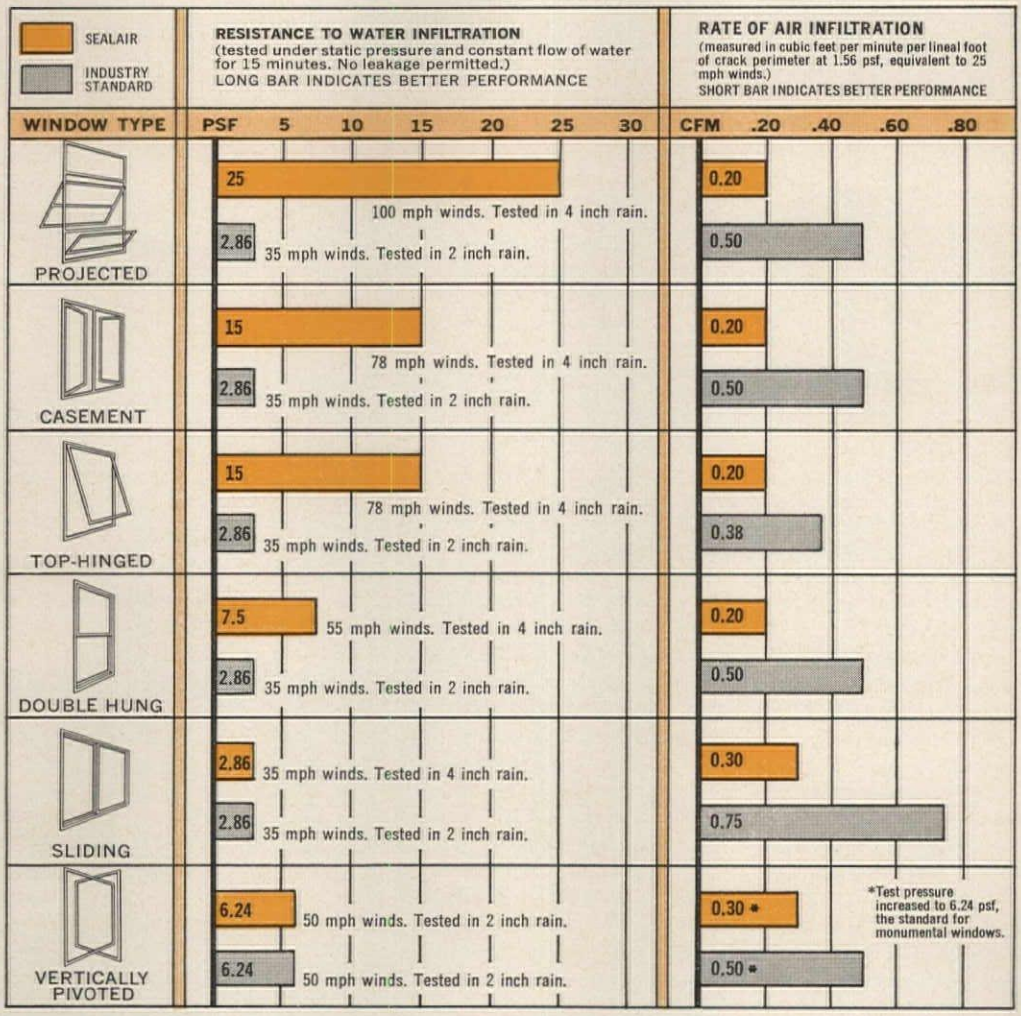

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NEWSLINES

Rabi

Galbraith

Wood

McMurrin

convention

Galbraith to Keynote 98th; Three Theme Speakers And Four Medal Winners Are Also Made Known

J. Kenneth Galbraith will give the keynote address at the 98th annual convention of The American Institute of Architects in Denver next month.

Also added to the list of participants are the names of four medal winners and three other distinguished speakers: Isidor Isaac Rabi, Robert C. Wood and Sterling Moss McMurrin.

The medalists are Ben Shahn, for fine arts; Alexander Girard AIA, allied professions; Harold Balazs, craftsmanship; and Gideon Kramer, industrial arts.

Dr. Galbraith, holder of America's highest civilian honor, the Medal of Freedom, is a former US ambassador to India as well as a renown economist, educator and writer.

Among his books are *The Affluent Society, The Liberal Hour,* and *Theory of Price Control.*

Galbraith will speak on Monday, June 27. The convention runs from June 26 through July 1, with the Denver Hilton as headquarters hotel.

Dr. Rabi, winner of a Nobel Prize in Physics, will address the first theme seminar on "Technology," June 28. He is a member of Columbia University's faculty and is a former chairman of the General Advisory Committee of the Atomic Energy Commission.

Girard

Shahn

Kramer

Balazs

Dr. Wood, Under Secretary of the Department of Housing and Urban Development, will address the June 30 theme seminar on "Environment." He was chairman of the political science department at MIT before appointment to his government post. He has written *Suburbia, Its People and Their Politics* and *Metropolis Against Itself.*

Dr. McMurrin, provost and E. E. Ericksen Distinguished Professor of

Continued on page 16

Sketch for Perspective Throws Things Out of—

It was intended really as a little perspective shaper, something to show that the official residence of the Vice President would not be the "palace" some alleged.

But it caused some confusion. *Time* magazine, for one, showed the drawing and labeled it the "proposed" mansion for Humphrey.

Rep. Kenneth Gray (D-Ill.), forced to answer attacks on his $750,000 mansion bill, had an architect work up a rough sketch.

He planned to display the rough sketch side by side with a blowup of the White House. All this was to dramatize graphically that the White House' main building was four times the size of the residence proposed for the Vice President, that the Veep dwelling would not be "as big as the White House."

That comparative exercise never came off, but the sketch found its way into the public domain and into some heartfelt criticism.

In any event, Congress passed the bill and the General Services Administration was to be handed the job of finding an architect once the measure was signed into law.

The fee is based on a government regulation that an architect's fee cannot exceed 6 percent of the project's cost, in this case $45,000. Financially, the commission is considered less than appealing. The prestige involved is something else.

The *Washington Star,* wondering what kind of architecture influential persons had in mind for the house to be located on choice acreage of the Naval Observatory, took a small poll and found unanimous preference for contemporary design.

Among those queried was Institute President Morris Ketchum Jr. FAIA who said the house should "express today's architecture at its very best. It cannot be imitative of the past."

Almost everyone interviewed felt GSA should give the commission to an architect of national renown.

"Now, can you cap this?" the architect asked

Back in 1908, when architects Palmer & Hornbostel of New York City designed the New York State Education Building at Albany, hand craftsmanship in terra cotta for buildings of classical design was an art mastered by many. Recently, when Charles S. Kawecki, chief architect of the Department of Public Works, New York State, needed 54 new column caps, and 1,000 lineal feet of ornamental cornice for the building, Federal Seaboard was able to meet his specifications by combining traditional craftsmanship in clay with modern manufacturing methods. Whatever *your* needs today—ornamental sculpture, bas-relief or perforated facades, polychrome panels or colorful smooth surfaces in thicknesses ranging from 4″ to ⅜″ in units large or small, Federal Seaboard will custom-make modern architectural terra cotta to your precise specifications. And you have every color under the sun from which to choose. Write for our file of creative applications, or tell us what you have in mind.

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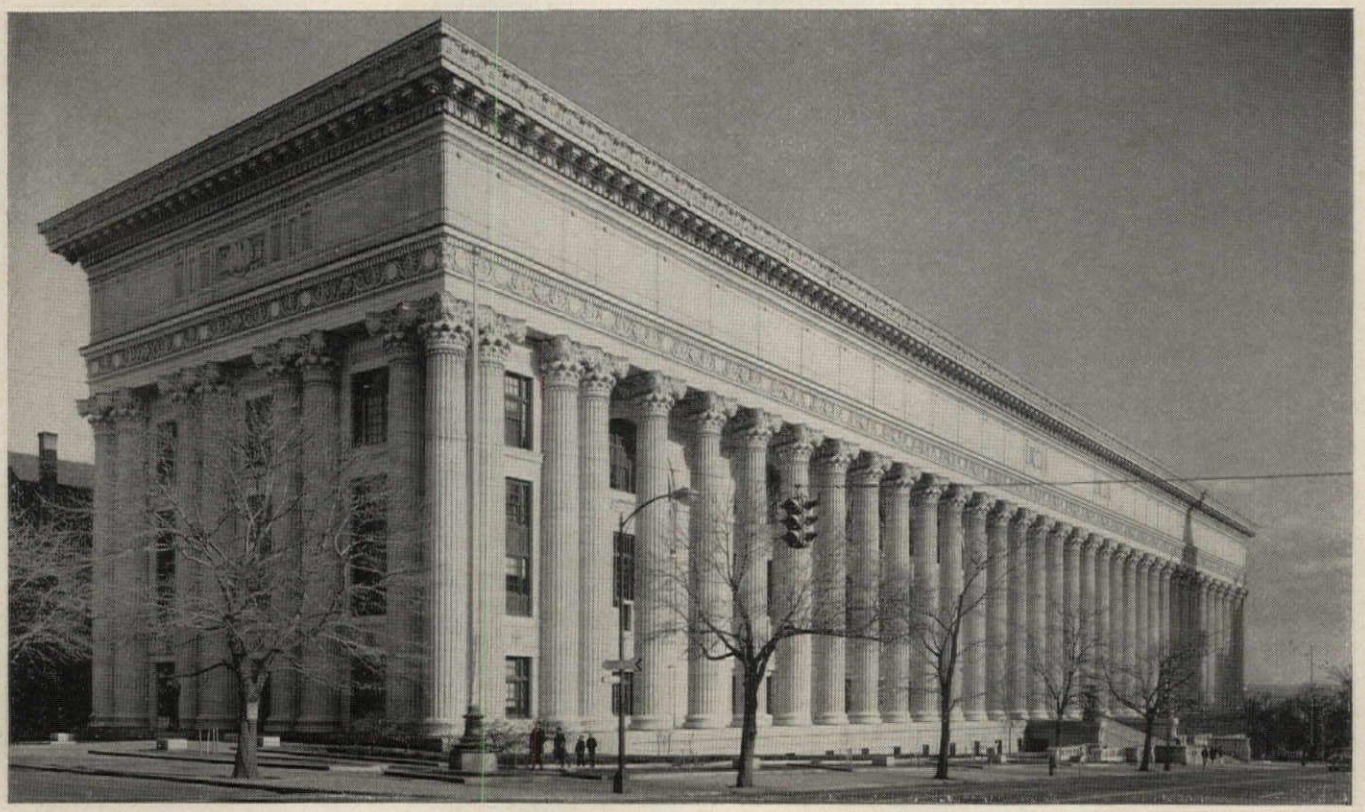
10 E. 40th St., New York 16, N. Y.
Plant at Perth Amboy, N. J.

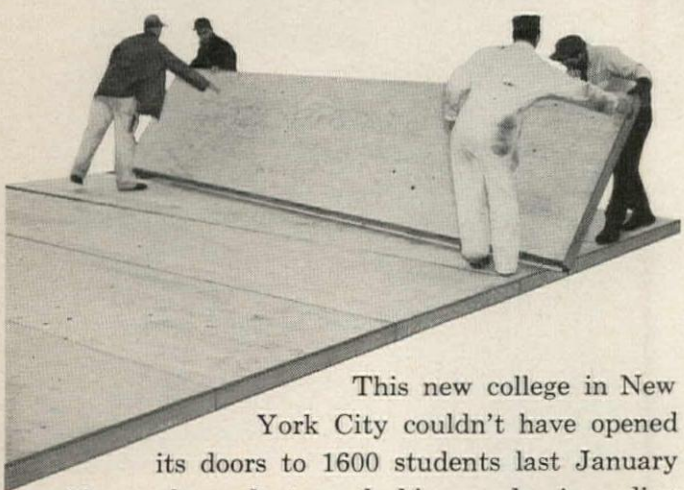


The hurry-up school.

Queensboro Community College. 22 buildings. 62 days from footings to completion.

How?

Plywood components.

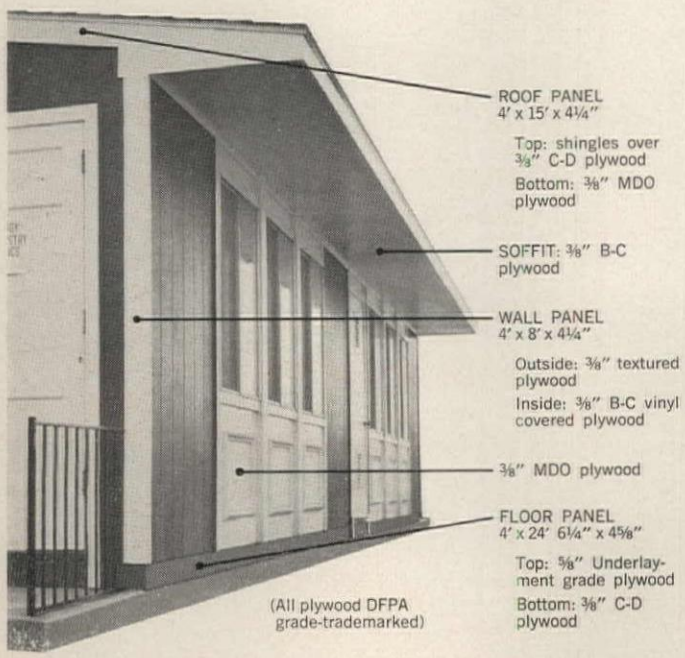


This new college in New York City couldn't have opened its doors to 1600 students last January without plywood stressed skin panels. According to the contractor's architectural consultant, the plywood component system was the best possible solution to the tight schedule – less than three months from plans to finish. The panels were used for floors, walls and roof.

The 22 buildings were prefabricated in Tulsa at the rate of one a day. Panels were prepainted, then trucked or piggy-backed to New York. Floor components are 24 feet long, the full width of the building. Roof panels span 12′ 6″, and are supported by a ridge gluelam, 7″ by 17⅞″.

On-site finishing consisted largely of installing carpet, furniture, plumbing, and equipment. Actual site work took just over two months.

Queensboro Community College, Queens, New York City / Owner-Lessor: CIT Educational Buildings, Inc., New York City / Fabricator and Contractor: Southern Mill Fabricators, Inc., Tulsa, Oklahoma / Architects: H. A. Tucker, Tulsa; and M. J. Goodman, consulting architectural engineer for CIT



The 18 classroom buildings are 24x40; the library, faculty offices and rest rooms are 24x32.

This is another example of the way plywood components can provide simple, good-looking structures in a hurry. But they're also versatile enough to solve sophisticated design problems involving unusual shapes such as curved roofs, folded plates and space planes. For more information on plywood components and other plywood building systems, send the coupon.

Newslines *from page 12*

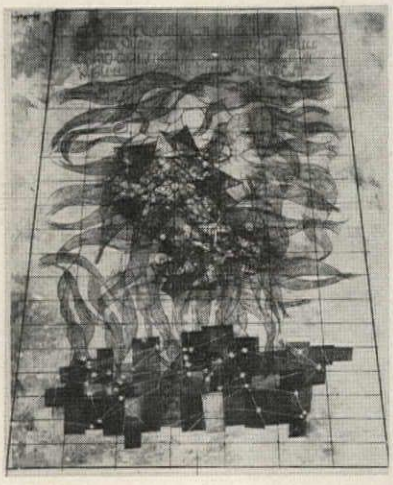
Philosophy at the University of Utah, will address the third seminar, "Man," July 1. He holds honorary degrees from five universities, has written widely and among national activities serves on the US commission of UNESCO and on the executive board of the National Cultural Center.

As previously made known, Dr. Nathan M. Pusey, Harvard University president, will give the Purves Memorial Lecture June 29 at the US Air Force Academy.

Besides the theme seminars, 10 workshop sessions will be held. Added to the previous list of nine was a July 1 workshop on "Industrial Architecture 1966," a discussion of questions on feasibility, lease-purchase, construction cost guarantees, completion schedules and other construction services attendant to industrial architectural services.

Five workshops will be held concurrently June 28, 2:30 to 4:30 p. m., and the remainder will take place July 1, same hours.

Fine Arts Medalist Shahn is a noted New Jersey artist whose painted commentary on the events of American life over the past 35 years established him as one of the nation's foremost artists.



Primarily an easel painter and muralist, he has recently worked in stained glass (above) and metals. His training and experience as a lithographer are evidenced in the precision of his works.

Shahn was born in Lithuania in 1898 and came to America as a child. Moved by events of his time, he developed a style which has been described as "alternating between realism and heraldic symbolism, arresting starkness and lyric poignancy."

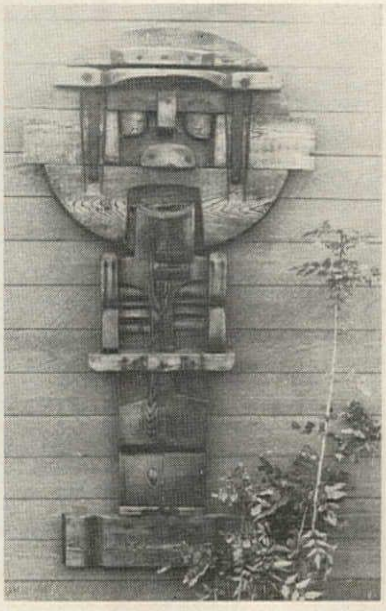
Allied Professions Medalist Girard is a Santa Fe, N. M., architect who specializes in the design of interiors and furnishings.

Girard is best known for his shops, showrooms, restaurants and residences. He is noted for a bold, exciting use of color.

His work has been published, exhibited and honored internationally. Among his most recent work is the redesign of all visual aspects of Braniff International Airlines. He has been design director of the Herman Miller Textiles Division for 14 years.

Six years ago he established the Girard Foundation in Santa Fe, an international collection of toys and other objects for exhibition to the public.

Craftsmanship Medalist Balazs' current work is in collaboration with architects from whom he has won commendation for an "ability to contribute positively to the total architectural concept."



He has been cited for a great range in subject, media, scale and purpose as well as a dynamic, searching personality.

Beginning his career making craft items sold in gift shops across the country, Balazs, now 38, worked his way into architectural commissions. His cast concrete murals, steel and copper sculptures, plastic panels and band-sawed wood reliefs grace many buildings in his home state of Washington.

Balazs has been self-employed since 1951 when he was graduated from Washington State College.

Industrial Arts Medalist Kramer of Seattle is the developer of the ION chair and he organized the ION Corporation to produce it.

Selected for use in the Space Needle restaurant at the Seattle

World's Fair, the chair is now being distributed nationally and is explained by the designer as the result of a concept that "views sitting as a dynamic instead of static condition."

Hence, says Kramer, the chair adapts itself "to the ever-changing requirements of the human body" rather than make its user "adapt himself to the chair."

He attended the Art Institute of Chicago and the Armour Institute of Technology but says his major education was gained in a brass foundry, furniture factory and aircraft plant.

Kramer has worked as a design consultant to trucking, hydrofoil craft and building prefabrication industries and he teaches industrial design at the University of Washington. *Continued on page 18*

Lincoln Bank & Trust Co., Large, Pa. Owner: Noble J. Dick. Architects & Engineers: Deeter • Ritchey • Sippel. General Contractor: Dick Corporation. Fabricator: South Hills Ornamental Iron Co., Div. of Mulach Steel Corp.

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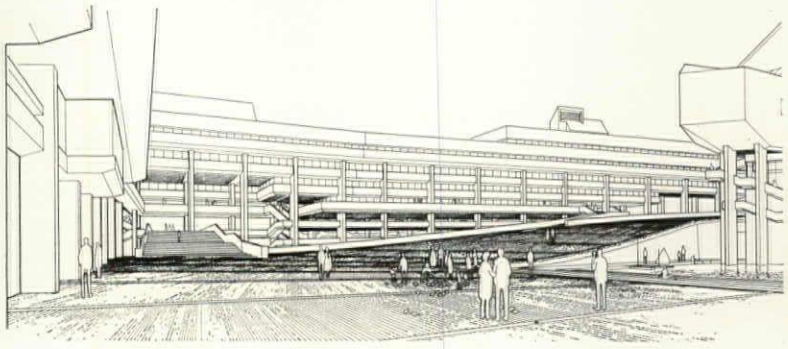
Newslines *from page 16*

Young Architect Wins Fremont Competition

A 30-year-old architect, Robert Mittelstadt, is the winner of a national competition for the design of a civic complex in Fremont, Calif.

The competition attracted 66 submissions from 18 states.

The winning design carries a $4,000 cash award and the commission for the first phase of the project, a city government building. The Fremont City Council has awarded a contract to Mittelstadt.



A native of Racine, Wis., Mittelstadt received a Bachelor of Arts degree from the University of Minnesota in 1959 and a bachelor of architecture degree from Yale University in 1964. He has been employed by a number of well-known firms and is currently with the Architects Collaborative.

The jury said that throughout its study of the Mittelstadt solution, it "sensed in many subtle ways the high degree of professional competence of the designer." The jury was headed by Pietro Belluschi FAIA, former dean of the School of Architecture at MIT.

Selected for second prize was the entry of Daniel Escudero, Jacques De Brer, Barry Elbasani and Donn Logan of Los Angeles, and third prize went to Ralph Rapson FAIA, Kay Lockhart, Richard Morrill and Frank Nemeth of Minneapolis.

Honorable mention went to Michael Graves and Ralph D. Bennett Jr. of Princeton University and to William N. Breger AIA, Sidney L. Katz FAIA, Thomas E. Regan and William Vitto of Pratt Institute.

The competition was for the design of the city government building, a hall of justice and a master plan for a proposed civic-cultural center. The two buildings form the first phase of construction. The jury strongly urged that they be erected concurrently and added:

"It must be pointed out that the scheme will reach its fullest power when all the proposed structures as well as the lake will have been built. It is in the achievement of this ultimate goal that the jury felt most enthusiastic about the winning design."

Fremont, situated on the east end of San Francisco Bay, has a population of 80,000. Its population is projected to reach 220,000 by 1980.

The jury said it sought a solution possessing "the power to move and to please (Fremont's) citizens in the long future," and that the Mittelstadt entry met this objective "in a most satisfactory way."

Mittelstadt, whose degree from Minnesota was awarded *cum laude*, attended Yale on scholarships, received the H. I. Feldman Award in 1963 and was a Rome Prize Fellow, American Academy in Rome, 1964-65 (see AIA JOURNAL, Jan. '65).

City of 'Vision' Receives Community Citation

Little Rock, Ark., is the first community of 1966 to receive the Institute's "Citation for Excellence in Community Architecture."

The city is engaged in a sweeping, 508-acre renewal of its core area in what is believed to be the first attempt to treat an entire central business district as a single urban renewal project.

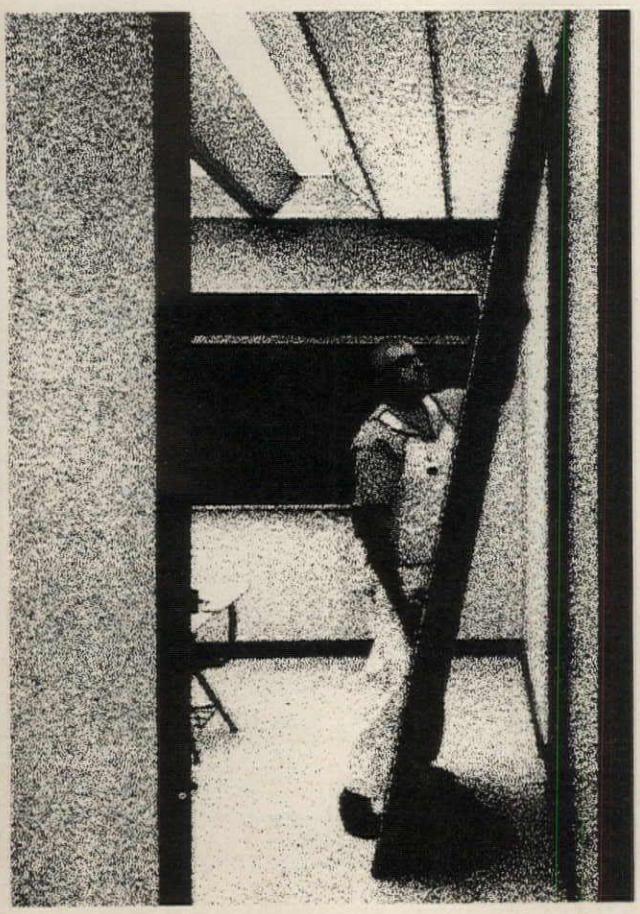
It is a 10-year undertaking, begun four years ago with another six to go. So far, expenditures for rehabilitation and new construction are nearing $75 million.

The citation, voted by the AIA Board of Directors and presented to Little Rock residents and Mayor Harold E. Henson, is for "vision in undertaking the planning of Central Little Rock, a comprehensive solution to present problems with bold anticipation of future needs . . ."

Continued on page 22

THE RONZONE SCHOOL

first to employ the new plastic space



The first school to open its doors, following the "space versatility" concepts of SCSD*, is in Clark County, Nevada—not California! This first educational "space-age" building is Bertha Ronzone Elementary School, by Julius Gabriele, A.I.A., Las Vegas, a 46,700 sq. ft. structure completed July 21, 1965, 17 days ahead of schedule.

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

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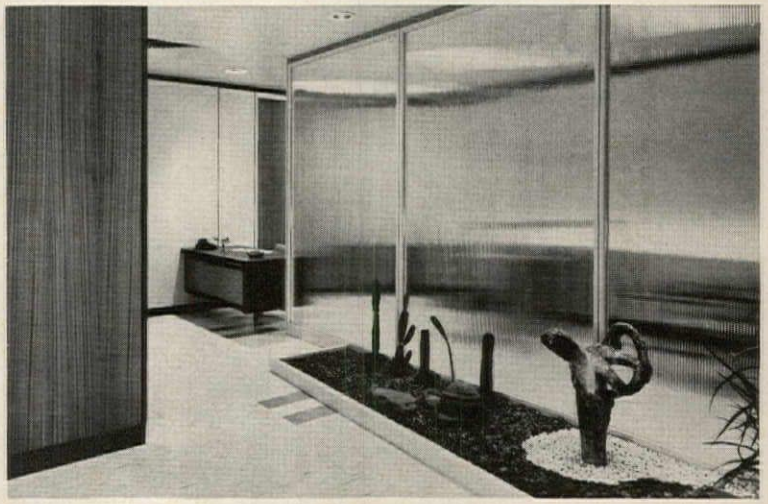

(Top)—New PROFILITE channel glass, attractively employed in office partition of Henry A. Corsini, Bankers Insurance Building, Macon, Georgia.

Rhythmic partition of Mississippi glass glazed in Hauserman movable partition. Photo courtesy The E. F. Hauserman Company, Cleveland, Ohio.

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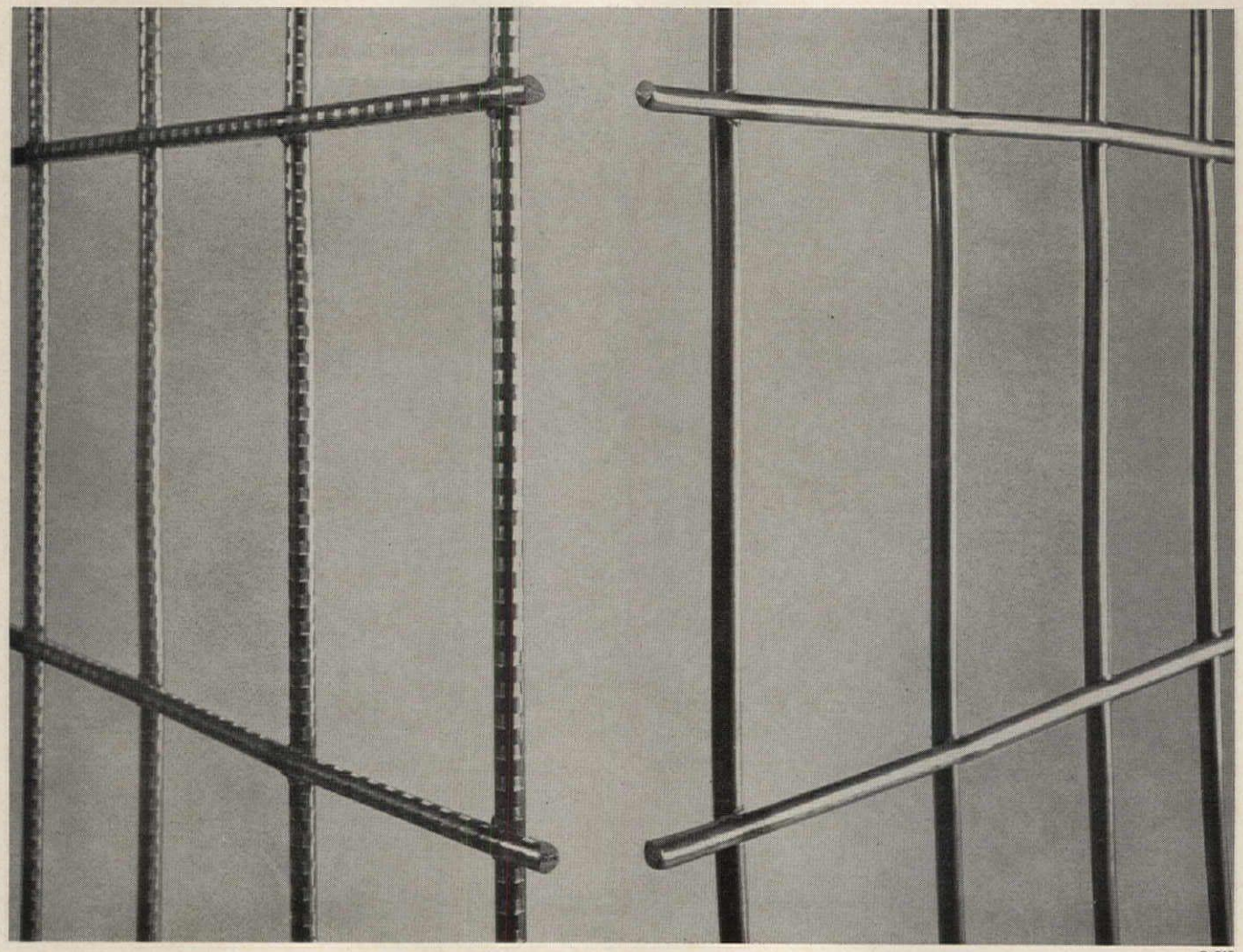

D-213

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Take your choice, but for detailed information on Fabri-Bond and standard welded wire fabric, available in either mats or rolls, get in touch with your nearest CF&I sales office or the Colorado Fuel and Iron Corporation, Denver, New York, San Francisco, Trenton. Sales offices in key cities.

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Newslines *from page 18*

Presentation was made by Institure President Morris Ketchum Jr. FAIA and the director from the AIA's Gulf States Region, Dan C. Cowling, at the region's annual conference in Hot Springs, Ark.

The Little Rock plan entails a traffic loop around the core and the elimination of crosstown traffic friction. It also involves a number of new public buildings, a convention center and hotels.

Sites for new apartments were projected to accommodate a back-to-town-living movement, and plans were made to restore and preserve historic structures and residential areas.

Throughout, planners envisaged plazas and tree-lined boulevards to enhance the esthetics of the area.

The Arkansas Chapter AIA and the Little Rock business community were instrumental in advancing the revitalization. The architectural firm of Associated Planners, Inc., developed the 10-year plan under contract with the city's Housing Authority. In addition a master plan was developed.

The citation program was inaugurated one year ago to recognize cities having planned architectural projects which realize the objective of creating vital environments for their core areas.

Eleven Libraries Chosen For Design Awards

Eleven library buildings, over half of them in the West, were premiated in the third Library Buildings Award Program.

The program is jointly sponsored by the AIA, the American Library Association and the National Book Committee, and awards are made in three categories—university, public and school libraries.

The jury awarded one First Honor Award and 10 Awards of Merit.

The First Honor, in the public library category, was given for the Magnolia Branch of the Seattle Public Library; Kirk, Wallace, McKinley & Associates, Seattle, architects; Willard O. Youngs, librarian.

Awards of Merit in the public category:

W. Clarke Swanson Library, Omaha, Neb.; Leo A. Daly Co., Omaha, architects; Frank E. Gibson, librarian.

New Jersey State Library, Trenton; Frank Grad & Sons, Newark, architects; Dr. Roger H. McDonough, librarian.

Casa View Branch, Dallas Public Library; William H. Hidell AIA, Dallas, architect; Mrs. Lillian Moore Bradshaw, librarian.

Wilmot Branch, Tucson, Ariz., Public Library; Nicholas Sakellar & Associates, Tucson, architects; John F. Anderson, librarian.

Salt Lake City Public Library; Edwards & Daniels, Salt Lake City, architects; Robert E. Thomas, librarian.

South Branch, Berkeley, Calif., Public Library; John Hans Ostwald AIA, Berkeley, architect; Robert S. Alvarez and Frank J. Dempsey, librarians.

The sole school library Award of Merit went to the McBean Library, Carpinteria, Calif.; Arendt, Mosher, Grant, Santa Barbara, architects; Mrs. Stanley Woodworth, librarian.

For university libraries, Awards of Merit were given for:

Continued on page 26

The Halle Bros. Co. Westgate Suburban Store Greater Cleveland. Design Coordinator: Pierre Lalire. Planners and Designers: Raymond Loewy / William Snaith, Inc.: Architects: Fordyce & Hamby. Says John G. Mitchell, Operating superintendent of the Halle Bros. Co.:
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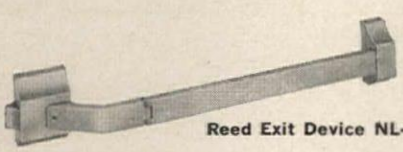
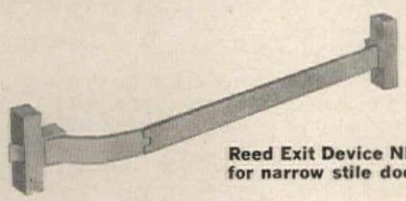


Reed Exit Device NL-30



Reed Exit Device NL-7
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Newslines *from page 22*

Swirbul Library, Adelphi University, Garden City, N. Y.; Richard J. Neutra FAIA and Robert E. Alexander FAIA, Los Angeles, architects; John Shober Burrows AIA, White Plains, N. Y., resident architect; Nora Gallagher, librarian.

Countway Library of Medicine of Harvard University Medical School, Boston; Hugh Stubbins & Associates, Cambridge, Mass, architects; Ralph Esterquest, librarian.

Research Library, University of California, Los Angeles; A. Quincy Jones FAIA and Frederick E. Emmons AIA, Los Angeles, architects; Robert Vosper, librarian.

Harold Spitznagel FAIA, Sioux Falls, S. D., was jury chairman. Members were Ulrich Franzen AIA, New York; Vernon Russell FAIA, Los Angeles; Frazer Polle, University of Illinois librarian; Robert H. Rohlf, director of the Dakota-Scott Regional Library, West St. Paul, Minn.; Virginia McJenkin, library director of Fulton County, Ga., Board of Education; and Hoyt R. Galvin, Charlotte, N. C., Public Library director.

The first exhibition of the libraries was held at the Octagon last month. Additional exhibitions are scheduled, including one at the AIA convention in Denver.

MEMBERSHIP DIRECTORY

A directory listing some 18,000 AIA members is now available from the Institute.

The data processing-compiled content is an alphabetical listing by surname and initials, street, address, city and state, chapter code and AIA or FAIA designation. It shows the membership as of February's end.

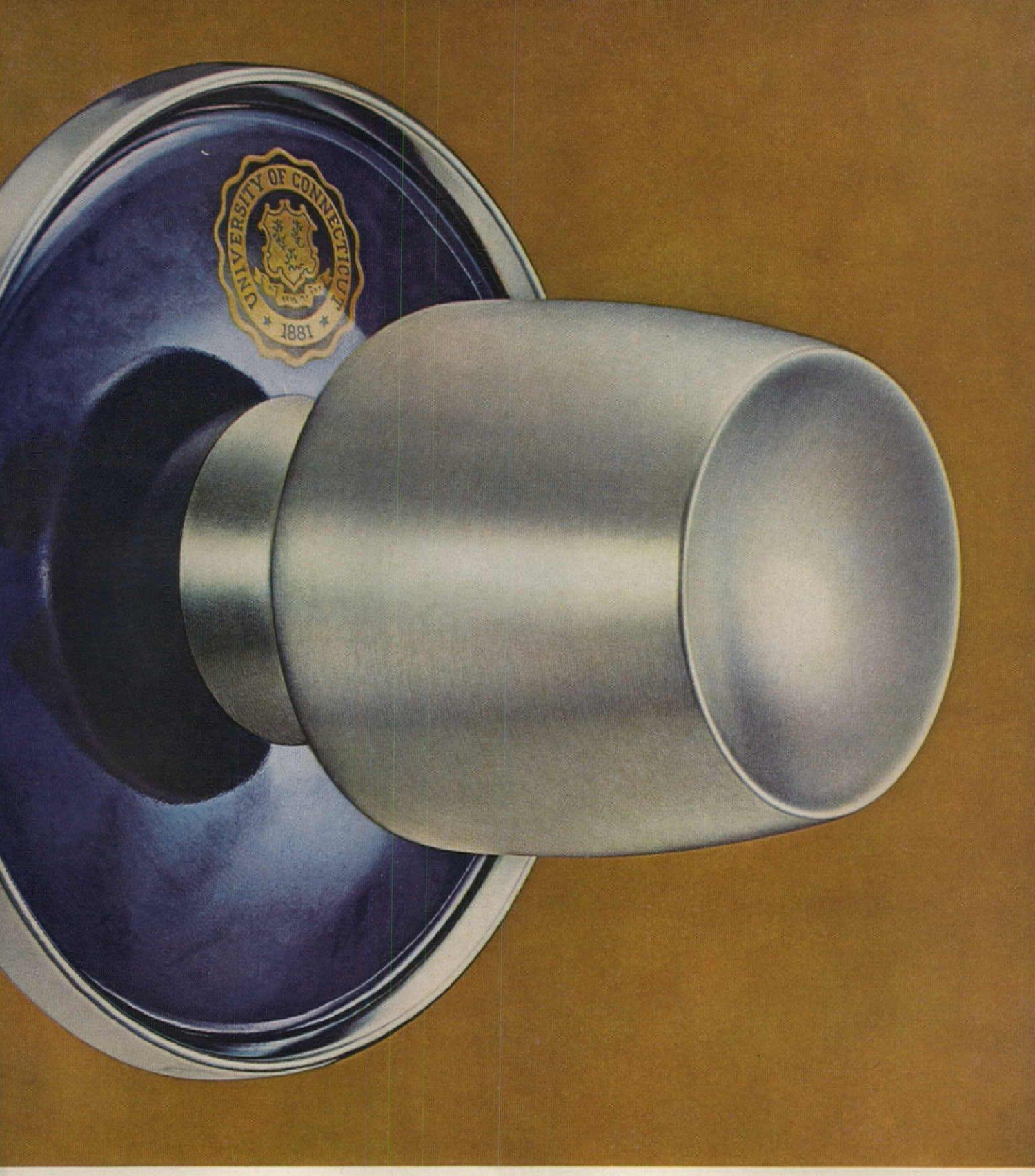
The price to AIA members and chapters is $2; to libraries, schools and associations, $10; and to industry, $25. Chapters are being asked to refer member requests directly to the Institute. Orders should be made to AIA Membership Directory, Institute Headquarters.

Events Mark Dedication Of New Boston Center

A new home for an old institution, perhaps the only one of its kind in America, is being dedicated in Boston this month.

Week-long dedicatory events marking the new building of the

Continued on page 28



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Newslines *from page 26*

Boston Architectural Center include a conference May 13-14 on "The Future of Architecture."

Founded Dec. 11, 1889, as the Boston Architectural Club, the center was incorporated for the purpose of associating those interested in the profession of architecture with a view to mutual encouragement and help in studies, etc.

The club provided evening classes for draftsmen working in offices. Included were drawings from life and cast, pen and ink and water colors, and members offered the instruction.

In a word, an atelier was created informally in the then popular tradition of the École des Beaux-Arts of the Sorbonne.

Such privately supported ateliers once flourished in many metropolitan centers; the Boston institution is believed to be the only one extant.

The club in 1911 acquired a building at 16 Somerset St. and the number of students increased. Courses of instruction became more formal and more defined.

In 1944 the organization was reincorporated as the Boston Architectural Center. Its purpose was described as:

"To provide instruction in architecture and related fields for draftsmen and any others interested in the practice of architecture or the allied arts, especially those whose employment might interfere with such education in day schools and universities."

The number of courses has since increased, and today the center offers a sequential curriculum of five years of evening school plus a thesis. A certificate is issued to students successfully completing all the requirements.

The Massachusetts Board of Registration accepts the certificate, when supplemented by five years of experience in an architectural office, as qualification for the examination of architects.

A student body that still works in architectural offices by day and attends classes by night reflects the character of the center program.

The center was displaced from its Somerset Street home in 1961 by the construction of a new state office building. It was moved to a structure at 320 Newbury St. in Boston's Back Bay.

In October 1963 the center's board of directors voted to hold a

Continued on page 30

Newslines *from page 28*

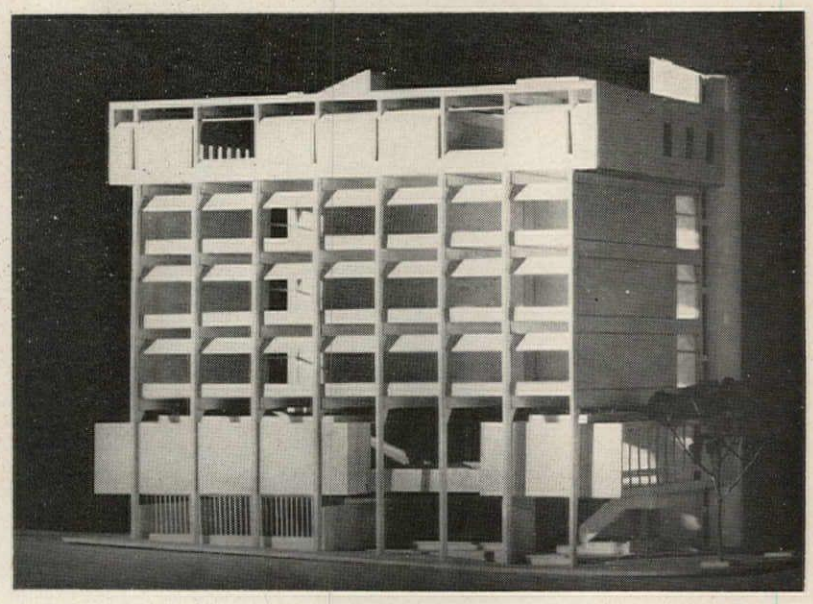
design competition, and the commission was awarded to the firm of Ashley, Myer & Associates.

The seven days of dedicatory activities begins May 8 with a formal opening ceremony followed by a number of professional exhibits.

The conference on the "Future of Architecture" gets underway with registration at 8 p.m. on May 13 and ends with a 7 p.m. dinner May 14, which will be addressed by Institute President Morris Ketchum Jr. FAIA. The seminars include outstanding speakers.

The center over the past 20 years has provided instruction for some 2,000 students exclusive of those taking refresher courses preparatory to examination.

A center spokesman said the program will be broadened to include continuing education for practitioners.



Square Competition Won by Landscape Firm

Sasaki, Dawson, DeMay Associates is the winner of the national competition for the beautification of Boston's Copley Square.

The Watertown, Mass., firm was chosen from 183 entrants in the competition announced last September for architects and landscape architects.

"A brilliantly presented solution," the jury termed the design of the landscape architects.

Two architectural firms—Cooper & Auerbach of Washington, D.C., and William A. Gould & Associates of Cleveland—won second and third awards, respectively.

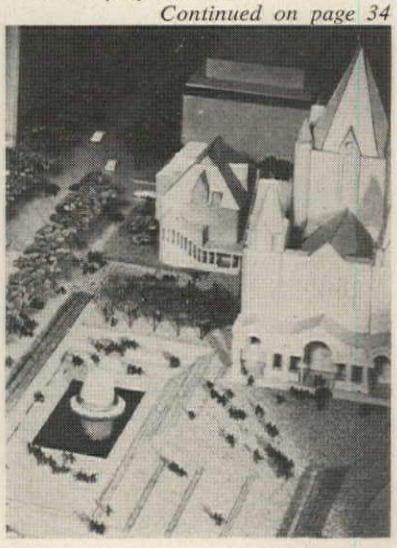
First honorable mention went to Herbert L. Hamilton Jr. AIA, Geoffrey Freeman and Peter Roudebush of Winchester, Mass. Honorable mentions were won by Richard Foster, architect, New York, and Earl R. Flansburgh & Associates, Cambridge, Mass., architectural firm.

Sasaki, Dawson, DeMay designed a sunken pool and fountain to balance the offset siting of Trinity Church.

Diagonal pedestrian movement is encouraged into the square where steps gently raise and lower levels. Views into the plaza are unimpeded, but once inside the space a sense of enclosure is created by low walls and plantings around the sunken area.

The City of Boston, Boston Redevelopment Authority, Back Bay Council and Back Bay Planning and Development Corp. were sponsors of the competition. Pietro Belluschi FAIA was jury chairman.

Continued on page 34



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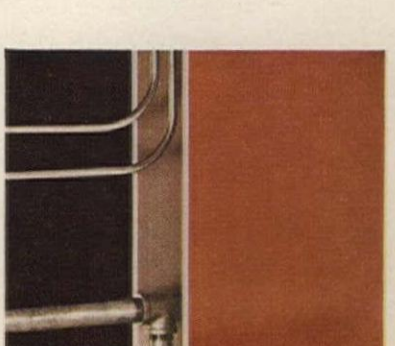

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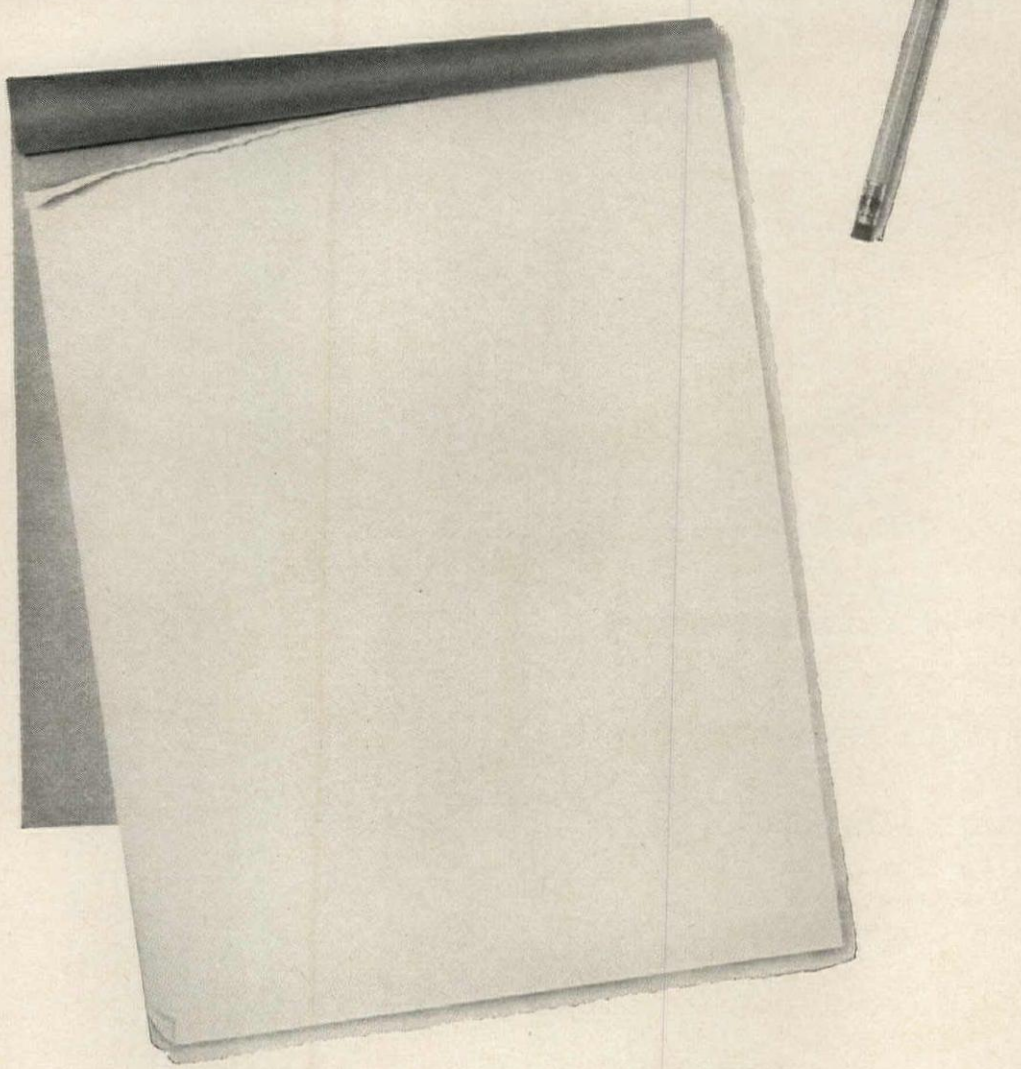

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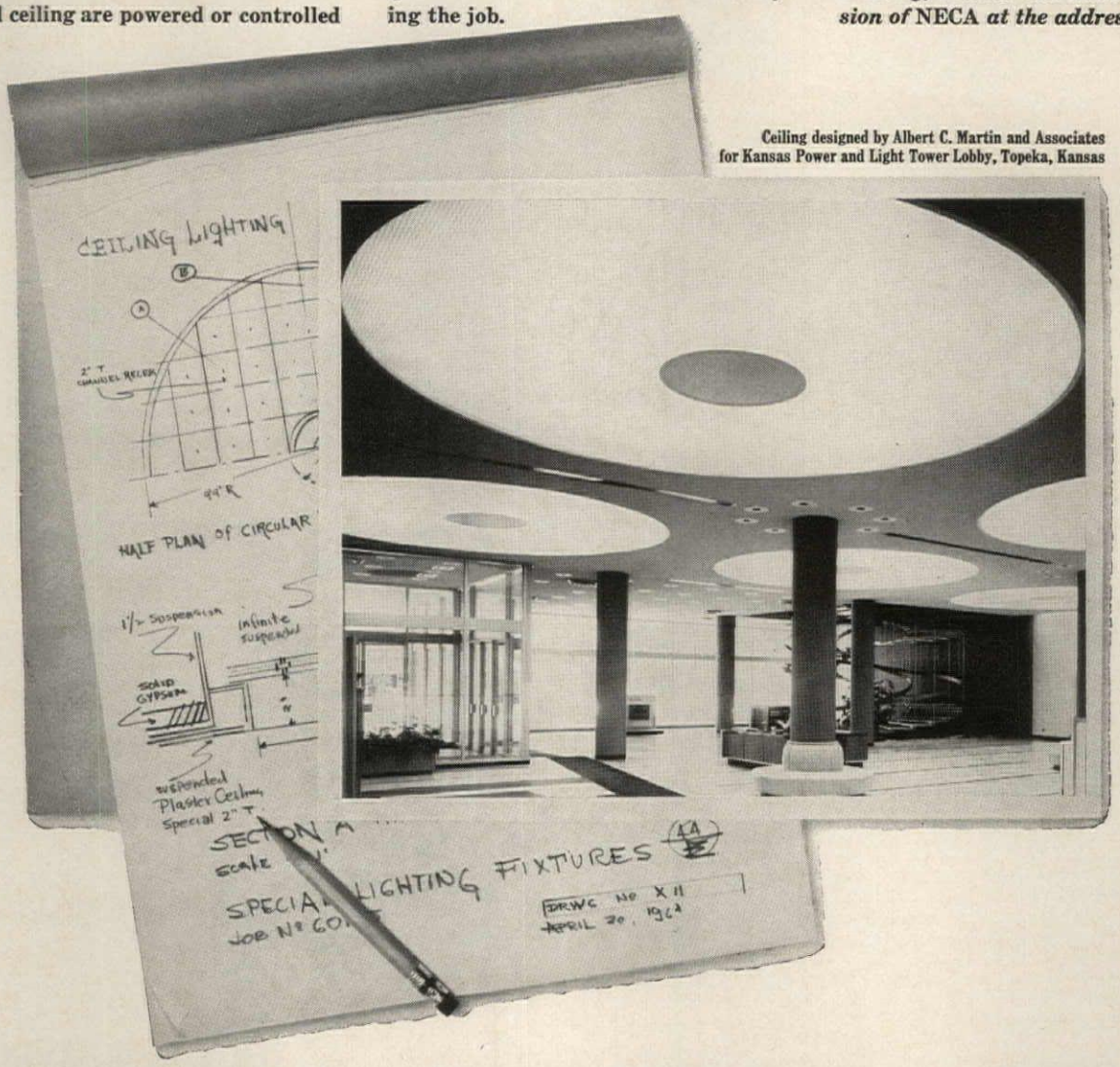

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Newslines *from page 30*

Charles Granger, Wife, Son Killed in Crash

Charles Granger AIA, his wife and their 14-year-old son died in a violent traffic accident while bound for their Austin home after a visit in San Antonio.

Granger was 52, Mrs. Marjorie Granger 41. The architect and his son, Wallace Bruce, were pronounced dead on arrival at the New Braunfels Hospital. Mrs. Granger was pronounced dead at the accident scene.

Joan Granger, 5, was taken to the hospital for treatment of a leg fracture. The Grangers leave two other children, Charles Thomson Granger III, 15, and Lauren, 13.

Police said the Grangers' car was struck headon by an auto that crossed over into their lane on Interstate Highway 35.

Word from Texas shortly after the March 20 crash listed the driver of the other car as hospitalized in serious condition.

Granger was a partner in the Austin firm of Fehr & Granger. He was a former president of the Central Texas Chapter AIA and served as chairman of the National AIA Committee on School Buildings and Educational Facilities from 1959 through 1961. ■

NECROLOGY

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Whittier, Calif.

EDKINS, GEORGE
Oaklyn, N.J.

GORDON, KENNETH A.
Altadena, Calif.

GRANGER, CHARLES, JR.
Austin, Tex.

HOWE, STANLEY W.
Monroe, Wis.

KELLER, CORNELIUS J.
Washington, D.C.

KLOMAN, CHARLES A.
Pittsburgh, Pa.

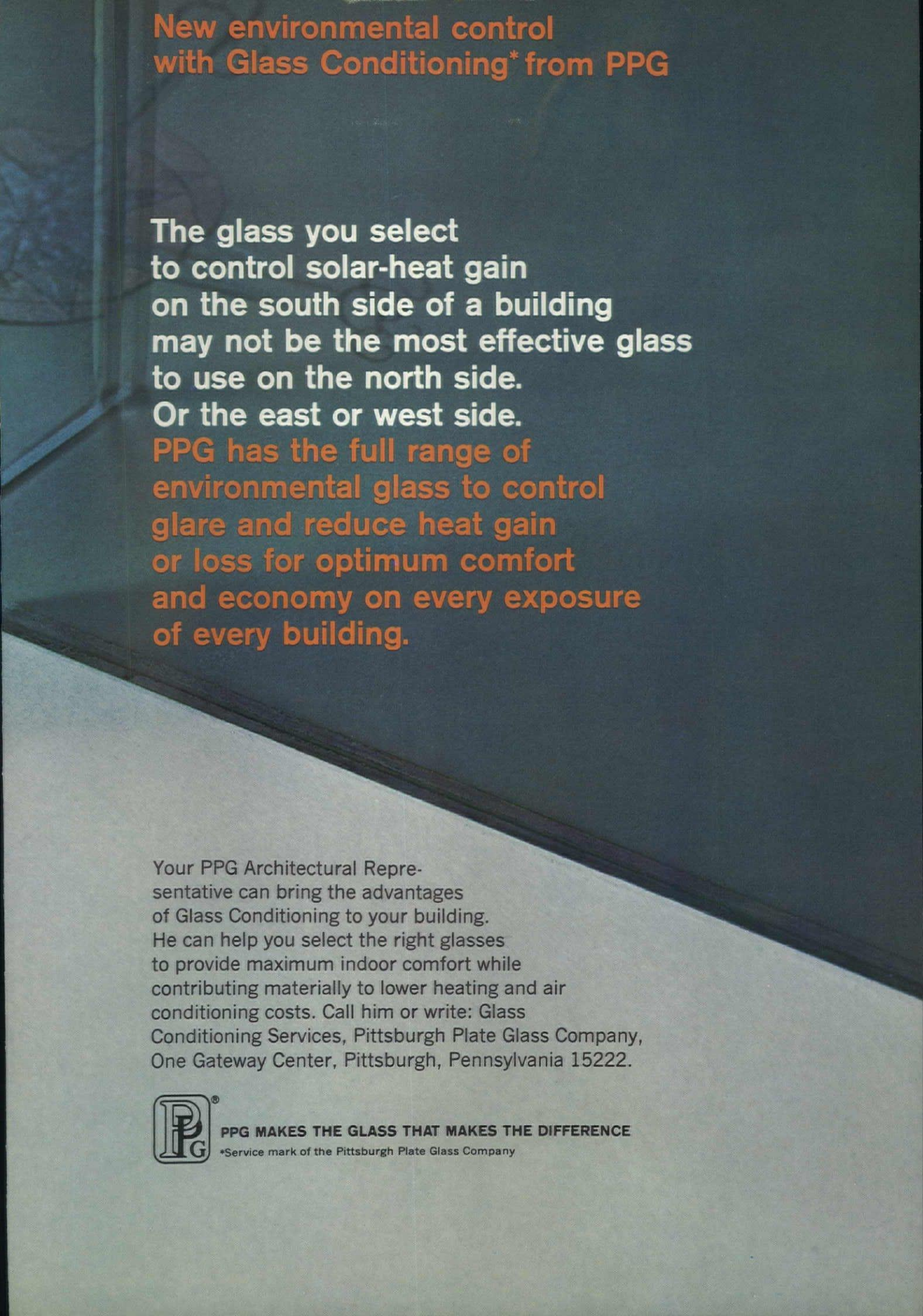
MARVIN, NEWTON F.
Toledo, Ohio

TARANIN, ALEXANDER
Altadena, Calif.

TREPAGNIER, HORACE E.
New Orleans, La.

WAUGH, EDWARD W.
Raleigh, N.C.

WOLFE, G. MORTON
Buffalo, N.Y.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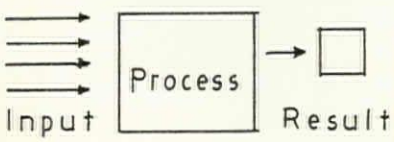
Who Will Do the Thinking?

LOOKING into the future is no crystal-ball matter for big modern corporations. Their research laboratories constantly seek new products, sometimes deliberately intending to render existing lines of products obsolete. Tradition is conspicuously not sacred. But *ahead* of research these corporations have special groups assigned solely to determining what business will be in the future. They must combine Cloud 9 imagination with sound projections of what the public will want.

Our profession is made up of many small units, none of which could undertake such studies. Collectively we have ventured into this field through the Institute's educational research project at Princeton. Its importance cannot possibly be overestimated. It is concerned with preparing the coming generation to be truly capable of designing man's total physical environment. It is important for the profession; important for society. As important as putting a man on the moon?

Space science is capturing the attention of many thinkers who have earthbound goals. What fascinates them is the scientific approach to problem solving developed by the moon shooters whose thinking has been unhampered by any background of tradition. Leaders in the disciplines related to human affairs are examining the methods of physical science to learn more about adapting its sure-footed approach to the advancement of knowledge. Dialogs along these lines are taking place with respect to the Princeton project.

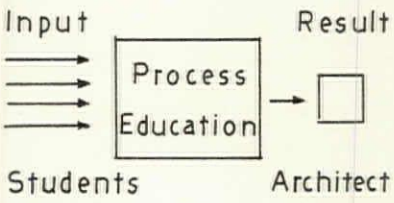
This simplified diagram represents what transpires in developing



a new widget or putting a man on the moon. A given result may require a very simple or very complex *input*. Correspondingly the *process* may extend to highly complicated arrangements of systems to translate input into an integrated *result*. We are familiar with the Critical Path Method as a new but comparatively unsophisticated treatment of the design or construction process.

In scientific lingo the *process* is often called "the black box" at the beginning of systems research because what must take place inside is unknown. Only after the result is clearly specified and the elements of input are fully understood can the researchers concentrate upon what must happen in the black box.

The simplified diagram for the Princeton project is this: research in human affairs. A first assumption is that the study is basically con-



cerned with educational processes, and this is correct. The project has already found many changes taking place in architectural schools. But what about the end result—the "architect"—20 years from now? Almost everyone agrees he will differ from today's architect and in most cases may be a member of a team.

How would you go about specifying the requirements for the architect of 1985? You might combine the best obtainable opinions of practicing architects, educators and selected types of clients. Emphasize the clients: Their needs are most influential in determining what the profession must do and must be.

How about supplementing opinion with facts obtained by research to answer such questions: What will be the volume of construction in 1985? What parts of it will be governmental, institutional, commercial, residential, industrial? What volume of work in urban design? What volume in multibuilding projects? How much building will have entreprenurial beginnings? What percentage of clients will want comprehensive package services?

How many persons must be practicing as principals in architecture? What must their several talents and specialties be? How many technicians or other supporting personnel will the profession require? How are they to be trained? To what extent will computerized processes replace drafting room work?

How many graduates must be produced by architectural schools? How can "internship" develop them into licensed practitioners? Methods for projecting statistics to answer many of these questions are known in economics.

The Princeton project is not funded for such research in great depth. The profession must prepare itself to support more educational research and the program must develop techniques for scientific projections to determine more accurately the nature of tomorrow's architect and the corresponding educational systems.

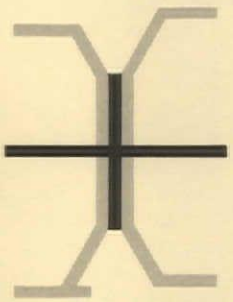
There is one devoutly desired accomplishment for the Princeton project: to develop some kind of "thinking team" to carry on. My original premise was that a democratically organized professional society could not match the investment of great corporations in their preparations for the future. But we should be able to marshall the brainpower. We need a central thinking mechanism something like the Committee for Economic Development which serves the business community.

I have high hopes that our project directors will define and begin to organize such a team from practitioners, educators and clients of the profession.

WILLIAM H. SCHEICK, FAIA
Executive Director

A·I·A
Journal

Cities on the move . . . .



AT NO OTHER TIME in our history have we shown such deep concern for the problems of cities and urban transportation. The year 1966, in fact, may well become a milestone in terms of the latter. For example, the nation's capital is mapping plans for a 25-mile subway system at an estimated cost of $431 million.

The President himself highlighted the situation in his recent letter to the administrator of the National Capital Transportation Agency: "Transportation is a critical problem for all major urban centers, and what is done here will have significance far beyond this region."

Mr. Johnson, in effect, was issuing a guidepost for transit officials and planners throughout the land when he further wrote: "While we seek to resolve problems of moving people and goods within the congested national capital area, our concern must *not* be confined to the utilitarian requirements . . . . In designing the system . . . I want you to search worldwide for concepts and ideas that can be used to make this system attractive as well as useful."

Taking the President's cue, Chicago architect Harry Weese FAIA, commissioned to do the conceptual design for the subway facility, went abroad. And well he might, for scores of foreign cities already have or are building rapid transit systems.

Meanwhile, construction in the United States is being undertaken at a feverish pace. Besides the NCTA system, these major projects are in the works:

- For a three-county San Francisco Bay area, a 75-mile subway and surface rapid transit system is under construction ($996 million).
- In the Boston metropolitan area, the Massachusetts Bay Transportation Authority has authorized the 12-mile South Shore and 12-mile Ready suburb extensions ($75 million).
- Between Philadelphia and Camden, the Delaware River Port Authority is improving its route and extending the 10.6 miles between Camden and Lindenwold in southern New Jersey ($62 million).
- In Cleveland, construction has begun on a 3.8-mile extension to link its downtown with the airport ($14 million).

In addition, serious planning for rapid transit is underway in Atlanta and Los Angeles.

North of the border, 14.5 miles is being added to the Toronto subway system ($284 million); and in Montreal, a completely new subway system of 16.1 miles is being constructed ($369 million).

Altogether, reports the Institute for Rapid Transit, U.S. and Canadian programs amount to more than $2.23 billion, and provide 169 miles of subway and other transit routes.

The American Institute of Architects recognizes the meaning of these developments to design professionals. As a case in point, Robert J. Piper AIA, administrator of the Department of Professional Services, moderated a symposium arranged by the Washington Gallery of Modern Art last fall and has since participated in other meetings.

Early next year (Feb. 8-10 in Williamsburg, Va.) the Middle Atlantic Region AIA will sponsor a conference "to clarify the place of transportation in relation to social and economic needs using the region —Delaware to Virginia—as an example; to make recommendations on the planning process as related to transportation; and to explore the role of the architect in this process."

The worldwide scope of the problem prompted the holding of the first International Conference on Urban Transportation in February. Three days of intensive discussions in Pittsburgh ran the gamut from intergovernmental relationships to financing to labor negotiations.*

It is not possible to begin to cover all developments and details in these 16 pages. But the section does attempt an overview which includes 1) excerpts from the Buchanan Report, "must" reading for anyone giving serious thought to transportation; 2) an idealistic look at rapid transit; 3) a proposal for balanced transportation; 4) an outline of design criteria. Supplementing these articles is a portfolio which highlights visual aspects of systems throughout the world.

One final thought: In selecting the title "Cities on the Move," the editors debated the use of a question mark. In light of recent events, an exclamation point appears more appropriate!

*Conference proceedings are available at $5 a copy from the Chamber of Commerce of Greater Pittsburgh, Chamber of Commerce Building, Pittsburgh, Pa. 15219.

Relating Traffic to Town

AN EXCELLENT BEGINNING for any discussion of transportation is the Buchanan Report, released in London by the Steering Group appointed by the Minister of Transport.

Formally titled *Traffic in Towns,* this is a realistic, clear study taking into account man and society for what they really are in today's world, rather than a futuristic projection of machines and concrete that would have the architect the sole saviour of the 20th century.

Italicized observations by Ralph K. Morrill AIA accompany the following excerpts:

The starting point is the principle that traffic and buildings are not two separate things but two facets of the same problem. To the highway engineer, buildings may simply be structures that line, and sometimes obstruct, his roads. But in fact they are the generators of the traffic and the destinations to which it is going. If there were no buildings, there would be no traffic—and conversely, if there were no traffic, there would be very few buildings. Similarly, those who design and locate buildings should not take it for granted that the street system will be able to serve them. The buildings which generate traffic should be integrated with the traffic arrangements in an overall concept of town planning. Insofar as this cannot be secured by permissive planning—that is, by regulating the activities of the public—it should be done by positive comprehensive redevelopment.

The analogy used is that of a large office building, with its halls and corridors carrying the traffic and its individual rooms representing the environmental areas. If, at first sight, the distinction between roads for traffic only and traffic-free areas should seem rather forced, then it can be answered that the distinction between rooms and corridors is also a comparative innovation in the history of architecture.

This is a total concept of architecture, which builds theory from basic sociological, political and economic facts, realizing that none of these can be separated in true architecture from their proper relationship to the final form of the urban environment. This is not the Rome of Sixtus V, and we must deal with today's world in today's terms.

Before very long, a majority of the electors in the country will be car owners. What is more, it is reasonable to suppose that they will be very conscious of their interests as car owners and will give them a high priority. It does not need any gift of prophecy to foresee that the governments of the future will be increasingly preoccupied with the wishes of the car owners.

A car-owning electorate will not stand for severe restriction. And even if severe restriction could be put on the statute book, it would be almost impossible to enforce. It is a difficult and dangerous thing, in a democracy, to try to prevent a substantial part of the population from doing things that they do not regard as wrong; black markets and corruption are the invariable fruit of such attempts at prohibition. Even if this overriding objection could be removed, there would still be severe difficulty in pushing any of the particular methods of limitation very far.

The book takes into consideration four studies: 1) a small town with complete redevelopment the objective; 2) a large town considering partial redevelopment; 3) a historic town with minimum redevelopment desired; 4) a central metropolitan block with time and space piecemeal redevelopment. These studies state the following facts:

· There are now virtually no urban streets that are completely safe.

· Why, for example, should the streets have to carry large tankers delivering fuel oil to individual buildings when it could be piped in the same manner as water or gas or (as in New York) steam?

· It is important that movement demands be studied as a whole, not merely those that involve the motor vehicle, because all the indications (including those from the United States) are that in a complex community no single system of transport can provide for all the movements involved and that coordination between two systems is required.

· Vehicles do not, of course, move about the roads for mysterious reasons of their own. They move only because people want them to move in connection with activities which they (the people) are engaged in. Traffic is therefore a function of activities. This is fundamental.

· The general lesson is plain enough that it is possible in a town of about 37,000 people, serving a hinterland population of about the same number, to provide for virtually all the use of vehicles that people are likely to want, but it will require drastic and expensive measures on a scale hitherto unexpected for a town this size.

· The great danger for the future would seem to lie in the temptation to seek a middle course by trying to cope with a steadily increasing volume of traffic by means of minor alterations, resulting in the end in the worse of both worlds—poor traffic access and a grievously eroded environment. This case illustrates the "law" that, given a determination to observe a certain worthwhile standard of environment, the amount of traffic that can be admitted depends upon the money that can be invested in physical alterations.

· It is concluded that there is no possibility whatsoever, in a town of this size and nature (Newbury, 30,000) of planning for the level of traffic induced by the unrestrained use of the motor car for the journey to work in conditions of full car ownership.

· This study of Leeds demonstrates three main points. First, it shows that the problems of vehicular movement, even in a complex city, are susceptible to analysis. There is no need to proceed by guesswork or hunch. The necessary characteristics of a network are almost as capable of methodical evaluation as the layout and dimensions of a steel frame for a building.

· Sprawl takes the form that it does primarily because peripheral spread is the "natural" easy way for a town to expand and because there has been no effective planning machin-

Permission to reprint from the 1963 report has been granted by the controller of Her Majesty's Stationery Office. Mr. Morrill, who selected the excerpts, is an associate professor of architecture at Auburn University and consultant to the Institute of Applied Technology, National Bureau of Standards, for urban esthetics on the Northeast Corridor Project.

ery to direct expansion into any other form. But high car ownership, and the post-war mortgage system of the Federal Housing Administration, which has been tied very largely to detached free-standing houses, have powerfully influenced the suburban character of the sprawl.

· People declaim the great destruction of property which the freeways have involved, but this seems to be the price that has to be paid for lack of planning in the first instance. Other people say that freeways "never solve the problem" because they become congested as fast as they are built. This, however, does not always seem to be the fault of the freeways; it is often the fault of continuing sprawl (admittedly, often sparked off by the construction of the freeway) which brings new loads of traffic, particularly of persons traveling to work by car. This, it would seem, must be the basic explanation of the Long Island Expressway, recently described as "the longest parking lot in the world," and on the Shirley Highway leading west out of Washington, which now has to be pulled up from end to end and doubled in width in order to deal with the increased load.

· The rundown of central areas antedates the freeways and appears to be a by-product of sprawl.

Conclusions of the book, not only stated but also substantiated by many exact charts, include:

· The broad message of our report is that there are absolute limits to the amount of traffic that can be accepted in towns, depending upon their size and density, but up to those limits, provided a civilized environment is to be retained or created, the level of vehicular accessibility a town can have depends on its readiness to accept and pay for the physical changes required.

· Our studies suggest that very few of the statutory development plans really face up to the future problems of traffic and transport. Many contain proposals of a palliative nature which, if persisted in, can do irreparable harm and prejudice more constructive measures.

· But a great doubt attaches to the equity of requiring the provision of space for the *optional* traffic generated by the building, especially space for car commuters employed in the building. To put it shortly: Why should an employer be obliged to provide parking space for all and sundry on his staff who may choose to drive to work by car primarily for their own convenience?

· Even if account is taken of the need to rely upon mass transport for the main movements of people in larger cities, our studies indicate that the use of private cars for journey to work, resulting in highly concentrated flows in the mornings and evenings, would remain as one of the main aspects of the traffic problem. If these peak flows are to be accommodated efficiently, it means that a road system has to be provided which is underused outside the peak hours. It can be argued that this is an uneconomical course to take when there is the alternative that hours of work could be staggered and the load spread more evenly over the day. . . . If this country is to move forward with a steadily rising standard of living, then one main demand will be for normal hours of daytime work for as many people as possible, and society is likely to feel it can afford the various facilities, including transport, that will make this possible.

· An aspect of the problem which emerges from our studies as extremely important, but which we have not had the opportunity to study in detail, is the esthetic design and landscaping of primary roads and interchanges. It is not only a matter of *locating* these roads with regard to broader considerations of environment but of ensuring that they are intrinsically well designed. In this it is important to ensure that the designs take account of the manner in which the structures are viewed. The driver's and stroller's needs differ. ■

Three Axioms for Rapid Transit

Defining the Ideal System

BY LELAND HAZARD

I BEGIN with some axioms for the major components of an ideal urban transit system: its vehicles must run on exclusive rights-of-way; its system of exclusive rights-of-way must be as coextensive with, and ubiquitous within, the real community as topography and technology will permit; its services must be regular, frequent and esthetically pleasing at fares which any can afford.

Before elaborating on each of these axioms it should be noted that for community mobility there is one axiomatic word: *separation.* There must be separation of the principal public transit vehicles from all other types; there must be separation of cargo-carrying vehicles from passenger-carrying vehicles; there must be separation of pedestrians from everything which goes on wheels.

Commingling of different types of vehicles serving different purposes and commingling of the walking man with the vehicles of the riding man—commingling is the death, separation is the life, of mobility. And mobility is urbanism's life.

It is popular these days to speak of balanced transit, meaning that even after a community has rapid transit there will still be private automobiles and mass transit buses. True enough. But insofar as these assurances are designed to allay the concern of auto and bus manufacturers, they fool no one.

After our nation's communities have rapid transit as I shall presently visualize it, there will be fewer private autos and public buses involved in public transit per thousand of urban population. The gross number of such vehicles will still be large; population increase will assure that. No one need sell his motor stocks. But some three-car families will fall to two; some from two to one; and the percentage of no-car families will be larger because a higher percentage of people will live in high-rise apartments near the rapid transit lines.

Insofar as the assurances about balanced transit are intended to allay the concern of unions and their members engaged in public transit, they should fool no one. The rapid transit I am about to postulate, unproved though it is as yet, will in-

An adaptation of the keynote address presented before the first International Symposium on Urban Transportation in Pittsburgh by a director of the Port Authority of Allegheny County.

volve fewer or *no* manual operators, and the elimination of streetcars and reduction of number of buses per thousand of population will decrease public transit employment as a percentage of total employment.

Since when did technological change not leave some businesses and industries and some people in temporary disarray? Never! The discovery of the wheel eliminated a lot of dragging around of things, and hence eliminated a lot of pulling and pushing jobs. The process has been continuous to this day.

One thing is certain. No community of substantial size can have balanced transit until it has rapid transit. And so I have put in these caveats about the real community and the economic and social casualties of change as a necessary prelude to a discussion of the three axioms of an ideal urban transit system. Each of these axioms calls for rapid transit, and that is what makes the big change.

The first axiom for rapid transit is exclusive right-of-way. There is a simple but fundamental difference between mass transit and rapid transit. Mass transit may mean simply that a significant number of people move in vehicles—buses, for example, which will carry 50 persons past a single point per unit of time, as distinguished from the private auto which carries an average of 1.5 persons past the same point in the same time.

But bus travel commingled with private auto and truck travel can be no more rapid than the whole assortment of low-powered, high-powered, underloaded, overloaded, flat-tired, dead-engined, longitudinal complex. And when some youth, still in his salad days, decides to share his driving responsibilities with a willowy female plastered to his right side, the community mass transit is subjected to utterly unpredictable erotic vagaries.

Rapid transit, unlike mass transit, must have its own exclusive right-of-way. In contemporary urban communities, only subways and an occasional elevated railway, as in Chicago, or an occasional monorail can be called rapid. And the term does not necessarily imply high speed; it does imply and must mean separation from all other traffic.

It is separation—exclusiveness of right-of-way—which is the fundamental. Exclusive right-of-way, and only that, can assure mobility on schedule for large masses of people. Any community which thinks otherwise is suffering from the 20th century opiate of the people: the private auto. A community may buy buses and lay highways until it is blue in the face, but it will not have mobility until substantial numbers of its public transit vehicles ride on exclusive rights-of-way.

Speed in rapid transit is a function of distance and number of stops, and the number of stops is a function of population density. If a community is, in effect, a straight line, as along a seacoast or a lakefront, then the distances will be greater and the speeds must be higher.

If, on the other hand, the community is, in effect, a wagon wheel, the several distances will be less, except in the greatest megalopolis; the speeds can be correspondingly less, but the passenger collection problem will be greater.

To summarize about the first axiom: Exclusivity of right-of-way is an absolute necessity; speed can be relative to the size and design of the community.

What I shall say concerning the second axiom is neither fact nor fantasy—not fact, because no system of the type I shall describe is now serving any public; not fantasy, because serious research work on such a system is in progress. In an ideal system, the complex of rights-of-way would be coextensive with, and ubiquitous within, the real community. Such ubiquity would involve a fundamental breakthrough in the nature of the transit vehicle itself and the programming of its operation.

The conventional railway car weighs 60,000 to 80,000 pounds. This is essentially what is used in our present rapid transit system, predominantly the subway. Suppose we had a car weighing only 10,000 to 12,000 pounds, only 15-20 percent of the existing conventional rapid transit car weight. Such a car might change everything—from the size, bulk, design and cost of the exclusive right-of-way; to the routes which the rapid transit system may travel and the grades it might ascend; to the system's ubiquity—comprehensive coverage—in the real community; to the costs of construction and operation and the esthetic characteristics of the installations.

Let us assume a lightweight transit car with a capacity of about 30 persons that could negotiate slopes on the order of twice the grades permitted by the 60,000 to 80,000-pound, steel-on-steel, transit vehicle. Then we may postulate that the flexibility inherent in the greater allowable grades and the lighter supporting structures would permit a system to more fully utilize low-cost land for rights-of-way and topographical advantages. There is much useless, and therefore cheap, land in many communities, particularly where the terrain is rugged.

I hold no brief for any certain material, product, industry, company or plan. But I cannot speak in riddles. So we assume that such a car would run on rubber and the rubber on concrete; and that the power would be electric.

Now we must look at such a hypothetical system from three points of view: 1) cost, 2) the central city, 3) the residential and suburban areas.

A conventional heavy-car system, piercing the hard core of a central city underground, costs on the average about $10-12 million per mile. But of this average, the figure for subways under the central city is $30 million per mile, while the figure for that part of the system on the ground in the suburbs is only $3 million per mile.

Here, then, is a powerful incentive to get above ground. If we could design a system to stay above ground in the central city, we might have—for the same money perhaps—five times more mileage in the residential and suburban areas. That is what the ideal calls for—more comprehensive coverage.

Let us assume that a lighter car on a lighter structure need not go underground. The system is noiseless so that from that point of view it is unobjectionable above ground. In the central city an ordinary building structure might support the right-of-way. The size and weight of the supporting structure might be so reduced that on certain city streets it would be no more than a continuous canopy above ground-floor shops with all electrical utilities and street lighting integrated into the transit structure.

Thus, at long last, with streetcars gone, we would be free of the clutter of poles and wires which have for so long defaced our streets. Such a system might actually be integrated into new buildings and in some places be incorporated into old ones. Conceivably, property owners would vie for the privilege of having the rapid transit system disgorge its passengers inside their buildings. And so, cost of acquisition of rights-of-way would be reduced and work time minimized.

STOCKHOLM TO SAN FRANCISCO

A Portfolio of Transit Systems

Visually, at least, the most successful transit systems currently in operation are found outside the United States. Several in particular demonstrate a "new clarity of purpose at once functional and beautiful, useful and pleasurable," as one architect put it upon returning from a trip abroad. While all eight of the foreign systems shown here are not necessarily held up as models, they do indicate the scope of design and service facilities. Representing the U.S. are the expanding and revitalized system for metropolitan Boston and the first completely new system to be built here in 59 years for the San Francisco Bay area.

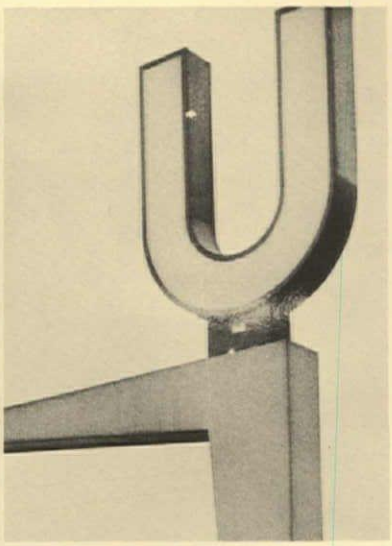
Stockholm *High-order design integration*

Moscow

Embellishments galore

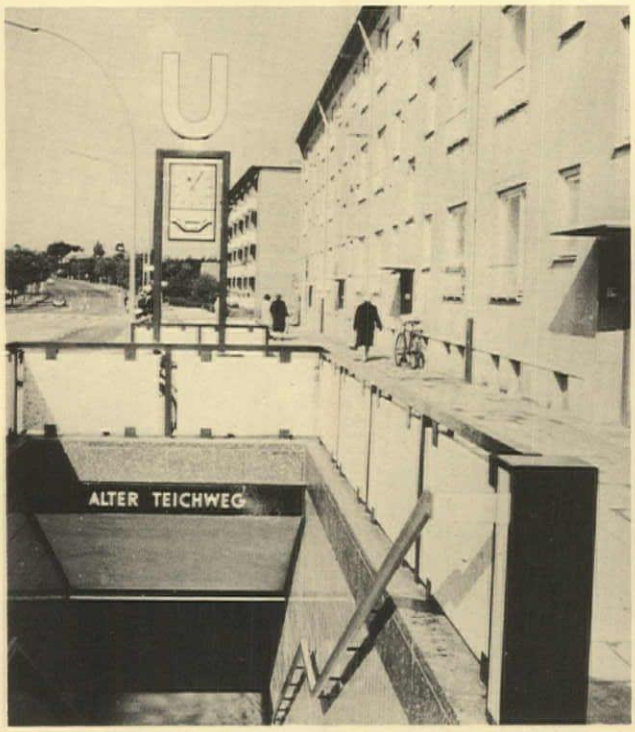
London

Distinguished signing



Berlin

Unified identification

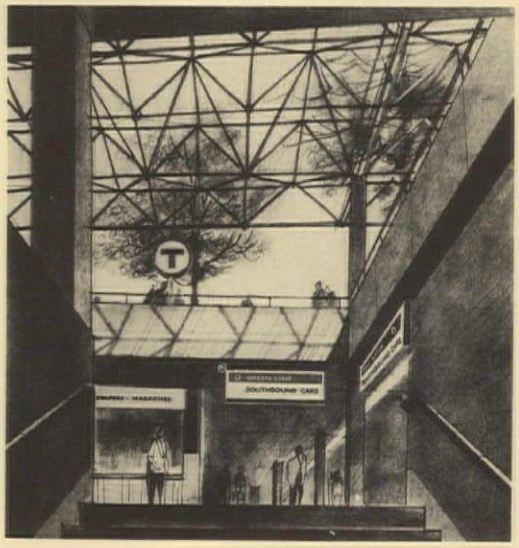


Japan *Intercity efficiency on the New Tokaido Line*

Paris
Tasteful shops

Milan *New underground system and more to come*

Toronto *Noise-reducing bridge*



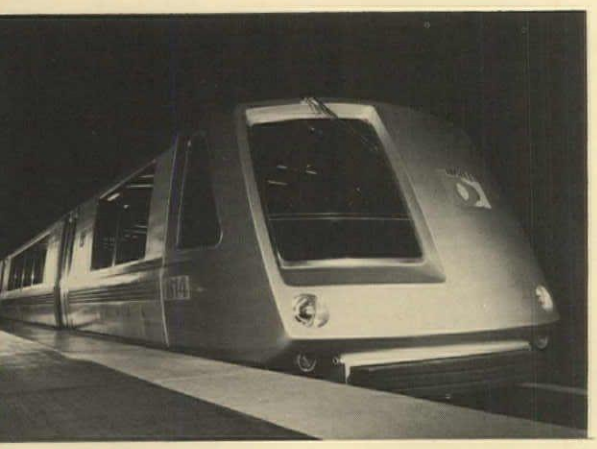
Boston

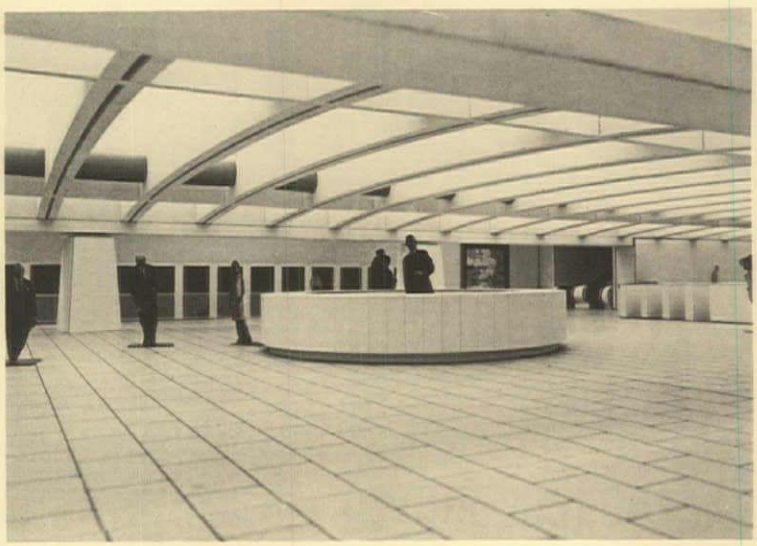
Before and after: revitalization

Consulting architects for the Massachusetts Bay Transportation Authority: Cambridge Seven Associates, Inc.

San Francisco Bay *Exclusive rights-of-way*

Chief consulting architect for the Bay Area Rapid Transit District: Donn Emmons FAIA (19th Street Station, Oakland, at right: Gerald M. McCue & Associates); landscape architect: Lawrence Halprin.





Here is the challenge. Do we have the wit to get rapid transit out of the ground? Do we have the engineering imagination to translate lower weight cars into lower costs throughout the whole system; to make bridges across rivers, structures winding up hills, loops, and loops within loops, spindling compared with the massive structures we are accustomed to for railway bridges and six-eight lane auto bridges. Can we make total rapid transit costs decline exponentially with the reduction in the weight of the car?

So much for costs and the central city. As for the suburbs and outlying communities, with lightweight, and hence graceful, structures, which can go along hillsides, loop around hilltops, pass through residential districts as easily as power and telephone poles, and carry the power and telephone lines to boot, with cars weighing little more than a big auto, handsomely and colorfully designed, and making less noise than an auto—here we see a whole new dimension and scope for rapid transit.

The old assumptions that people will have to use their autos anyway (Park and Ride or Kiss and Ride) or take lurching feeder buses to the collection points on the roaring rapid might yield to a new concept of quiet, graceful transit which spins its gossamer threads throughout the community with the felicitous ease of a spider making its web.

The figure of the spider's web is precisely applicable to a transit design for a wagon-wheel community because it symbolizes both efficient design for mobility and sufficient strength for its purpose. In the design of the spider web we find the suggestion for how certain communities may now lay out a system of mobility, given light materials and spindling construction comparable in our scale with those which the spider employs.

We come now to a fundamental difference between the conventional and an ideal transit system. If cars are to carry only 30, even fewer, passengers (there is some optimum yet to be discovered for the ratio between weight, power, design and number of passengers per car), and if network mileage is to be greatly increased, then there will be many more individual vehicles in the transit system.

This brings us to the computer. The ideal cars will operate like horizontal elevators. There will be no lookout, no motorman, no operator. Perhaps there may be a nurse-hostess moving from vehicle to vehicle at stationstops, *chic* to remind men of their manhood and gentle to help old ladies.

There is so much folk mystery about the computer that I hesitate to mention the word—the greatest threat to man's ego since Copernicus told him his earth was not the center of the universe. A man, with men helpers, can run a relatively simple transit system such as the subways of any of the great cities of the world.

A highly flexible system for, let us say, a community of 500,000 up to 1, 2 or 3 million people with 10 times the usual rapid transit network mileage in spiderweb form and 10 times the number of vehicles—such a system is beyond a man and men at any given time.

Now to the point. A simple system of 30 miles or even more does not justify the computer. But a flexible system of five to ten times that mileage and with a correspondingly larger number of vehicles, in a complex, spider-web pattern, can perform permutations and combinations of service beyond any heretofore known human experience.

It is feasible to imagine computer procedures by which, as riders enter the system, they push destination buttons. These signals go instantly to the computer. If points of congestion show up at the computer, it orders slight detours within the spider-web, even in the downtown complex, so that all keep moving; no one sits in frustrating immobility on an expressway or on a main line, and all arrive on schedule.

There is an operating pilot plant in the Pittsburgh area to test the feasibility of a prototype of an ideal system called Skybus. True, the cars weigh 18,000 pounds, and the supporting structure is heavier than I have visualized, but the model is much nearer to the spider-web, spindle construction than it is to the conventional systems.

The cars *do* go without operators. They *do* stop at the platform gate within a 12-inch tolerance. They *do* start on their own and stop on their own. And they *are* so silent that in a building which the vehicles skirt, the noise-recording device installed in that building has not even registered.

The commissioners and the Port Authority of Allegheny County, the Federal Housing and Home Finance Agency, the Commonwealth of Pennsylvania and the principal industrial corporation of this area have pooled their resources and skills to make this $5 million pilot plant feasible. It is working; much remains to be done.

Still you ask, "Why so late; and if anything so obviously good is really feasible now, why was it not done long since?" First, from about 1900, and now for 65 years, America has been enamored with the auto. Why not. It is the best instrument of aggression since the cave man's knobbed club. While we Americans were getting civilized, it was probably as harmless a device —i.e., the auto—for working off aggression as any.

Aggression is a luxury our society can no longer tolerate in its urban areas. But we suffer from a cultural lag. There are still pavers and trafficists who think we can put our motorized camels through the eyes of our municipal needles. And to this day city planners and authorities are building more and more of those tax-exempt shrines to the auto known as parking stations.

Preoccupied with the auto, we have neglected transit research while our basic transit industries, beset with government nagging and truck competition, fell into a research-obviating neuroticism.

You may have forgotten that one of the conditions of my third axiom is that the rapid transit and its services must be esthetically pleasing. Urbanism is a global phenomenon. Soon, far more than half of the world's population will live in cities.

These great cities all over the world are the repositories of our one-world culture: the record of the thoughts and deeds which give man his claim to be called man. The one best hope of our world civilization is to make accessible, and readily so, these treasures of art and architecture; and all the examples of excellence which have come from—and have found a place in our cities of the world—the sensitivities of the ages.

Now when I say that a rapid transit system must be esthetically pleasing, I mean that it must be something more than just a means of reducing commuting time, important as that is; it must comport in grace and elegance with all those rich stores which bespeak man's ageless reach for truth and beauty.

And when the rapid transit comes to bring man to restore his soul from the works of his fellowmen, it should come quietly and with dignity and in keeping with the human scale. ■

No 'Either-Or' Proposition

Preparing the Proper Mix

BY REX M. WHITTON

THE CITY is an instrument of communication, bringing people together by its very purpose and nature. At the same time, its pattern of development is, to a great extent, determined by the kinds of transportation available to its inhabitants.

Obviously, the physical layout of a city dependent on horse-drawn vehicles and pedestrian transportation cannot be the same as that of a city which utilizes trains, streetcars and subways. And the tremendous increase in individual mobility brought about today by the almost universal availability of the motor vehicle has introduced new possibilities in urban arrangements that would have been unworkable a few decades ago.

Thus, transportation is an inseparable element of any city and cannot be considered apart from the city itself. Further, while we are concerned with the transportation problems of our cities, we should recognize that such problems are themselves indications of and result from the vitality of our cities.

The problems we face, then, are those that arise from the success of the cities. And highway transportation has played a large part in this success. We must keep it clear that, in trying to improve our cities, we are not performing emergency surgery on a dying organism; we are not trying to restore the city as it was in some idealized bygone time.

We are, rather, trying to adapt the city to the demands of a new time and a different future. If we fail to recognize this fact, especially in our efforts to improve transportation, we will find ourselves fighting yesterday's battles and overlooking those of today and tomorrow.

As for today and tomorrow, we can take encouragement from the fact that we have more options before us than ever before. The variety and flexibility of the transportation available to us now, and the prospect of new contributions from modern technology, give new freedom to the city planner and the urban architect.

Let us not, however, be drawn into viewing these options as an "either-or" proposition. The time is long since past when that irritating and persistent question, "Highways or mass transit?" should have been laid to rest. Nearly a decade ago, when I was with the Missouri Highway Department, I sponsored an urban transportation study in St. Louis. In it we concluded:

"Some drastic curtailment of driving privileges is, of course, one answer to the problem. We believe, however, that there is another and better alternative for achieving efficiency of movement: a coordinated and balanced transportation program which includes transit facilities sufficiently attractive and convenient to induce a substantial number of 'automobile commuters' to leave their cars outside of the areas where both street capacity and parking space are and will continue to be at a premium."

I believe that conclusion is no less valid today. There is a need for highways and transit to complement each other, but it is in the requirements of the individual urban area which should determine how—and to what extent—this is is done.

Time, of course, will not stand still. As we already have seen in the growth of motor vehicle transportation, the auto and the truck not only brought new dimensions of individual freedom, mobility and comfort; they also made many urban arrangements completely out of date.

This development is continuing today, and there is every prospect that not only will urban areas grow at a rapid rate, but the demand for urban transportation, and particularly for individual transportation, will continue to grow. (Urban traffic presently is increasing by 5 percent a year.)

As I see it, we have a broad spectrum of responses available to us, any or all of which could be applied to one degree or another:

- We could strive to build more and better highways, with the objective of a fully adequate urban highway system.
- We could try to increase the traffic-carrying capacity and efficiency of the existing urban highway and street system.
- We could try to manipulate traffic peaks through staggered hours.
- We could try to curtail the use of motor vehicles, through economic or legal restrictions. This would imply an attempt to force automotive traffic into mass transit.
- We could try to increase use of mass transit by subsidization, improved facilities and improved service.
- We could devote much more attention to the basic physical arrangement of communities—both to reduce the need and length of such movements as home-to-work and home-to-school—and to take full advantage of the mobility and flexibility of motor vehicle transportation, alone or in combination with transit. This approach certainly is a challenge to planners and architects, and their contributions could have far-reaching impact on the long-range solution of urban problems.
- We could increase research and development on individual transportation systems, adapting the enormous investment we already have in urban highways, to more efficient commuter and intraurban service.

For reasons of space, this list of possible responses is necessarily oversimplified. But I think it shows there are not panaceas. There are difficulties—some more apparent than others—in any of these approaches. It is most important, therefore, that we be realistic about the limitations of any proffered solution and take the best of all.

As to mass transit, while I, for one, would welcome any help in reducing the rush-hour loads on our urban highways, its practical contribution to the overall transportation needs of our urban areas is necessarily limited.

This is true both of rail rapid transit and bus transit. Rail rapid transit has proven feasible only in the very largest cities and, then, only to serve high-density areas. There it serves those commuters who travel to and from downtown,

The author is federal highway administrator.

but primarily only during peak rush hours. In this way, it does relieve a portion of the rush-hour burden on highways.

However, the relative service, in actual practice, is indicated, for example, in Chicago where rapid transit occupies the median of the Eisenhower (formerly Congress Street) Expressway. The rapid transit lines have a theoretical capacity of 40,000 passengers an hour, compared with an actual 10,000 passengers an hour for the expressway. But the rapid transit actually attracts only 40,000 passengers a day, while the expressway handles 140,000 a day. In addition, the expressway provides vital freight service, as well as large numbers of buses as a mass transit facility in a different form.

As another example, San Francisco's Bay Area Rapid Transit is expected by its builders to carry 5 percent of the area's total passenger traffic. This volume would account for only one year's annual traffic growth in the area.

Again, in Washington, D.C., the National Capital Transportation Agency estimates that its entire long-term planned system of 83 miles of subways and surface rapid transit will handle 14 percent of the area's passenger trips in 1980. (So far, however, only 25 miles have been authorized.) But, between now and 1980, total passenger trips will have increased 50 percent by conservative estimates, so that the additional load alone on other forms of transportation will exceed all of that which the subway expects to handle.

In spite of these limitations, rail transit performs an essential service in the larger cities and is particularly indispensable in handling peak-hour commuting traffic in high-density corridors. Therefore, it is a necessary element in a balanced transportation system.

Nationwide, however, the greatest portion—over 75 percent—of transit patrons are being handled today by bus. By and large, bus transit suffers the same handicaps in rush-hour congestion that private vehicles do. Since buses need highways and since they—to the extent they attract passengers away from private vehicles—can help reduce the load of highways, it is advantageous to improve their efficiency as part of the total transportation effort.

To this end, studies are underway, in cooperation with HUD, on the possible provision of express bus lanes on freeways and on new arrangements for bus loading and unloading and for terminal facilities. It is amazing how little the advantages of bus transportation—in economy, flexibility and service—have been recognized by architects, and city and transportation planners.

In the smaller urban areas, it appears likely that private vehicles will be relied on exclusively in the foreseeable future.

Thus, our cities today are heavily reliant on the auto and the truck, and there is every expectation that they will continue to be so. While the motor vehicle did not create suburbia and the dislocations and outward expansion of our cities, it facilitated this evolution by providing new mobility and flexibility to the economic and social forces at work in our cities. The suburban sprawl, so often decried, resulted from largely unplanned and spontaneous rearrangements of urban elements.

It is clear that until something more versatile and flexible appears, highways will continue to play a predominant role in meeting the transportation needs of our cities, and in facilitating the rearrangement and expansion of existing communities and the development of new ones. They have to, simply because most of our urban travel is between scattered points lacking the dense trip concentrations that would make transit feasible.

There are, however, practical restraints on what can be accomplished with highways, and I would not want to minimize these. I have indicated how highways and transit must complement each other; we cannot build enough highway capacity in the most congested urban areas to meet all needs. And highway builders fully recognize this.

But there is another aspect to restraints on highways, and this goes back to my original premise that cities and transportation are for people. If highways—or any other form of transportation—are to serve the city, they must be compatible with the city. Highway planners have increasingly recognized the seriousness of this problem and the complexity of the decisions it involves.

They are facing the reality that transportation is but one element, although a vital one of the basic organism, which is the urban community. Within each community there are many public and private interests in addition to transportation, and these are sometimes competing or conflicting. When these conflicts are not resolved, needed improvements are delayed and the whole metropolis may suffer.

In order to proceed with orderly speed in meeting the urgent transportation needs of our urban areas, then, transportation planners must respect the interests that overlap their programs. This requires decisions that integrate a great variety of considerations.

Highway planners, for example, must take into account the primary function of a highway to move people and goods. They must provide capacity, safety, comfort and economy, but they must recognize the impact of the highway and its power to shape the city. To do this, they must respect the public interest in esthetics, both in highway design and in the treatment of roadsides; in humane land acquisition policies and in the displacement of people and businesses; and in the cultural and recreational values of the community.

The Bureau of Public Roads has been emphasizing that highway builders must accept all their social responsibilities. It has worked closely with HUD on urban renewal projects and on public transit projects; and recently I obtained the agreement of eight of the nation's outstanding city planners, architects, landscape architects and engineers to advise BPR on route location and design principles for use on federal-aid highway improvements in urban areas.*

But the most important tool for assuring the integration of highway improvements with the overall interests of a community has been the establishment of the urban transportation planning process in some 227 urban areas under a requirement of the 1962 Federal-aid Highway Act. Through this process, each urban area is responsible for planning its own destiny.

Highway transportation, with its unequaled versatility and flexibility, is a powerful force in molding the city of the future, but it will not realize its potential unless it is accepted as an integral feature of overall urban design and applied with the maximum of skill and imagination. ■

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* Matthew L. Rockwell AIA, Chicago, and Kevin Roche, Hamden, Conn., architects; Lawrence Halprin, San Francisco, Michael Rapuano, New York City; John O. Simonds, Pittsburgh and Marvin R. Springer, Dallas, landscape architects and/or planners; Thomas C. Kavanagh, New York City, and Harry B. Powell, Seattle, engineers.

Esthetic Considerations

Designing a Brand New System

BY DONN EMMONS, FAIA

THE CONSTRUCTION of a completely new and modern transit system is becoming a reality in the San Francisco Bay area. A second is about to begin in Washington, D.C.

Prior to these two events is a gap of half a century during which no wholly new systems were built, no real transit research was carried out, and no technical advances that might have broken the deadlock were put forward by equipment manufacturers or anyone else. Starting at this time is like starting to design a modern airliner using a World War I bomber as your most advanced prototype.

The problems are not merely technical. A new transit system calls for entirely new solutions in urban planning, civic design, programming for future regional growth and development, to say nothing of social and political adjustments that must be faced.

The Bay area has run into many of these problems. The nation's capital is fortunate in being able to learn from that system's successes and failures, for even the day-to-day decisions to be made are awesome, and all too often the interests of community groups are diametrically opposed.

Basically the new system—to successfully compete with the automobile—must be fast, efficient, convenient, attractive and comfortable. It must enliven the commuter's spirit and not be the twice-daily nightmare that most existing transit offers. The stations must be handsomely designed and fitted into the fabric and scale of the community so that each becomes an important community asset.

To accomplish these ends requires strong public interest in the development of the system to assure that none of the vital elements are overlooked or kicked aside in progress.

The budget is undoubtedly inadequate. In our present value systems, transit is a secondary form of transportation and is so treated. The California Highway Department's annual budget exceeds the total cost of the Bay Area Rapid Transit system, including tracks, stations, trains, tunnels and terminal shops. Compromises must certainly be made, and probably already have been made.

Here superior judgment is all important. If you expect the system to grow and acquire real public acceptance, don't compromise on the ultimate quality. Don't let expedience commit the system for all time to second-rate and inconvenient operation. Make sure that limitations are not built in that will thwart future development.

Perhaps the most difficult and frustrating facet of the development of the transit system is the interaction of its needs with that of the community. Here is the greatest need for public knowledge, understanding and determination.

The construction of the new system automatically brings with it opportunities for each community to improve and enhance itself, and at the same time supplement and enhance the quality of the transit system and help to assure its success.

The construction of the system will disrupt an area for many months, and it is unthinkable that the chance be missed to revitalize the area around a station by rearrangement of surface streets, creation of major open spaces, sunken plazas to bring daylight into subway stations, and the development of related shopping and cultural facilities.

The advantages to all are obvious, but these civic projects must be developed concurrently with the stations. It is a process that takes long and careful study and negotiations, and it also is an opportunity that, once lost, is gone for all time.

Everybody gives lip service to this ideal, but the necessary action is something else again. It takes a strong force to overcome the natural inertia and get things moving.

These community developments obviously cannot be squeezed into the transit budget. Each must carry out its own. Recognize the opportunities. Get the best possible planning talent and work closely with the transit system designers. Put a bomb under your planning commissions. Don't let them drag their feet until the battle is lost. This can well be what makes the difference between a tolerable system and a fine one that people will ride with enthusiasm.

The design team that will create the system should be put together with infinite care—like a fine watch—if you are to expect and get the highest quality, not only of engineering but also of urban planning and architectural design.

Start with your board of directors, who should bring a very high order of judgment to their evaluation of the enormous conflicts they must resolve. At least some of them should be dedicated to a high quality of design and be knowing enough to recognize it when they see it.

The professional team must be carefully balanced. The most skilled and experienced engineering firms should be paired with an architectural firm of equal distinction who must be given equal standing and authority.

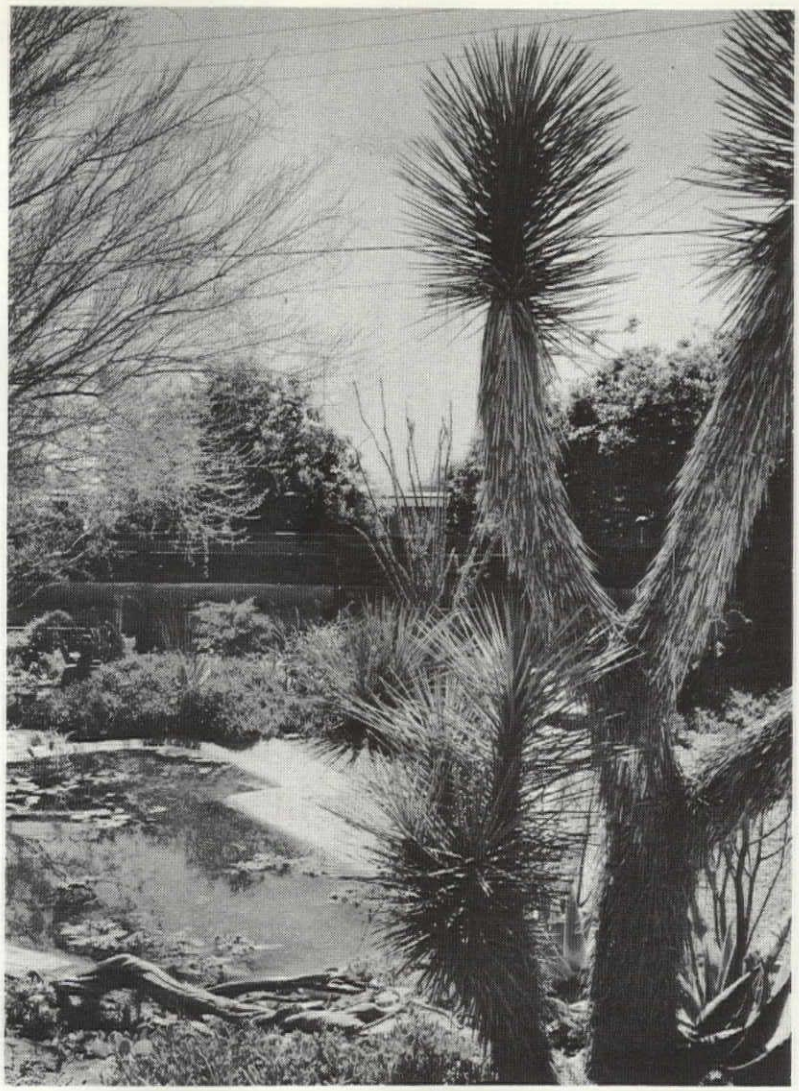
The most important decisions and the ones most apt to directly affect you and your community are not the details of tunnel design but the location and design of the stations and how they fit into the urban complex of which they must become a vital part.

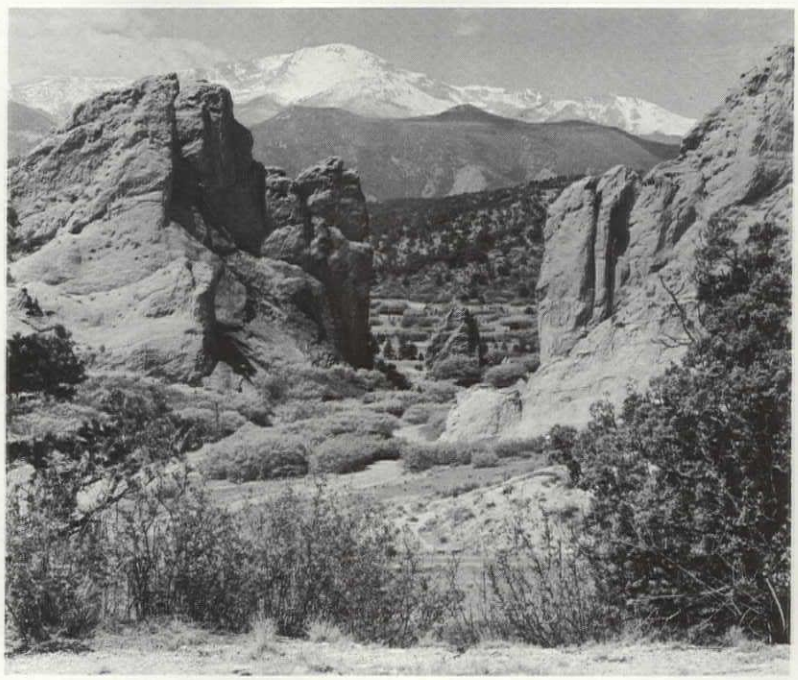
All the skill in the world will be ineffective without the authority to put adequate emphasis on sound urban planning and quality of design. These more abstract values must not be pushed aside by the great and pressing engineering problems that are the guts of the system.

I would also strongly recommend that the board of directors bring in as consultants one or more eminent architect-planners who know and understand your community and its problems, to interpret for them and advise them on the quality and suitability of the work of the professional design team.

This would again help to make sure that the broader aspects are not lost among the details so that your system, 50 years from now, will have the sound planning and flexibility that will let it grow with the changing times. ■

An address presented before the Washington Gallery of Modern Art symposium by the chief consulting architect for the Bay Area Rapid Transit District.





Western Mountain Region: Two Glimpses

Embracing six states—Arizona, Colorado, Nevada, New Mexico, Utah and Wyoming—the AIA's Western Mountain Region ranges from lofty peaks to undulating plateaus to vast unpeopled deserts. As Denver prepares to host the 1966 annual convention, it seems especially fitting to present two facets of that region: "Water in the Design of Desert Cities" and "100 Years of Colorado Architecture." But each and every building will have to vie for attention with 14,110-foot Pikes Peak near Colorado Springs. For although it ranks only 33rd in height among the state's peaks, it is by far the most popular. Framed at the right by the escarpments of the Gardens of the Gods, it was first spotted rising abruptly from the plains by Lt. Zebulon M. Pike in 1806. He and his men attempted to climb it during a blinding blizzard. Forced back, he declared the peak would never be scaled. This summer, scores of architects and their families will join the thousands who annually reach its top—afoot, on horseback, by cog railroad, by automobile and by bus.

I: Water in the Design of Desert Cities

BY MILTON D. LOWENSTEIN, AIA

IT IS HIGH NOON on the desert. An August sun, drawn hungrily through sealed glass windows, battles grimly with blasts of "conditioned" air inside a room high in a city's office building on the desert's edge. The scene outside, in all three dimensions, along the streets and up along the buildings, stamps on our consciousness the familiar "grid" of a typical American city.

The aridity, stark barrenness and rigidity oppresses the layman and affronts the trained sensibilities of the designer. Instinctively he imagines what would be more agreeable to the perceptions, more appropriate for desert living, more in accordance with indigenous traditions.

Could water perform the needed changes? But water would have to be used in the context of realistic urban growth, urban habits and the total regional development. Of Aristotle's four basic elements—air, fire, stone and water—the one most needed in the design of desert cities has been the most neglected by the designer. While space or air, the heat and light of the sun and our quarries are continually studied for further exploitation, only cursory attention is given to the attributes of water as sources of physical comfort and experiences that refresh the spirit.

The most successful application of modern technological skills to regional and architectural design in which water played a creative role is, to my mind, the town of New Gourna, Egypt. It was conceived and erected by the great Egyptian architect, Hassan Fathi, whose career and reputation in his country is remarkably similar to Wright's in America. New Gourna is as much a

Seen from a distance, the dichotomy of desert mountains and water is resolved. The two appear as organic components of a natural configuration. Although snow helps bind them together, it only tends to emphasize a basic integrity.

part of Egypt as are the Pyramids, the desert and the Nile. The architect displayed both an awareness of the magnificent scale of desert and river and a sensitivity to the implications of the most ordinary uses of water. Noting the care he was taking to provide for the needs, not of a hypothetical "average family" but of each separate home, I asked him why he had omitted putting running water in the houses. The architect pointed to the women returning to the old town he was replacing. They were carrying water in jars balanced on their heads. He told me that if they had water available in the house, the faucets would be left turned on and the water regarded as something of a miracle! Instead, he provided wells and laundry facilities throughout New Gourna from which the women could fetch the water and wash as they always had. His almost reverential treatment of water, even that used in the lowly laundries which are approached by steps down to a small stone-lined plaza, appears to dramatize the cycle of experiences which begins in Egypt with the source of all traditions: the river Nile.

This mighty river, it should be recalled, and its desert banks stretching to the horizons, had set, millenia ago, the scale requirements which only great pyramids and temples could satisfy. The Nile, the desert and the architecture—disparate elements united organically into a design configuration—were evocative of moods and aspirations quite different from those experienced in a traditional Chinese garden, a cloister or a modern Bedouin village. An entire spectrum of different thoughts and feelings, as well as building techniques, lies between these illustrations of the design uses of water. It is the one omnipresent constituent of all the designs. Almost as pervasive as air, water forever in search of the sea seems most like the process of man in search of a destiny in the cosmic order.

"water, water everywhere"

Conceived as an element in a design configuration, water can contribute to the solution of two kinds of contemporary problems which are met in arid regions:

1) Those brought about by factors external to the individual, i.e., flood, aridity or pollution. They affect the physical well-being of the community at large.

2) Those brought about by factors within the individual, i.e., as a result of mental duress or deprivation and of anxiety. They affect the emotional tone of the individual.

The first type, the contribution of water to the physical well-being of the members of a community, can be precisely analyzed in terms of statistical data which is susceptible to use in design formulas. Although these may need some modification to account for regional peculiarities, characteristics of general significance predominate and are applicable on a worldwide basis. UNESCO is supporting the activities of an "International Hydrological Decade" which will devote its time to the first type of problems, today's pervasive water crisis, and will offer design information for water exploitation.

"books in running brooks"

But the second type of problem, the contribution of water to the individual's psychological stability or spiritual attitudes, cannot be easily analyzed nor can stock solutions be universally applied. The etiology of effects embraces the incidence of cultural values too profound or otherwise obscure for objective analysis; they lie beyond the technological skills, the "know-how" of a designer. Only to the extent that considerable experience enables him to have some personal involvement with a complex of indigenous influences can he contribute to any kind of solution. Even then, unless he himself is a member of the community, he can offer only what is heuristically illustrative, what merely *tends toward* a "right" answer.

Because they seem to illustrate a trend in design, some suggestions by this writer published in the *Arizonian* about five years ago are briefly presented here. Among the proposals was to provide a public park and site for cultural centers in a dry river bed which extended about 15 miles from north of Scottsdale, southward to Tempe. Indian Bend Creek, as it is known, had then few encumbrances, and the design included restoring the original stream, now partially underground and a flood hazard. The park's termini were to be two centers of cultural activities: Arizona State University and Taliesin West.

The design had its ecological, entrepreneurial and esthetic aspects. The restored stream would act as a flood control measure for an area notorious for its periodic washed-out highways. Also, the value of the abutting land would be enhanced and, by proper zoning, could be made preferential residence property. Finally, the Valley of the Sun would have an area landscaped to express the aspirations of families eager to have their children learn from making the desert bloom.

The present preoccupation with bringing water to the desert seems sometimes to be degenerating into an overwrought pious refrain. Growing out of a canal obsession, the tune has overtones of pathological rejection of important principles of land use and other fundamentals of regional planning. The baleful sounds consist of a sales pitch for some buildings seeking new tenants or more business for the old ones. Does architecture have to depend on stunts with water touted somewhat as once was structural virtuosity? It would be the knell for the mother of the arts as she was dragged down to the level of a billboard.

The commercial usage of canals running through a city recalls the *kali* of Indonesian cities. Buildings fronting on these great open sewers are occupied during the day by people who have little interest in maintaining public property adjacent to their offices. Canals would here also only initiate the problems created by high-rise structures in the central business district of Phoenix. Would the sight of a distant band of water, ecologically isolated, be of any value to tenants busily occupied high up in their offices? Such canals seem as absurd as are the small isolated plazas some contemporary architects provided for huge structures in a city of skyscraping architecture and scurrying automatons!

Equally futile seems the gesture of crowding out-of-scale fountains into the busy entrances to commercial or public buildings. They cannot compare with the lovely fountains of Rome, whose forms reminiscent of an ancient culture are organic elements of a total design. Here the piazza, like the Hellenic agora, were intended for leisurely promenading, discussion and contemplation. Fountains placed in odd corners of contemporary buildings become trash collectors for hurrying multitudes and eyesores for the sensitive proponents of a better environment.

High-rise structures and water may be made compatible design elements if conceived within a configuration which has regard for their scale and the local ecological or traditional rationales. Office buildings belong not in the central business district but on the periphery of the city, possibly near a large reservoir, or within a vast system of canals bordered not with resentful slum dwellers but with fields of flowers or wooded areas. Here, where the city ends and the desert begins, is the space which can match the high aspirations of our greatest architects and planners.

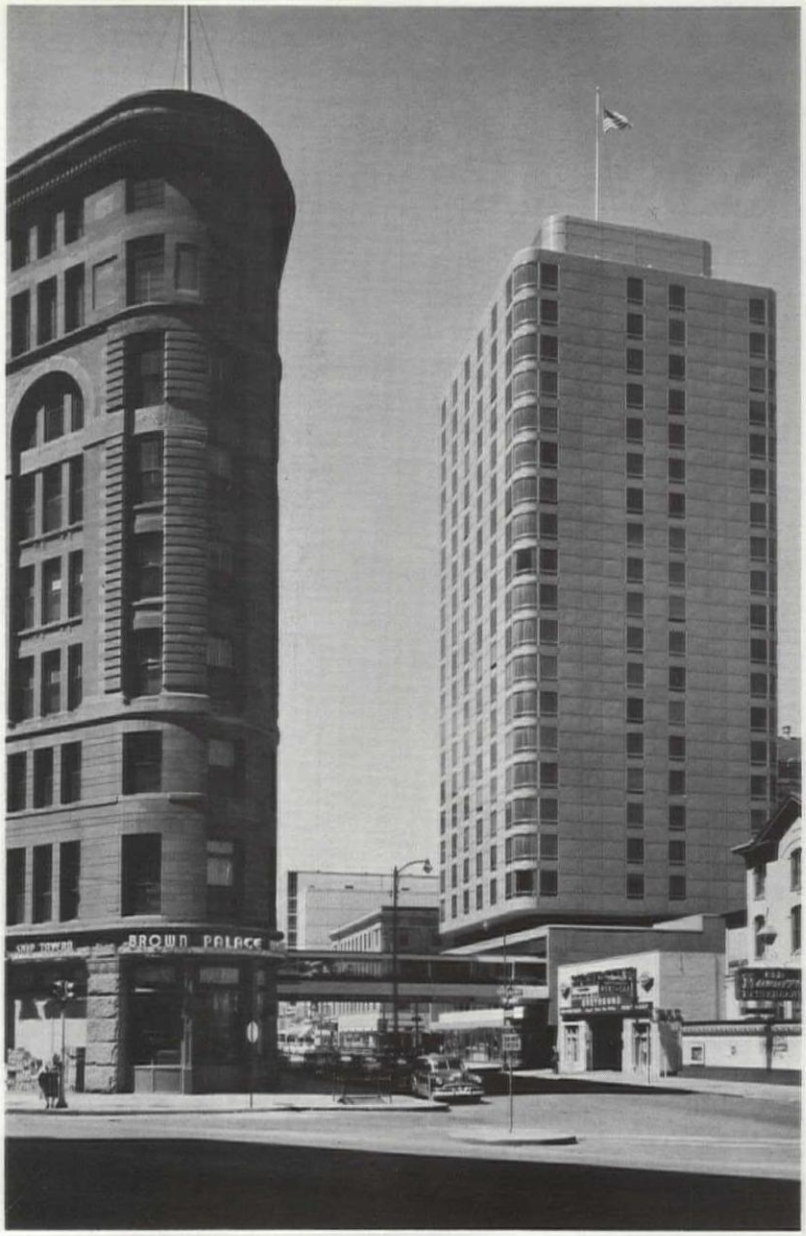
Is it not time that the central business district of horse-and-buggy days be eliminated and replaced with the finest homes and cultural centers? Served by canal-fed streams and ponds whose upkeep an enlightened affluent community, under a "district architect," would assure, the new center would inevitably start other trends of renewal for all parts of the city. The design would revive long-ignored indigenous cultural experiences free of the contaminative influence of eastern metropolises. Traffic lanes increased in size and number (logically, as they flowed outward to the business border) would be buried in the verdure of privately cared-for parks and gardens along waterways whose dimensions would also increase away from the intimately scaled residential center of the city. Urban freeways at the city's periphery, en route from serving regional shopping centers, would join together commercial, manufacturing and warehouse enterprises. Here, instead of a grid street system, would be landscaped corridors: parks and malls with canal-fed ponds and fountains. Scaled to the pace and perceptions of pedestrians and accented by sculpture, every feature would be designed to maintain the humanizing values which modern architecture and traffic arteries need to save us from the brutalizing effects of aseptic purposes.

"and the spirit of God moved upon the face of the waters"

Though a tiny rain drop be dissected on a slide, only a scientist's avid curiosity may be satisfied; though a mighty wave be depicted on canvas, only the demands of an artist's importuning ego may be gratified; though UNESCO's "regional studies are planned within the International Hydrological Decade on the use of water basins which stretch over several countries" (*UNESCO Features,* No. 460), only the chauvinists and cartel maneuverers may profit. Even the sea itself, like the desert in its vastness, by suggesting the universe's enormous dimensions, leaves man merely temporarily humbled and feeling alone.

But the whispering of a small brook, the gentle invasion of a pond or the large, strongly directed flow of canals can be creatively exploited in the design of desert homes, cities and their arid environment. The varieties of scale, if kept within the context of humanizing aspirations, are unlimited. Extending from the intimate values of home life to the entrepreneur's publicized concern for more markets, where scale is carefully observed, a design can only gain from the presence of water. It becomes the flux of the design's integrity joining man to the social order and to the desert's transcendent order in nature. ■

The author is a faculty member at Arizona State University.



II: 100 Years of Colorado Architecture

WHEN NEW YORKERS were seeing the construction of St. Patrick's Cathedral in 1859, gold was being discovered in Colorado along Chicago Creek on the present site of Idaho Springs—and Denver was a city of teepees and little else. Since then, its architecture has matured to take its place among some of the finest in the nation.

The interesting architectural landmarks will be found in the mountain-ringed mining towns, in the plains villages and in the older sections of the larger cities, with such plentiful materials as clay, stone, wood and sod very much in evidence. In the Mile High City itself, the weathered stone structures in the business district, along with the brick and sandstone houses in once-fashionable residential sections, date from the 1880s. Fire ordinances in effect since 1886 have limited buildings to masonry construction and heights of moderate levels.

As its contribution to the state's centennial year in 1959, the Colorado Chapter AIA organized an exhibit from which the photographs on these five pages are taken. A committee headed by F. Lamar Kelsey AIA documented the historic progression with the help of several photographers including Guy Burgess, whose work makes up the greater portion of this portfolio.

No more appropriate print could lead off the collection than the old and the new Brown Palace Hotel. The old (1892, designed by F. E. Edbrooke & Co.) has been famed through the years for its fine service and distinguished architecture, which features an open central lobby nine stories high. The new (1959, W.B. Tabler Associates) is a 22-story addition and good neighbor.

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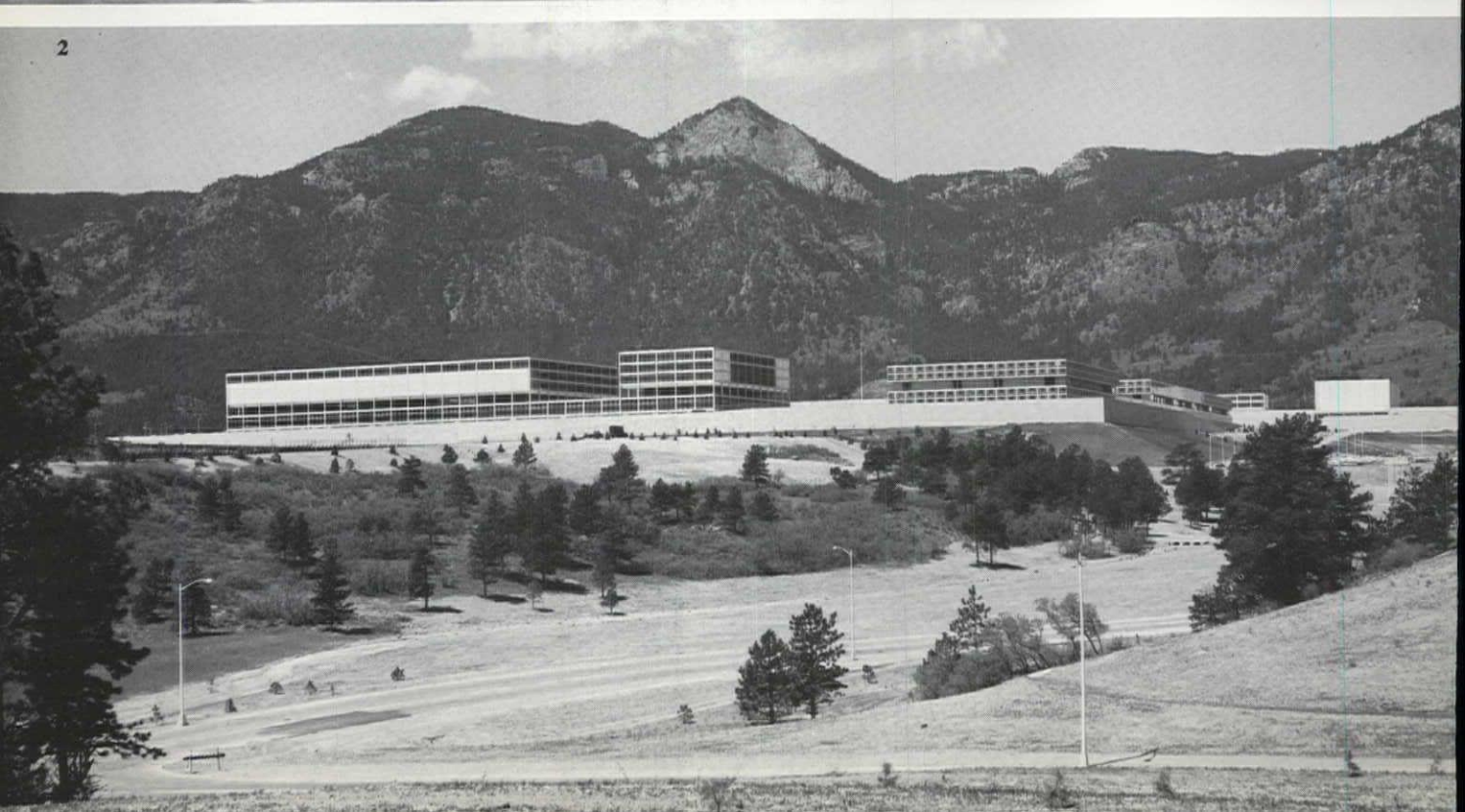

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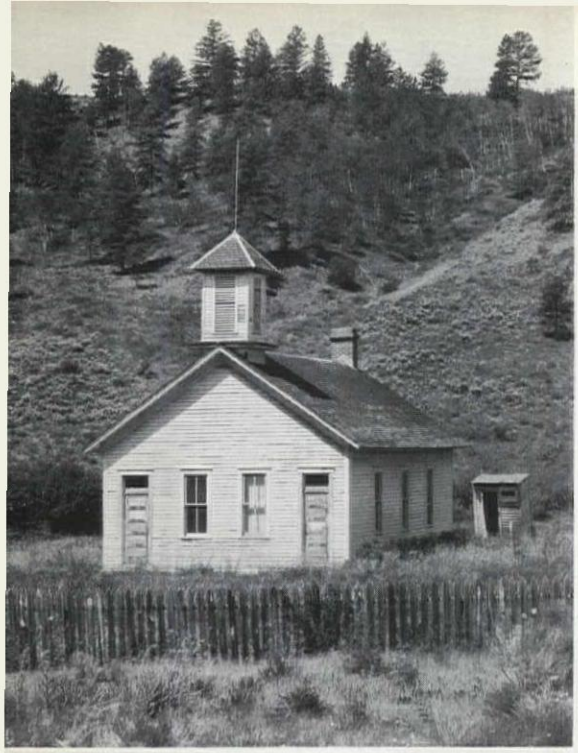
1. *Denver Hilton Hotel (1960) and May-D&F Department Store (1958), planned as a total complex: I. M. Pei & Associates, architects; Ketchum & Sharp, associate architects. The store, comprised of two contrasting structures set beside a sunken ice-skating rink, received an AIA First Honor Award.* **2.** *US Air Force Academy (1959, prior to completion of chapel), Colorado Springs: Skidmore, Owings & Merrill, architects. A range of the Colorado Rockies provides the backdrop for the steel-framed aluminum and glass buildings.* **3.** *C. A. Baldwin Residence (1914), Broadmoor: T. McLaren, architect. Modeled after the Grand Trianon in Versailles, it remains one of the grand houses of Colorado.* **4.** *Colorado State Capitol Building (1908), Denver: E. E. Myers and F. E. Edbrooke, architects. The outer walls of the structure, which took 22 years to build, are of Colorado granite, 5 feet thick; the dome is covered with 24-karat gold.*



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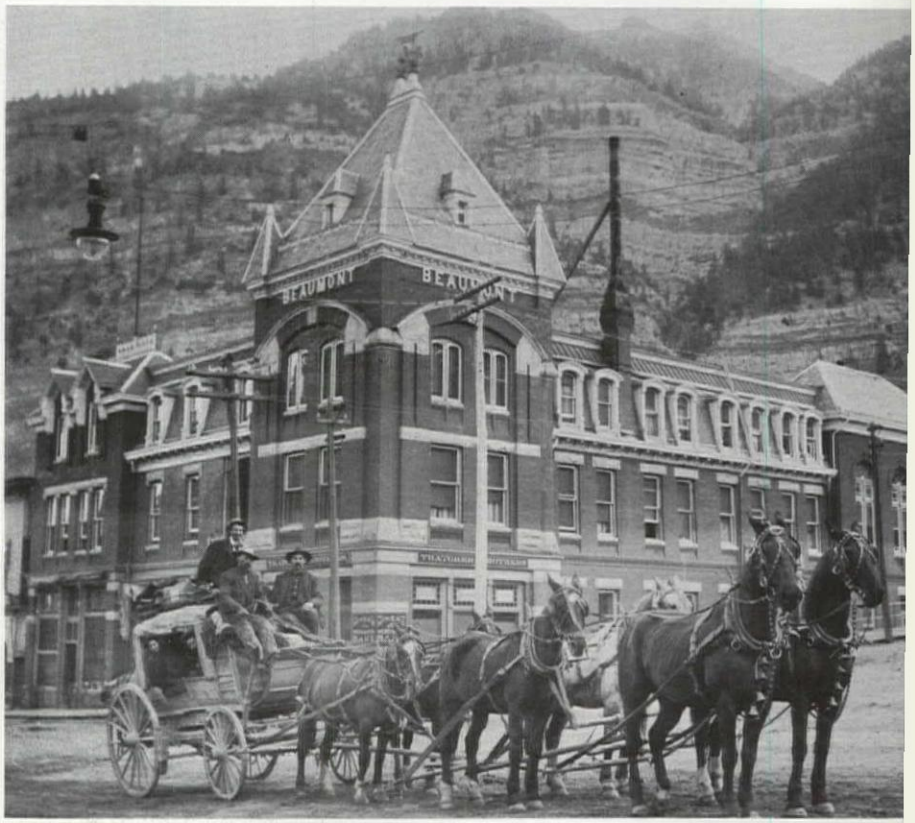

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5. *Country School, Russell. Typical of the turn of the century, this structure stands near the summit of La Veta Pass.* **6.** *Beaumont Hotel (1887), Ouray: O. Bulow, architect. With such luxuries as steam heat and electric lights, it created quite a stir in the mining town.* **7.** *Street scene (1885), Westcliffe. These were the days of "false front" architecture, wooden buildings and plank sidewalks.*

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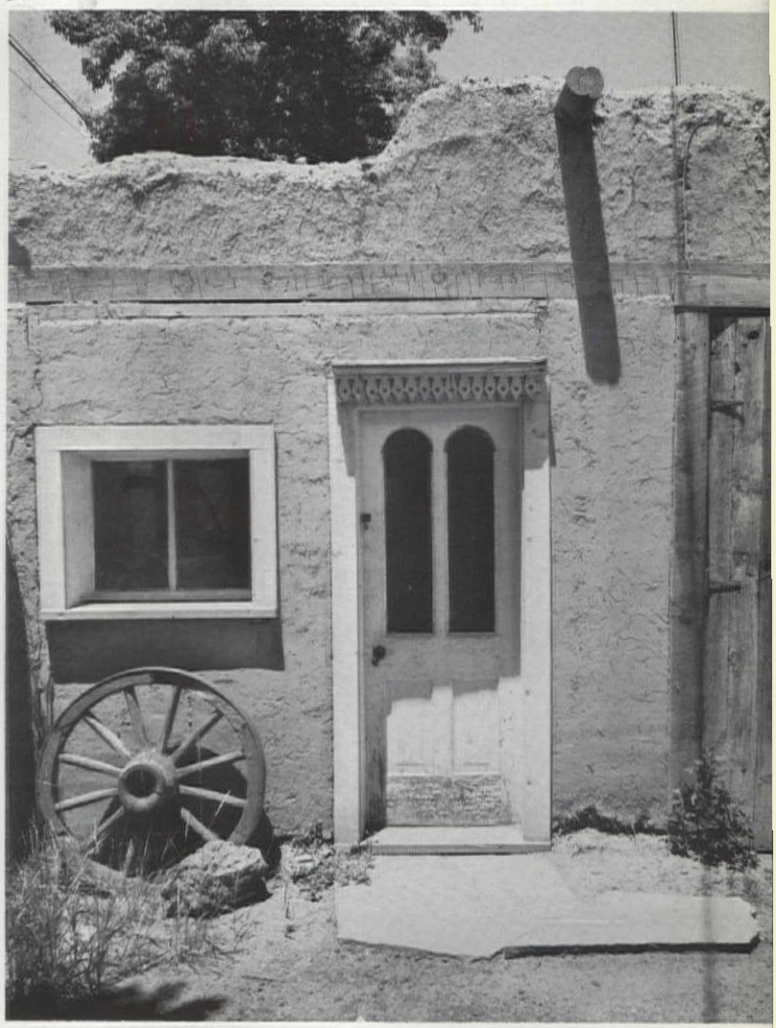

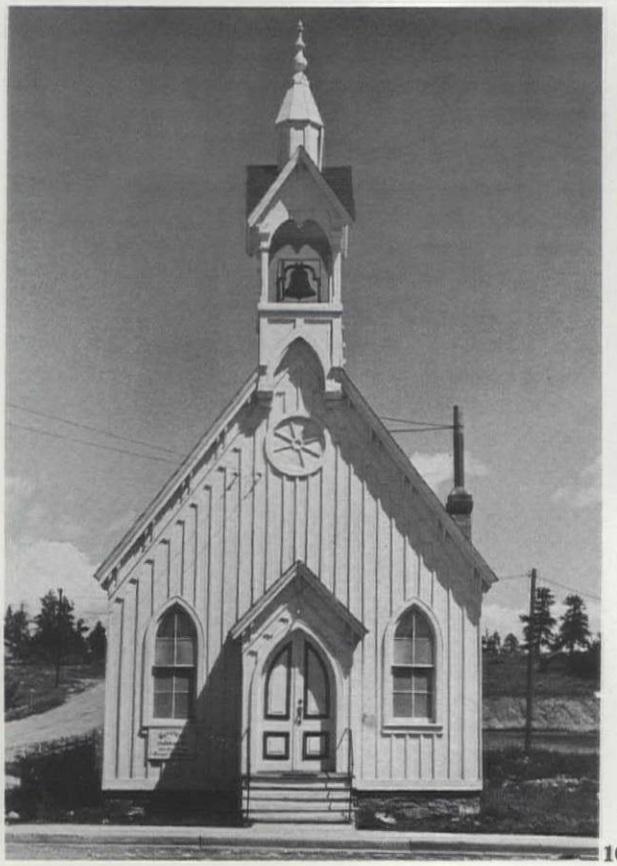

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8. *Opera House (1878), Central City: Robert S. Roeschlaub, architect. After years of inactivity, this charming granite building reopened its doors in 1932 and has since been host to productions and stars of national fame.* **9.** *Baca House (1869), Trinidad. Thick adobe walls and sod roofs were typical of many buildings in southern Colorado.* **10.** *Sheldon Jackson Memorial Chapel (1874), Fairplay. Situated at an elevation of 10,000 feet, the little white church is still in use.*

Responsibilities in Owner Purchase

BY LEONARD MAYER, AIA

OWNER PURCHASE or reuse of material and equipment involves responsibilities for the owner, contractor and architect.

Sometimes owners find that the purchase of material and equipment prior to the contract award offers savings in time and cost; but purchase after may also result in time and cost savings, especially if the material and equipment are specialized in nature and for an unusual building type. In such cases the owner may be best qualified to select this special material and equipment—a particle accelerator used in radiation therapy or theoretical physics research, to cite an example.

An owner may buy structural steel, say, prior to contract award to assure delivery at the time it is needed. Prior orders can result in savings of construction time, obviating the need to wait until the successful contractor places the order.

Pros and Cons

Owner purchase or reuse, not a new practice by any means, has both advantages and disadvantages. The owner should consult with his architect to determine the best course to follow when he contemplates purchase of material and equipment.

The owner must take the responsibility of the initial ordering and see that the material and equipment are delivered to the construction site on time. The contractor generally cannot be held responsible for such material and equipment until they are delivered to the site. If any delays occur in fabrication or transit, the owner must be prepared to suffer possible loss in construction time and added cost.

It is the responsibility of the architect during the preparation of the contract documents to schedule the material and equipment to be procured by the owner. He must note on the drawings, specifications and the addenda the material and equipment to be owner-purchased and installed, or owner-purchased and contractor-installed, etc., allowances, delivery dates, instructions to the contractor for the receipt and storage of the material and equipment, etc. AIA Document A501, Recommended Guide for Bidding Procedures and Contract Awards, alludes to this architect responsibility:

"The contractor has the right to expect that the information shown and described in the contract documents is sufficient to enable him to prepare complete and accurate estimates and that he will not be penalized for any deficiencies in these documents."

Contractors do not object to owner purchase or reuse of material and equipment. Often, however, they point to a lack of information and details furnished to them. Chapter 14, Architect's Handbook of Professional Practice states:

"If certain materials are to be furnished by the owner, the architect must exercise every possible precaution against possibility of unsatisfactory substitutions. Since control over what the owner does is likely to be much more difficult than control over what the contractor is permitted to supply, there is greater risk of an adverse effect on the ultimate combination of materials. The owner must be led to understand the responsibilities implicit in any wish to exercise his own prerogative in this respect. As control of selection is diminished, the need for vigilance and precautionary measures increases. Again, knowledge of the quality and limitations of all materials to be furnished, no matter by whom, is of paramount importance if difficulties, controversies and failures are to be successfully avoided."

The architect must advise the owner whether his purchase or reuse will, in fact, reduce construction time and cost. Time and labor involved in removing, dismantling and delivering existing

The author is director of the Institute's Professional Practice Programs.

and, in many cases, obsolete equipment to the new site, then reassembling for installation, may equal if not exceed the cost of new equipment.

The owner should understand that the architect's fee will be based on the inclusion of the cost of this owner-furnished material and equipment, whether new or reused, in the total project construction cost. Article 6.3 of AIA Document B131, Owner-Architect Agreement explains:

"When labor or material is furnished by the owner, the project construction cost shall include such labor and material at current market cost."

Designed and Specified

Article 6.1, AIA Document B131 states:

"Project construction cost as herein referred to means the total cost of all work designed or specified by the architect but does not include any payments made to the architect or consultants."

From this it may be inferred that since the architect did not develop detailed drawings and specifications, for this material and equipment, he is not entitled to a fee based upon the cost of this material and equipment. The phrase "design and specify" cannot have such a narrow definition.

The complex installation and service requirements of specialized material and equipment may dictate the design and planning of all or major portions of the structure and space relationships, selection of other material and equipment (including mechanical, electrical and plumbing equipment) for the entire project.

The architect must determine the physical requirements (size, weight, etc.) of this material and equipment which, though not in the contract sum, is shown on the drawings, noted "N.I.C" (not in contract) or furnished by "others." Schedules have to be prepared indicating owner purchased and installed or owner purchased and contractor installed, or other variations. The architect's drawings and specifications will call for installation, connection, trim, finish, etc., to provide the owner with a complete and functioning unit. The architect must spend considerable time reviewing and coordinating the shop drawings on this equipment with all other portions of the work.

The architect has to work with a variety of equipment manufacturers to coordinate his design and planning to accommodate their "standard" units, then detail adjustments must be made during the construction phase for the successful bidder's material and equipment. If the owner wants to reuse existing material and equipment, the architect must inspect and determine its reusability upon the likelihood of it being damaged during removal, disassembly and reinstallation.

The contractor's cost for accomplishing this work is included in the project construction cost, and in this way the architect receives partial compensation.

However, if the material and equipment are attached to the building structure, or require direct services, the architect is entitled to additional compensation above and beyond the fee he may receive by reason of the "project construction cost" as reflected in the contract sum. This is because of the additional "design and specify" services required to complete the project.

Additional Compensation

Since the contract sum does not include the cost of material and equipment furnished by the owner, how does the architect determine his compensation for the additional services?

The architect's experience will tell him that a particular building type may have a considerable amount of owner-furnished equipment requiring a tremendous amount of time in design and planning coordination. Therefore, the architect and the owner must discuss and agree upon one of the following (or other) methods of additional compensation whether the owner and the architect anticipate such procedures at the contract execution.

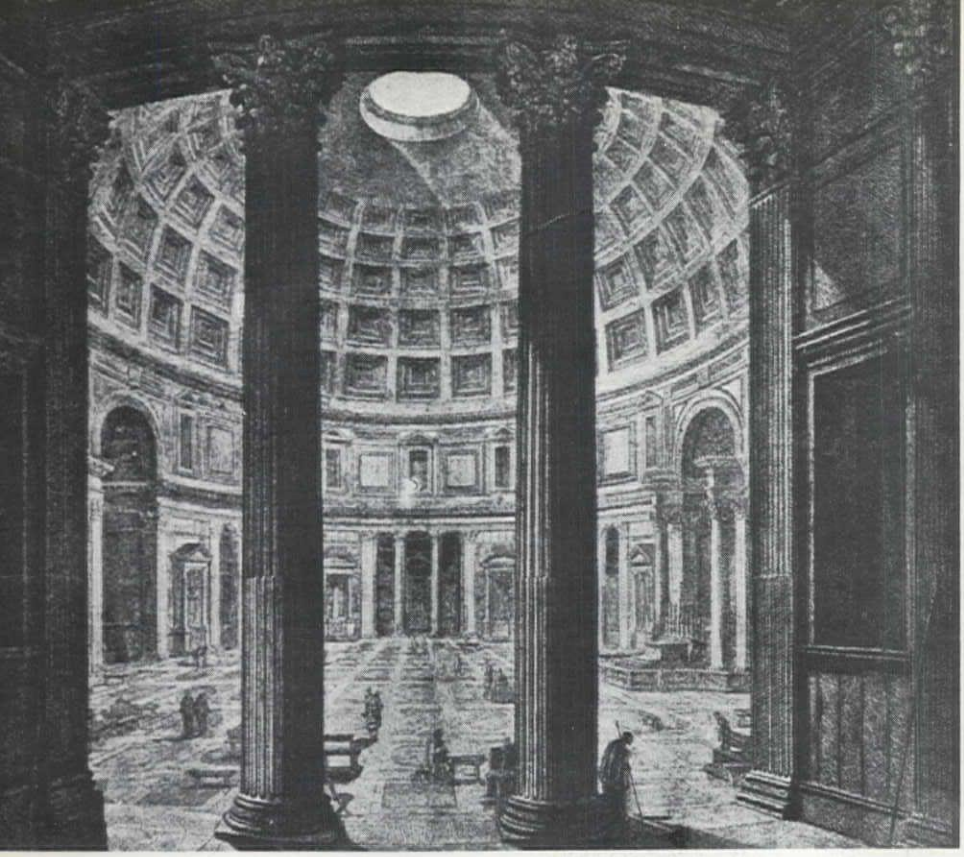
a) a percentage of the market value of the equipment

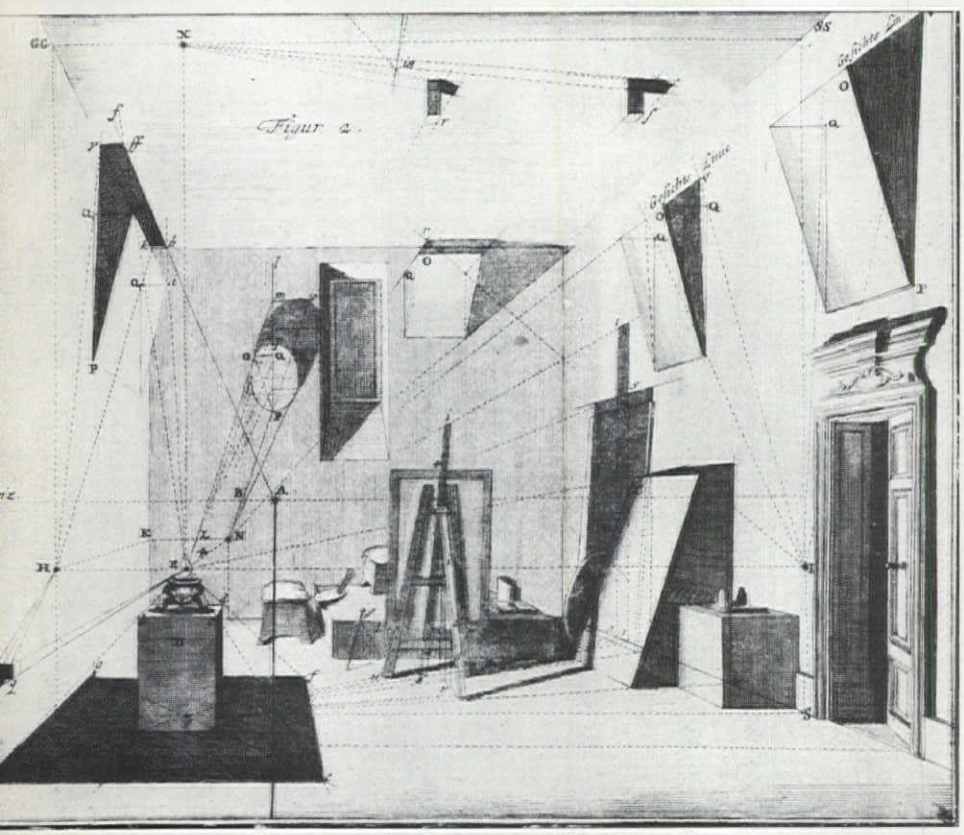
b) a multiple of direct personnel expense incurred during the design and planning phases and coordination of services required to accommodate the particular equipment

c) a cost-plus-fee arrangement for such services

d) the total fee for basic and additional services may be a percentage of the sum of the contract price and the market value of the owner-furnished material and equipment.

These arrangements must be made at the time the owner-architect agreement is executed. ■





The Romans showed an understanding of light in their handling of the interior of the Pantheon. In 1719 a German artist studied the shadows produced by a point (flame) source of light with various elements on the walls, ceilings, floor.

LIGHT THROUGHOUT THE AGES

BY W. D. RIDDLE, AIA

In discussing the visual environment with numerous groups at the General Electric Lighting Institute in Cleveland's Nela Park, the resident architect makes some historical observations of interest to his colleagues as well.

ANCIENT ARCHITECTS and builders were intensely aware of the importance of light, which is being rediscovered in our day as a design medium.

Take the Parthenon on the Acropolis, for instance. The Greeks knew that the bright sky would tend to swell around the corner columns and make them appear smaller. Thus these corner columns were made larger in diameter than the inner ones, silhouetted against the interior wall which generally was in shadow.

The Romans with their concrete could span wider spaces than could be accomplished with trabeated structure. The Pantheon with its dome 140 feet in diameter is an example. A shaft of light is admitted through the 30-foot diameter oculus in the dome's center. Around the perimeter of the interior are niches containing statues or memorials to the Roman heroes and gods, which are spotlighted by this sunlight shaft.

The light is also scattered as it strikes the floor and wall, producing a diffuse effect. The situation is not unlike the condition outdoors on a sunshiny day with the direct light from the sun creating highlights, shade and shadow, accompanied by a mellowing of the diffuse light from the sky dome.

All this may add vitality and interest without changing the average amount of light. While the quantity of illumination often is important, it is only the beginning in creating a stimulating visual environment.

With electron microscopes it has been found that the windows in Chartres Cathedral are composed of colored, translucent and clear glass in different arrangements. This apparently explains why the windows appear to be producing instead of transmitting light, which contributes to their beauty.

Something else occurs at Chartres. The interior is lighted by a multiplicity of colored light sources which produces a subtle but interesting effect, softening the oak

chairs and stone walls and even the pavement.

The Baroque designers, particularly in Germany, were adept at coordinating light. Their clear glass windows, which admitted light for interest and movement, were not the architectural elements that the stained glass of Chartres was.

The success of the Baroque designers was due to an understanding of light and the light-modifying characteristics of materials—and their light source was the sun. It is interesting to speculate on what they could have done with our lighting technology today.

With the introduction of iron in the Industrial Revolution as a building material, structures began to change rapidly. Eiffel could build his tower and Paxton his Crystal Palace. Heavy load-bearing masonry walls were replaced by a network of small iron members, leaving most of the surface to be with nonstructural material.

Paxton filled these spaces with glass, which allowed all the light possible to enter the building. The Crystal Palace was one of the first modular structures, the module being determined by the size of a piece of glass that could be made. In addition, it was one of the first prefabricated buildings as more than 40 foundries made the iron parts that were assembled in a short period of time on the site.

Just as some of the industrial fairs in England and on the Continent gave designers and engineers an opportunity to experiment with new structure, some of our fairs in the United States afforded a chance to work with the new light source: Edison's incandescent lamp.

At the Buffalo World's Fair (1902) the architectural character of many of the buildings was emphasized at night by rows of bare lamps.

The Pacific Exposition in San Francisco (1915) served as a proving ground for early floodlighting, as in the case of Maybeck's Palace of Fine Arts. The types of electric lamps were limited, and floodlighting equipment had to be developed.

At this point in time, designers can, within relatively broad limits, choose the quantity, distribution and color of light which serve their purpose best. But in developing the visual environment, the geometric relationship involving the observer, objects and surfaces looked at, and light sources becomes important. The amount, distribution and color of light must be related to the light-modifying characteristics of materials. Most are color selective to a greater or lesser degree and can only transmit to the eye, colors contained in the light source.

The process of visual comprehension is rather complex and not as yet fully understood. Considerable research has been done on the relationship of light to visual performance, but the emotional effect is somewhat more difficult to reduce to laboratory experiments.

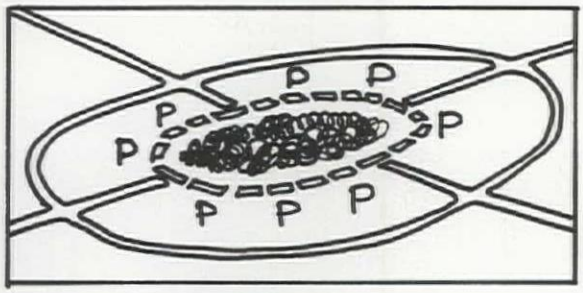
Modern technology has made possible the use of greater amounts of illumination with comfort and economy. And as new airconditioning techniques are developed, light is becoming a partner in creating a better thermal environment. ■

Maybeck's Palace of Fine Arts at the Pacific Exposition is an excellent early example of floodlighting. The first illumination laboratory was established so that designers and engineers could study lighting effects on form, volume, color.

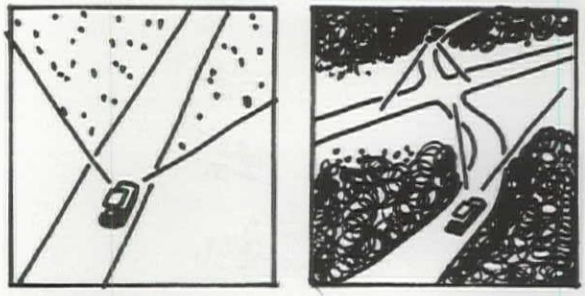
URBAN DESIGN WORKSHEET 9

PREPARED BY PAUL D. SPREIREGEN, AIA, FOR THE COMMITTEE ON URBAN DESIGN

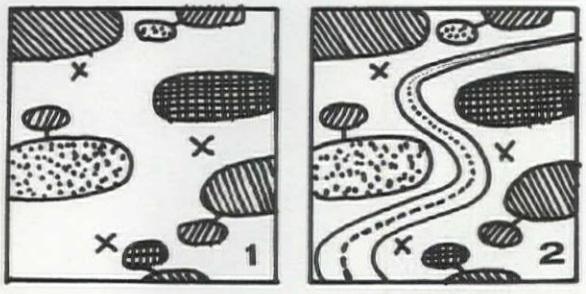
Highway Design Pointers



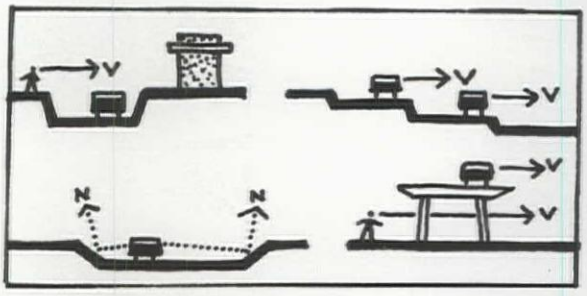
Tie expressways into major surface arteries, which should lead to parking serving principal activity areas.



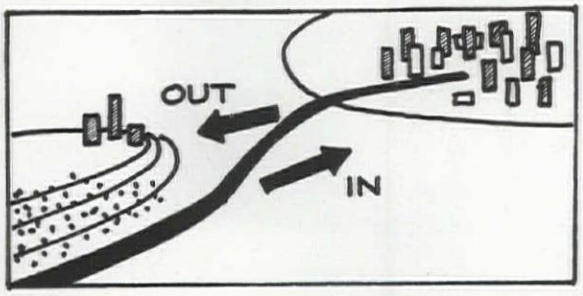
Present panoramic views for long, straight stretches; tunnel vision forward for winding stretches or decision areas.



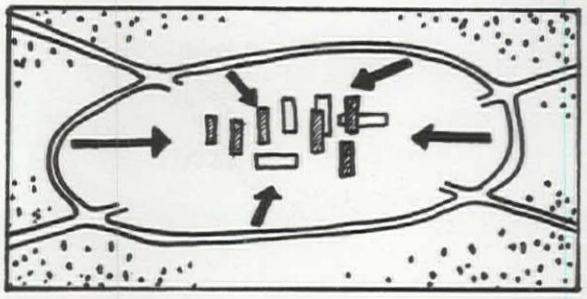
Map an area's assets and linkages before planning route location, then determine a scale of priorities.



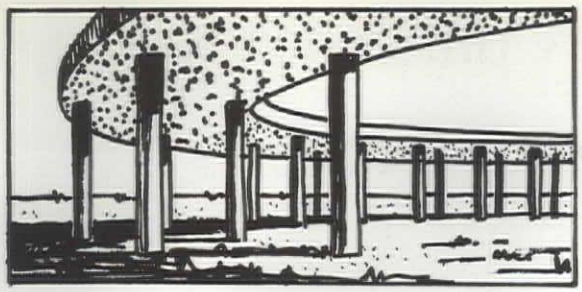
Employ grading—depressed or elevated—to preserve a vista, present a side view or panorama, or reduce noise.



Align expressways for views of urban features: downtown clusters for approaches; landmarks, topography for exits.

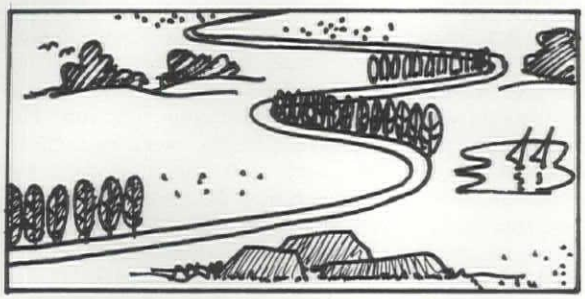


Align circumferential routes to give periodic vistas to central orienting landmarks.

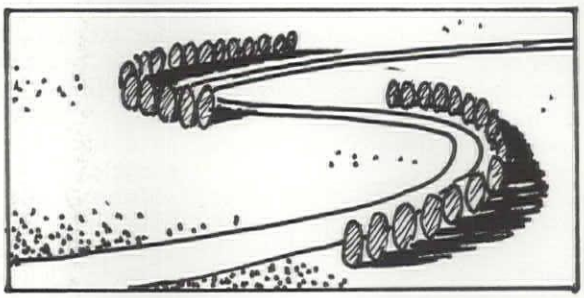


Do not clutter bold engineering forms with applied decor, but rather let them speak for themselves.

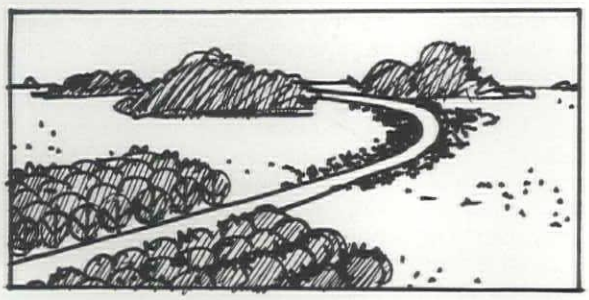
Design for the nighttime scene with ribbons of light for marking routes and clustered illumination for interchanges.



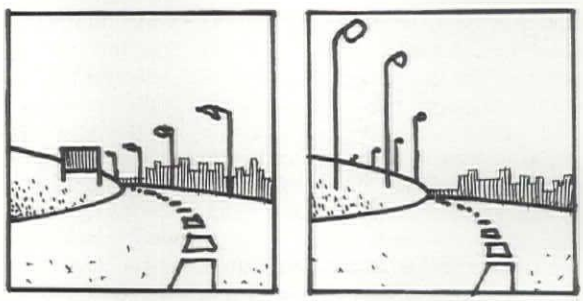
Embellish dull landscapes with an orchestrated or choreographed sequence of "events" to keep drivers alert.



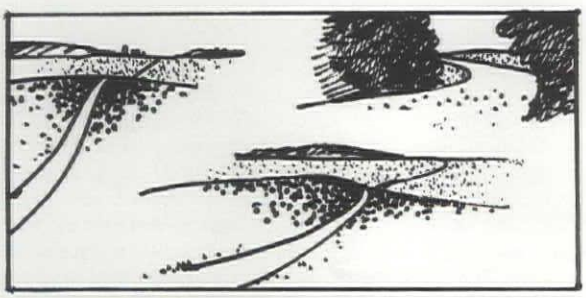
Use formal stands of trees as visual guides for escorting drivers around curves.



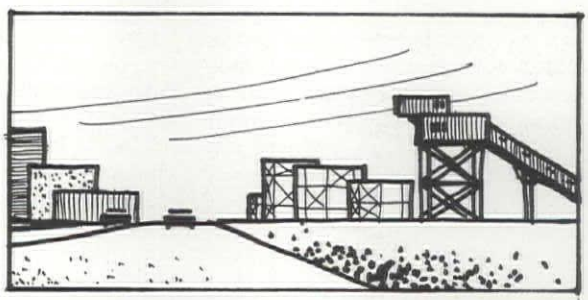
Use large and bold landscaping forms on expressways to accommodate high-speed visual perception.



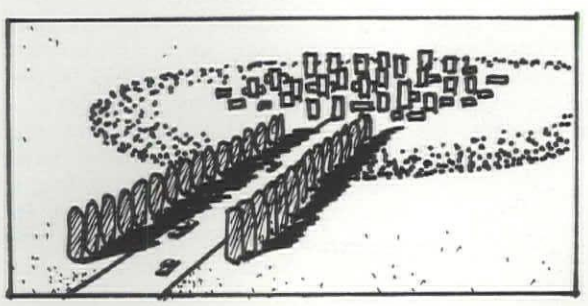
Do not block a good view with roadscape hardware such as lighting standards, rails or signs.



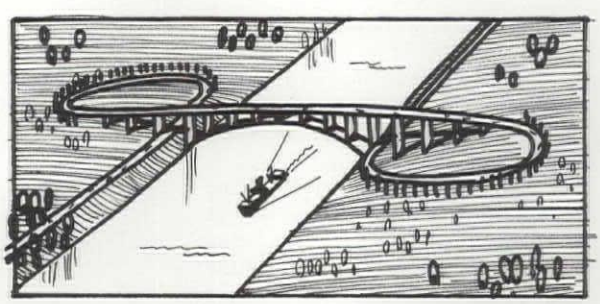
Present dramatic views dramatically—at a hill's crest, by rounding a hill, by emerging from a close to an open area.



Allow urban fringe areas which usually have large industrial forms to be seen in simple, uncluttered outline.



Use "green fingers" to welcome and accompany the incoming motorist into the urban center.



Align roads to give full vistas of large engineering features, particularly bridges at river crossings.

The Automobile as a Conference Room

BY ROBERT I. HOYT, AIA

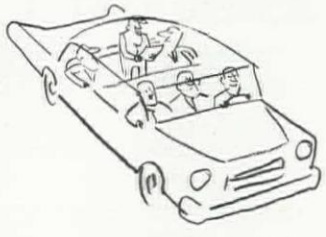
THE FAMILY SEDAN in America provides flexible transportation. It also is a status symbol, the very essence of planned obsolescence, an unchaperoned closet for youthful intimacies and a noisy demonstrator of young destructivity under the guise of inventiveness.

Furthermore, the sedan provides great utility as a mobile, capsulated conference room. Having had recent rewards from its use, I would like to share my experiences.

It has been wisely said that the chief troubles which architects experience are the result of failures of communication and understanding. The client as a beginner and a one-time buyer is usually not highly skillful in defining his needs.

The architect may talk too much but never say enough—at least to the right member of the committee. Even his magnificent drawings and models do not fully teach the client the opportunities, both good and bad, for joint decisions of program and design solution.

Visiting buildings similar to that under consideration can be most beneficial, for basic as well as subtle variations of policy and execution may be observed in operation and commented upon by experienced



users. The automobile permits not only the visiting but forms an intimate meeting place between visits.

Four or five people make a fine car-full, and eight to twelve places may be visited, appointments being preset and an itinerary carefully established, printed and distributed before the dawn of departure.

No previous conferences are

needed for programming, since this may be done before the first visit. A two- or three-day trip is ideal, for living together creates a mutuality of interest and trust as well as a line of communication not possible in a shorter period. Those sufficiently interested and generous to make the journey are susceptible to the treatment.

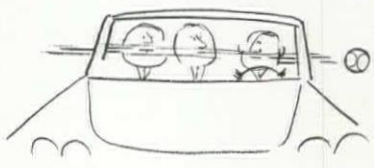
The catalytic automobile permits achievement beyond that of the office conference room or restaurant lunch table. There are no telephones; sleep is precluded by highway bumps and interruptions at gasoline stations; map-reading and girl-watching are sufficient to provide needed relief.

Hosts are generously helpful in revealing hopes and failures of their program and variations in philosophy, budget, staffing, plumbing and architectural concept. The social environment is eased if they are told the visitors wish to make only *original* mistakes.

The visiting team becomes homogenized, and the rapport causes the architect to ask staffing and budget questions, while his clients try on architects' and engineers' hats. Leadership and chairmanship give way to the sort of empathy to be found in a pickup team of ex-champion basketball players.

The clients learn the role of the architect in his counseling skills, and they come to understand subtleties of concept, mutations of utilization and variations of architectural solution. Their needs become clear to the architect, and the unlimited opportunities for the exchange of ideas help his clients to make knowledgeable choices and realize the finality of them.

After the first five or six visits, the entire program becomes less



tangible, and physical fatigue enhances the feeling that little has been gained. This is the first sign of real progress, for order is achievable only from disorder.

When the last visit is over, the architect achieves a remarkable surge of confidence and comprehension and he may then reap the harvest of the journey. Having scheduled the last stop some hours from home, he can best sit by the driver and take charge as chairman of the programming function. He may do six weeks' work in a short time and gain much stature by demonstrating his visual memory and analytical skill.

He may best review each building that has been visited and systemically compare it with the proposed program. He may do this categorically, starting with programs and then the buildings, foundations, walls, heating, etc. He must invite comment, affirmation of observation and contradiction.

The architect may then describe the proposed program and put together the new building in words, gaining help as it is offered, along with a better understanding of concepts, desires and fond hopes.

Properly done, this fatiguing effort will save weeks of design research in the drafting room. The trip is soon over, and tired bodies seek the comfort of a well-earned rest.

Within a very short time, the design table will have a splendid result, which the team will gather to examine. It is gratifying to hear, "Just look at that—it is just what we were all talking about." Beyond this simple pleasure, the architect has the comfort of knowing that when reviewed by the Committee of the Whole, his work will be defended by his brainwashed crew.

Those who have never used the automobile conference room have missed a wonderful aid to happy practice. Try it sometime, but do not schedule the trip during the World's Series, and take a quiet car that has been tested for comfort. The work is hard, the rewards are splendid. ■

ASSOCIATION OF COLLEGIATE SCHOOLS OF ARCHITECTURE

Editor: *Marcus Whiffen, College of Architecture, Arizona State University, Tempe.* **Contents:** *Ivory Tower and Outlook Tower by Charles Colbert; Eolithic Examinations by Jeffrey Cook; UIA in Paris by Thomas Howarth; ACSA in Stillwater by Cecil D. Elliott; Book Review by Bernard P. Spring.*

The Architectural School in Its Community

Ivory Tower and Outlook Tower

BY CHARLES COLBERT

In a paper presented at the 1965 ACSA Southwestern Region conference at Tulane University the former dean of the School of Architecture at Columbia discusses the relationship of architectural schools to the academic community of the university and to the community at large, and suggests changes in the schools and in the universities through which that relationship might be made a more effective one.

AS WE RISE UP and look to ever-expanding horizons of human possibility, we must wonder at and glory in man's eternal search for maturity. As we view the products of this incessant striving, no single human accomplishment is more inspiring than man's search for truth and knowledge within and beyond himself. The longing for regenerative power is most tangibly expressed in our educational institutions and their evolution.

The Ivory Tower of individual isolation and inward looking narcissism has been generally exchanged for the Outlook Tower with its overview of our collective potential and opportunities for personal growth. Today, beyond the singular good of the individual, our schools search for opportunities to contribute to the common good. As Patrick Geddes conceived the Outlook Tower in Edinburgh as both a tool for and a symbol of human change, so educators today must find their own tools and their own lasting symbols.

In large measure the definitive morality of the so-called "learned professions" has deteriorated. Profit, power and comfortable acceptability have debilitated several noble callings. This breakdown of tradition and higher human idealism, for whatever reasons, is more than an emancipation from false Victorian morality. It is a breakdown of substance.

Today, within the field of architecture, for instance, it may well come to pass that the doctrine of *idealism* does, in fact, have its seed roots in a new form of material and moral reality. Perhaps "moral materialism" or "material idealism" are terms of architectural motivation not as contradictory as we thought. It could be that our patent arguments of the past now have a new slant and that innate honesty can only occur through the proper use of material things.

As we compare the 1965 Chevrolet and the Titan I, we can begin at no lower level than an analysis of human conduct in general. The essentials of this consideration must begin in our schools. For it is from our mothers and our schools that our personal morality rises and is nurtured.

Before we may isolate the architectural school in its milieu, it is necessary to seek the broader purpose and position of its parent (or intracommunity of neighbors)—the university itself. For today the inertia of habit is being replaced by dynamic and accelerating change. The roots of dissent at Berkeley, for instance, grow from the same stratum as those in Selma and in Vietnam. Without a better understanding of the function of the university in the realm of public affairs, we can never thoughtfully discuss the architectural

school in *its* community. For every unit of a university must "fit" both "within" and "without" for effective action.

First, let me say that in my mind, the purpose of a university has been exquisitely stated by Alfred North Whitehead in *The Aims of Education:* "The justification for a university is that it preserves the connection between knowledge and the zest of life, by uniting the young and the old in the imaginative consideration of learning. The university imparts information, but it imparts it imaginatively. At least, this is the function which it should perform for society. A university which fails in this respect has no reason for existence. This atmosphere of excitement, arising from imaginative consideration, transforms knowledge. A fact is no longer a bare fact; it is invested with all its possibilities. It is no longer a burden to the memory; it is energizing as the poet of our dreams, and as the architect of our purpose."

Students and Teachers

The key to both the purpose and position of a university is of course based upon the interaction between student and teacher. Each must nurture the other. But recent events indicate a serious rupture of these relationships in our time. Whatever triggered the unrest in Berkeley (and I believe that it is an extrapolation of religious and political unrest in New York and beyond), the fault of its continuation can only be attributed to a weak and flaccid faculty and an insecure student body.

The parent fault was discussed by Whitehead in an address to the American Association of the Collegiate Schools of Business in 1927 when he said: "The whole art in the organization of a university is the provision of a faculty whose learning is lighted up with imagination. This is the problem of problems in university education; and unless we are careful, the recent vast extension of universities in number of students and in variety of activities—of which we are so justly proud—will fail in producing its proper results, by the mishandling of this problem."

This prophecy, so brilliantly borne out by the article "Berkeley and the Future of Our Universities,"* indicates again the necessity of a reassertion of conviction, imagination and vitality in education. It also presents the popular and very probably erroneous idea that today students "are aware of the shortcomings of their society and are passionately looking for authentic values to replace what they perceive as the phony slogans and spiritual tawdriness of so much of the public rhetoric and action of our time." Whether the student search is "passionate" or whether traditional idealism of the young is in a state of flux and subject to pervasive misguidance, a pertinent statistic remains: Over one-half of the population of the United States is under 23 years of age!

Another salient point in today's news is that like all public figures, university administrators are belittled as "fund-raisers" and are usually considered to be devoid of scholarly interests. While this obviously has some foundation in fact, we may never admit that our universities and their leaders are geared to other goals than the ultimate useful and scholarly development of students and faculty. Boards of trustees are hard and sometimes ruthless taskmasters, but when the presidents of our universities become mere financial instruments of "institutional survival," they have perverted the essence as well as the dignity of their position.

Obviously, education requires huge sums of money, but it is equally clear that belittling "means" cannot justify even the most glorious "ends." *For it is also by example that we teach*—and it is through the moral and physical strength to "refuse" that discipline and character are developed in the young. "The modern complex social organism, the adventure of life cannot be disjoined from intellectual adventure," as Whitehead puts it.

But, it also "requires that discipline of character which can say 'yes' and 'no' to other men, not by reason of blind obstinacy but with firmness derived from a conscious evaluation of relevant alternates." It is the right, often the obligation, of the college president and school dean to say NO! If these traditional leaders of our greatest institutions of change are incapable of this simple moral act, then we can expect no less than chaos and anarchy in our schools and ultimately in our streets.

Zest, imagination, moral conviction and purpose can only exist where institutions of learning transcend their central objective of rote learning. Students and teachers must personally confront and grasp the realities and challenges of real problems of the day. For while education may first deal with abstractions, it can only be fully realized by current, appropriate and stimulating examples and applications. The human is egocentric, and first we must train students for themselves and the simpler pleasures of knowledge; afterwards we may engage social purposes and a higher idealism.

But in the natural beginning, self, understanding and power are ends in themselves for the student and often for the teacher as well. The expansion of personal involvement from selfish

* A special supplement, *The New York Review of Books,* March 11, 1965, "Berkeley and the Fate of the Multiversity," by Sheldon S. Walin and John H. Schaar.

understanding to purposeful application is often, in fact, the transition from personal isolation to a new clarity of contributive service. Zest and conviction will not rest in the straitjacket of the individual aim. Ayn Rand to the contrary, altruism and collective opportunity are of at least equal worth to unrestrained capitalism and unbridled individualism.

University, Multiversity and Worse

The university, then, is a delicate and an unstable collection and balance of various attitudes, disciplines, self-interests, backgrounds and objectives. They are supposedly assembled for their mutual growth, strength, understanding and zestful interaction. Often, however, deep frictions needlessly develop from conflicting personalities. Sometimes stemming from parochial attitudes, but often attributable to no other cause than personality crazures developed through overconcentration and jealous specialization, these crazures nonetheless can actually destroy the usefulness of the institution. Rather than a university, we find multiversities and, worse yet, militant diversities—political anarchy!

The great educational reconciliation of our times will be a method whereby we may effectively articulate the physical sciences and the humanities; the professions and the arts; diverse theoretical disciplines and their useful application to human needs. Our greatest opportunity is to find a means of reassessing and replacing old and ruined disciplinary barriers with newer and more logical and attractive and seductive veils of cognizance. Methods for deeper communication must be found for interdisciplinary discourse and, where possible, diagrams, cartoons and other less personal systems of understanding should augment the word and the numeral.

With the foregoing as a crude prologue, I come to the body of the subject at hand. Posed as a question, it is: "How can the architectural school best serve its community?" From this point onward, let us assume that we may discuss two related but highly distinctive groups which together constitute "the community." One is the "academic community" (or "scholarly" if you wish) and the other is the "community-at-large." The academic community may be defined as that amalgam composed of all disciplines and branches of knowledge at the single institution and of all similar groupings throughout the world. The community-at-large consists of the university's immediate surroundings and those generative or destructive forces which animate it. Both, of course, go beyond the boundaries of the university ground and even the limits of the containing city.

With respect to its immediate academic community, the school of architecture holds deep and irrevocable responsibilities. Impossible to describe fully or define, the paramount responsibility is that for enclosure, for environmental conditioning, for the near-illusory symbolism of "thing," "artifacts," "structural assemblies." But even here we must further describe what is meant by a school of architecture.

By my definition, a school of architecture embraces and accepts (through its products) the responsibility for the total physical environment in which man lives. More specifically, it contains, arbitrates and coalesces that portion of all those academic disciplines and human pursuits which ultimately affect the physical shape and disposition of man's living working habitat.

In less conventional terms, the school of architecture which I would like to have you visualize with me would contain that portion of all disciplines which can be applied through city planning, traditional architecture and product design (what Henry Kamphoefner calls a school of design). Divided into this trinity of graded physical concerns, it would extend its authority from individual products of industrial design such as furniture through individual units of construction or buildings, to the establishment of a physical form and syntheses of entire urban areas.

Disciplines from the physical, political and social sciences and the arts would be related to a single unifying purpose even as a common light source diffused through a prism brings forth the multicolors of the spectrum. Economics, real estate, building finance, taxation, entrepreneural calculation, public law and government, geography, sociology, anthropology, statistics, psychology and many other formalized disciplines and less distinct human specialties would combine in the blender of man's physical ecology. But this is a drab, dreary and hackneyed proposal. What can animate it and might bring it to reality?

University Without Departments

The only method I know, and I have given it long thought, is to reduce our university to a series of functional subgroups. I propose that our new version of the university will have no schools, colleges or departments. It will have only disciplines and "little universities within." The disciplines may be grouped or entirely autonomous. In any event, the basic working units' physical arrangement will be symbolized by a group of constellations (faculty minds) in dynamic movement.

In point of interest concentration, in architecture for example, the full-time faculty would consist entirely of design critics, and no other graduate architects would teach architects. All other members of the teaching staff and faculty would

be available from and shared with their primary discipline, lying outside of the denaturing influence of too demanding a physical synthesis. The school of architecture would receive about one-third of such faculty members' time, interest, devotion, vitality, zest and, most of all, growth. Two-thirds of each man's time would remain within his fundamental or parent discipline (such as psychology, mathematics, philosophy, etc.).

Each such contributing faculty member would agree in youth (instructor or master's level) to devote one-third of his life effort to a deep, expanding and tangible concern for man's habitat and physical accoutrements. In this oath of service he would countenance the learning relationship between head and hand; symbolic philosophy and graphics; intuition and experience and a new sense of "moral materialism" for physical things. Each member would accept responsibility for an effort to apply his knowledge to the proper evolution of man's environment.

Teachers and Researchers

In this fashion, the academic community is functionally organized to produce and improve innovators rather than mere professional technicians. The scheme (without budgets, vacations, tenure, personalities and trustees) might nearly realize Whitehead's dream of a faculty of contagious imagination. For as he says: "It can only be communicated by a faculty whose members themselves wear their learning with imagination."

Whitehead asks: "Do you want your teachers to be imaginative? Then encourage them to research. Do you want your researchers to be imaginative? Then bring them into intellectual sympathy with the young at the most eager, imaginative period of life, when intellects are just entering upon their mature discipline. Make your researchers explain themselves to active minds, plastic and with the world before them; make your young students crown their period of intellectual acquisition by some contact with minds gifted with experience of the intellectual adventure."

And to do this, the liberal arts tradition (four generalized years immediately after high school) is ruinous. The facile mind of the adolescent high school graduate is essential and must be immediately cultivated. To reduce the effectiveness of these very limited years of maximum growth potential through lack of imaginative applications of learning is a horrifying and an unnecessary psychological deprivation.

With respect to the surrounding community-at-large and the academic community, the future school of architecture must take thoughtful lessons from the medical-center concept of professional education. Design critics—architects, designers, city planners, mentioned earlier—would be required to maintain an associated professional practice as a precedent to teaching. Whether research or conventional professional services, faculty members themselves would serve as prototypes of the professionals they train.

The school of architecture would in fact be an incubator, as well as a training ground for young professionals. New professionals would be continually pumped through the early financial trauma of practice or revived later for further professional usefulness. Like the medical centers of Europe and the Northeast, the faculty would use university facilities and students to the fullest and pay equitably for it. As their practices increased, their pay, office spaces and responsibilities would be reduced commensurately. Like the first medical center, "full-time" and "geographic full-time" faculty members would denote the difference between academic rank and the degree of academic responsibility. Time and competence are not the same and do not lend themselves to generalized titles.

Thus by interlocking a faculty of dedicated specialists and performing researchers and practitioners, the process and symbolism of created and realized projects would be further available as necessary teaching tools. As with the London County Council (the best architectural and planning school in existence and probably the only good one—except it isn't a school at all), the continuity of evolutionary development of actual problems becomes available in the architectural laboratory and classroom.

The zest and vitality of universal gain and a sense of community participation becomes available to students and faculty alike. An "outpatient clinic" has been made available to architectural students, and clinical instruction is truly available for the first time. In addition, architectural and planning aid become more accessible to the community as a whole and broadened basic research facilities are possible.

Such a balanced arrangement of professionals in all of the design fields would also allow much needed coupling to other independent research groups. Bureaus of governmental research and similar analytical and fact-finding groups could associate in a firmer fashion. The university's position in public affairs is dramatically improved through its potentiality for direct and independent community service.

The Architectural School and the Campus

As a most extraordinary and divertingly naive thought, such an organization of an architectural school should logically accept full responsibility for campus planning and design—at greatly reduced

fees and with enormously enlarged contact, competence and service. Leaning back to back, the school of architecture (or "little university within," if you will) could dramatically enhance the benefits to the university. Buildings and building groups could be harmoniously planned, and the economy and continuity of planning coupled with adequate predetermination of needs and unit programming. The university's buildings could in fact come to symbolize the university's real commitment. Though this is realizably dangerous, and an ultimate heresy in some back-slapping alumni quarters, it does have the strength of logic.

Related to "a little architectural university within" built upon the medical-center concept and dedicated to the university's self-expression of realizing its own designs for its efficient and symbolic buildings, I also suggest the advisability of a reasonably autocratic administration. We all despise the hedging of faculty group decisions and committee platitudes. What is so evil about equating responsibility and authority passed upward toward retribution, the president, the trustees, the public and God?

It is even possible that the demonstration at Yale earlier this month when the question was asked, "Why not creative teaching?" is a major issue of our times. Does anyone have a right to be always right? Does anyone have a right to absolute employment security? Does anyone have a right to views without review? If teachers do, why not administrators?

Conformity or Diversity?

Other concerns of an interinstitutional nature within the academic community give me concern. They may be stated as questions. Why do all universities have such insensate desires to conform in size, shape, type and format to their competitors? Why do they not choose to determine strengths on the basis of natural diversity? Why build to national norms rather than innate strengths? Or are we completely computerized?

Why do we still build all of our architectural programs around the core study method or the tutorial critic? Is there no basis, under other conditions, where small groups and the lecture system may not be superior?

How can we continue such a system while at the same time removing the foundation of the responsible autonomous teacher? Should we continue inconsistent grading by juries or should we return this basic responsibility to the teacher?

These are only representative of questions regarding the school of architecture in its community—its academic community. Even deeper, more significant and less resolved questions lie in the realm of the community-at-large. Here the school of architecture has two functions. First, it acts as a watchdog and coordinates the work of other groups to protect the public against improper encroachments; but second, and even more important to me, it must innovate and direct public action for needed change.

Unscrambling Urban Confusion

For instance, if the city is to have a larger scheme of things, its physical symbolism is a responsibility of its school of architecture. If we are concerned with "herded town populations," "opponents" with livid conviction and even "hate" must be coupled with "proponents" of thoughtful change, even in the cloak of saccharin "do-gooders." We must respect and protect the heritage of our parents, but we must love and direct our needed offspring properly.

In our "little university within," we may use the Ivory Tower to collect, analyze and protect, but we must also utilize the Outlook Tower to propose, innovate and realize. For architecture not only reflects our entire culture, it must affect it also. A regenerative power lies dormant in our schools of architecture. It can only be revived through a new zest for living and imaginative change. This will come where administrators, teachers and students work vitally together. Perhaps we will find such an environment before man is placed on the moon.

The architects should show the best techniques of the moment for unscrambling urban confusion. The architectural educator is the proper custodian of more humane qualities in our city centers—whether through multilevel segregation of functions and vehicles or the proper utilization of nature and natural phenomena to subdue the machine and all-man-designed urban environment. We need trees and growing things in our central business districts. The local school of architecture should maintain a continuous public demand for such action.

The proper position of the architectural school in its "public-at-large community" is twofold. It must preserve what is old and good and it must introduce innovation. It must fight the destruction of a major asset such as Jackson Square in New Orleans, and it must innovate by suggesting that New Orleans really is a great deal more than the Vieux Carré. It should be able to show how a 1965 pedestrian community of mixed small houses and shops can be far superior to the decadent Vieux Carré—even if it was located on the underprivileged side of Canal Street.

And we architectural practitioners should support our schools and see that their contributive innovations are not only encouraged but actually realized as well. ■

History and Theory and NCARB

Eolithic Examinations

BY JEFFREY COOK
Arizona State University

There is much to be said for and against the multiple-choice-answer type of examination, and most of it has been said many times. On one thing, however, both sides to the dispute are agreed: that it demands as much knowledge and skill from the examiner as any other type of examination does. If the examiner's knowledge is inadequate, or his information out of date, the examinee who knows more than he does will often be penalized; if the questions are poorly thought out or ambiguously worded, chance will play too large a part. Mr. Cook shows that the NCARB examination in History and Theory is vulnerable to criticism on these counts. He makes the plea that NCARB should employ the known and tried methods of evaluating the questions and thus ensuring the validity of the results.

WHEN SEVERAL YEARS AGO the National Council of Architectural Registration Boards proposed a uniform series of licensing examinations for use in all states, employing a multiple-choice answer technique, a number of objections were raised by those who doubted the suitability of the chosen means for the job to be done. Experience of the December 1965 series of NCARB licensing examinations has shown that the objections were well founded.

The present NCARB examination, at least in part, represents what may be described as an eolithic stage of development. One may take comfort from the thought that from this earliest state of culture, in which the crudest tools are first used, one can look forward to better things, for the tools can only improve.

Nowhere in the examination battery is there any attempt to assess the literacy of the candidate. The NCARB examination has seven parts, five of which are of the multiple-choice-answer machine-scored type. The other two, Site Planning and Architectural Design, are studio-type, fixed-time, preliminary design presentations similar to solo design exercises in many schools of architecture. These are perhaps the best capability test for any prospective architect, since they parallel so closely the professional demands of architectural practice.

One might criticize certain details. For example, the indication of full grown elm trees on the site of a proposed community center in southwestern United States, where elms do not grow at all; or the statement in a site planning problem that a railroad crossing might be handled by either an overpass or an underpass, when contour lines indicated no such possibilities and when there was not sufficient distance on one side of the tracks to develop the necessary ramp.

But these are minor criticisms, and perhaps one must allow a certain idealism if solutions are to be arrived at within time limits that are also unrealistic when set against even the poorest professional practice. With regard to the time limit, its appropriateness is, of course, dependent on the kind of problem. The 12 hours allowed for Architectural Design is usually acceptable. But the five hours for Site Planning is inadequate, especially with the increased emphasis on "total services." Who can design a reasonable layout in a small walnut grove for a commercial development of 200,000 square feet commercial area and 300 low multiple-dwelling units, together with the quantities of auto parking necessary, in five hours?

The five multiple-choice-answer examinations are 1) History and Theory, 2) Building Construction, 3) Structural Design, 4) Professional Administration and 5) Building Equipment. Surprisingly—in view of the neutral examination technique—each had its own special character. Building Construction was a dry and dusty "nuts and bolts" proposition—a verbal test of motor skills. Professional Administration was straight out of the Octagon. It may be flattering to The

American Institute of Architects that its Handbook on Professional Practice is the only common denominator between states on this subject, but it is also an indictment of the profession at large. The much maligned and dreaded Structural Design takes on an intriguing character in the multiple-choice examination. Calculations are required to be shown for a minimal number of questions, but the provision of a choice of answers gives the subject something of the air of a prostitute holidaying in a gambling casino.

Occasionally the subject emphasis is questionable. For instance, 10 percent of the Structural Design examination was based on the concept in welded joints that eccentric loading requires eccentric welds. In other subject areas there was even an absence of concept—a definition of the Critical Path Method in which the only possible answer identified CPM with computers.

Yet these criticisms of parts of the December 1965 battery are minor or even pedantic in comparison with these which must be made of the History and Theory examination. Perhaps this area will be an eternal challenge for the mechanical testers because it involves not facts alone but also the interpretation of facts. The dry bones of chronology and taxonomy are mental litter until they have been clothed with meaning by the critic and the theorist. The NCARB examination in History and Theory does indeed recognize and give due weight to judgment and interpretation. The question is, whose judgment?

The Gamble House by the Greene brothers in Pasadena is most important because of its:

1. *Inventive use of wood on exterior*
2. *Functional-spatial development of interior*
3. *Structural ingenuity*
4. *Anticipation of the ranch house*

Of the four answers supplied, the third cannot be the one looked for, since structural ingenuity is not a special attribute of the Gamble House. The other three are all potentially correct. The richness derived from a feeling for the nature of a material is nowhere better demonstrated than in the Greenes' detailing of wood. The sequence and proportions of the interior spaces are perhaps fairly typical of American houses of the first decade of this century, but in their direct relationship with sleeping porches, and raised and planted terraces and patios, the Greenes outdid their contemporaries. In fact, the house is both distinguished in spatial planning and to be counted among the Californian progenitors of that current American dream house: the ranch house. The answer then depends upon one's personal view of what is "most important"—isolated inventiveness, contemporary superiority or long-term influence.

Which of the following building materials is most typical of the architecture of Constantinople?

1. *Brick*
2. *Mosaics*
3. *Marble*
4. *Concrete*

Of course, all four were used. Perhaps one is supposed to rule out mosaics as being decorative rather than structural. Then one could reason that concrete, being "most typical" of Roman architecture, cannot be "most typical" of Byzantine. That leaves one with brick and marble. How is one to assess their relative degrees of typicalness? By weight?

The form of the architecture of ancient Egypt was in origin

1. *Spatial*
2. *Sonic*
3. *Thermal*
4. *Climatic*

No one, to my knowledge, has yet proposed that Egyptian architecture was sonic in origin. Since heat is an attribute of climate, the term climatic is the more descriptive of answers 3 and 4. But

there are two correct answers, for what architecture does not originate from spatial needs? Egyptian temple architecture, with its axial sequences of contrasting architectural experiences, is unquestionably spatial. But so even are the pyramids. And if this seems untrue to the examiner, it is time that he read the new introduction which Giedion added to the 1962 edition of *Space, Time and Architecture*—allowing that he may not have had time yet to look into Giedion's more recent book.

In the development of an architecture of high-rise buildings in the United States, which of the following factors was most important?

1. *Industrial—mass production of iron, steel and glass*
2. *Economic—cost of land, rent*
3. *Geographic—location and purpose of cities*
4. *Administrative—development of corporate business structures*

On what grounds can one suggest that one of these four correct answers is preferable to the others?

Questions of styles and categories can be even more confused, owing to lack of context or—what is worse—apparent ignorance on the part of the question writer.

The Unité d'habitation at Marseilles is an example of architecture that is:

1. *Functional*
2. *New Brutalism*
3. *Contemporary*
4. *Eclectic*

Le Corbusier doubtless considered it "contemporary"—at least until he designed something else; a latter-day Banister Fletcher would doubtless favor "functional." One suspects that "New Brutalism" is the answer our examiner is after. Should one go along with him? Not if one has had the curiosity to do a minimum of research into the meaning of the term, looking it up in Hatje's *Encyclopaedia of Modern Architecture;* for one reads that the phrase, the New Brutalism, was first uttered in the early summer of 1954, which was also the year of the completion of the school at Hunstanton, Norfolk, by the Smithsons, cited there as elsewhere as the first true Brutalist building. (The Marseilles Unité went up in 1947-52.)

The style of the Campanile, Baptistry and Campo Santo at Pisa is:

1. *Romanesque*
2. *Gothic*
3. *Byzantine*
4. *Early Christian*

Here, of course, no single answer is correct, because the campanile is Romanesque, the baptistry is both Romanesque and Gothic, and the Campo Santo is Gothic.

In the design of the Palatine Chapel at Aachen, Otto of Metz was strongly influenced by an earlier building of what style?

1. *Roman*
2. *Byzantine*
3. *Romanesque*
4. *Early Christian*

First of all, the question contains a misattribution. The Ottos of *Mainz* (Nos. I, II and III) of the late Carolingian period were indeed important in the arts. But they lived a century and a half after the building of the Palatine Chapel of Charlemagne. Undoubtedly the NCARB is thinking of Odo of Metz, who was probably the first architect registered north of the Alps.

Most scholars—though not all—believe that in the design of the Palatine Chapel, Odo was influenced by S. Vitale, Ravenna. In Banister Fletcher, S. Vitale is classified as Byzantine, and one has an uncomfortable suspicion that our examiner is looking for that answer, blissfully unaware that what we now know about S. Lorenzo, Milan (not mentioned by Sir Banister), and about the dating of Ss. Sergius and Bacchus, Constantinople, makes the hypothesis of influence from the Eastern capital on the design of S. Vitale (apart from the decorations which aren't imitated at Aachen anyhow) quite unnecessary. Indeed, one historian, Bodo Cichy in *The Great Ages of Architecture,* has pointed out that "there are many valid reasons for considering the whole of sixth century religious architecture—whether basilican or centralizing—under the heading of Early Christian."

Between the years 1795 and 1895, which country least demonstrated architecturally an integration of modern materials and techniques?

1. *Germany*
2. *France*
3. *England*
4. *USA*

To take the designers who first come to mind in this connection, Germany had Schinkel, France had Viollet-le-Duc and Eiffel (who was an engineer), England had Paxton (a horticulturalist) and the United States had Bogardus (a promoting inventor) and Jenney (an engineer). Thus, if architects are a prerequisite for architecture, the integration would seem to have been effected less in architecture than in construction. If one were to choose an architect who both felt and demonstrated in his work a concern for architectural expression appropriate to the means of his time, the choice might well be Schinkel. However, it is

almost certain that the looked-for answer to the question is Germany.

Which modern American building most owes its form to economic determinants?

1. *United Nations*
2. *Guggenheim Museum*
3. *Empire State*
4. *Wainwright*

Only the Guggenheim can be discounted immediately. The case for the UN, on practical and economic terms, has been stated many times—by the coordinating architect, Wallace Harrison, among others. The Empire State obviously takes advantage of its site with its high tower thrusting up out of a low total city-block coverage. But the memory of how it stood half empty for 10 years hardly makes its form convincing economically. Finally, is the Wainwright young enough to be considered modern? If so, its height and disposition are right, and the let-in light court at the rear achieves a plan form consistent with satisfactory natural lighting throughout the building.

At the close of the 19th century, which architect made the greatest contribution to eclecticism in the USA?

1. *Roebling*
2. *Burnham*
3. *Paxton*
4. *Hunt*

When the anachronic nonarchitects have been eliminated, the choice is between Burnham and Hunt. The latter might seem to be the answer—until one considers that he had been in practice for 30 years when the 19th century closed and had never been anything but a "dyed-in-the-wool" eclectic. Burnham, on the other hand, was a prominent Chicago architect of the "commercial style" who in his sponsorship of the eastern classicizers as coordinating architect of the Columbia Exposition of 1893, as well as in much of the later work of his firm, surely made a contribution of critical importance to eclecticism in America at the close of the 19th century. But I would bet that Hunt is the official correct answer.

My conclusion is that the December NCARB examination in History and Theory was written by an examiner with limited knowledge. Hence those questions which favored the examinee whose knowledge was limited. Luck too played an important part. Without luck, how would one have chosen the Empire State Building or Hunt—assuming that those were the "right" answers?

Petty semantic tricks, typographic ambiguities and arbitrary classifications also played far too large a part. What is needed is to find authorities for objective evaluations. Perhaps in terms of the widening appreciation of a plurality of "theories of architecture," the decline of Sir Banister Fletcher as the omnipotent judge is a healthy move, but what authority shall fill the void? When will the examiners discover Hitchcock, Mumford, Pevsner, Giedeon and Scully?

More important, the powers that preside over state licensing examinations should know what it is that is to be examined. As the total examination exists, it consists of 44 percent technique, 8 percent philosophy and 48 percent synthesis or execution. It might be argued that these percentages represent the effect of the architect's ability on the "health, safety and welfare" of the public. If such a small portion of the examination must measure a man's understanding of the world that preceded him in his self-chosen task, there is hardly an excuse for chance. Rather, the modesty of the portion should increase the need for accuracy in evaluation.

Lastly, assuming that state and national examiners have a comprehensive knowledge of what they want others to know, and can select from this body of knowledge what is important, there should be no obstacle in the way of obtaining a satisfactory examination *regardless* of the technique. As a student and as a teacher of history and theory, I have experienced examinations in several places and from both ends. In particular, in the last two years, I have written about 1,000 multiple-choice-answer questions for the testing and machine-scoring of classes of 500 students. An automatic procedure of the machine-scoring technique is an evaluation of the test itself. Each question is evaluated as to difficulty as well as discrimination indices. The test itself is measured against a percentile standard so that the idiosyncrasies of individual questions do not jeopardize the conscientious individual.

In the NCARB examination, individual questions apparently have not been tested. If they had, the ambiguities, errors and subjective classifications would have been eliminated. Such flaws could be tolerated if the examination were evaluated against a standard percentile of performance. This technique would allow a fixed number to pass each examination and would allow professional qualification to seek its own level. Apparently, this idea is repugnant, for the passing score of 75 percent has been proclaimed to be an absolute one.

Limited knowledge of a field is hardly the ideal prerequisite for an examination of competence in a professional field. Still less is chance. If the multiple-choice-answer examination is indeed the most appropriate tool for the job, then the well-known techniques that can perfect it and verify its validity should be used. ■

Two Meetings, Two Dimensions

Architectural conferences, congresses and conventions come in all sizes, national and international, local and regional. Some take all architectural knowledge for their province, others limit their field of view. The first of the two articles that follow describes what was certainly one of the largest of the 1965 get-togethers, the VIII Congress of the International Union of Architects in Paris; the second samples the discussions at what certainly was not the least interesting, the South Central Region meeting of the ACSA held at Oklahoma State University.

I
ARCHITECTURAL EDUCATION
UIA in Paris

BY THOMAS HOWARTH
University of Toronto

THE ORGANIZATION of a world congress and the ordering of debate so that many national groups, delegations and individuals may have a voice, is an operation of indescribable complexity, and one must admire the skill and devotion of those who plan and direct such a program successfully.

The administrative work of official delegations at Paris seems to have been largely completed during the few days before the serious working sessions began, and the *séances de travail* were very well arranged. There were three panels, A, B and C, dealing respectively with General Studies, Technical Education and Design. Three work periods were allocated each day (9-11 a.m.; 11.15-12.45 p.m.; 3-5.30 p.m.), and each panel discussed its topic on each of three successive days: the first being devoted to "training before," the second to "training during" and the third to "training after" architectural studies. This meant that anyone who wished—panelist or member of the audience—could attend any or all of the nine consecutive working sessions, and thereby avoid the frustration so often experienced at assemblies elsewhere when important discussions overlap. From 5:30 to 6 p.m. each day the rapporteurs attempted to summarize the debate.

All the panel members were changed for each session, but the chairman, two rapporteurs and secretary remained throughout. Each panelist was allowed 10 minutes for his presentation, and afterwards the meeting was opened to questions or contributions from the floor. Participants were allocated five minutes each, and after the first session the response was so lively that everyone who wished to speak had to fill out a slip of paper with his name, country and topic. Those who attended the sessions regularly appreciated the necessity for this form of control, and no one with a worthwhile contribution to make was prevented from speaking.

The subject of architectural education is a popular one these days, and a great deal of preliminary work had been done by standing committees and national groups during the interval between the congress in Havana and the Paris assembly. Unfortunately, their excellent publications did not reach many of us in time for detailed study before we participated in the work sessions. Most of the issues raised, however, were familiar to those who have been deeply involved in education—although they may well have been new to the practitioners who do not teach—and the universality of our problems and the difficulty of finding adequate solutions were at once reassuring and challenging.

The present writer attended eight of the nine working sessions and the following notes will give an impression of the range and substance of topics discussed.

Statements of a general nature culled from many sources were used by way of introduction. For example:

- Architectural education should be concerned with the basic understanding of society and cultural development; this will range from literary and historical sources to the sciences that increase our knowledge of the human environment.
- The *manner* in which education is dispensed is more important than its basic subject matter.
- The student should be encouraged to develop his personality without "falling into the temptation of egoism and pride."
- Emphasis should be placed on the acquisition of basic knowledge so that architects may participate in a dialogue with the technician and scientist.
- Teaching cannot create imagination, perception and sensitivity, but it is the duty of the teacher to awaken, sharpen and develop these qualities in his students.

The following points emerged from a study of the three areas allocated to the panelists: before, during and after the educational process.

Before

· "The opinion of men must be formed at school" and the design of the school itself can have a major influence on the child.
· In an age when architects work increasingly for the public rather than for an elite, it should be essential to introduce some architectural content into elementary and high school programs.
· Communication media—films, lectures, publications, etc. should be exploited for the education of the public.
· Vocational guidance, aptitude testing and other selection methods should be major factors in ensuring the success of architectural education at university level.

During

· A school of architecture appears to have the essential mission of giving an esthetic, technical and humanistic training to students who have previously acquired an adequate general education.
· It is now recognized that, generally speaking, the architect is inadequately educated in the liberal arts and humanities fields.
· Teamwork and the resolution of "problems on an ever-vaster scale" and "the architecture of vast urban complexes" should form an important part of the students' curriculum.
· Some knowledge of the human sciences must be acquired so that the architect may be able to converse intelligently with his colleagues and clients in other disciplines. (Now that international problems are becoming so important, it was regretted that a foreign language was no longer mandatory in many schools of architecture.)

After

· There is wide recognition of the need for a substantial period of organized professional experience after graduation and before licensing.
· The need for some form of international licensing to practice was recognized although the difficulties were fully appreciated.
· The necessity for more post-graduate research on architecture and urban design was stressed repeatedly.
· Refresher or "recycling" courses, especially in technical subjects and in matters relative to our knowledge of man and society are urgently needed everywhere. (A Russian speaker said that his government is setting up refresher courses in many subjects, and in its experience such courses need to be of six months' duration if they are to be effective.) The UIA was urged to establish international courses, especially in town and city planning.

During the discussion the most dramatic intervention (which the chairman permitted to cut across the agreed limitations of time) was by a spokesman for "The Third World"—Africa and the Middle and Far East, that great emerging force which we had already encountered in the Commonwealth Association deliberations at Malta. Stress was laid on the social problems of these countries, on their desperate need for help in the education and training of architects and technicians. Such is the speed of urbanization, we were told, that the Third World has no time for frills and niceties, its needs are basic and urgent if even minimum standards of living and human comfort are to be established and maintained. In such a situation the architect must be prepared to make far-reaching decisions on a wide range of social and planning problems in addition to those of building. "Exhibitionism," said the speaker, "has no place in the developing countries."

At the preceding Commonwealth conference, the writer drew attention to the fact that the needs of the developing countries were so unlike our own that a new system of education might have to be evolved bearing little resemblance to our traditional patterns. Canada has one architect to about 6,000 people, but Ceylon has 34 architects and a population of 10 million people; Pakistan, 25 architects and one school of architecture to a population of 100 million. It is evident that research on this problem is needed urgently with some clear, uninhibited thinking on the aims and objectives of environmental education. Studies of new teaching methods and the exploitation of audio-visual aids would seem to be essential, but in any case the solution must be based on an understanding of the real needs of the country. The exhibition of students' work from Ghana shown at the École des Beaux-Arts in Paris demonstrated how indigenous practices and traditional skills could form the basis for a teaching program, and this was a particularly interesting albeit modest beginning.

The system of "twinning" developed in the United Kingdom is one positive contribution which merits extension internationally. By this system a well-established school and one in a developing country agree to close liaison by way of staff and student exchanges, etc. So far this system has worked successfully between the Architectural Association in London and Kumasi University, Ghana; and between Liverpool University and the school at Nairobi. The citizens of the Third World have much to teach us and, all our sophistication notwithstanding, we have much to learn.

The following points are taken from contributions by many speakers over the three-day period.

- A Frenchman pointed out "it is not because things are difficult that we don't do them; it's because we don't dare to do them that they seem difficult."
- An Argentinian said there are 70 million illiterates in Latin America, and architectural education must be seen in the context of essential social reform, with particular emphasis on housing.
- A Belgian advocated combined studies with psychologists and others at an advanced level in order to better determine environmental needs.
- A Russian stressed the fact that many of our major design problems (mass housing, for example) demand modern industrialized building techniques and a more imaginative approach by architects. He reminded us that a school of architecture —like a high school—cannot teach everything; our duty is to lay sound foundations.
- A Briton said "the architect is the integrator, not only the co-ordinator." He added the suggestion that architects should be encouraged to discuss with students in the school their current work, and design and constructional problems.
- A Greek said that 60 percent of architectural students in his country were women—a phenomenal change!
- A Frenchwoman suggested that students should volunteer to conduct architectural tours for high school pupils. Newspapers should be encouraged to set up architectural essay and drawing contests for children as a means of increasing their awareness of the physical environment.
- A Spaniard objected to the publicity given through the press and other communication media to buildings that look attractive but do not work.
- An American described the architect as an environmentalist and rated his ability to work with other professional colleagues as more important than individuality.

One of the most refreshing interventions came from the student representative of the British Architectural Students Association, Miss Hawkins of London University who, very quietly and effectively, pointed out that the views of the students seemed to have been overlooked by the congress and, furthermore, that BASA's representatives had found the meetings singularly uninspiring: Their own international assembly at Stockholm had been much more productive.

The congress program was so arranged that those who did not wish to attend all the work sessions were suitably entertained. The pattern of a typical day was as follows: 9-11 a.m., work session; 11:15-12:45 p.m., architectural film show; 1-2 p.m., luncheon break; 2-5:30 p.m., conducted tour of selected buildings in the city; 5:30-6 p.m., synthesis of the day's work for those who stayed behind; 6:30-8:30 p.m., "repos"; from 8:30 p.m. on the usual organized divertissements—the Opera, a Seine boat trip, ambassadors' receptions, etc.

The Value of Participation

Through the intellectual stock-taking that follows inevitably upon such a conference, one attempts to assess the value of participation on a national as well as on a personal basis. The advantages of membership of the UIA are as obvious and the benefits as elusive as those of membership in any other great international organization that has noble ideals but little power, distinguished sponsorship but little money and dedicated workers but too little continuing collaboration.

Participation permits us to observe the attempts of others to solve universal problems; to contribute our own experience in the hope that others will listen and learn from our achievements and mistakes; to share in the pooling of new information and challenging ideas; to understand the needs of others and, by understanding, approach more closely to that concept of universal brotherhood that is implicit in all such organizations. We cannot escape the fact that the future of the Third World in terms of education, human environment and personal dignity should be as much our concern as the resolution of our own local and provincial problems which, by comparison, seem trivial indeed. ■

II
Design Process Theory ACSA in Stillwater

BY CECIL D. ELLIOTT

Oklahoma State University

A PAPER DELIVERED by Dr. Roy Gladstone of the Oklahoma State University Department of Psychology, in which he undertook a clarification of terms, *theory, principle, rule,* etc., began the proceedings. (Of course, in spite of this beginning, semantic difficulties continued throughout the meeting.) A panel representing painting, philosophy, physics, and sociology commented on the use of theory in their fields. The architects then mulled over what had been said by the outsiders and at the same time developed both general and specialized points. Charles Colbert, invited to observe and listen, gave a summary of what he had heard and led a rather lively closing discussion.

No firm conclusions were reached, and none were expected. Few resolute statements were

made, but the discussions produced a provocative miscellany of opinion, conjecture, consensus and inquiry. The following quotations from the transcript of the meeting are intended to indicate the character of discussions; from their brevity they cannot hope to convey the general pattern of talk or the full meaning of those who are quoted.

The possible utility of theory was given tacit acceptance. While most participants were reserved in their claims for or against the use of theory, a need for it was stated in general terms.

NOLAN BARRICK (Texas Technological College): There is a fact that always haunts me: that architects generally are not very adept at specifically describing what they mean. We've heard about theory here, and it's all turned out to be like the various descriptions that the blind men gave of the elephant as they felt parts of the animal. We do little to enlarge the designs of the student at a time that is of benefit to the student. We do criticize him, if we take criticism to be a negative factor. We really tear him up. We tell him everything that is wrong with the design, how he ignored every theory of design. But we never get around to explaining what we mean.

THOMAS C. MAYBERRY (Philosophy, OSU): Philosophical theory, even if it cannot guide practice, can do something to guide the discussion of the products of practice. While I'm inclined to make only very modest claims for the efficacy of philosophical theory and for its practical value, I do believe that such theories can do something to enlighten practice, can broaden understanding and can do a great deal to improve the quality of intelligent discussion concerning the subject matter with which they deal.

GLADSTONE: The architect is much ego-involved with creativity; but in carrying out any creative task, a great deal of routine work is inevitably involved. It is true that theory, if it is a good theory—which is a big *if*—will aid creativity. It is also true that creativity may result from organizing principles in a new way, and, of course, the principle is the tool *par excellence* for dealing with routine. Thus, architects do use principles whether they are verbalized. I would suggest that it is much easier to teach a verbalized rule than an unverbalized rule or principle.

Once creativity had been mentioned the peculiarities of the creative mind became an open topic. Although there was no direct discussion of the relationship between creativity and the formalization inherent in theory, it was obviously a matter of concern.

MENDEL GLICKMAN (University of Oklahoma): The personality structure of the experimental physicist is likely to be different from that of the theoretical physicist. The person who creates in the most fundamental sense—the theoretical physicist, the creative artist—these people are likely to be much less constrained. They don't care so much what people think about them. They are less bound not by the fundamental mores but the rules of society, not ethics but politeness.

SAMUEL OLKINETZKY (Museum of Arts, University of Oklahoma): It seems to me that creativity consists of illogical insights into the realm of emotion and feeling, which might be called the sense of what is "*wrong*fully *right*."

GLADSTONE: This is certainly the way in which a great deal of creativity in the past might be described. It is a violation of the kinds of ideas which people have and thus, as you put it, wrongfully right—because eventually it does turn out to be right.

OLKINETZKY: I would stress the illogical aspect of it, since it doesn't fit in a logical system—the framework that an individual normally works in.

If the role of the creative individual involved risks, it was also apparent that anyone undertaking to theorize would have to be willing to assume the same sort of risks. Testimony from other fields of study did not encourage one to conclude that theorizing was a simple and sedate procedure, nor was reference to the field of architecture any more reassuring.

SARAH SUTKER (Sociology, OSU): You have to go to other people and ask silly, naive questions. That is hard. You have to read where you probably have not, you may have to accept the rigors of logic and mathematics when you are not good at them; but that isn't as painful as having to immerse yourself in areas where you don't properly belong. Still, I think theorizing takes you there.

EUINE FAY JONES (University of Arkansas): A little bank on a corner in the town—this is a terrifically difficult thing to achieve. How are we going to prepare students to change man's total environment, spread them out over so many other disciplines?

GEORGE B. THURSTON (Physics, OSU): When you have formulated the beginning theory, when you have tested exceptions to it and tried to bring in the information which you excluded, and when you have what you might consider a total success at this whole operation (when you have explained what you set out to explain), then you drop it like a hot potato and go on to something else—because at that point the interest is over.

SUTKER: If you add problem-finding to problem-solving, you would be closer to theorizing. It

can lead to conflict because of the uncertainty involved. If you go into the unknown, you are going to perceive this unknown with difficulty. You're going to put out ideas which are wrong and, even worse than wrong (if I may be forgiven, coming from the field I do), ridiculous. Can those sciences or arts which are trying to be somewhat more systematic stand to appear ridiculous?

There was some reassurance that the sweeping scope of theory and the individuality of art might not be in absolute conflict.

GLADSTONE: There is a kind of problem for which there is a single solution. For another kind of problem there are many solutions, all of them potentially equally good, some perhaps much better than others. The artistic problem is this kind, for which many possible solutions might be good solutions.

OLKINETZKY: There is order, discernable order, in nature, which we see and recognize. I think someone said that the general principle about water is that it all flows down hill to the sea. But each river and each puddle is unique, and this is the most important part of theory.

Without conclusively establishing reasons, a functional need for theory in architecture seemed to be felt. The use of theory to assist in communication, to develop a vocabulary, was referred to frequently.

COLBERT: A building certainly doesn't achieve what I consider architecture unless it contributes to the general purpose of mankind and of architecture—and don't ask me what that is. Architecture must contribute to the mass of knowledge beyond the immediate function or acceptance of that building. It's got to edge into the general realm of thought.

ROBERT S. HARRIS (University of Texas): At such a conference as this the effort to state theory interrupts the process of developing theory. Our effort to say "I think such and such" interrupts our thinking about such and such. We think it's necessary, it seems useful to us, but an artificial moment of theorizing stops the usefulness of it. Any effort to talk about theory is hard to take, but it is necessary to communicate in order to get someone's assistance.

COLBERT: Whether we need theories to react against or need theories so that we can evolve our own theories, I don't know. But we've got to evolve our own and be able to reduce them to something finite and transferable to other minds.

BARRICK: I think we have to teach the student to theorize. When we talk in this vein we all want to duck under the table because most of the students are already adept at theorizing!

Nevertheless, the mutability of theory seemed to be accepted without regret. Perhaps this was due to the views expressed by panelists from other fields.

THURSTON: A good theory is rarely discarded. A good theory is expanded upon and modified, but a good theory is always a useful thing. It's palatable to the mind and has a collection of miscellaneous things that you can put together in one simple idea and stick in your head. So any good theory is an almost ageless thing, but it's subject to a lot of enhancement and modification.

HARRIS: I was sure the session would be primarily involved with arguments about whether theory was better than practice or practice better than theory. I'm glad we haven't had that. It seems to me that theory is supposed to assist thinking and that we ought to be at ease about how long theory lasts.

But there were a lot of misgivings and many reservations. The dangers of ill-used theories and instinctive opposition to theorizing were somewhat balanced against the fact that no reasonable alternative to theory was proposed.

GLADSTONE: Theoretical statements are devised to fit observed data. They are valuable only to the extent that they enable us to predict or remember more effectively than the data on which the theory is based. It is quite possible to theorize in such a way that adaptation is made more difficult rather than easier.

JOHN G. YORK (University of Oklahoma): What happens to theory in design when you overtheorize? That's an open question.

HARRIS: I don't see how you can think too much. I think you can ignore the situation, but I don't see how you can think too much.

COLBERT: Don't worry about premature systematization. The breath of life can't be automated out.

GLADSTONE: It is not possible for a person to act in a way which has no influence at all, and since this is so, behavior based upon poor evidence is better than behavior based upon no evidence—if the quality of the evidence is recognized.

CUTHBERT SALMON (OSU): Principles are nice things to have, but you could also have bad principles, could you not? Is there any moral aspect to principles?

GLADSTONE: I should say there is not. A principle is a tool like a hammer. A hammer may be used to beat somebody's brains out, in which case the hammer is not bad, but the person using it. It is also true that a person may be so beaten

upon by his teacher that nothing becomes important to him except being right. The use of these principles gives him right answers; under such circumstances—I'm hypothesizing now—creativity is inhibited. He is afraid to be wrong, but that is not the fault of the principle itself.

HARRIS: I like how mussy theorizing is, because this puts us where we don't get either the institutionalization of theories—as we have known them too often in art—or the institutionalization of reaction against theories. I know this from my own background. My training says I'm supposed to react against theory.

ELLIOTT: But after all, the idea that you cannot encompass art by theory is in itself a theory.

Toward the end of the meeting, and especially in the last session, theory was more frequently referred to as a means of clarifying objectives and evaluating results. The idea that such a standard might be self-derived and self-imposed by the architect interested the group.

COLBERT: I do believe that the qualitative can be measured, and I think it's a matter of instinct and reason that we can be sure that it's measurable. In the qualitative the entire being is involved, not just some attribute. And while all that is qualitative is ultimately subjective, and the ultimate decision will be subjective, there are methods of measure so that you can say one thing is better than another and tell why.

JONES: We have to let the student tell us what he is trying to do and by what rules he's trying to play. It can be a concept about functional relationships. It might be a concept about structure or form or about delineating form. It might be about related geometry or putting materials together or the nature of materials as they are assembled. . . . I think our criticism of the student's work should be combined with trying to point out to him where he has been consistent with what he says he is trying to do, how well he has accomplished this in his own terms, and where he's failed in those terms. Show him a way of testing and evaluating his consistency.

SALMON: I think it's design and theory, rather than theory and design. As a student you usually have four or five answers to the instructor's questions—answers or rationalizations. This seems to be acceptable to instructors and to clients as well. So, you do what you like. But you are not supposed to do what you like. Apparently the worst thing you can say about a painting is just "I like it." . . . A cow *likes* grass.

The success of such meetings is, fortunately for us all, always uncertain. The generality and abstraction of the topic caused no discomfort, there being an adequate number of examples and applications brought forth. But the prevailing opinion at the end was this comforting thought:

COLBERT: I think the chief value of this meeting was a glimpse into other disciplines and seeing all their insecurities, frictions and limitations. They're so similar to our own. ■

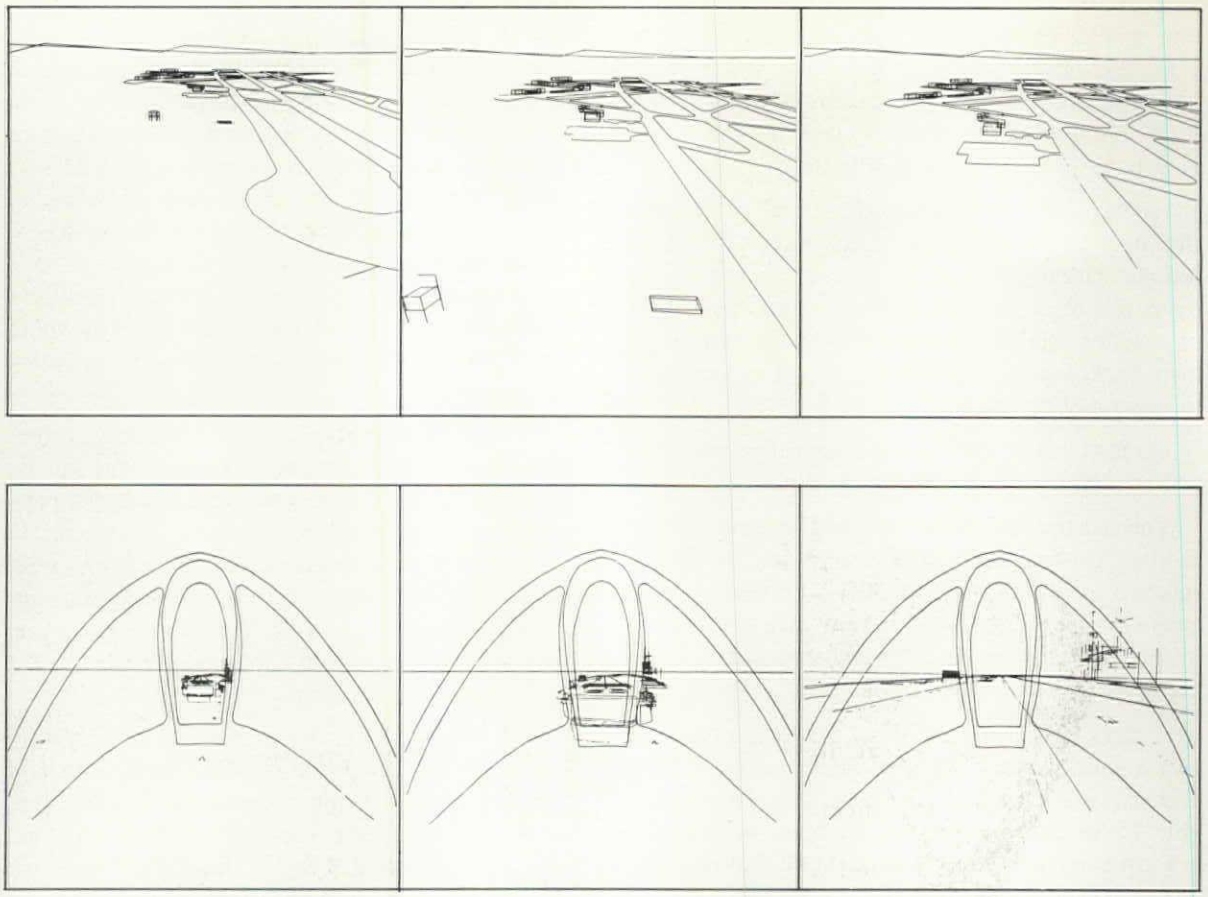
Review: Concerning Computers

Architecture and the Computer Proceedings of the First Boston Architectural Center Conference, 1964. Boston: Boston Architectural Center, 1965. $2.

Only 100 people were expected at the conference on "Architecture and the Computer" organized by the Boston Architectural Center. But almost 500 came in the midst of an ice storm. They were well rewarded. The conference will cast its shadow on many succeeding discussions of the role of the computer in architecture. It set a high standard for both breadth of content and depth of discussion.

A remarkable amount of consistently lively and cogent talk was packed into the one-day meeting. In the morning and afternoon sessions there were seven presentations of the most advanced state of the art. None of these were speculations. Everyone who spoke was able to report on work actually done with the computer. Three of the talks dealt with relatively familiar and perhaps predictable uses of automatic data processing as an aid to engineering design and scheduling of work.

Most astonishing to the audience, made up almost entirely of architects and students of architecture, were the demonstrations of the graphic capabilities of the computer. What emerged was a sense that the machine could make obsolete most of the basic technical skills that now dominate both academic training and practice. For example, the computer graphics programs developed at Boeing Company by W. A. Fetter can already be used to simulate the visual experience of moving in and around a design. This animation technique makes traditional methods of presentation look very crude by comparison. And the graphic data plotting methods developed by Howard Fisher suggest that an unusually effective method is available for the translation of facts and figures into large-scale physical plans.



Aircraft visibility motion pictures as developed in Boeing's computer graphics program.

Of course, it was pointed out again and again that people, not machines, still have to decide what data are relevant. Architects are not immune to the newly discovered disease the computer boys call "gingo" (garbage in, garbage out).

The other part of the conference probed the potential of the new tool and its possible effect on the role of the architect. In his luncheon talk, Serge Chermayeff hurled a scathing challenge to the way architects conceive of the services they now provide. It was, in effect, a restatement of the primacy of functionalism as a motivating force for the profession. He was roundly applauded, but many were not convinced.

The evening panel discussion was brilliantly led to, and held to, the central issues by Henry Millon of MIT. Particularly valuable were the penetrating observations of (nonarchitects) Marvin Minsky and Aaron Fleisher, also from MIT. Both of these men clearly had experience in depth with the use of the computer. This led to a far more sophisticated discussion of the future than is usually heard from architects who have read a few books on the subject.

The beneficial side effects on anyone attempting to use a computer, the almost inevitable clarification of the thought process used in problem-solving, was brought out by the comments of François Vigier of Harvard. This idea could provide some comfort for those who would like to try the computer but do not have one available. For many problems, the work on the "software" or programming can do as much good as actually processing the data—or possibly more good. So anyone can play, whether he has the hardware at hand.

During the conference, one of the participants observed that it was clearly a coup for the tiny BAC to have organized such a successful and pertinent conference right in the front yard of Harvard and MIT. The vigor and intelligence of the people (mostly volunteers and many from the neighboring giant institutions) can set an example for any architectural school. There is probably no better report of the state of the art and the key issues raised by the use of the computer in architecture than the slim volume that came out of this conference.

BERNARD P. SPRING
Princeton University

Correction: Robert Lytle of the University of Michigan was inadvertently omitted from the roster of the ACSA Committee on Publications and Public Relations as printed in the December issue.

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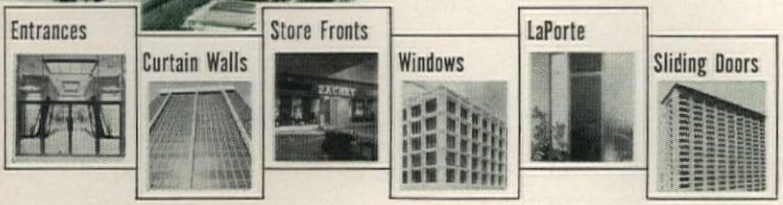

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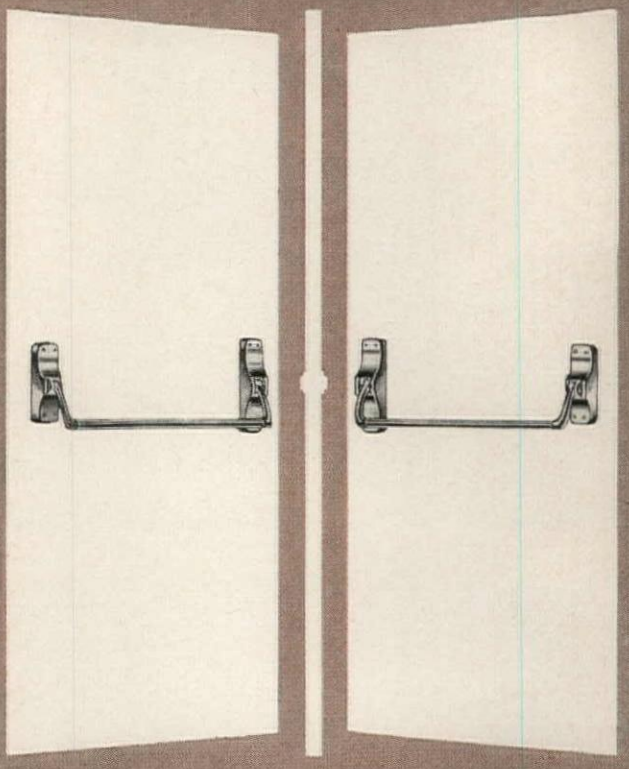

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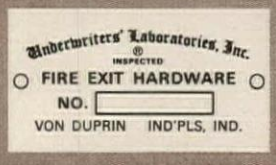

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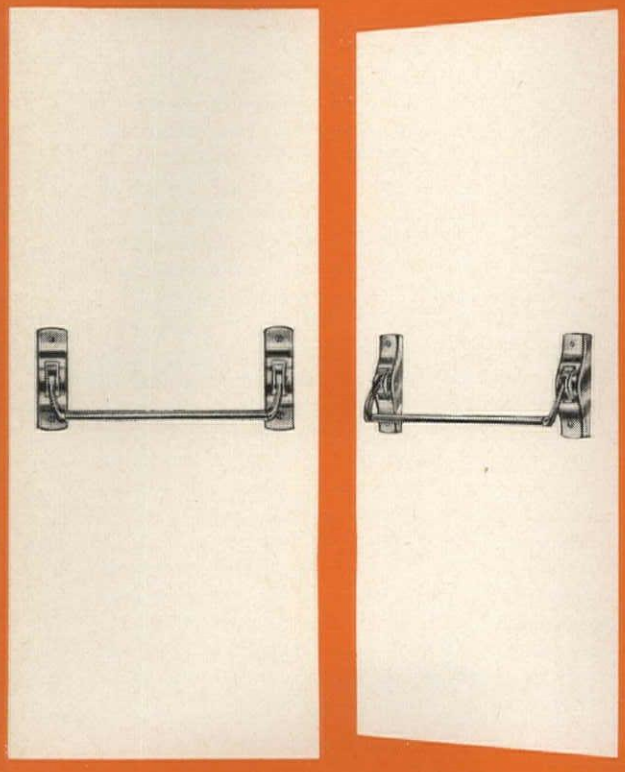

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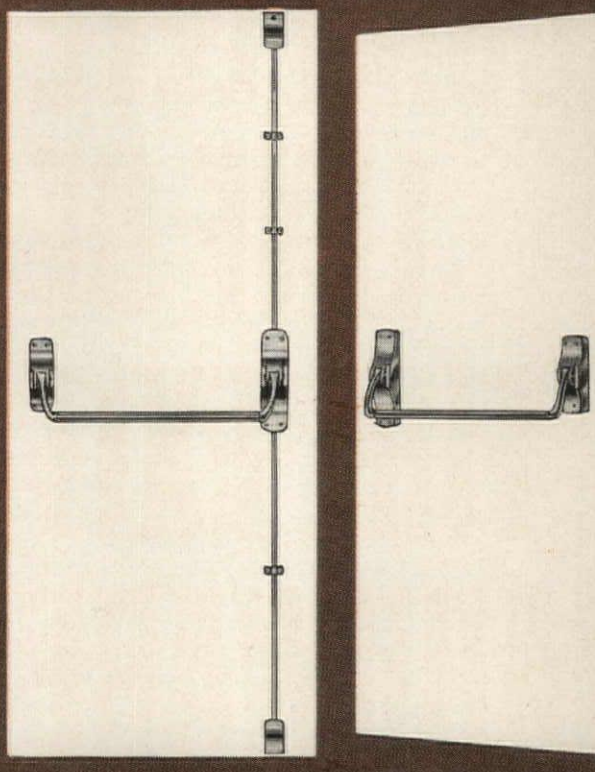

In addition to rim, mortise lock and concealed vertic rod Fire Exit Hardware, Von Duprin also offers th 8817 *surface mounted* vertical rod Fire Exit Hardwa for use in combination with Von Duprin 88 seri mortise lock devices.

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Cooling by the Flock

AIRCONDITIONING'S phenomenal growth has been accompanied by a proliferation of cooling systems and equipment types (see below).

Coming on strong in the past half-dozen years, however, is unitary equipment, defined by the Air-Conditioning and Refrigeration Institute as factory-assembled and packaged equipment and occupying that middle ground between "central station" equipment and "window" units, the latter rated as appliances. It accounts for a little more than half the industry volume.

Unitary has ridden the boom in the residential market: Pollster Lou Harris found in a survey that air-conditioning is now considered a necessity by 69 percent of America's families.

But unitary also scores well in stores, shopping centers, restaurants, schools, office and apartment buildings.

Some architects say it frequently gives them design flexibility they would not otherwise enjoy. It provides significant construction and operational economies, they explain. It is compact and may be located in a variety of spaces.

In apartment buildings, unitary avoids the possibility of a breakdown throughout an entire building. It eliminates the need for an on-site maintenance man. It gives occupants complete control over their home climates and it cuts the owner's operating costs because unoccupied apartments are not cooled —or heated either in the case of combined heating-cooling units.

Apartment-sized heating-cooling units mean ductwork is reduced to an absolute minimum. "Outside" installations in shopping centers, schools, etc., also reduce ductwork in addition to being easy to reach for maintenance purposes.

In multi-zone control, unitary equipment performs well. Schools, stores and warehouses have been designed with a flock of different cooling zones. The easiest arrangement is to have a separate package of unitary equipment in each zone.

Office and apartment buildings require such control since, ideally, each office or living unit should be able to select the interior climate most agreeable to its occupants. Unitary equipment, sized to cool single rooms or large suites, provides this kind of individualized climate control.

For members of the design profession who bear some responsibility for performance, unitary equipment gains appeal through a performance and capacity certification program.

The ARI's Unitary Certification Program now covers more than 90 percent of all unitary equipment rated at up to 135,000 Btuh. It also covers the cooling cycles of heat pumps of the same size.

Under the program, equipment manufacturers are required to submit their own specifications and test data on all models to ARI engineers who study and evaluate them.

The testing is conducted by the Electrical Testing Laboratories in New York. Four performance tests —maximum operating conditions, low temperature operation, insulation efficiency and condensate disposal—must be passed.

If a model fails a test, the manufacturer must lower its rating, improve it or withdraw it from the market. If he does none of the three, he loses certification on *all* his equipment.

One Big Duct

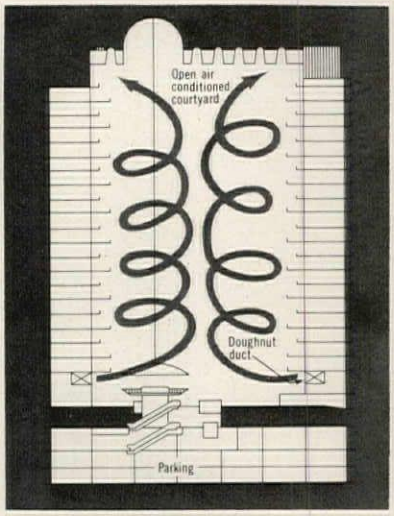
AN ARCHITECT in Atlanta has designed a 21-story, skylight-topped atrium to do double duty as an air-conditioning duct.

"The idea is not just to be different," said John Street AIA, an associate of the architect, John Portman AIA. "This is an entirely functional concept. We built it to effect savings."

Mechanical space under the second floor contains the dehumidification and refrigeration equipment. It also contains a huge doughnut-shaped duct that will spew 190,000 cfm of air into the courtyard through outlets aimed upward at 15 degrees.

This is to overcome stratification, to cause the air to rise in slow spirals to the top where it will be collected and returned through a single down duct.

Each of the 800 plush rooms of the hotel nearing completion will have a fan-coil unit capable of circulating 300 cfm. A duct from the courtyard to the unit will admit 90 cfm; the other 210 cfm will be recirculated room air.



To maintain a proper balance in the room, 90 cfm will be exhausted through a bathroom vent. The bathroom vents will exhaust 75,000 cfm.

An intake on the mechanical level will suck in air to compensate for that loss. The courtyard air, therefore, will be about 40 percent fresh air.

Engineers anticipate no more than a 4-degree variation in temperature from top to bottom.

Temperature control of air injected into the bottom of the courtyard will be maintained by a sensor at the top. Further, each room will feature individual thermostats to regulate the flow of hot or cold water through the room's fan coil unit, enabling guests to individualize their room temperatures.

Since rooms on one exposure may be drawing heat while those on another are being cooled, the system is divided into four zones. ■

This is Cathy Robinson '68

(In '86 the Simmons Dorm Line furniture still will be here)

Why? Because Dorm Line built-ins start with a welded steel framework that never needs repair. It is manufactured under quality-controlled production procedures which simply cannot be duplicated by jobsite construction methods.

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2. SATISFIES VARYING AIR DISTRIBUTION REQUIREMENTS: Different requirements of air distribution within each room are easily satisfied with the Conwed ventilating grid system. You can design the system with combinations of non-ventilating members for the conditions and aesthetics desired.

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2' x 2' or 2' x 4' ceiling board is necessary.

4. LIGHT LOCK "VISUAL SECURITY": Special grid design, with matte black finish on interior surface of channel, provides visual security, deadens reflections and completely obscures light spillage from recessed fixture housings. Unsightly above-ceiling construction can't be seen through the channel.

5. QUIET, CLEAN OPERATION: The grid operates quietly, providing efficient air distribution. There is no concentrated staining or dirt accumulation on the surface of the ceiling material.

6. PERMITS WIDE SELECTION OF CEILING MATERIALS: The new, trim design of Conwed ventilating grid is harmonious with a wide variety of surface designs or textures. Almost any ceiling board or translucent panel can be selected.

7. CUSTOM PAINTING AND SPECIAL EFFECTS ARE APPEALING TO DESIGNERS: Striking architectural design can be achieved without the handicap of ordinary slotted ventilating grid systems.

For example, where definite modular effects are desired, the grid can be repainted a dark brown or black matte finish on the job. Or, repainted Conwed ventilating grid can be used with the regular production white baked enamel finish standard grid to provide many repetitive or non-repetitive design modules. These, and other combinations offer the opportunity for unlimited design variations.

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BOOKS

"WE HAVE LITTLE ENOUGH of antiquity and visible tradition; we must protect what remains of this heritage against the bulldozer and its master, the land speculator," says AIA President Morris Ketchum Jr. FAIA in a foreword to *A Restoration Manual,* by Orin M. Bullock Jr. AIA.

But once the bulldozer has been stalled and the speculator thwarted, what then? The architect faced with his first restoration is in urgent need of technical procedural advice in addition to moral support.

The manual, to be published this month by Silvermine Publishers, was written for the AIA Committee on Preservation of Historic Buildings in an effort to provide such guidance. Subtitled "An illustrated guide to the preservation and restoration of old buildings," the manual does not minimize the complexities and difficulties inherent in such a commission.

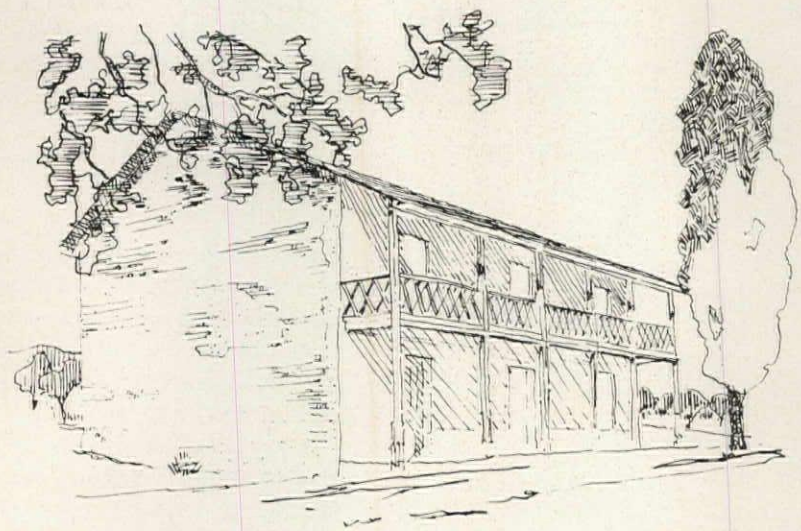
The architect is warned that he "will find all restorations much more time-consuming than new construction or alterations. His first few commissions will be most frustrating unless he has a staff trained in this field. Office assistants capable of understanding or detailing architectural features more ancient than those of 1920 . . . are exceedingly rare."

Duties of the historian, the archaeologist, the architect and the contractor are enumerated, and the differences between contracts for restoration work and new construction are described.

Careful distinction is made between "restoration" projects, "preservation" (stabilization of the structure in virtually its existing form, to arrest deterioration); and "reconstruction" (re-creation of a building from documentary, archaeological and architectural research and evidence). Owners and sponsors of restoration projects are warned that "a new building may cost more than anticipated; an old one *always* does if the sponsors and owners accept their responsibility to the future."

Nevertheless, the author contends, "Restoration is fun. . . . The challenge of determining what was, speculating on why, relating the sort of life or activity which took place in the space . . . to similar functions of our own time is one of the more stimulating intellectual puzzles."

A Restoration Manual is illustrated with over 100 sketches by the author, supplemented with photographs by the National Park Service and HABS measured drawings. An appendix contains reprints of technical papers, selections from a 19th century glossary, a bibliography and an index. The jacket price is $8.50; however the book is available to AIA members at $6.80, plus 20 cents for postage and handling. Write Silvermine Publishers, Inc., Comstock Hill, Silvermine, Norwalk, Conn.



Modern School Shop Planning. Ann Arbor, Mich.: Prakken, 1965. 256 pp. $4.50

The fourth revised and enlarged edition of this comprehensive work on the planning of industrial educational facilities contains materials which originally appeared in the pages of *School Shop* magazine gathered from various authoritative sources. This new edition places stress on the environmental factors of light, sound, heat and color—all of which affect learning. There are over 300 well-chosen illustrations, plans and diagrams.

Designing and Decorating Interiors. David B. Van Dommelen. New York: Wiley, 1965. 277 pp. $9.95

History, philosophy and the basic elements of interior design are given in this book addressed to the contemporary homemaker. Every element comprising a home, from dime-store drinking glass to Knoll-designed sofa, is considered. Much practical, helpful information is included, although one is inclined to think that too much space is given to a discussion of the obvious.

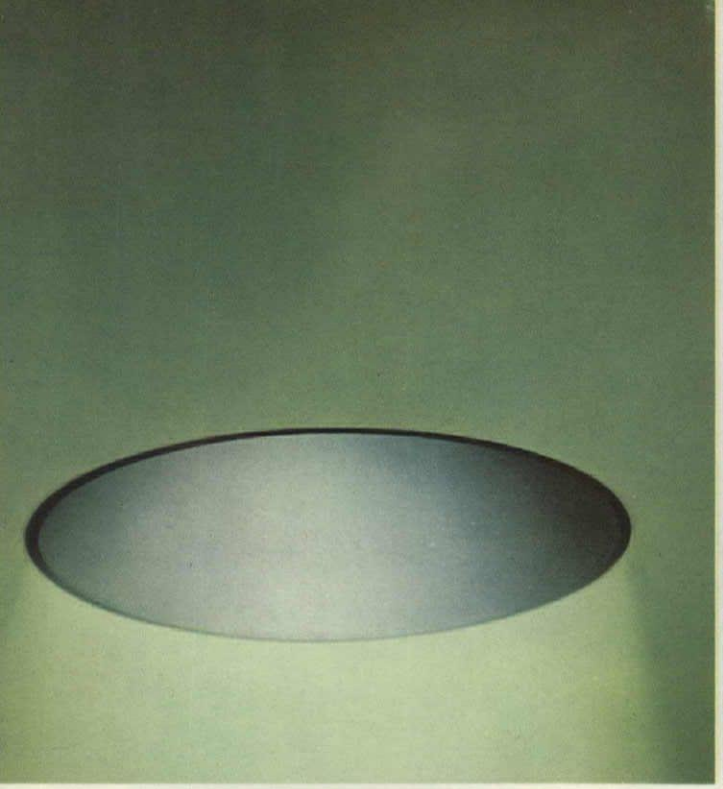
The affluent society we enjoy has brought art into many homes, and it is good to have consideration given to the use of paintings, prints, sculpture, etc. One wishes, however, that there had been more a feeling of delight in such beautiful things and less of a determination to be sure each piece serves a purpose well in the decorating. It is refreshing to have attention paid to inexpensive objects and their use in the home, and we are told how such things as box crates can be utilized, and that things like rocks, shells and weeds can add touches of beauty.

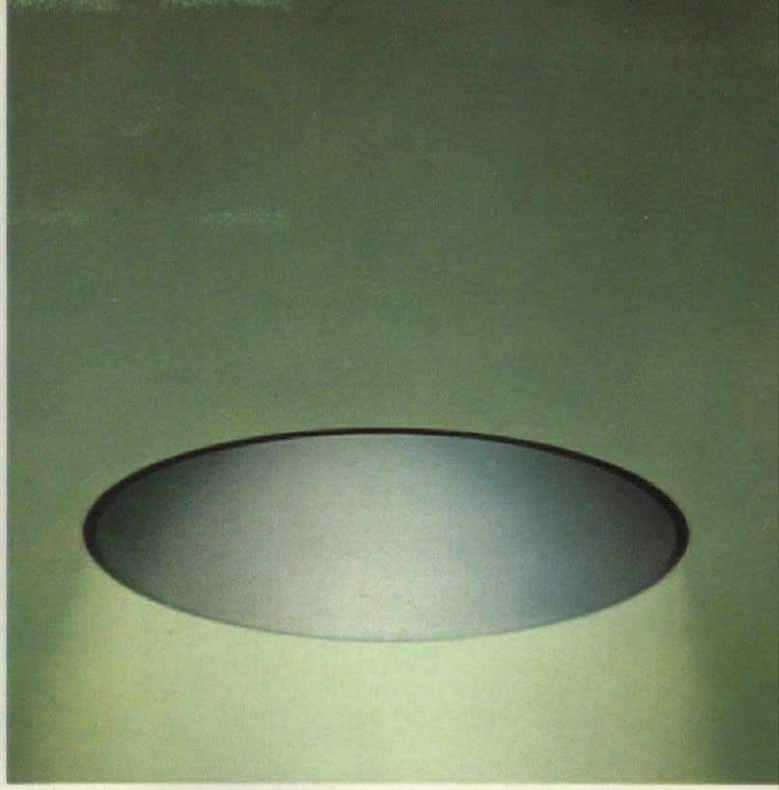
Dilemmas of Urban America. Robert C. Weaver. Cambridge: Harvard University Press, 1965. 138 pp. $3.50

According to the first Secretary of Housing and Urban Development, three of the dilemmas of urban America are new communities (see AIA JOURNAL, Sept. '65), urban renewal and racial policy problems. This book is based on his 1965 Godkin Lectures at Harvard University.

New Architecture in the World. Udo Kultermann. New York: Universe, 1966. 208 pp. $10.50

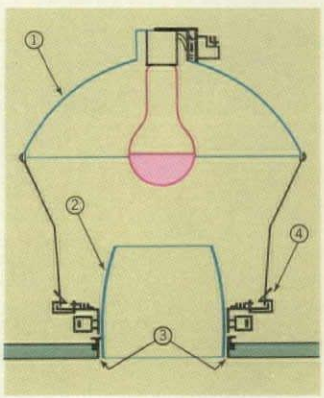
So many are the picture books of contemporary architecture that one marvels that still more are being published. This one is slightly different in that the arrangement is by building type. Included are such groupings as museums, churches, hospitals, sports buildings, and there are sections on housing projects and "building of cities." Kultermann's introduction is cursory. Unfortunately, there is no index either by place or by architect. ■





general downlight

adjustable accent light



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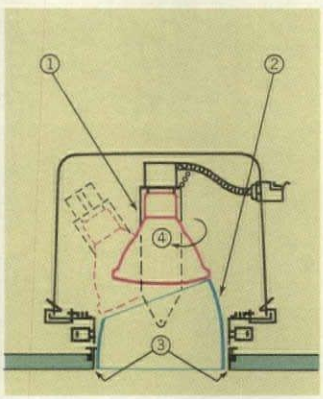

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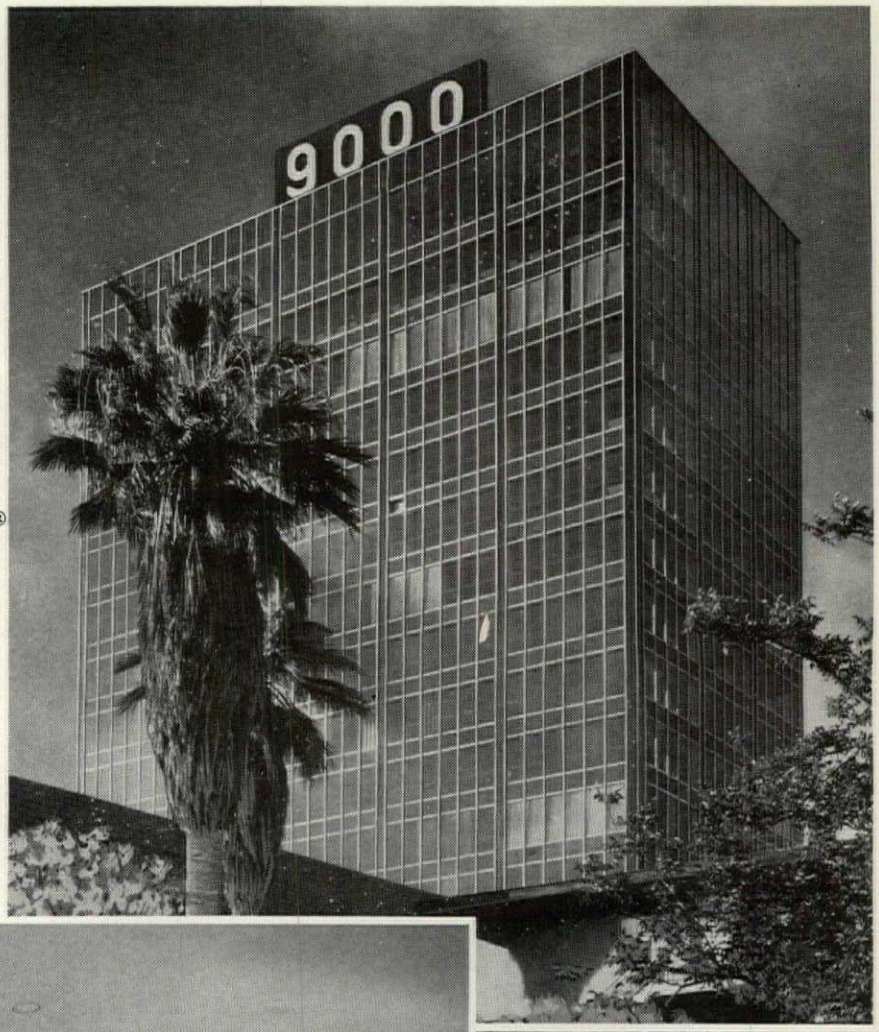

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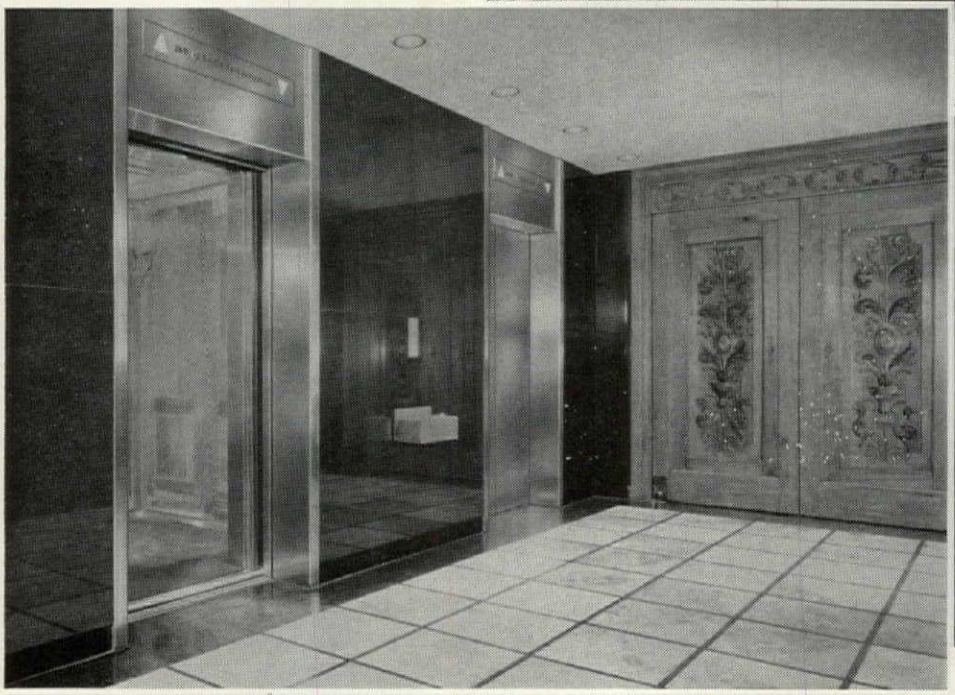
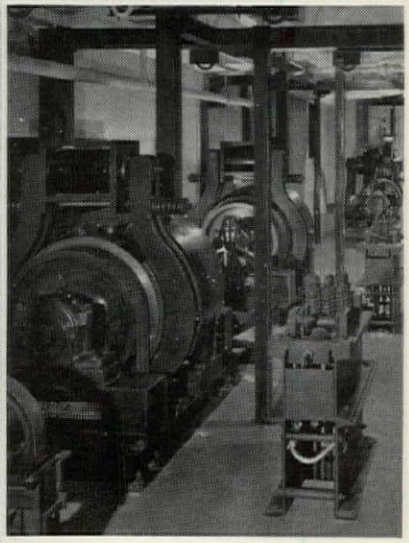


To the left are two of the four Montgomery Elevators in the marble-floored lobby. In the background are two French hand carved doors from the Hearst Estate at San Simeon.



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CALENDAR

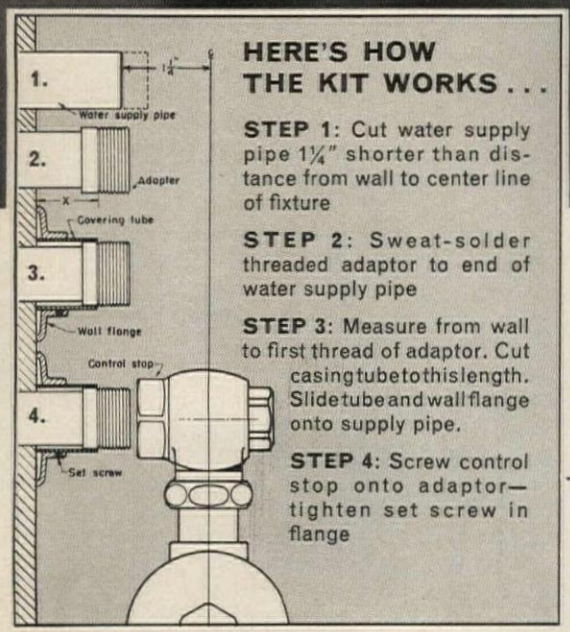
May 8-12: ASLA Annual Meeting Yosemite National Park, Calif.
May 10-12: Building Research Institute Spring Conferences, Statler Hilton Hotel, Washington, D.C.
May 13-14: "Future of Architecture" Conference, Boston Architectural Center, Boston
June 21-24: American Hospital Association Institute on Design, Denver
June 24-25: NCARB Annual Convention, Denver Hilton Hotel, Denver
June 24-26: ACSA Annual Convention, Brown Palace, Denver
June 26-July 1: AIA Annual Convention, Denver Hilton Hotel, Denver

AIA Regional and State Conventions

May 10-12: Wisconsin Chapter, Lake Dawn Lodge, Delavan
May 20-21: Tennessee Society of Architects, Claridge Hotel, Memphis
July 21-23: North Carolina Chapter, Grove Park Inn, Asheville
Sept. 8-10: New Jersey Society of Architects, Essex and Sussex Hotel, Spring Lake
Sept. 29-Oct. 1: Illinois Council, Ramada Inn, Champaign
Oct. 5-8: Florida Association of Architects, Deauville Hotel, Miami Beach
Oct. 6-9: California Council, Monterey County Fair Grounds, Monterey; East-Central Region, Brown Hotel, Louisville, Ky.; New York State Association of Architects, Whiteface Inn, Lake Placid
Oct. 7-9: New England Region, Sturbridge Village, Mass.
Oct. 12-15: Western Mountain Region, La Fonda Hotel, Sante Fe, N.M.
Oct. 13-15: Louisiana Architects Association, Jack Tar Capitol House Hotel, Baton Rouge; Architects Society of Ohio, Carrousel Inn, Cincinnati
Oct. 20-22: Pennsylvania Society of Architects, Hotel Hershey, Hershey
Oct. 24-26: Northwest Region, Benjamin Franklin Hotel, Seattle
Oct. 27-29: South Atlantic Region, Queen Charlotte Hotel, Charlotte, N.C.
Nov. 3-5: Central States Region, Lassen Hotel, Wichita, Kan.

AIA Committee and Related Meetings
(At the Octagon unless otherwise noted)

May 13-15: Esthetics, Houston
May 25: Joint Commission on National Capital
May 26-28: Urban Design Workshop, College of Environmental Design, University of California
May 27-29: Documents Review
June 5-11: AIA-ACSA Teachers Seminar, Cranbrook
June 10: Office Procedures
June 24-25: School & College Architecture in conjunction with UIA School Commission, San Francisco
June 26: Preservation Officers Symposium, Denver
July 14: AIA-American Association Medical Clinics Jury ■



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STEP 1: Cut water supply pipe 1¼" shorter than distance from wall to center line of fixture

STEP 2: Sweat-solder threaded adaptor to end of water supply pipe

STEP 3: Measure from wall to first thread of adaptor. Cut casing tube to this length. Slide tube and wall flange onto supply pipe.

STEP 4: Screw control stop onto adaptor—tighten set screw in flange

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LETTERS

Criteria for Cities

EDITOR:

The possible four-part formula for tomorrow's city which President Ketchum suggested in a talk [cited in the *Memo,* Nov. 8] seems like interesting dinner-speech material but unwise publicity material: it might unfortunately be taken literally as the one best approach for every American city.

It is not necessary—is it?—to remind ourselves that we are giving a service, not selling a product; and furthermore, there is no one physical pattern applicable to all cities, any more than there is a universal stock school plan or a standard pattern for campus development.

What is good for mild, hilly, scenic, waterfront and underdeveloped Seattle is not good for Denver's rigorous climate nor for Boston's old and built-up metropolis.

What the architects should be saying to America is that *performance criteria for living* should be determined by each city to fit its own people and desires; what form the city takes then will depend on the wills and imaginations of each city's leaders and designers.

In our haste to give hope to the people, let's not think there is any simple visual answer we can sell them. The exploding population and the fast-increasing automobile count are not as much of a problem as what we do with them—and this is each city's own problem—to be solved with the same attention to local realities that we would use in creating good architecture.

JOHN M. MORSE, AIA
Seattle, Wash.

ED. NOTE: President Ketchum has responded with these comments: "I certainly agree with Mr. Morse that 'there is no one physical pattern applicable to all cities.' Each deserves its own solution. Diversity will continue to be the spice of cities and of urban life. All that can be analyzed is a practical *approach* to urban solutions in terms of today's conditions.

"In my speech on 'The American City of Tomorrow,' I attempted to analyze a trend, made evident in the AIA Citations for Excellence in Community Architecture, which *'may well be'* an answer to the basic problem of controlling and separating auto and pedestrian traffic. It is not, nor could it be, a universal answer to urban architecture, which is a living art, changing and developing with each individual solution. That is its strength and continuing inspiration."

EDITOR:

This War on Community Ugliness so popular in many areas today is a war that architects have fought (some with tongue in cheek) since time immemorial. The thing that triggered the topic in modern times was the Conference on Esthetic Responsibility held in New York's Plaza Hotel in 1962, sponsored by the New York Chapter AIA.

One wonders if there is a solution, or if it is political expediency. To date "ugliness" is a grand conference theme, but one sees or hears of negligible solutions. The AIA public relations program finds much material in the subject.

In the middle '20s when I was a green architectural graduate—and the greenest came out of Texas—my old professor told me to "go to New York to work, to study and to learn what's going on, because in 20 years we will be doing that here." He thought of the larger structures, and he was completely enthralled with the work of McKim, Mead & White. Following his suggestions, in the late '20s I found work, night schools, ateliers—and I found Tammany Hall running rampant. I remember I noted in my diary: "They're smart. They play the minority. Once a year they give them a cheap picnic in some public park and then carry the solid block."

I recently read Richard J. Whalen's book *A City Destroying Itself,* which offers a perfect combat plan for the War on Ugliness. The "quick buck" and how it is gotten is told in simple English. Even some architects can shut the right eye so they can get in the game. On reading Whalen's book, you can see the fog lift, and the many, many things that make a city tick come in clear perspective. Just how New York City will ever balance, I don't know. I do think architects and decision-makers in every community should put this book on their "must" list and read it and reread it. If we can reverse New York's dilemma in our communities, we will win this war.

Maybe my old professor was right when he said that "in 20 years we will be doing that here!"

ARTHUR FEHR, FAIA
Austin, Tex.

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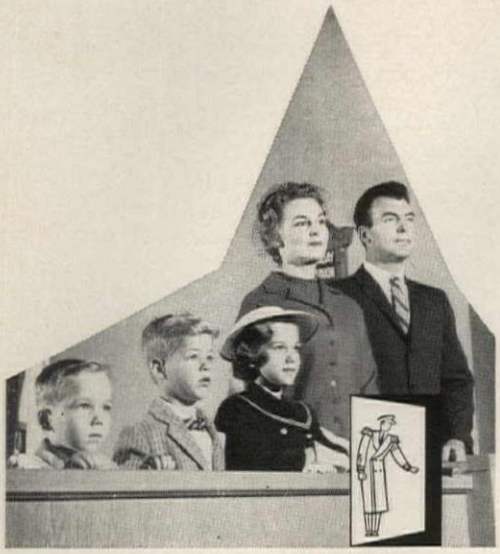

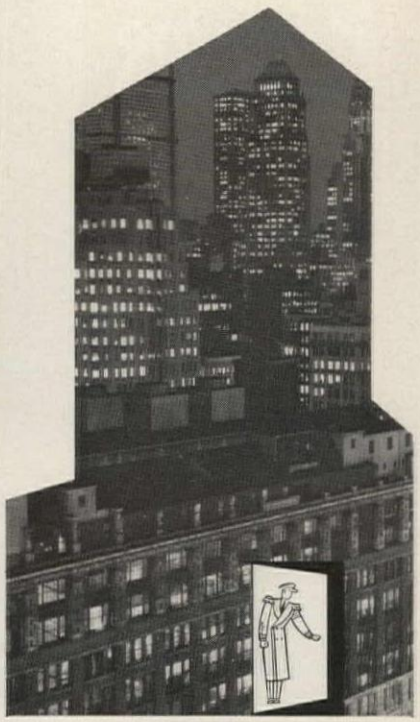

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