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OCTOBER 1966

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BPA

VOL. XLVI, NO. 4

General Articles

Concrete Comes of Age

News Feature

Departments

Cover: Typical sprocket for the Timber Shores Travel Trailer Resort project by Meathe, Kessler & Associates (see Practice Profile)

LOOKING AHEAD TO NOVEMBER

Art as an Element of Architecture: The use of art in architecture has greatly increased in the last decade, even to the point where federal agencies, officially, at least, accept it as a way of life. The new question, then, is this: Are architects and artists ready for such a collaboration. Paul Damaz AIA provides his own answer in the affirmative, "but only if both show a certain amount of knowledge, discernment and modesty. It can be successful if architect and artist know each other and respect each other; in other words, if art and architecture complete each other while retaining their integrity." A companion piece relates how a Pacific Northwest banking firm is buying good architecture and local art for the numerous branches it is constructing throughout the state, often in relatively rural communities and with an unusually fine record of acceptance—and recognition from a university museum.

The Best of the Clinics: Architects are expressing considerable interest in this relatively new building type, designated as a structure for the group practice of at least seven physicians in the first national awards program co-sponsored by the AIA and the American Association of Medical Clinics. The seven winners, including one First Honor Award, will be presented next month.

Happenings at the Workshops: Among the most popular, and certainly most useful, aspects of the 1966 AIA convention in Denver were the 10 workshops, each devoted to a particular facet of architectural practice, ranging from "Emerging Techniques" to "Legislation." A summary of the highlights of the sessions should point the way to some new directions and provide a helpful package for the busy professional.

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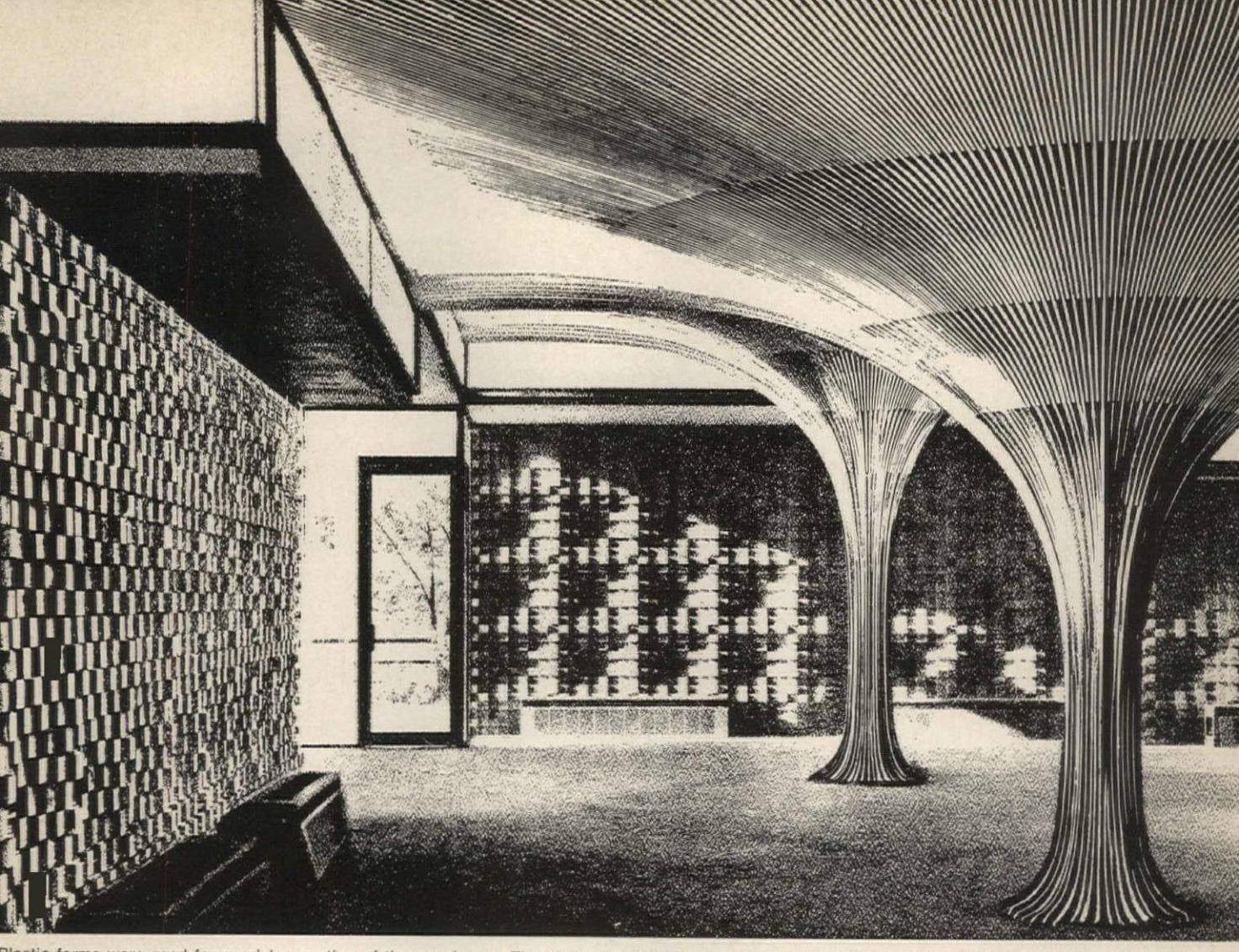

Plastic forms were used for precision casting of these columns. The high-early-strength concrete, made with Lone Star's INCOR® 24-hour portland cement, permitted forms to be stripped the following day. Maximum aggregate size was 3/8".

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Construction of this concrete forest presented an unusual challenge. Color uniformity throughout the exposed, unfinished concrete surface was a requisite. High early strength was required because casting took place in cold weather. **INCOR®**, America's *first* high early strength portland cement, thus played a vital part in the successful completion of this unique, complex and impressive building.

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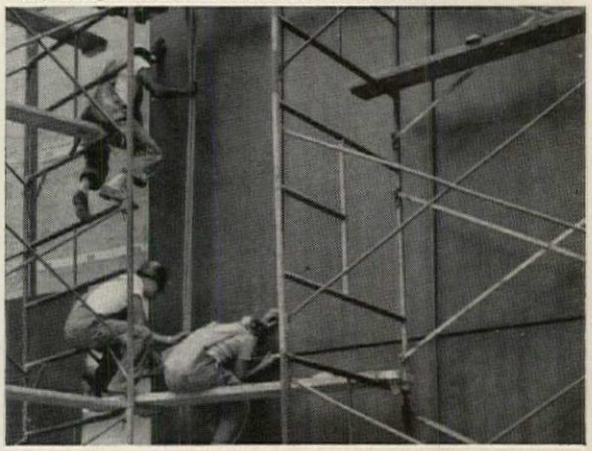
Chicago Civic Center has more than 70,000 sq. ft. of paneling with new Fire Retardant Novoply core

Designed by the Chicago Civic Center Architects, a group composed of C. F. Murphy Associates, supervising architects; Skidmore, Owings and Merrill, associate architects; and Loebl, Schlossman and Bennett, associate architects. General contractor is Gust K. Newberg Construction Co., Chicago. Photo: Woodwork Corporation of America.



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COMMENT & OPINION

The Urban America conference on "Our People and Their Cities" has just ended as this issue of the AIA JOURNAL goes to press. It was an elaborate program, indeed (to be reported next month), with sessions devoted to housing, the work environment, transportation and leisure, with luncheon addresses by the Vice President of the United States and New York's Mayor John V. Lindsay, and with a White House reception at which Mrs. Johnson greeted each of the 850 delegates whom had been invited from across the land.

But when it was all said and done, the high point of the conference, to this observer, at least, was the delightful presentation by Wilfred Owen of the Brookings Institution. Published here in its entirety is "The Fable of How the Cities Solved Their Transportation Problem." ROBERT E. KOEHLER

Once upon a time: There was a nation of 200 million people that was the most powerful country in all the world. At the national level the inhabitants were very rich, but at the local level they often turned out to be quite poor. And as luck would have it, they all lived at the local level.

Seventy percent of the population was crowded into 1 percent of the land, which they called cities. One-fifth of the city people were the victims of poverty. Many of them lived in slums where housing was unfit for living, schools unfit for learning and the air unfit for breathing. To top it off, the urbanites were always getting stuck in traffic.

Now the leaders of the people decided that what the urbanites needed most were expressways to get the rich through the blighted areas faster and subways to keep the poor from seeing how bad things were on the surface.

But the cities continued to grow uglier and the frustrations greater, and while the people were moving more, they were liking it less. And there were riots in the street.

Now the trouble with the urbanites was that they never caught up with the problems because they were always caught up in the symptoms. Traffic congestion was one of them. The reason for traffic congestion was basically that too many people were crowding into too little space, and without the semblance of community plans. In addition, the cities had old-fashioned streets never designed to move traffic and lined on both sides with parked cars to make sure they didn't. The urbanites left no open space to balance off the built-up areas that generated traffic, and they put their housing as far as possible from the places people worked. So the possibility of getting a job was often missed by the impossibility of getting anywhere near it.

The commuting problem was compounded by an ancient tribal custom. People with light complexions worked close in and lived way out, while people with dark complexions were expected to work way out and live close in. As a result the urbanites were always trying to get from where they shouldn't be to where they shouldn't have to go, and they all tried to get there at the same time.

Now there were certain wise men in that country who saw that the so-called transportation problem was really part of the larger problem of urban design. The basic trouble, said the wise men, is not how badly people move, but how bleakly they live. What we need is trees and grass and fresh air, decent houses and schools, and convenient recreation. People should spend their time enjoying the city instead of spending their money escaping it.

Lo and Behold: When the leaders of the country heard this, they decided to put one man in charge of cities full time, just as the nation had a man at the top to worry about fighting the enemy. This was a good idea because the enemy turned out to be in the cities, and the cities were a lot closer to home.

The chief urban worrier lost no time doing the things that cost the least and showed up the best. The obvious first step was to clear the streets of vehicles that were parking, double parking, or cruising in the hope of parking. These vehicles were destroying whatever transportation capacity there was, and they were making neighborhoods look like assembly lines. Never had so much space been used to help so few at the expense of so many.

The answer was the Off-Street Parking and Playground Act, which made loans to finance attractive multi-level garages in cities agreeing to ban parking on the streets. Service stations were included within these structures to help pay the bill, and play space was provided on the roofs. The effect was to double street capacity, reduce congestion, improve safety, decrease noise, make room for curbside plantings and increase the livability of neighborhoods. Traffic was improved 25 percent and the scenery 100 percent.

About That Time: The second step was to take the rush out of the rush hour. The Staggered Hours Act offered tax concessions to all companies willing to schedule worker arrivals after 9 o'clock. The size of the tax rebate increased for each quarter hour beyond 9 o'clock. Cities were able to compensate for the reduction in taxes by the reduction in congestion and therefore the lower cost of providing the necessary highways and public transit.

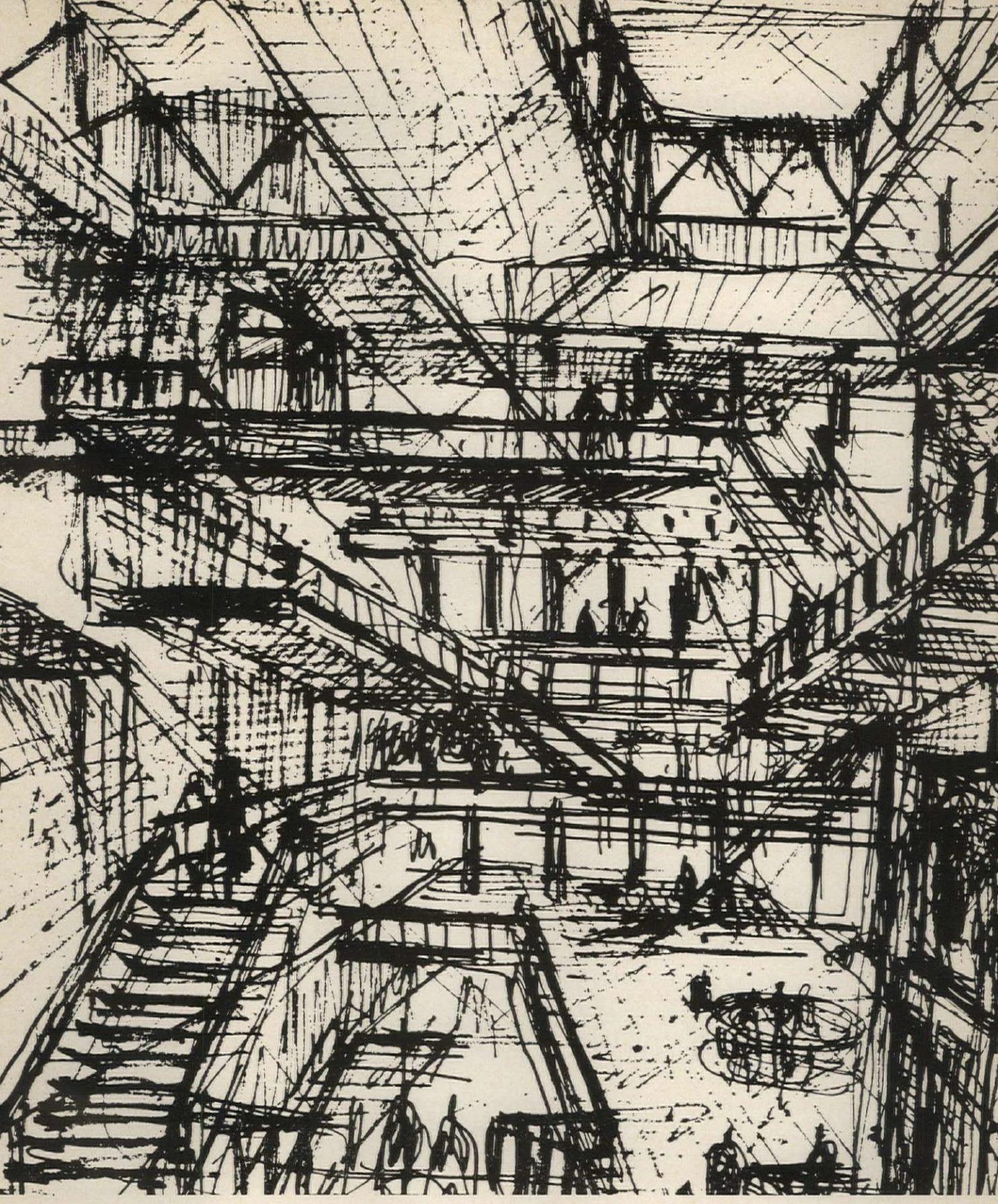
The rush hour was further tamed by charging half price for a transit ride or a parking space after 10 o'clock. Employers and workers had long resisted staggering work hours on the grounds that this would decrease productivity, disturb sleeping habits, destroy car pools, disrupt dinner and undermine the family. But all it did was reduce congestion.

The next step was to close the gap between home and work by letting people of all colors live where they wanted to. This restored the nation's image as well as the function of the central city. For now the center could provide the cultural and entertainment focus and the specialized activities for all the people of the metropolis.

The next legislation was the Transit Riders Protection Act of 1966, designed to pay homage to those brave people of the nation who rode in public conveyances. Street networks were designed for buses only, and buses were built that were quiet and sweet-smelling and that people could get into. It was stipulated that riders should be told where the bus was going and when the next was coming. Metropolitan area transit was scheduled by computer, and the whole works displayed electronically at each stop. The revenues of all transport media were pooled to pay the bill for regional transportation systems by road and rail and in the air.

But the emancipation of transit riders caused ferment among pedestrians, who were the lowest caste of all the urbanites. Under the banner "Walkers of the World Unite!" they

Continued on page 94



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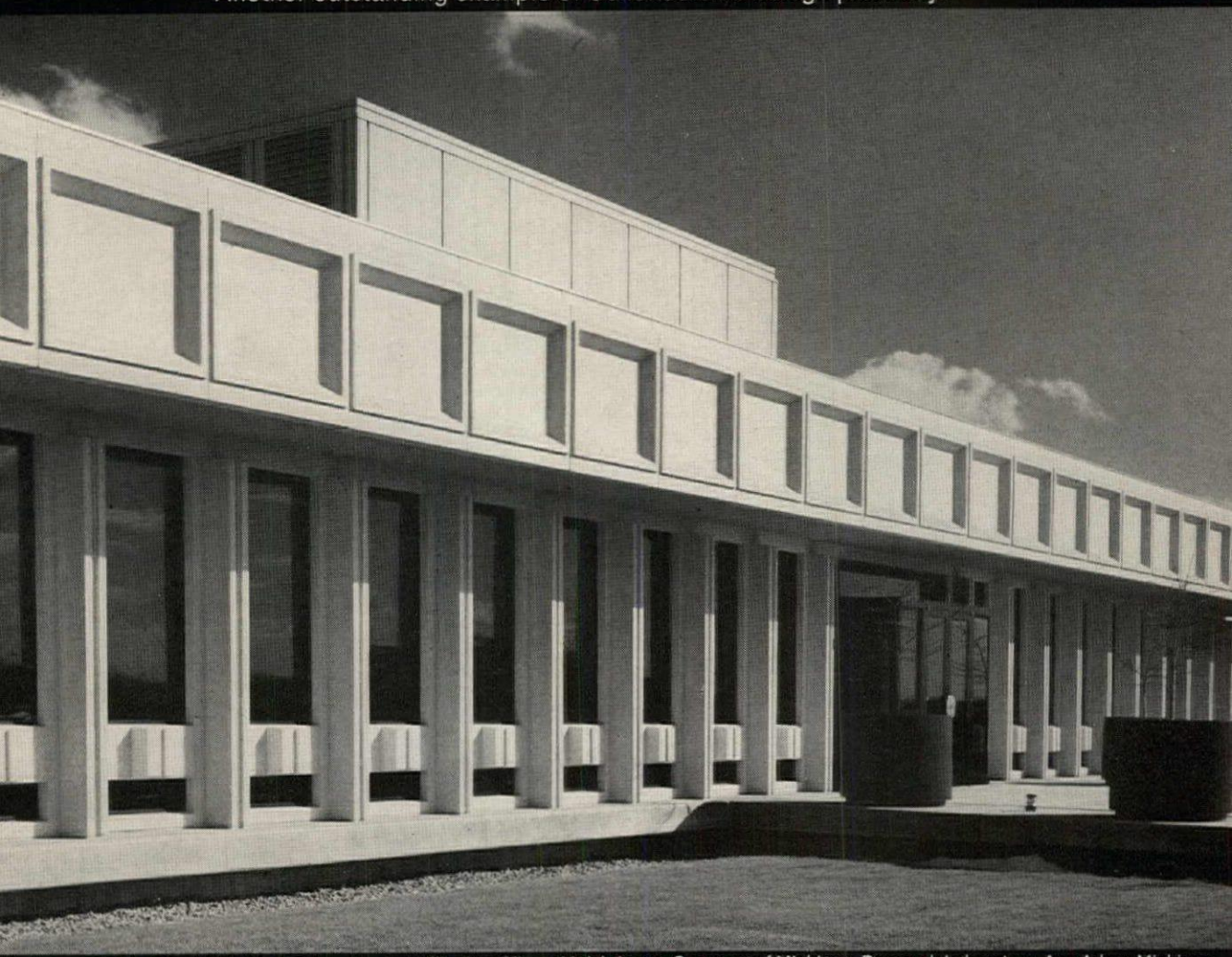

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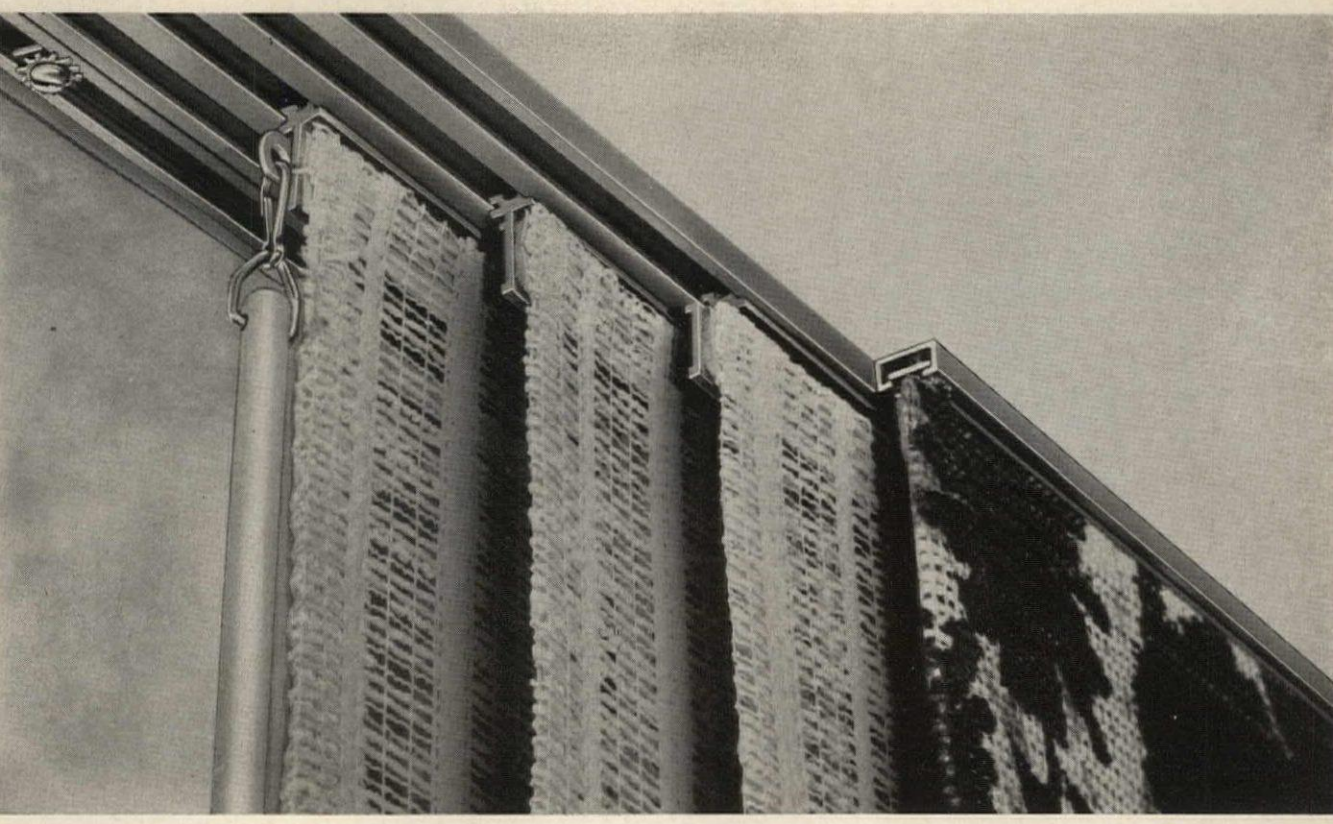

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NEWSLINES

Federal Aid to Limping Cities Branded by Senators As Scattered Inadequacy; Hearings Will Resume

The city, John Kenneth Galbraith told the AIA convention, "is the key unit in the management of environment." If this be so, things look bad for the environment.

That is the inference forced by a Senate subcommittee's hearings on organization of federal agencies in community and urban development.

For one thing, the cities need more power, mayors told the senators. For another, they are sorely short of funds required for reinvigoration. Moreover, federal programs are not doing the job they should be doing, Sen. Abraham Ribicoff (D-Conn.), said.

Ribicoff, subcommittee chairman, advocated an additional $10 billion yearly in federal aid to cities and said a tax increase would be necessary to swing that kind of help. But Ribicoff said he saw no chance that either the administration or Congress is willing to ask for a tax increase.

The hearings concluded—until next year—with the administration accused of an ineffective approach to curing urban ills. The Bureau of the Budget caught much of the blame. Said Ribicoff:

"This task of coordination and a unified view has been sadly ignored in our headlong rush to adopt bigger and newer programs. And this failure must be laid squarely on the doorstep of the Bureau of the Budget because that's its traditional function as an arm of the President. For too long, this agency has abdicated its responsibilities in this area."

Sen. Robert F. Kennedy (D-N.Y.) agreed but added: "It's the fault of the legislative and executive branches as well as the cities."

The three weeks of hearings were rife with controversy and criticism. Ribicoff and Kennedy were particularly hard on Housing and Urban Development Secretary Robert C. Weaver.

At one point, with Weaver attempting to show how housing has improved over the past five years, Kennedy retorted: "In New York, sub-standard housing went up from 420,000 units to 520,000 units."

Ribicoff and Kennedy alleged that HUD is not doing enough, is enmeshed in outmoded programs and is perpetuating the "delusion" that the United States is adequately coping with its urban problems.

BUCHENWALD

A Ribicoff subcommittee witness accused Americans of ignoring ghettos as World War II Germans living next to Buchenwald ignored Buchenwald.

"They convinced themselves it did not exist," said Joseph Lyford, author and professor at the University of California at Berkeley.

Institute Backs Schmidt as Hegner Successor

The AIA has urged that William A. Schmidt be appointed commissioner of public buildings in the General Services Administration.

Schmidt is serving as acting commissioner following the resignation of Casper Hegner AIA, under whom he was deputy commissioner.

Institute President Charles M. Nes Jr., FAIA, in a letter to John W. Macy Jr., Civil Service Commission chairman, said:

"We believe Mr. Schmidt's administrative capabilities, his technical background and his conspicuous contributions to GSA over many years amply qualify him."

"The working relationship between Mr. Schmidt and architects commissioned for GSA projects has been universally good. He is, in our opinion, a dedicated civil servant of the very highest caliber."

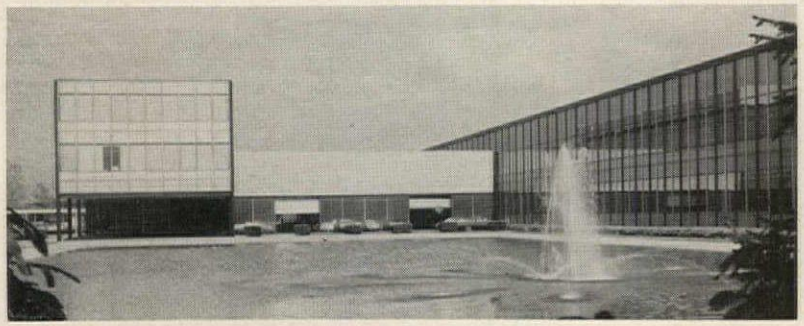
Schmidt is a 55-year-old native of Sheboygan, Wis., who in 1934 was graduated in civil engineering from Marquette University and who entered the federal government the following year. He has been with GSA since 1941.

people

Name 'Saarinen' Follows in Wake of the Master

For the first time in three decades the name "Saarinen" is missing from the roster of US architectural firms.

Eero Saarinen & Associates of Hamden, Conn., has changed its name to Kevin Roche, John Dinkeloo & Associates. Roche and Dinkeloo joined the Saarinen staff within three weeks of each other. That was in 1950.



The first large project occupying both was the General Motors Technical Center in Warren, Mich., described recently by a GM spokesman in noting that the center (left) is 10 years old, as "as fresh practically as the day it was completed."

Dinkeloo was project manager for the $100 million job and Roche was a designer. In 1955 Roche became principal design associate to Saarinen. Dinkeloo had already become principal in charge of technical development, working draw-

Continued on page 14

White concrete panels shape themselves to your ideas

gning precast concrete panels for curtain walls, re no restrictions of shape or pattern. Virtually nceivable design can be carried out by precasters. an range from rectangular to square, diamond-, curved or multiplanar. Even unusual sculptural ief and open grille surfaces are possible. □ The e pattern of the precast units on this headquar- ilding present a lace-like appearance that is effec- ay or night. Made with ATLAS WHITE portland cement, the panels are attached to a suspended buildi frame. This achieved an unbroken solar screen patte that would have been spoiled with exterior column □ Explore the possibilities of precast white concre units with your local precaster. And, for information ATLAS WHITE portland cements, write to Universal Atlas, P.O. Box 2969, Pittsburgh, Pa. 15230. *"USS" and "ATLAS" are registered trademarks.*

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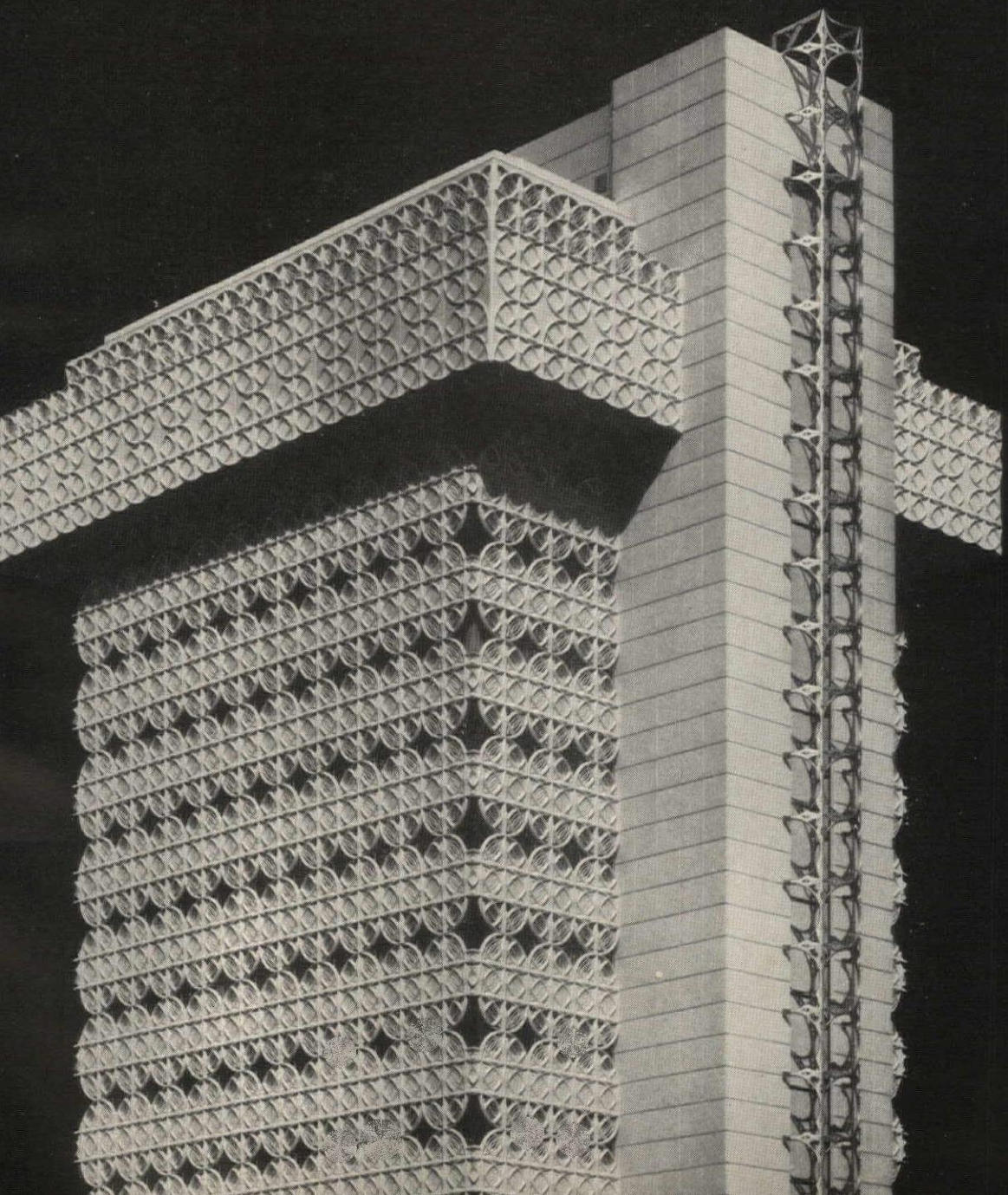
Lincoln Income Life Insurance Co., headquarters, Louisville, Ky. **Architects:** Taliesin Associated Architects, Scottsdale, Ariz. **Contractor:** Robe E. McKee General Contractor, Inc., Dallas. **Structural Engineers:** Wilso Andros, Roberts & Noll, Chicago. **Mechanical Engineers:** E. R. Ronz & Associates, Louisville. **Precast Concrete:** Crest/Schokbeton Concre Division of American Metal Climax, Inc., Lemont, Ill. and Schokbet Pittsburgh, Greenville, Pa.

USS UNIVERSAL ATLAS CEMENT DIVISION OF UNITED STATES STEEL

WF



ings, specifications and construction supervision.

The new firm with its staff of 102 is a direct descendant of the one Eero Saarinen formed, which in turn had evolved from a partnership of Eliel and Eero Saarinen in 1937.

Since Mr. Saarinen's death in 1961 the firm continued as a partnership of Roche, Dinkeloo & Joseph N. Lacy. Lacy, 61, is retiring from active practice with the firm but will continue in an advisory capacity.

► Federal Highway Administrator Rex M. Whitton has been presented the 1965 International Road Federation award for outstanding road development and has been named IRF "Man of the Year."

► Paul M. Rudolph AIA has received an Honorary Doctor of Fine Arts degree from Colgate University.

It was only the second such degree given by Colgate. The earlier recipient was Robert B. O'Connor FAIA, architect of the Everett Needham Case Library, in 1959. Rudolph is architect of Colgate's Charles A. Dana Creative Arts Center.

► Former Institute president Arthur G. Odell Jr FAIA was among four North Carolinians honored by their state with North Carolina Awards for creative achievement for the benefit of mankind. Another was Luther H. Hodges, former governor.

► Charles S. Haines II AIA of New York was one of five alumni of the University of Kansas to receive citations for distinguished service.

► Malcolm R. Stirton AIA vice president and a director of Harley, Ellington, Cowin & Stirton, Inc., was appointed to the new Wayne County Planning Commission.

► Grady Clay, urban affairs editor of the Louisville, Ky., *Courier-Journal* and editor of *Landscape Architecture Quarterly*, has been named a special consultant to the nation's first Urban Journalism Center for working newsmen at Northwestern University. The center is being established under a Ford Foundation grant.

► Fritz von Grossmann FAIA has received the Milwaukee Symphony Orchestra's "Golden Baton Award" for exceptionally meritorious service to the symphony. He has led fund drives for the orchestra and is a longtime member of its board of directors.

York has been awarded the Frenc Government's *Palmes Academique* with the rank of *Chevalier d l'Ordre des Arts et des Lettres* fo his "contribution to the architec tural profession and education for in France and furtherance of arch tectural education and achievemer in the United States."

► The Citizens' Planning Counc of Seattle, an organization opera ing at city, county and state leve to encourage effective citizen pa ticipation in and support of plar ning, has re-elected Robert H. Eyr AIA as its president.

Stamp to Get in Licks For Natural Beauty

A five-cent Beautification c America stamp is scheduled fc issuance this month.

It shows the Jefferson Memoria framed by a bough laden wit cherry blossoms.

Designed by New York artis Gyo Fujikawa, the three-colc stamp is intended to encourage pa ticipation in the natural beaut campaign in which Mrs. Lyndo B. Johnson has taken a leading rol

Preservation Conference Considers Guidelines

Guidelines for coordinated e forts in a national preservation pr gram will be considered at the 20t annual Preservation Conference c the National Trust for Histori Preservation.

The Oct. 6-9 meeting in Phila delphia's Bellevue Stratford Hot is expected to attract some 1,00 delegates, a trust spokesman sai Key federal officials will join wit preservationists in considering wha Trust Chairman Gordon Gra termed an "essential" need fc coordination between public an private agencies.

He noted that pending federa legislation would provide financia aid for preservation and said it "important that some guidelines b set by those working in the prese vation area if we are to mov promptly and effectively to carr forward the program envisione under the pending legislation."

Federal officials slated to tak part include Interior Secretar Stuart L. Udall, HUD Secretar Robert C. Weaver, GSA Adminis trator Lawson B. Knott Jr. an Highway Administrator Rex M Whitton.

Continued on page 1

THE MAGNIFICENCE THAT WAS GREECE...

TOMB OF MENECRATES
Greece. Built 600 or

The ancient Greeks had a *feeling* for roundness, notably round *columns,* used externally. Masters of simplicity, proportion and detail, the early Greeks were sensitive of taste . . . and *sharp of eye* . . . the first, perhaps, to defy the monotony and stiffness of absolutely straight lines and right angles, with delicately planned curves and inclinations — and round columns — as in the famed Parthenon.

This Greek architectural understanding preceded most of the world-wide appreciation for *"variations of round"* . . . and in their temples, helped to achieve the surprising beauty which the educated eye today still recognizes as far more than the simple *sum* of proper "proportion" and "composition." It is *"roundness"* — appreciated and used with skill.

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with or without dec
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with skill to contrib
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Louisiana, Mo. • Lowell, Mass. • Montclair, N.J. • Munroe Falls, Ohio • Mystic, Conn. • Newport, Tenn. • Richmond, Va. • Tacoma, Wash. • **MEXICO:** Mexico City

Newslines *from page 14*

Product Literature Goes Under Double Scrutiny

Judging is now taking place with awards to be announced later this month in the Construction Industry Product Literature Competition.

And a critical conference on building products literature will be held Nov. 9-10 at the Statler-Hilton Hotel in New York.

The conference aim is to acquaint sales and advertising personnel of building products manufactures and their advertising agencies with more effective ways to present their products to specifiers, users and sellers.

The competition and conference are coordinated efforts of six organizations—the AIA, Consulting Engineers Council, National Association of Home Builders, National Lumber and Building Material Dealers Association, the Producers' Council and Sweet's Construction Catalog Services.

In past years the Producers' Council held separate competitions in cooperation with the AIA, CEC and NAHB.

Under this year's unified approach, product catalogs, space advertising, direct mail and other types of literature will be evaluated at one time by separate juries appropriate to literature groupings meeting the specific needs of the sponsoring organizations.

The awards will be announced at a black-tie dinner in the Waldorf-Astoria, New York, Oct. 27.

education

Burchard Serves Berkeley Until Dean Named

John E. Burchard has been named acting dean of the College of Environmental Design at the University of California at Berkeley. He succeeds Martin Meyerson.

Burchard, 67, was dean of the School of Humanities and Social Science at MIT for 16 years, going to Berkeley in 1964 as visiting professor of environmental design and later becoming acting chairman of the department of design.

Burchard is serving in an interim capacity pending a permanent appointment. Meyerson left to become president of the State University of New York at Buffalo.

► Thurman I. Potts, president of

Continued on page 18

3 1/4

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Von Duprin 50

Circle 231 on information card

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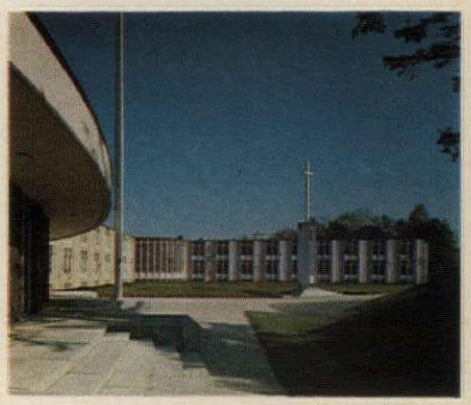
Structural Mo-Sai wall units 7 feet wide by 24 feet high were cast with gentle concave surfaces of exposed white quartz. Alternating windowalls have a dark Mo-Sai background of exposed flamingo quartz, red granite, and black obsidian accenting the white quartz surfaces of graceful arches cast in the Mo-Sai.

The Mo-Sai wall units were welded to plates in the concrete flooring and then the second floor and roofing concrete was poured, filling around dowels and in grooves cast in the Mo-Sai. The alternating concave panels and arched windowalls of Mo-Sai form a striking maintenance-free facade, as well as a rugged fire-resistant structural system.

Make use of the versatility of genuine Mo-Sai on your next project — along with the years of experience of your local licensed Mo-Sai manufacturer.

Lumen Cordium High School / Bedford, Ohio
John F. Lipaj • Associates • Architects
General Contractor: Martini Construction Co.



Mo-Sai®
PRECAST, PRESTRESSED CONCRETE
WITH EXPOSED AGGREGATE

Circle 228 on information card

Newslines *from page 18*

the foundation for a Yugoslavian national planning institute.

Following on the heels of the meeting, attended by representatives of the Universities of Cornell, Chicago, California, Southern California and Wayne State, a two-year project, administered by Cornell, was begun to provide Yugoslavia with the technical assistance to establish the planning institute.

► The $3,000 LeBrun Traveling Fellowship won by James F. Knight, University of Illinois graduate student in architecture, was one of two national awards he received over as many months. He also won the $5,000 Lloyd Warren Fellowship, the Paris Prize.

► Forty-four students and graduates of Columbia University School of Architecture benefited from William Kinne Fellows Memorial Traveling Fellowships and Scholarships over the summer. It was the largest number ever given. Stipends totaled over $70,000.

► Eugene J. Mackey III, a 1962 graduate of Washington University, won this year's James Harrison Steedman competition, open to architectural school graduates with at least one year's professional experience in St. Louis. The award provides a $3,000 fellowship to assist in a year's travel and study in Europe.

► "Free Money" for the president of Harvard University to use as needed is provided by a new fund created by the Harvard Corporation from unrestricted gifts from business firms.

The corporation immediately assigned $68,000 received to date to the "University Ventures" account, and President Nathan M. Pusey allocated $60,000 of this to the current capital campaign of the Graduate School of Design which is seeking $11.6 million for a new building and money for additional endowment to support faculty salaries and new emphases in the school's program.

Fifteen Receive Awards In Prestressed Program

Fifteen structures were cited in the 1966 Prestressed Concrete Institute Awards Program with two of the winners—the School of Journalism at Syracuse University and the Greenbriar Shopping Center in Atlanta—earning particular praise from the jury.

Continued on page 34

Patented TAB-LOCK attachment...fast, easy, tool-free...offered only with Eastern's Acoustical/Fire-Safe Suspension Systems

Eastern's pioneering double web grid design was so superior, it was quickly duplicated by competitive systems. **But our patented TAB-LOCK tee-to-beam attachment can't be copied!** Insert tee. Bend tab. A positive lock is instantly assured! Eastern's grid members with TAB-LOCK are interchangeable in 3 standard weights plus fire-rated design. The result: maximum economy for all load and spanning conditions. See Sweets 11c/Ea, or write for complete specs.

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(The original caulk couldn't stand the weather.)

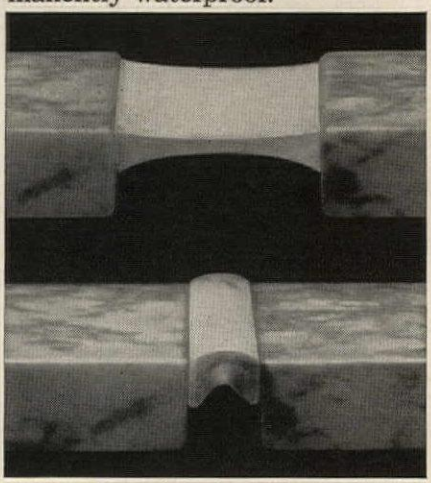
Was it the Florida heat or a hurricane named Dora?

Chances are, both caused the vinyl caulk in this Florida hospital to break down in just two years. (And it was guaranteed for five!)

Now, General Electric's Silicone Construction Sealant is doing the job. It's providing superior protection day in and day out. And it'll survive Hurricanes Dorothy, Dolores, Donna and Dinah!

In fact, tests show that G-E Silicone Construction Sealant will take punishment of high winds and rain, intense heat and sunlight for years without loss of bond or elastomeric properties.

Because it's permanently flexible silicone rubber, it withstands severe expansion and contraction cycles. It won't crack, crumble or leak with age. And it's also permanently waterproof.



Joints expand and contract 10,950 times in 30 years. So will G-E Silicone Construction Sealant.

So recaulk with G-E Silicone Construction Sealant. Or use it from scratch and forget about recaulking. It comes in standard caulking cartridges and a range of permanent colors.

For more information and color swatches, contact your G-E distributor or write: Section EA10239, Silicone Products Department, General Electric Co., Waterford, New York 12188.

GENERAL ELECTRIC

Newslines *from page 30*

The 70-store, completely enclosed and airconditioned shopping center is distinguished by "elephant trunk" eaves bordering its sides. The center, the jury said, "brings architecture to a field which has, to a large extent, distinguished itself by 'nonarchitecture.'

"The use of the European tradition with the important galleria suppresses the usual garish advertising signs without a single merchant losing his identity. It dignifies the shopping center in an extremely imaginative way, and, through the use of precast and prestressed materials, coordinates the appearance of its many shops."

Architects for the center were Edwards & Portman of Atlanta. The journalism school, by I. M. Pei & Associates, brought this jury comment:

"This structure will take its place as a classic of American and perhaps International architecture. The building suggests that monumentality is coming back, answering a very clear and obvious desire on the part of masses of people.

"Monumentality is no longer an objectionable word. It is achieved here in a simple and disarming way without a grandiose or antidemocratic spirit."

The building received a First Honor Award in the 1965 AIA Awards Program. Other winners in the Prestressed Concrete Program (all 15 awards are of equal status) are:

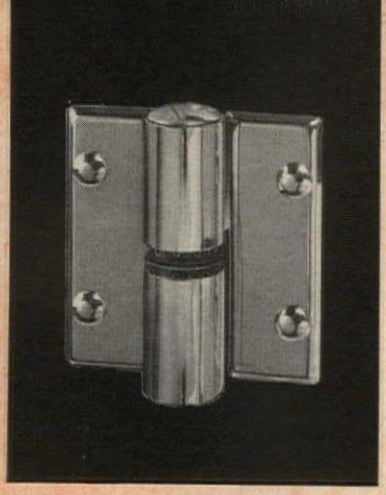
Cascade Orchards Bridge near Leavenworth, Wash., by Arvid Grant & Associates, engineers; Estancia High School, Newport Beach, Calif., William E. Blurock & Associates, architects; First National Bank, San Diego, Calif., Tucker, Sadler & Bennett, architects; and Children's Hospital Medical Center Parking Garage, Boston, the Architects Collaborative.

Bank of Park Forest, Ill., Fridstein & Fitch, architects; Central Mall and Transportation Centre, Simon Fraser University, Burnaby Mountain, B.C., Canada, Erickson Massey Architects; and Lytton Savings and Loan Association Buildings in Oakland and Canoga Park, Calif., Kurt Meyer & Associates, architects.

Laboratory, Research Council of Alberta, Edmonton, Alberta, Canada, Bell, McCulloch, Spotowski Associates, architects; Century Building, Seattle, Wash., Bystrom & Greco Architects; LaGuardia Airport Runway Extensions, Port of New York Authority Engineering Department with contracting a joint venture of J. Rich Steers, Ben C. Gerwick, Inc., Tully & DiNapoli and Spearin, Preston & Burrows; Los Pensasquitos Creek Bridge, San Diego County, Calif., California Division of Highways; and Laurentian Autoroute Bridges near Ste-Adele, Quebec, Canada, Regis Trudeau & Associates, consulting engineers.

Serving as jurors with Morris Ketchum Jr. FAIA, past president of the AIA and chairman of the jury, were J. Neils Thompson, president of the National Society of Professional Engineers; William J. Hedley, president of the American Society of Civil Engineers; R. Jackson Smith AIA of Eggers & Higgins, New York; John C. Parkin of John B. Parkin Associates, architects, Toronto, Canada; and Gene Leedy, architect of Winter Haven, Fla.

Continued on page 38



Weis hardware is solid brass
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of brilliant chromium plate.
This rugged, handsome hinge mounts
on the interior surface for inswing,
or exterior for outswing, and is
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...a quality feature of Weis Toilet Compartments

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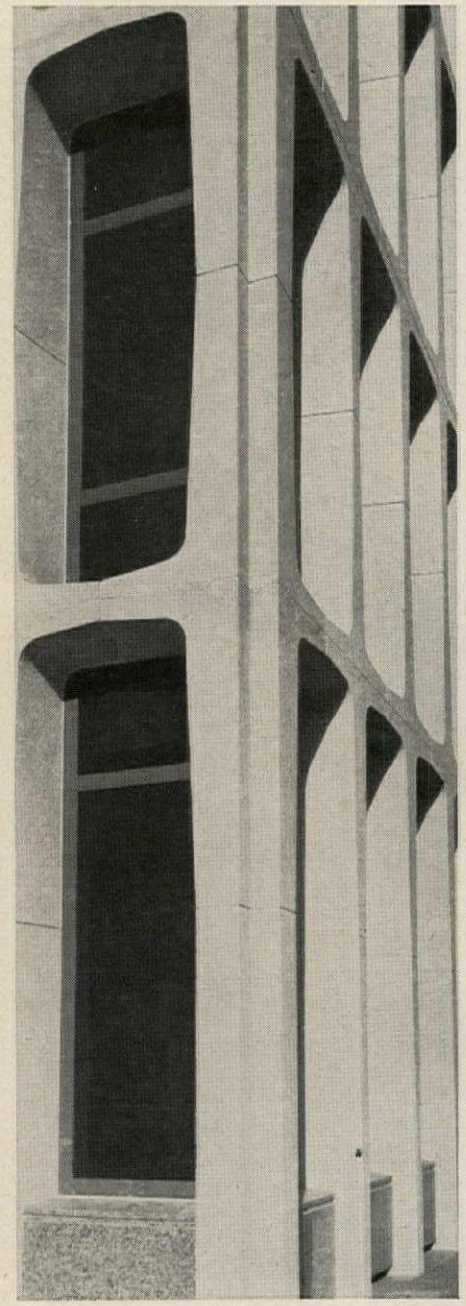
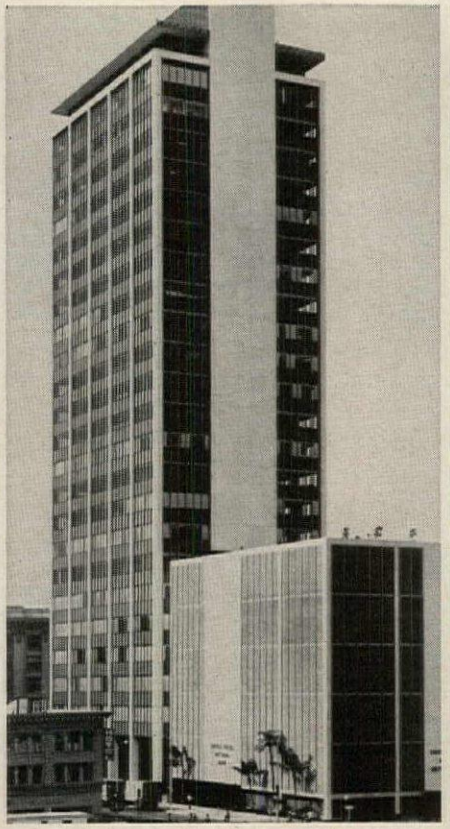
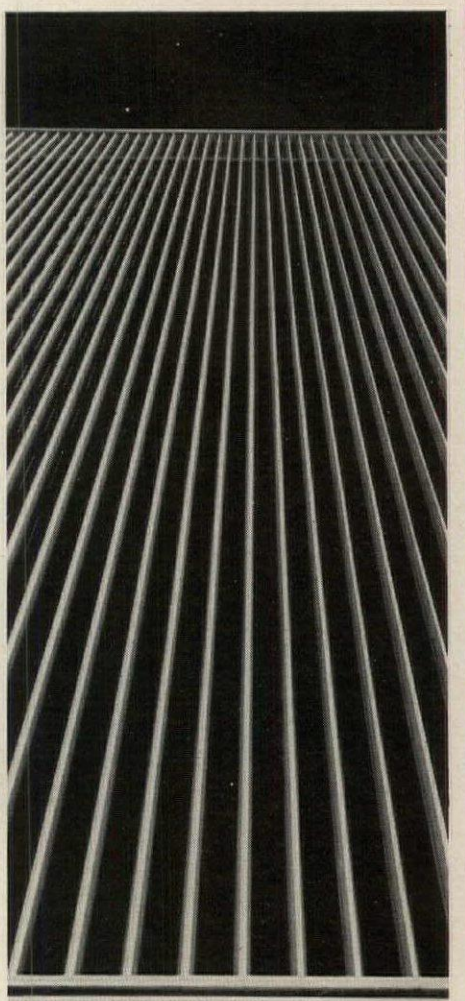
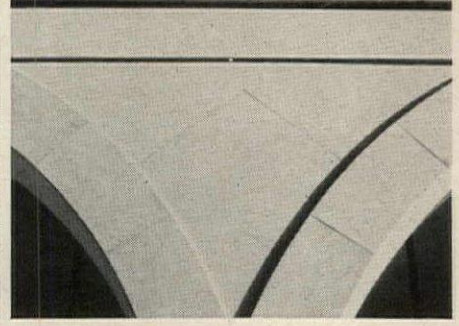




These buildings all feature precast concrete units made from Trinity White.





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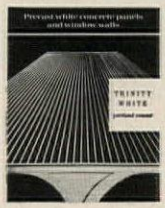

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Newslines *from page 34*

Seven Buildings Selected In Steel Frame Program

Seven buildings, five of them in the Midwest, have been cited in the annual awards program of the American Institute of Steel Construction.

The selections were made from 100 entries received from all parts of the country. Awards of Excellence were made to four:

- The Chicago Civic Center, designed by C. F. Murphy Associates, supervising architect; Skidmore, Owings & Merrill and Loebl, Schlossman, Bennett & Dart, associate architects.
- The Equitable Building, Chicago, designed by Skidmore, Owings & Merrill.
- Inland Steel Products Co. Calumet Road Plant, Milwaukee, designed by William P. Wenzler, Architect & Associates, Inc., in association with the Engineers Collaborative Ltd.
- Birmingham Bloomfield Bank, Wixom Branch, Wixom, Mich., designed by Ziegelman & Ziegelman.

Winners of AISC Awards of Merit were:

- The Atlanta Stadium, designed by Heery & Heery—Finch, Alexander, Barnes, Rothschild & Paschal, Associated Architects and Engineers.
- State Street Bank Building, Boston, designed by Pearl Street Associates, a joint venture of F. A. Stahl & Associates, Inc., Hugh Stubbins & Associates, Inc., & William J. LeMessurier Associates, Inc.
- First Federal Building, Detroit, designed by Smith, Hinchman & Grylls Associates, Inc.

Jurors for this seventh awards program limited to steel-framed buildings were Lawrence B. Anderson FAIA, dean of the School of Architecture & Planning at MIT and member of the firm of Anderson, Beckwith & Haible; Mario J. Ciampi FAIA, San Francisco; Charles M. Nes Jr. FAIA, Baltimore, president of the AIA, John C. Portman Jr. AIA, Atlanta; and Dr. Lev Zetlin, consulting engineer, New York.

Winning architects are recipients of stainless steel plaques carrying etched pictures of their buildings; certificates go to structural engineers, contractors, steel fabricators and owners. Plaques for mounting on the buildings are also given. ■

NECROLOGY

BARRY, GERALD A.
Glenview, Illinois

FITCH, AUSTIN E.
St. Louis, Missouri

FRONCZAK, JOSEPH E.
Buffalo, New York

FROST, FREDERICK G. SR.
Darien, Connecticut

HAMILL, NORMAN JAMES
Butte, Montana

HAMMOND, HAROLD
Allentown, Pennsylvania

LOESCHER, FREDERICK EMIT
Harrisburg, Pennsylvania

MASSARI, FRANK STANLEY
Stamford, Connecticut

MILLER, ROBERT L.
Lake Charles, Louisiana

RESNICK, PAUL
New York, New York

SMITHEY, LOUIS P.
Roanoke, Virginia

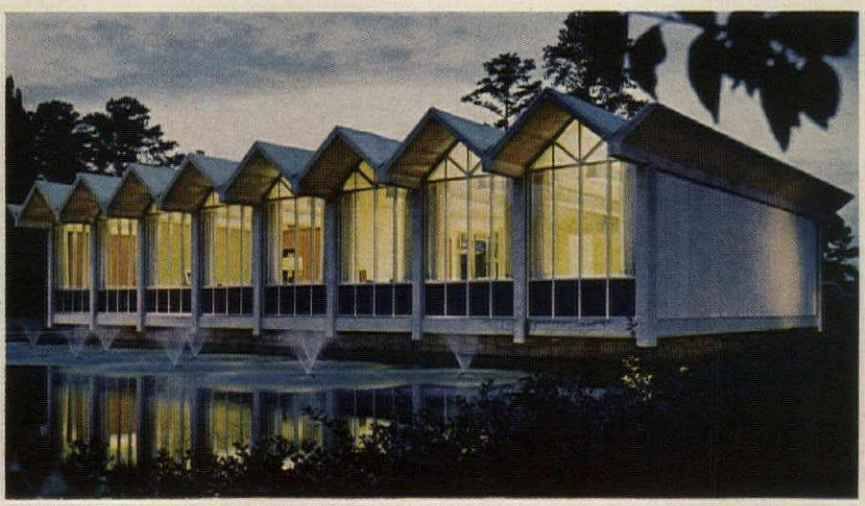
WILKINSON, LAURANCE E.
Chicago, Illinois

WILLIAMS, MILTON ROGERS
Dayton, Ohio

The Brotherhood Mutual Life Insurance Company Building, Fort Wayne, Indiana. Architect: Orus Eash, Fort Wayne, Indiana.

Civic Auditorium, Jacksonville, Florida.
Architect: Kemp, Bunch & Jackson, Jacksonville.

The Chancery Building of the Archdiocese of St. Louis.
Architect: Charles Guariglia (Bank Building & Equipment Corporation), St. Louis.



Lutheran Theological Seminary, Columbia, South Carolina.
Architect: Lyles, Bissett, Carlisle & Wolff, Columbia.

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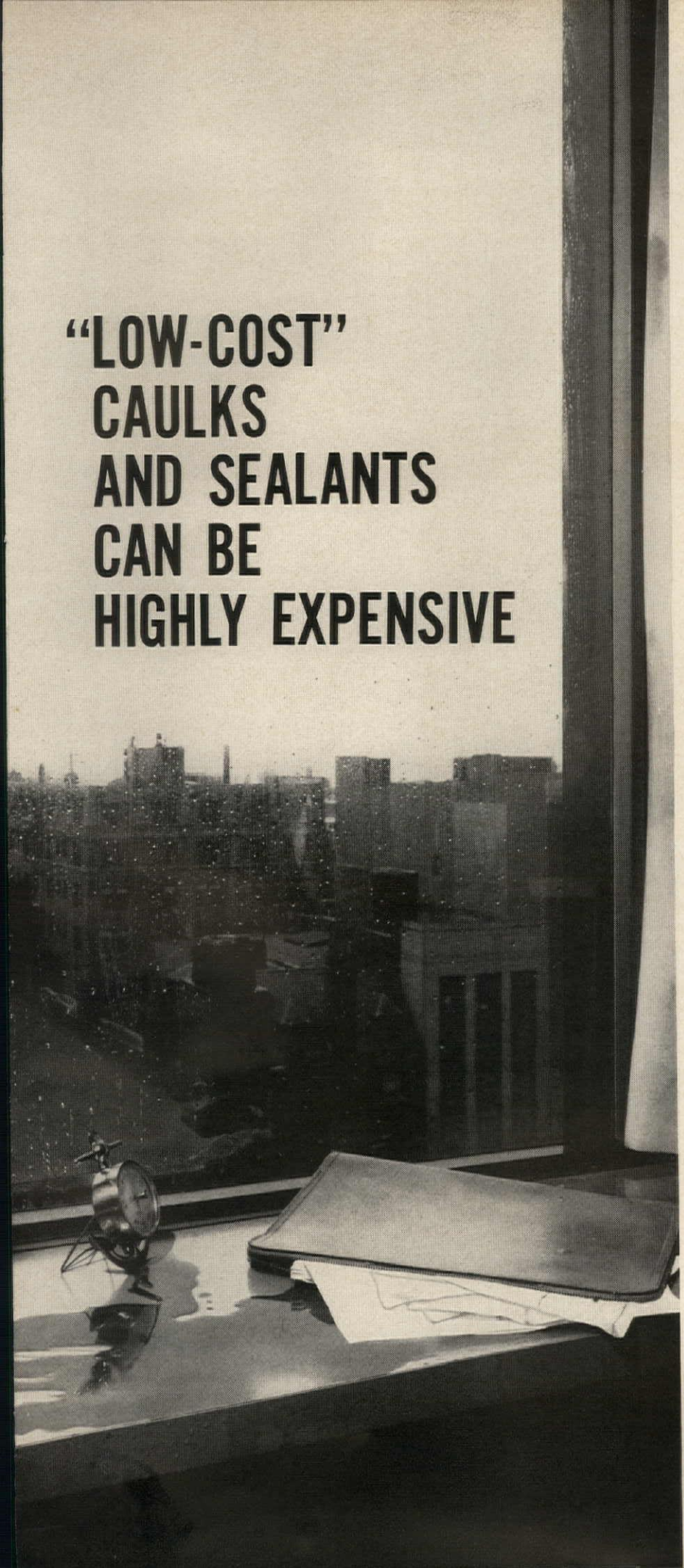

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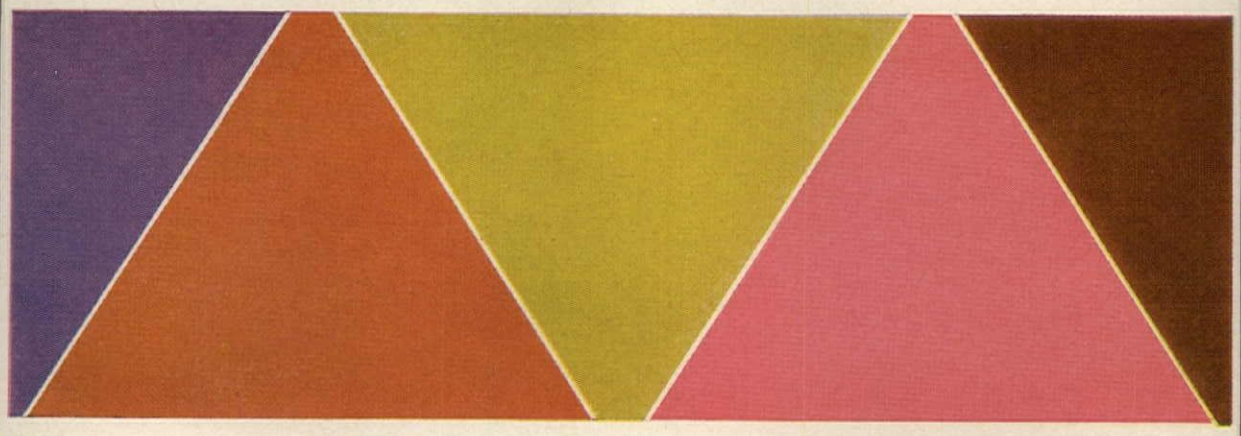

SHADES OF DARWIN

Are design demands like adaptability and permanence really incompatible? In these times, why not buildings with adjustable rooms, functioning in an unrestricted, highly divisible yet controllable, air-light universe? The obstacle has been cost, until a most unusual performance specification was written for new schools in California*. This document required structural-mechanical suppliers to bid as collaborating groups, and to show integrated, compatible systems. One of the successful solutions is Space Grid™—a joint development by a half-dozen national companies**. Space Grid also incorporates several mechanical options beyond the spec, extending its application considerably further than institutional construction.

In this system, the structural-heating-cooling-lighting-ceiling-partition systems become a single organism meeting high environment criteria in every classification. With these it allows swift, radical and convenient rearrangement of the comprehensive room plan. Space Grid adds the dynamic dimension of adaptability to room usage, and thus wards off obsolescence indefinitely. Survival of the fittest, you might say. Fast construction, single responsibility and better component performance are natural advantages of this approach.

Space Grid does not poke its nose into the design solution; nearly all its elements lie neatly concealed inside the service envelope above ceiling plane. For details see Sweets File, 2A/Bu. Or write direct to Architectural Systems Department, Butler Manufacturing Company, 7601 East 13th Street, Kansas City, Mo. 64126

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

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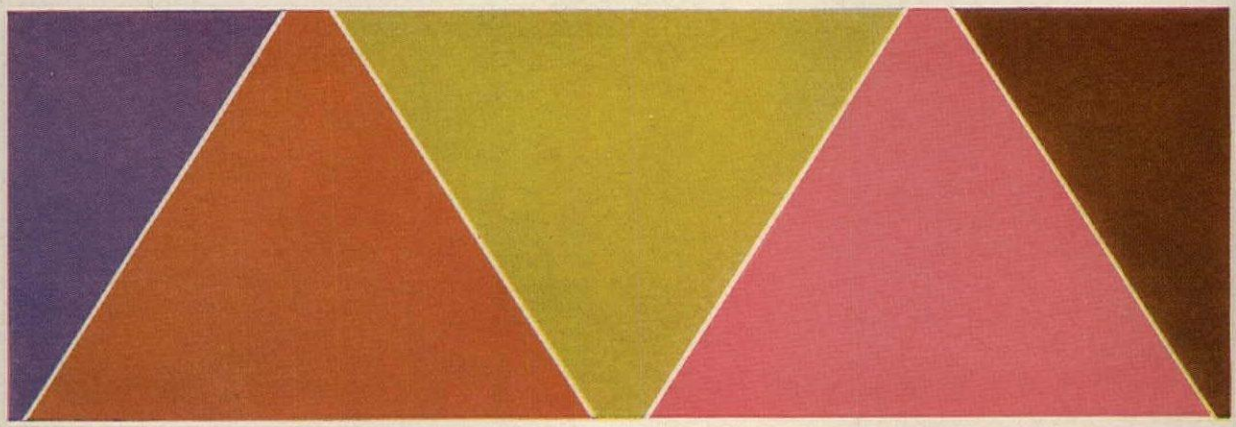

SHADES OF DARWIN

Are design demands like adaptability and permanence really incompatible? In these times, why not buildings with adjustable rooms, functioning in an unrestricted, highly divisible yet controllable, air-light universe? The obstacle has been cost, until a most unusual performance specification was written for new schools in California*. This document required structural-mechanical suppliers to bid as collaborating groups, and to show integrated, compatible systems. One of the successful solutions is Space Grid™—a joint development by a half-dozen national companies**. Space Grid also incorporates several mechanical options beyond the spec, extending its application considerably further than institutional construction.

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

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Cost of Architectural Services

ONE OF THE significant current projects of the AIA is the development of a nation-wide, comprehensive survey of the cost of providing architectural services. The objective of the project is simple; the implications and the promise, however, run deep. The objective is a thorough, impartial and documented study of the cost of providing various services, including consultants' services. The implications are that a whole new statistical basis will be provided which will allow in-depth studies of many current business practices.

The need for the study is based on the frequently encountered poor business practices found in the profession. Architects, much concerned with good design and professional ethics—and generally respected for conscientious attention to both—are less accomplished when it comes to using good business principles. And for this they incur client reactions ranging from confusion to serious misunderstanding.

The kinds and extent of services provided, the basis for establishing fees, the contracting procedures, business efficiency and the quality of work that is produced vary tremendously from one architectural firm to another. There is a variety of managerial systems and accounting procedures. The corporate basis differs from state to state.

The result is that clients are generally unknowing of the range and depth of services which the architect provides for his fee. They are unaware of the many services, both professional and technical, that the architect himself must routinely purchase to conduct a normal project. Some architectural firms provide extensive program studies while others consider this an additional expense. Some firms will work towards specific time schedules while others refuse to be tied down. To the corporate client experienced in sophisticated management practices these varying practices are often illogical.

The profession is continually pressed, especially by government agencies, to substantiate costs with relationship to fees which often leads to the establishment of statutory fee limitations. Efforts to present cost information supporting fees are hampered by the absence of reliable, profession-wide data from objective and impartial sources.

In view of these questions, the AIA Board of Directors has established a special Task Force on the Cost of Architectural Services which has been given the charge to develop a procedure and make recommendations for establishing a comprehensive, nation-wide survey to determine the cost of providing architectural services.

Once specific data from a large representative sample of the profession has been collected and analyzed the base will have been laid for renewed studies of numerous aspects of practice.

New cost accounting procedures can be developed which can be based on a more thorough knowledge of the needs of architectural firms. The use of a more uniform accounting and recording system will allow the use of computerized service centers which can provide a much broader range of better quality services to the architect and at a lesser cost than now results from inhouse efforts. Better accounting systems will provide architectural management with the basis for a more thorough analysis of the firm's operations—its strengths and weaknesses.

Substantiated cost data from across the nation will allow the establishment of more equitable fee structures and help to eliminate the arguments from within the profession as to what constitutes standard or basic services. Reliable cost data will make it possible for more jobs to be negotiated on a cost-plus or other more equitable basis. It will be possible to expand or revamp the whole professional contracting program.

The differences, if any, between the cost of doing business with government, corporate and private clients, will be revealed, facilitating negotiations.

In the process of collecting cost data from across the nation, considerable information will be brought together regarding the business management procedures now in use. This will be necessary in order to be able to analyze the cost data. The result will provide hints of emerging new techniques of practice which may be helpful to the entire profession.

The Task Force, headed by Gustave R. Keane AIA, began a thorough analysis of the problems at hand and investigated possible ways of implementing the nation-wide, comprehensive survey of costs. The conclusion was that a pilot study of a select group of representative firms should be made in order to determine specifically what information must be collected, how much such collections would cost, and whether or not the nation-wide, comprehensive study was, indeed, feasible and worthwhile.

With Board approval, the firm of Case and Company, management consultants, was retained to conduct the pilot study and develop recommendations for the nation-wide study. Case and Company has had wide experience in studies of a similar nature and is perhaps best known among architects for its work with the California Council in the investigation of improved fee structures. Case and Company, under the direction of Vice President Dr. Charles Marsh, is currently collecting cost data in the pilot study and will make its report to the Board this fall.

President Charles M. Nes Jr. FAIA has indicated his desire that the nation-wide study of costs be among the high priority items in the Institute's program during his term. Assuming that Case and Company will find the nation-wide study feasible, and economically within our grasp, and assuming the Board concurs, we can expect a flurry of activity around the country late this fall or early next year.

BENJAMIN H. EVANS, AIA
Director of Research Programs

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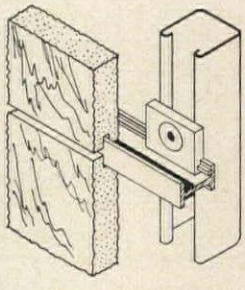

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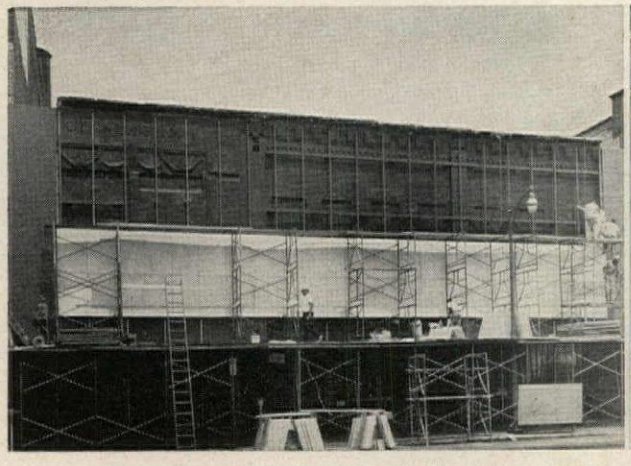
Robert P. Byram, Architect



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A·I·A Journal

PRACTICE PROFILE

The principals of Meathe, Kessler & Associates combine design integrity and business knowhow to develop an office ever on the move.

Orderly Growth in Size and Stature

THE OLD SAW that opposites attract is no better demonstrated than by the principals of Meathe, Kessler & Associates, Inc., a firm whose influence on the architectural scene belies its age and size.

Housed in a one-story corner building in Detroit's suburban Grosse Pointe, Philip J. Meathe AIA has an adding machine in his office, while next door William H. Kessler AIA has a drafting board—two facts that neither man ever allows the other to forget. Friendly competitors in a sense, each brings a professional attitude to his own area of operation.

In directing the 25-member staff, the partners on occasion may knock heads as they strive for goals spelled out in establishing their practice in 1955: to produce outstanding architecture and to make a profit—in that order. The 15 or more awards and citations attest to the former, just as meticulously kept business records and growth charts support the latter. Kessler concurs with Meathe that "We want our firm to become sound financially so that we may offer the best possible service to our clients and the most possible benefits to our employees."

From the outset, the two principals, ages 40 and 41, agreed to develop their organization in five-year increments, each with well-defined objectives based on the good design/sound business approach. And they continue to do much soul searching about the future of their likewise youthful, enthusiastic office. With two five-year plans already accomplished, what about the third? The question they ask is: "How big, and in what direction, shall the firm grow without compromising the excellence of services?"

For the pace has been increasing in tempo each year since they left Detroit architects Leinweber, Yamasaki & Hellmuth—Meathe in charge of production, Kessler as a designer—to set up shop (along with a third partner for two years) in an 18x20-foot store building, and with two residential commissions for a starter.

The Grosse Pointe location was a natural for native-son Meathe, a 1948 graduate of the University of Michigan. Kessler, who was born in Reading, Pennsylvania, studied at the Institute of Design in Chicago and the Graduate School of Design at Harvard University, earning a degree in 1950, before returning to the Midwest to accept a design position several years later.

Partner Kessler, Francis, partner Meathe and DiLaura.

Kessler paid little heed to acquaintances who warned him that the area would not be a stimulating climate for his artistic endeavors; instead, he designed his own home in Grosse Pointe and has become active in the community and the AIA, as has Meathe, Institute director of the Michigan region.

Organizational Structure

The organizational structure of the practice was founded on the premise that design competence is not enough but must be accompanied by knowledge of construction costs and of building technology as well as sound business procedures. It is only natural, then, that the partners are backed up by two associates who are opposites in their own way: one in the area of design and the other in building construction.

The five-year plan became the medium to improvise that structure. The initial objective was to get the firm established, which meant 1) bringing in and expediting the work, 2) developing a staff, 3) building up a cash reserve.

Residential clients and the US Army Corps of Engineers, for the most part, kept Meathe and Kessler occupied the first year. In his previous affiliation, Meathe had acted as project director for a $20 million job for the Corps, and within a week's time the new firm was contacted by the agency, which resulted in commissions for three or four years.

As for 1956, two jobs completely different in size and scope were to bring much publicity: the remodeling of a restaurant-lounge in a luxury Detroit hotel and the Mount Clemens Public Housing project. The latter was a breakthrough for the young office, representing a departure in low-cost housing for the nation.

"We felt that people with low incomes should be able to obtain shelter in which they could be recognized as individuals," the partners explain. Accomplishing their ideal proved to be an uphill battle at first. Although the contract was signed at the end of November, it was not until a year later that the firm got the go-ahead to produce a design which would offer the tenants such amenities as service yards to keep sites uncluttered and would earn for the architects a national AIA Award of Merit plus two state citations, all in 1960. The firm's initial recognition came two years earlier, however, when it won three awards—First Honor, Award of Merit and Honorable Mention—in the Homes for Better Living program co-sponsored by the AIA and *Life* Magazine.

STAFF BREAKDOWN

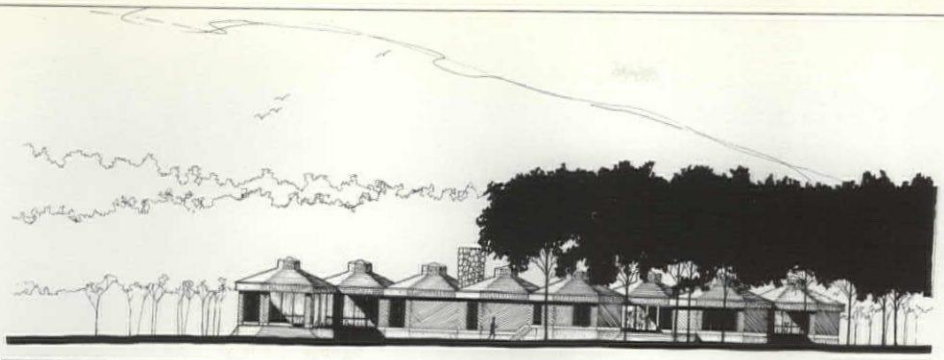
Principals	2
Clerical (secretaries and bookkeeper)	3
Architectural Design	3
Architectural Engineering Design	7
Mechanical and Electrical Engineering	4
Specifications	1
Construction Inspection	5
Total	25

Mount Clemens undoubtedly was a giant step in establishing the office's reputation and led to two more similar projects. Meathe and Kessler realized, however, the danger in becoming known as "public housing" architects at the expense of other commissions. They have thrived on a variety of building types, as indicated by some of the early work

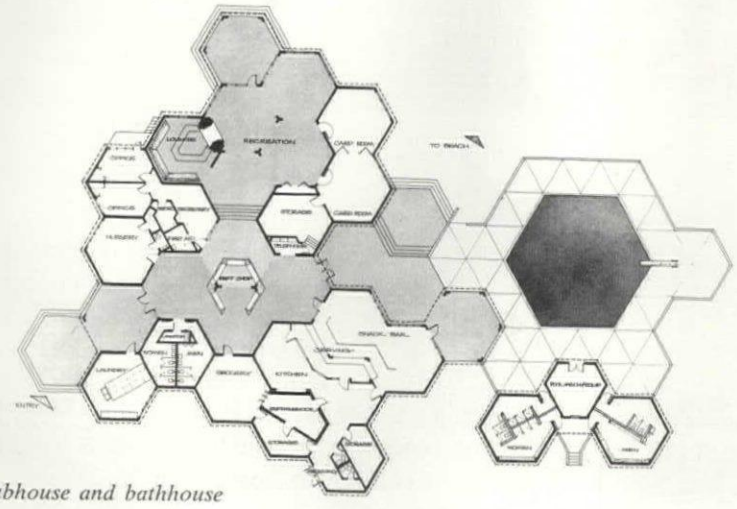
PERCENTAGE ANALYSIS OF YEARLY ARCHITECTURAL BILLINGS BY CLASSIFICATION

Residential	41%	20%	10%	20%	28%	10%	3%	9%	2%	7%	1%
Educational	1%	2%	15%	1%	14%	44%	43%	64%	72%	47%	70%
Religious[1]	—	—	3%	10%	4%	2%	23%	3%	2%	—	—
Medical	11%	—	—	—	—	—	—	3%	1%	9%	12%
Commercial	10%	31%	33%	1%	28%	17%	7%	7%	4%	19%	6%
Industrial[2]	—	1%	—	—	—	—	—	—	—	—	—
Defense[3]	37%	46%	27%	30%	20%	8%	—	—	—	—	—
Government	—	—	12%	38%	6%	19%	24%	15%	18%	18%	11%
	1955	**1956**	**1957**	**1958**	**1959**	**1960**	**1961**	**1962**	**1963**	**1964**	**1965**

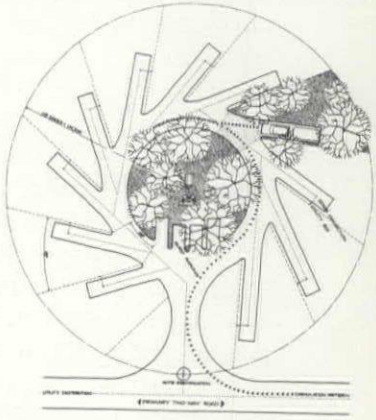
1. The firm now has a Presbyterian Church commission at an estimated cost of $650,000. The lag in this category exists because the original work was done for the Catholic Archdiocese of Detroit, and "it became apparent that the client wanted to be dictatorial in the methods of architectural services performed," the partners explain. "Furthermore, the fee schedule established by the Archdiocese is unrealistic." 2. The principals do not intend to become involved in this area since three of the largest industrial architectural firms have their offices in Detroit. 3. This includes such agencies as Army Corps of Engineers and NASA.

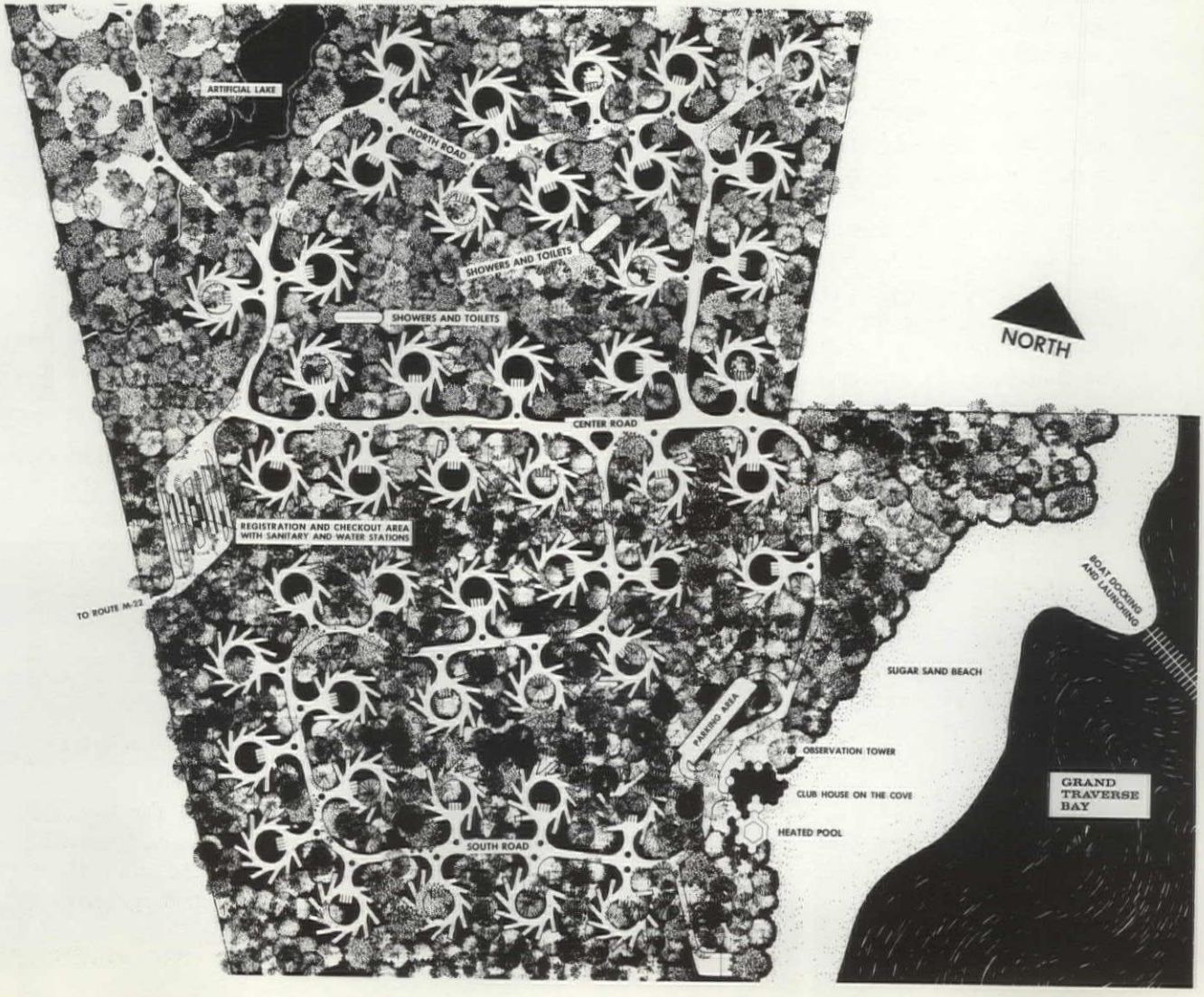


One of the most challenging commissions undertaken by the architects is Timber Shores Travel Trailer Resort, located in 150 acres of near virgin timberland on the shores of the Grand Traverse Bay on Michigan's Lower Peninsula. The sprocket design not only fits into an organic type of site but also facilitates the maneuvering of the trailers themselves, even by amateur drivers. The modular system of hexagons for the clubhouse will permit expansion since it is difficult to pin down the requirements for such a facility in this type of travel trailer resort.

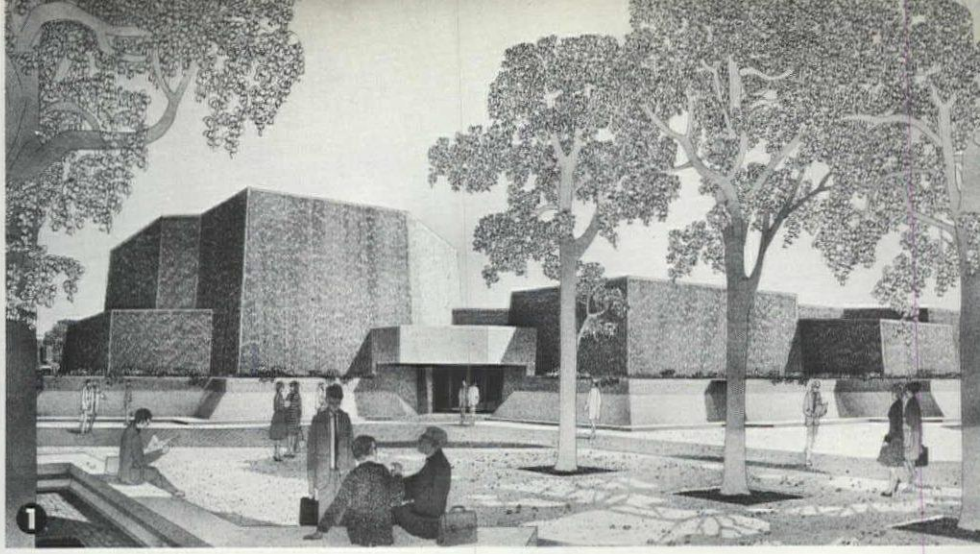


Clubhouse and bathhouse





The firm's new work continues to show a spectrum of building types. The Lecture Halls Building, State University of New York, Stony Brook, Long Island **(1)**, is designed with the floor of a major campus plaza at its base and with its final form as a derivative of the size and function of the various lecture halls. The New Market (Va.) Battlefield Memorial **(2)** is conceived to bring unity and strength to its theme of valor through a continuous concrete surface. Arnold Home in Detroit **(3)** provides housing for the elderly in a three-story addition. The Warren (Mich.) Judicial Council Building Annex **(4)**, sited adjacent to an existing city hall, contains courtrooms on the lower four floors with future offices above.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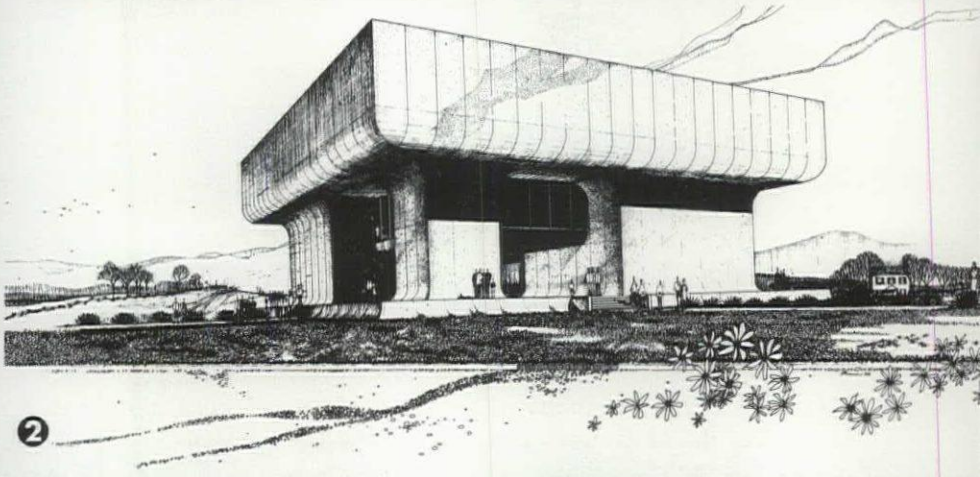
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3


4

Project Work Flow

It is in expediting the work that Meathe and Kessler most forcibly demonstrate their "opposite" characteristics. The program development and preliminary designs are normally handled by Kessler or his design associate, and either may become involved in the client presentations. The preliminary outline specification is prepared by Meathe, who always does the preliminary cost estimate. Armed with the structure's estimated cost, the designers have complete information which allows them to properly proceed with their work.

The responsibility for preliminary working drawings falls upon the production chief or a job captain; the design associate supervises the day-to-day operation. After approval, the preliminaries are assigned to a job captain for preparation of the final working drawings. It is interesting to note that all detailing is done by one employee in the production department.

Prior to the development of the final cost estimate, all working drawings are checked twice. The estimate itself is prepared by Meathe. In addition, he normally places the job out for bids and supervises the opening. However, questions that arise during the bidding phase generally are answered by the production chief or a member of his staff.

Upon award of the contract and during the building stage, all work is directed by the associate in charge of field construction. This supervisor, or one of his four assistants, may be on the job full time, depending upon its size and complexity. In any event, he spends about 30 hours a week in the field and may work an almost equal amount of time in the office.

After each building is up, a critique is held to review the problems, the components, the spaces. In stressing the importance of contract administration, Eugene DiLaura Jr., associate of the firm, voices his philosophy this way: "Every aspiring architect should design and build a two-car garage before his graduation from school."

It is apparent that the associates play an unusually important role in the office structure. Designer Edward D. Francis says, "The word 'associate' is more than a title here. We become working members in a competitive position—in essence, principals of the firm." Meathe and Kessler admit that a growing practice with a fixed commitment to develop excellent design is bound to have an organizational pattern which has its flaws. Some confusion exists because of overlapping functions and responsibilities which are not clearly defined. In the long run, however, the partners are convinced they are pursuing the right course.

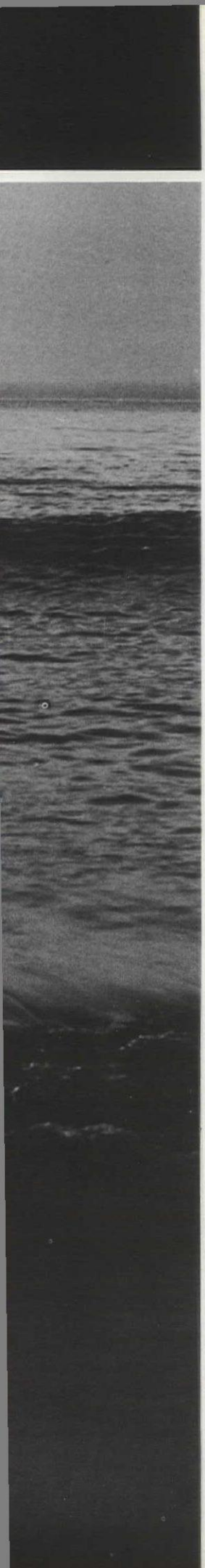
Expansion Program

After spending close to 12 months discussing the desirability of the office's future growth, Meathe and Kessler have decided "to embark upon a calculated expansion program, being fully committed, however, to retrench if the quality of professional services tends to be weakened or incomplete. It is our firmest conviction that such services are of far greater importance than the scope of the projects undertaken or salary remunerations enjoyed by the members."

The partners further explain: "Obviously, the benefits of expansion will enable our office to be placed in a better position for architectural commissions of larger magnitude than those currently undertaken. Furthermore, the expansion program will allow the firm to provide additional strength to second-echelon members in the firm."

With Meathe and Kessler seeing eye to eye on this approach, and with each bringing an essential ingredient to the practice, the current and following five-year plans should produce a provocative, profitable future. ROBERT E. KOEHLER

DESIGN OF THE LUMINOUS ENVIRONMENT



The nature of light is only describable by enumerating its properties and founding them on the simplest possible principles. As these principles transcend our ordinary experiences they must be cast in a purely logical, that is to say mathematical, form. But that is never enough, for, though logic tells us what deductions must be right, it does not tell us what will be interesting, and so gives no guidance as to the direction the theory will take. In choosing this direction much help is derived from analogies and models, which are often loose and incomplete, but without which no proper understanding of the subject can be acquired. We shall therefore describe, largely by means of analogies, the behavior of light, and this is the "real" nature of light. C.G. DARWIN 1929

Introducing a Six-Part Series

A designer of lighting systems for architectural projects, Seymour Evans bases his singular philosophy on a strong feeling that people are an exciting element in a building and lighting makes them so. He has shown a particular interest in defining the fundamentals of the luminous environment. For one such definition, which serves as a point of departure for the entire series, Evans turns to the quotation cited at the left.

His New York City firm, Seymour Evans & Associates, is self-contained, having on its permanent staff an architectural designer who coordinates the lighting with buildings and a mechanical designer who produces shop drawings as part of the specifications process; a consulting optical and physics service also is retained. Commissions include office and college buildings, airports, hotels, hospitals and exhibition halls from coast to coast.

Seeking a Behavioral Language

BY SEYMOUR EVANS

Light is perception. And perception is knowledge of the physical world. Understanding of perception is essential to an understanding of the world of light. The characteristics and the effects of light as stimuli are generally predictable.

If architects and consultants communicated in terms of these essential characteristics and qualities of lighting, they would be developing a methodology which simplifies thought and increases creativity and communication. With this methodology as a basis of communication, architects would be freer to perfect their handling of the purpose of lighting, which is—other than to see by—to ennoble buildings and space and to dramatize people.

One	One	One lighting concept to fulfill one task or one situation
One	Many	One lighting concept to fulfill many tasks or many aspects of lighting
Many	One	Many lighting concepts to fulfill one task or one aspect of lighting
Many	Many	Many lighting concepts to fulfill many tasks or many aspects of lighting

Any professional designer must be concerned with the following characteristic values of lighting: efficiency, economics and esthetics. When confronted with a new project, the designer must ask himself what value or values are required in the given situation. And in that situation, is one value more important and required to carry more responsibility than the others?

The many-to-one chart illustrates a rapid method of thinking about the handling of the situation the designer has ahead of him, of determining the general way he will solve the problem at hand.

The concern for lighting efficiency is the concern for the function of the lighting. The concern for lighting economics is the concern for the structural components of the lighting solution. The concern for lighting esthetics is the concern for the behavioral aspect of lighting.

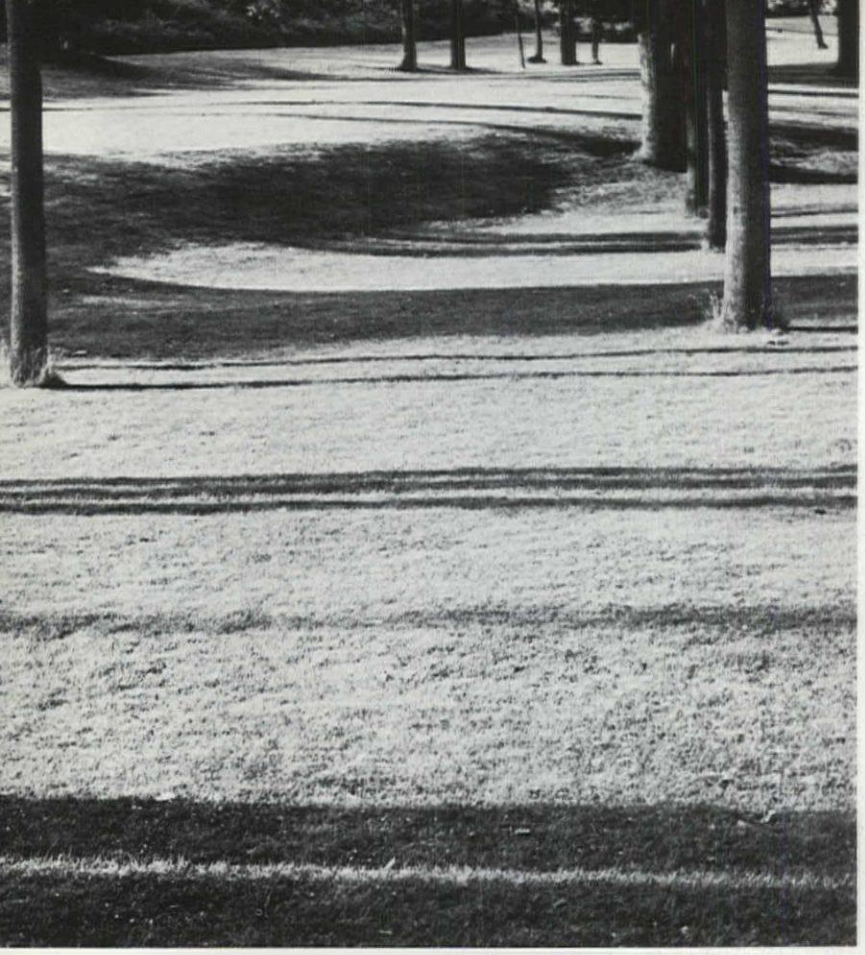
In the latter instance, the designer must know how he wishes people and space to behave or react. He might try to lure them on by making promises with his lighting, or he might try to excite people by using sparkling lights.

It is often difficult to communicate intelligibly about lighting and its characteristics. For this purpose, reference to charts and diagrams is useful. The following attempts to clarify the relationships and the interrelationships between the functional, structural and the behavioral elements of lighting design.

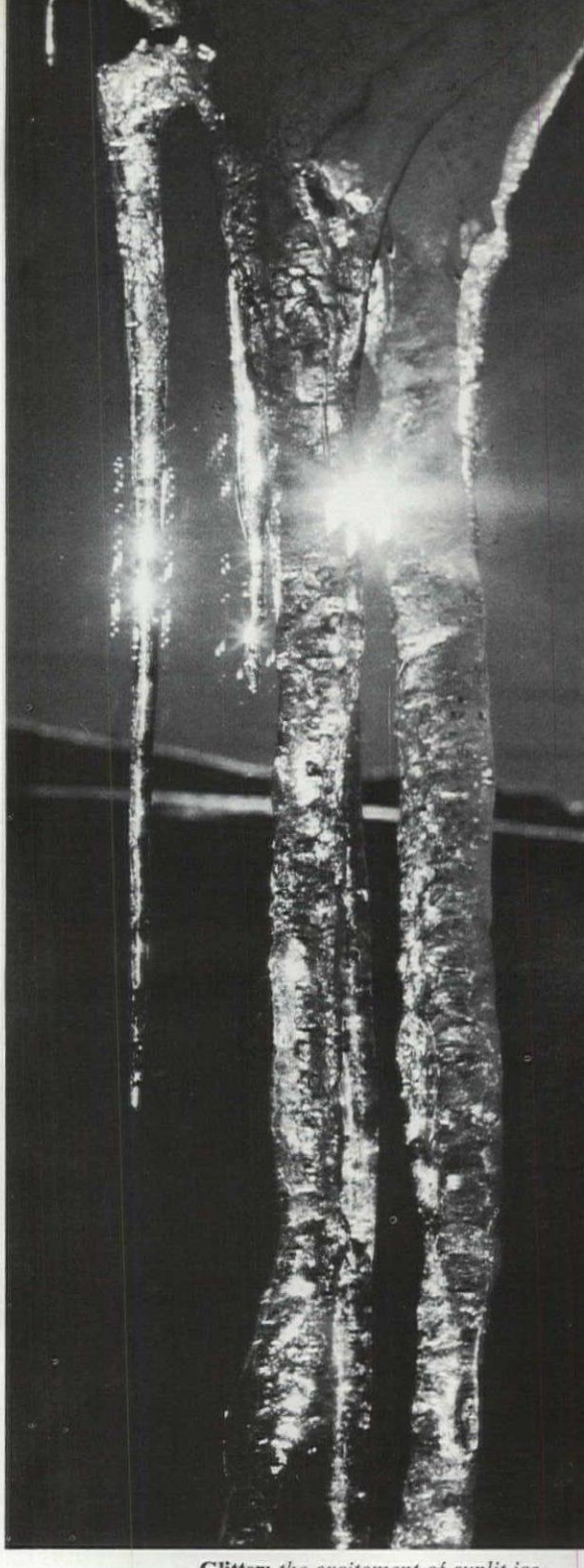
Lighting relates with architecture in three characteristic ways: it com-

Ambience: *the glow of a foggy morning*

Beam: *the shaft of sunlight in a dark forest*



Change: *the bright sparkle beyond the shadows*



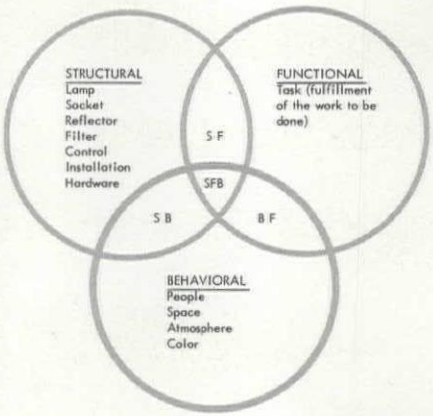
Glitter: *the excitement of sunlit ice*

Focus: *the sunlight on a single leaf*

plements, continues or completes its surroundings.

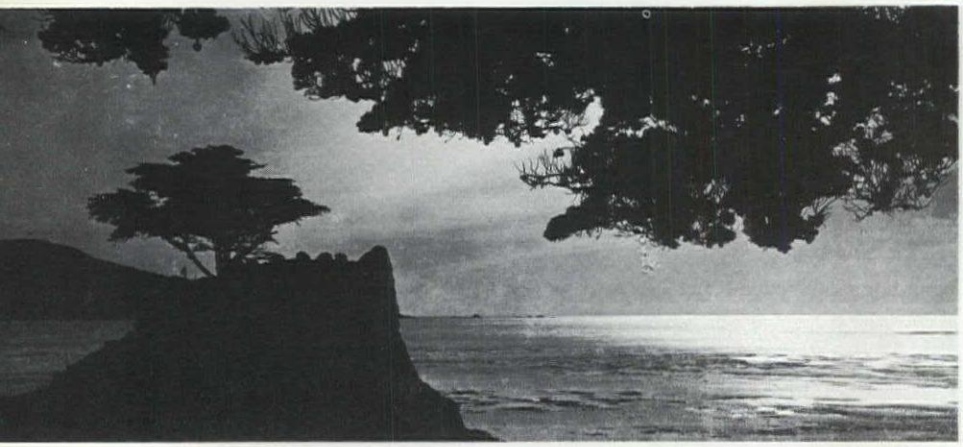
· Lighting which complements its environment is lighting which improves upon the physical limitations. If a room is too narrow, a wall light wash is installed to make the room appear wider.

· Lighting which continues is lighting which extends the effect of its surroundings by dramatizing or reinforcing.



· Lighting which completes is lighting which fills in or completes the lighting situation if part of the gamut of lighting values is not present. For example, if insufficient emphasis is put upon the functional value of a lighting solution, the designer must complete the solution by adding the right amount of light for the task. The designer must determine the importance of each value in relationship to the particular lighting solution.

The qualities of light and their combinations can lead to infinite variety and creativity in lighting design. Such variety can be achieved through the organization of light qualities in a binary system. If we consider the three in terms of their presence or absence in combina-



Silhouette: *the single tree against the sky*

tion, seven possibilities exist. (The eighth, absence of all three, need not concern us here.) The creative designer will make use of these variations of presenting the qualities which he desires. For example, beam (B), ambience (A) and silhouette (S).

B	-	-
-	A	-
B	A	-
-	-	S
B	-	S
-	A	S
B	A	S

Gaudi said of architectural design, "Return to the origin." Similarly, an understanding of the basic qualities of natural light would be helpful to the designer. In nature, there exist all of the elements which, when properly isolated and then recombined, comprise successful lighting design. Man isolates these qualities for use in his own artificially illuminated environments. The achievable elements and the definable sensations of light include qualities of play, form and color.

However, these qualities are at present best definable by analogy. The difficulty that the technician and the architect have in communication points to the need of a second language of lighting through which these men might converse. The structural functional language already exists and is absolutely essential for agreeing about the amount of light, but now we must go beyond and find a behavioral language which men from all design backgrounds can understand and employ together.

The photographs on these pages describe the behavioral qualities of lighting which exist in nature and by analogy in the environment designed by man. ■

A Guide to Industrial Site Selection

Architects frequently express concern over problems inherent in trying to design a building for an industrial client on a site which has been unwisely or hastily selected. A recent survey of 400 large corporations show they share this concern. Over 70 percent of those polled said they "might ask an architectural firm to perform one or more such comprehensive services as site selection, process engineering, space programming," etc. Obviously, most of these phases of planning are closely related and should be developed in a logical sequence under the leadership of the architect. The following guide is another in the series of articles financed by supplementary dues and prepared by the AIA Committee on Industrial Architecture (Louis deMoll* FAIA *chairman), Commission on Public Affiairs (David N. Yerkes* FAIA, *chairman).*

SELECTION OF the proper site for an industrial facility is vital to the success of the project, whether for a manufacturing or a processing plant, a distribution warehouse, a research facility, an office building, or for a combination of several of these. If the site selected does not fulfill all of the criteria, the overall project cost may be considerably increased and completion delayed. Even the proper functioning of the facility may be adversely affected if the site is not a good one.

Too often a site is selected and purchased without full investigation in an effort to expedite the project. Industry today demands shorter and shorter construction schedules from concept to occupancy. These schedules depend on clockwork timing and on having a minimum of unforeseen crises which may cause delays. When critical delaying problems arise during the development of new facilities, they are frequently the result of some inadequacy of the site.

Such inadequacies may range from poor subsurface conditions to legal problems resulting from unsuspected restrictive covenants.

Construction materials cost relatively the same amount per unit, no matter by whom or where they are installed. Site conditions, more than any other single factor, will affect the ultimate project cost. The site is a major variable; thus, to compare the square-foot cost of different projects, one must consider the varying site conditions of each.

For a 100,000-square-foot facility, the cost of site surface improvements, e.g., the type and amount of paving, curbs, landscaping, storm water drainage and outside lighting, can range anywhere from $100,000 to $300,000. The same building may be said to cost $10 per square foot or $15 per square foot, depending upon whether the figure includes such items as site development and utilities, or simply the basic building construction cost, as both architect and client soon learn.

The Team to Select the Site

The architect who becomes involved in the project, as often happens, after the site is selected, sees the results of both successful and disastrous site selections. He also sees many methods employed. Large corporations, with their own construction planning and real estate divisions, are generally more successful than small firms at selecting a site. Even the large corporations, however, sometimes

* George T. Heery AIA, "How Architects Fare in Corporate Building," AIA JOURNAL, December 1965.

fail to investigate thoroughly sites under consideration. Other corporations which have no regular group to perform this function generally establish a committee or team of persons of various interests to investigate sites. Often these groups include executives such as plant managers, quite capable in their own fields but with little or no knowledge in construction. Sometimes a corporation will assign the site selection duty to a single individual simply because he is administratively available at the time.

The natural tendency in site selection is to assign the study to someone who is experienced in real estate. Certainly such a person has the necessary knowledge of sales contracts, etc., but he seldom has sufficient background in construction to evaluate the suitability of a given site for a specific facility.

The architect's ability to assimilate all of the particular requirements of the building, to relate these to the peculiarities of the site and to unite both into a unified project makes him the logical catalyst of the site selection team.

This team should consist (minimally) of a realtor specialist, a representative of management and the architect. Some architectural firms have affiliated with, or have on their staffs, real-estate specialists. The architect may advise the employment of other special consultants for soil analysis or sewage treatment. More important, he can develop, from a topographical survey and test borings, a site feasibility study.

Suitability of Land

Consideration of the suitability of land for industrial purposes falls into two major aspects. *The first is its relationship to the pattern of development of the community itself.* To evaluate the suitability of a site, a manufacturer must go beyond the physical features of the site in his investigation. Is the community economically and politically sound and progressive? Are educational facilities complete and accredited? Have campaigns for such drives as the United Fund been subscribed fully? Are climate and recreational facilities such as to make the location desirable? Is the labor situation favorable? What is the tax structure of the area?

Proper site selection also frequently involves the study of marketing, available manpower and transportation. For the most part, manufacturing concerns must determine the general location of the planned facility on the basis of their own marketing studies and analyses.

Another aspect is suitability with regard to the particular plant requirements of the industry, in terms of size of site, availability of utilities, type of terrain and the location of the site in relation to such services as highways, airports, railways, etc. The site should also be suitable in shape to accommodate the processing flow-pattern of the particular industry.

It is in this area of site analysis that the architect can be most helpful to the industrial client. What, then, are the physical criteria of the site which should be thoroughly investigated?

Transportation

Does the proposed facility need a railroad? If there is a choice of railroads and one provides more frequent switching and better service, it should perhaps be given preference. Such a competitive situation may work to the advantage of the industry.

A plant should be located in a spot where traffic will not be bottlenecked by narrow or overloaded roads. Adequate leads to the plant from major highways should be weighed carefully.

In some cases, there is a definite freight advantage to having materials brought by water to or from a plant. If this is true, a location on navigable water should be sought.

More and more frequently air transportation is desirable or essential to an industrial plant. Key personnel may likewise find it advantageous to be within half an hour of an airport.

Utilities

Is there an adequate supply of electrical power readily available at favorable rates?

Bottled gas may serve where only a limited amount is used. However, adequate source and pressure of gas should be checked where there is a substantial need. Can natural gas be furnished on an uninterrupted basis at a reasonable rate? If not, standby artificial gas will be required.

For many industries, water supply is a major factor in the manufacturing process. It is always required for fire protection, and the available supply should be checked carefully with regard to availability and pressure. In some cases an elevated storage tank may be required for adequate supply and pressure.

A tract recently purchased for a 200,000-square-foot research laboratory is a case in point. Although the site was served by a public water authority, it was discovered too late that the water authority had three wells, with a total production capacity of 300 gallons per minute, and one 75,000-gallon elevated tank. The pumps were started and stopped manually. The system served a growing community with a current population of 1,500. It was quite evident that the planned facility would dry up the rest of the town during peak periods. Progress was delayed while negotiations were carried out with the public authority to improve the supply. It was also necessary to include in the

project a ground level tank and fire pump, costing in excess of $50,000.

Capacity of storm and sanitary sewers should be investigated. Where a small plant must provide its own system, percolation tests should be made; if percolation is poor, a sewage lagoon system could require a much larger site. Large plant installations would need to make arrangements with public authorities for sewer facilities if none exists.

One client bought what appeared to be an adequate site for its 300,000-square-foot plant. Subsequently, the client had to pay to run sewers to an adjoining township system, make a sizable monetary contribution to the construction cost of that system, and—because the sewer system was not completed in time for planned occupancy—build a temporary sewage disposal plant. Thus construction cost was increased $1 a square foot or the site cost went up $3,000 per acre, depending on how project costs were assigned.

The owner of a plant with a need for industrial waste disposal is aware of the tendency toward ever more rigorous and unpredictable controls on the disposal of such waste. Cities, as well as regions, are taking an interest in abating pollution of air and water. One large plant in Denver illustrates how complex this disposal of by-products can become. This plant was forced to abandon its original practice of holding poisonous waste in small lakes when migrating waterfowl were found poisoned in large numbers. This plant is now pumping waste into deep underground disposal wells, only to find that the pressure and greasiness of the waste are now suspect as a possible cause of the recent earthquakes in the Denver region.

Physical Characteristics

The physical aspects of a particular site are of extreme importance. It may be desirable for some plants to have three times the original plant size in usable land; for others, as much as 25 times. Reasons include setback requirements, parking areas, parking access roads, trucking facilities, storage yards, future plant growth and landscaping.

Some physical characteristics deemed undesirable by a realtor or plan manager may be turned to advantage. An architect, after studying the various processes and product-flow diagrams of a plant, may find that such features as sloping ground can be put to use. Remember the old practice of locating the ore-processing mill in the mountains and using gravity to deliver the finished product at the proper level? Separation of the public from processing and separation of raw material from the finished product are also made possible by different grade levels. You have seen many examples of the successful screening of parked cars, achieved by dropping the parking area below sightlines. In northern climates, however, sharp rises or falls from access roads can produce hazardous driving conditions. On the other hand, siting a building to minimize cut and fill, particularly where rock exists, is of extreme importance.

A client recently considering a Richmond, Virginia, site for a 400,000-square-foot warehouse discovered that a study of contours showed even the best building location on the site would require $380,000 in grading costs, adding nearly $1 per square foot to the construction cost. This is a sizable increase for a building that should cost only $8 to $9 per square foot for the total project.

Site configuration is also important. A narrow site, or one with the spur of a railroad limited to one narrow end, could cause constriction of product-flow. Both could cause an extra operational expense over the life of the plant if the logical movement from supply of raw material, through processing to delivery and shipping of finished product is hindered. If the architect is brought into the site selection early enough to study the basic plant-flow processing, these and other errors in site-selection will be avoided.

The image projected by the public view of the plant can be worth much in advertising value. Again, the architect has the ability to visualize the possibilities of the site at the start. Landscaping, dramatic approaches, visible night lighting and third-dimension depth attraction can all create an advantageous "memory retention" for the public.

Before any site is agreed upon, the owner should take an adequate number of soil borings to make sure he knows the cost of proper foundations for his plant. In some cases, land which looks good may require deep footings, stub piles or other relatively costly footings. In other cases, there may be running sand or rock close to the surface.

Although the technology of evaluating subsurface soil conditions has improved immensely, borings are frequently slow and expensive if an entire large site must be examined, and we are turning more and more to specialists who combine geology and photographic interpretation to reveal subsurface conditions. Some soils consultants can, by a brief geological examination and the interpretation of aerial photographs, draw contour maps of the subsurface rocks and predict the direction and flow of underground seepage.*

Other Considerations

Land cost is an item of concern to every owner; however, if most of the other factors are favorable, this one is not the most important, as the value of

* John R. Quay, "Site Selection and the Soil Survey," AIA JOURNAL, January 1965.

the land will usually increase. Often it is well to acquire land several years in advance of actual need, for a desirable site might not be available later, or the cost might be considerably higher.

A common error in site selection is the inability to predict future growth and the resulting need for more land. As a consequence of lack of foresight, a company must sooner or later either split its operation or move to a new location—which, of course, is costly. It should also be borne in mind that, should the time come that a plant is to be sold, the prospective purchaser may want space for plant expansion and the accompanying increased need for employee parking.

Other important factors that must be explored by a would-be purchaser of property are zoning requirements, taxes and special assessments, and unusual circumstances which may affect insurance rates. If an adjacent plant employs some highly explosive or fire-hazardous process, or if there is little firefighting equipment close to the site, the fire insurance rate may be excessive.

The final selection of a plant site usually is irrevocable. It has a significant effect on the ultimate success of the project in terms of cost, time and operation, and cannot be treated lightly. The purchase of a site is an important investment and deserves the talents of experts. ■

SITE SELECTION CHECKLIST

This list should serve as a reminder of pertinent considerations when selecting a site for a proposed industrial facility. When comparing several sites, each could be rated as adequate or inadequate on each item. Depending upon the nature of the facility, some criteria may not apply (particularly those listed under "Living Environment Evaluation").

SITE EVALUATION CRITERIA

A. Living Environment Evaluation

1. schools for children
   a. pupil/teacher ratio (over 30 might be considered inadequate)
   b. instructional $ per pupil
   c. other factors
      - number of private and parochial schools
      - total size of school system
      - condition of facilities
2. housing for sale or rent
3. attractiveness of community
   a. general appearance by inspection
   b. outstanding features, i.e., large lake, campus, etc.
   c. existence of planning board and zoning ordinances
   d. existence of board of realtors
   e. existence of architectural board and advisory committee
4. travel to universities (applicable where research facilities are contemplated—over an hour would be inadequate)
5. taxes for employees
6. local recreation and cultural activities
   a. local swimming, public and private
   b. golf courses, public and private
   c. other sport facilities
   d. theater, concerts, museums
   e. other cultural
7. churches
8. medical care
   a. hospitals (minimum adequacy is one hospital within 30 minutes' drive—consider number of beds, number of admissions, personnel
   b. physicians and dentists—number
9. quality of local government, police, fire protection
   a. form of government
   b. per capita expenditure for police
   c. per capita debt
   d. per capita expenditure for fire protection
   e. fire insurance rates

B. Building Site Location Evaluation

1. initial and future neighbors (determined by zoning, if any)
2. attitude of community
   a. encouraging attitude, evidenced by zoning and other inducements presented by government, chamber of commerce and other municipal bodies
   b. indifferent attitude and mild opposition
   c. outright opposition
3. personnel transportation
   a. air and/or rail service available for visitors and executives
   b. travel time to airports and national rail terminals
4. availability of services (e.g., machine shops, maintenance; chemical supply houses, others required for operation)
5. availability of clerical and laboring help (can be determined by interview with employment agencies and other employers in the area)
6. publicity in location—advertising value of location
   a. interstate traffic highway
   b. local traffic highway
   c. local street
7. hotels, motels and restaurants (necessary for corporate traffic)
   a. available within 15 minutes' travel
   b. available within 15-30 minutes' travel
   c. available within 30-60 minutes' travel
8. rail services
   a. adequate service
   b. reasonable rates
   c. cost by RR or owner
9. highway improvements—state, federal or local
10. building codes—will desired construction be permitted without fireproofing or firewalls?

C. Physical Site Characteristics Evaluation

1. available usable area—how much of site may be unusable due to existence of
   a. setback requirements
   b. streams or swampy areas
   c. utility or public rights-of-way
   d. other
2. attractiveness of site
3. topography
   a. suitability for building without excessive cut and fill
   b. if rail service is required, is rail elevation suitable for access to building area?
4. subsurface conditions
   a. evidence of rock or unusually soft underlayment
   b. subsurface water filled ground or natural terrain

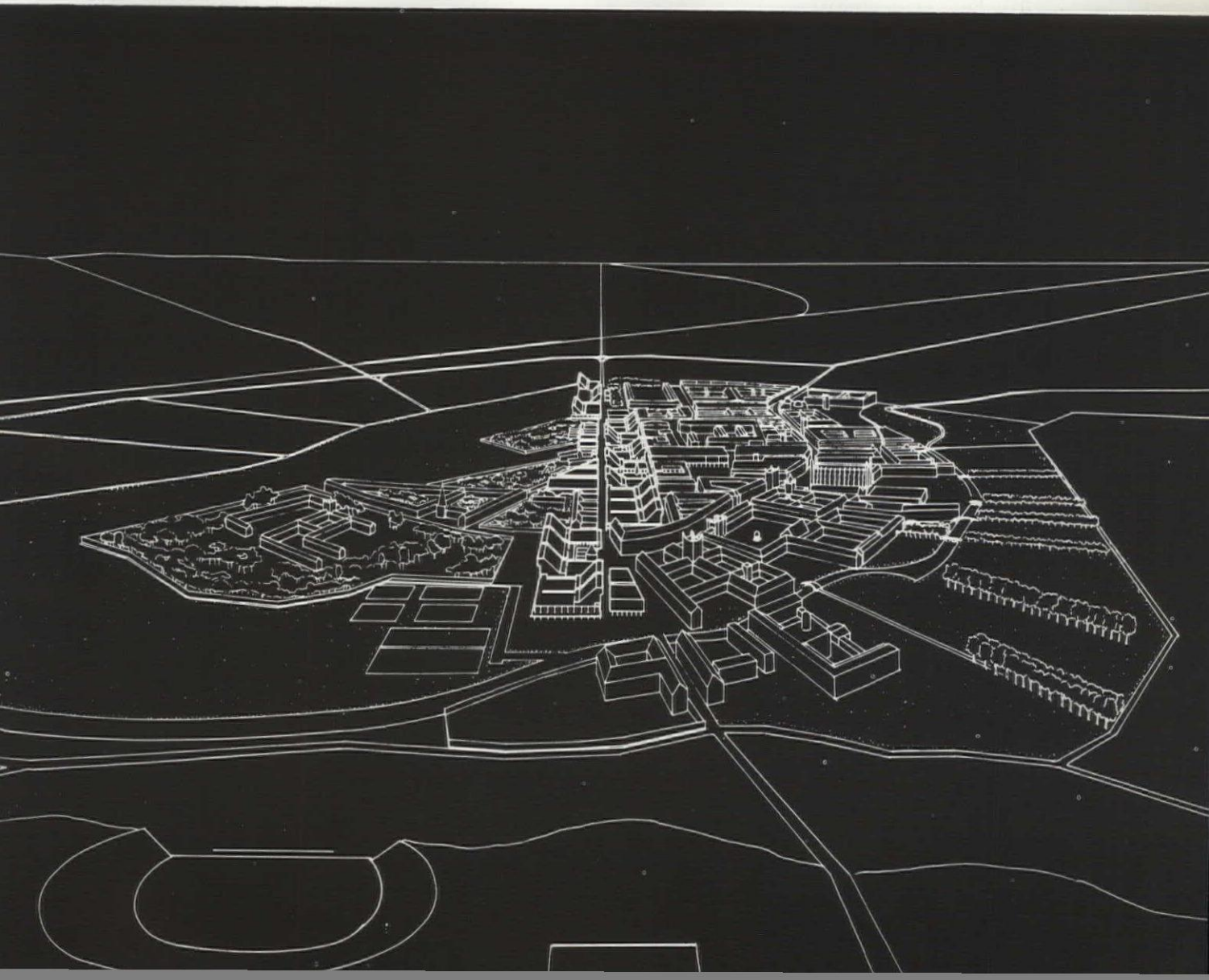
D. Utilities Evaluation

1. electric power
   a. available single source or double source
   b. rates
   c. type of service
   d. ownership of substation
2. water—public, adequate main and source for
   a. domestic use
   b. fire protection
3. sewage
   a. public sewer of sufficient size available
   b. type of private disposal require effluent discharge available
   c. industrial waste disposal
4. gas
   a. suitable main available
   b. special regulations

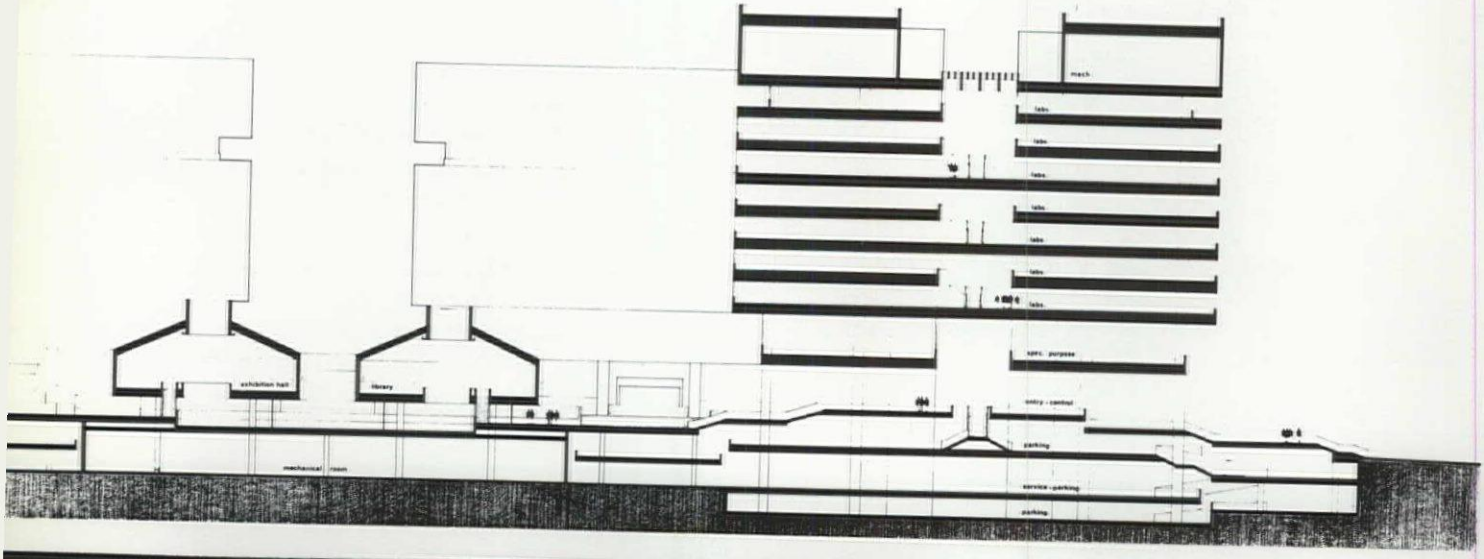
1966 Rome Prize

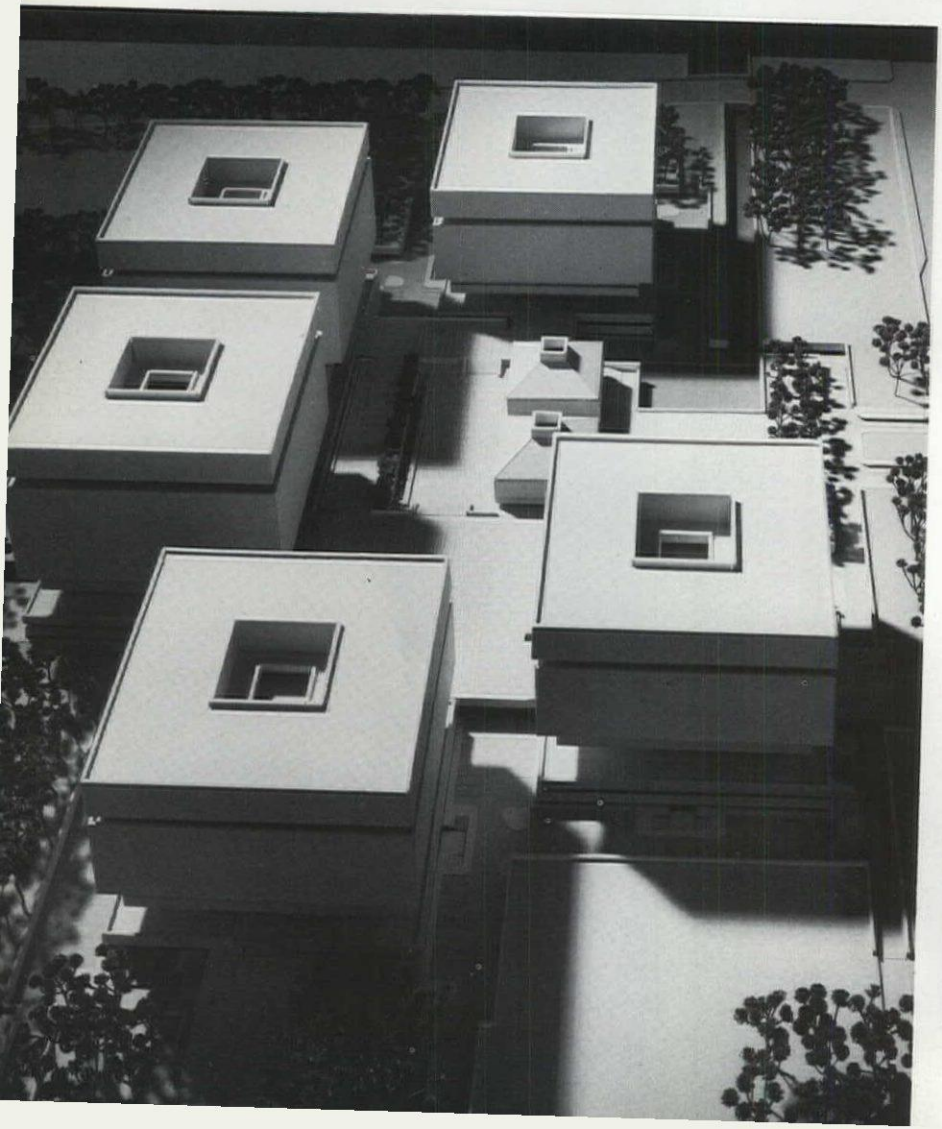
AUSTRIS J. VITOLS
THOMAS V. CZARNOWSKI

Prize-winner Vitols, 26, whose married students' dormitories, a fifth-year design problem, appears at left, received a Bachelor of Architecture degree from the University of Minnesota and a master's, in 1965, from MIT. He has had professional experience with Leonard S. Parker AIA, Pietro Belluschi FAIA and Eduardo Catalano. Czarnowski, 23, studied at Princeton and Cambridge Universities and this year received from Princeton a Master of Fine Arts degree (architecture). His plan for Cambridge, England, appears below (and p. 63).

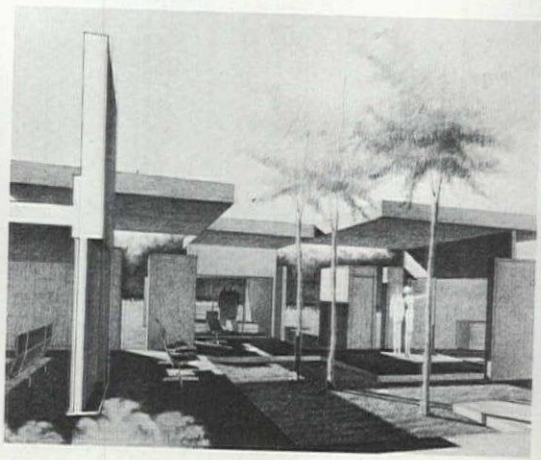


1966 ROME PRIZE

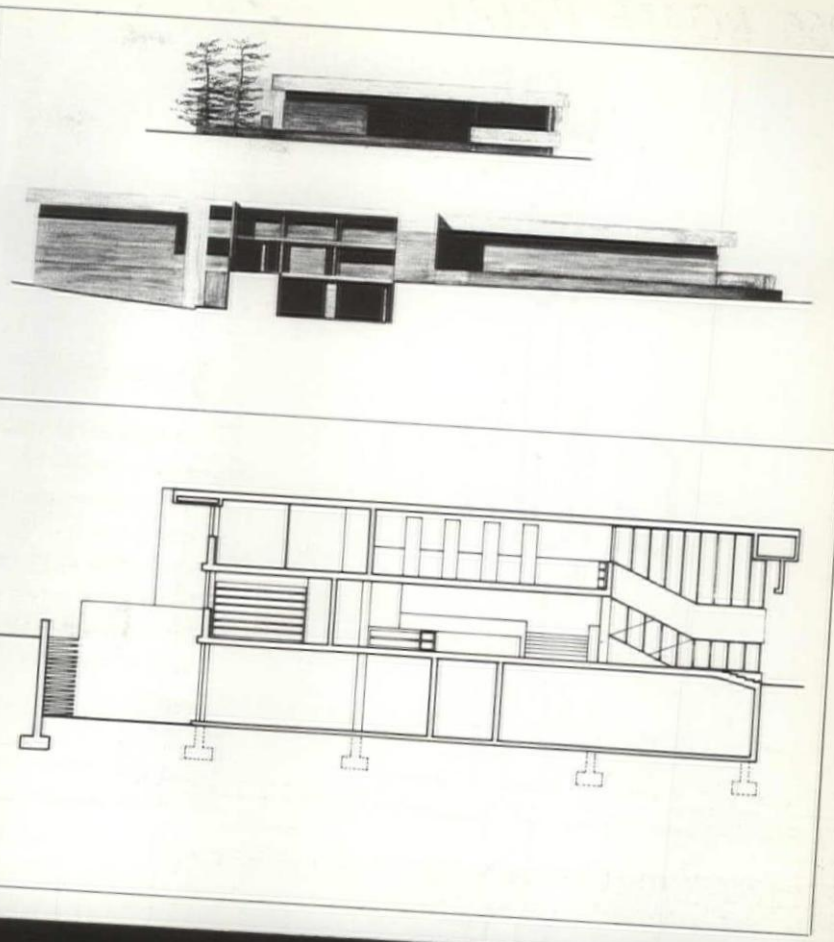




NASA Research Center at Cambridge, Massachusetts, above and at left, had objective of initial completeness but was designed to accept growth. Multilevel plaza covers parking, mechanical room. Below is a vacation house, another fifth-year design problem for Vitols, Latvia native.



third-year design problem of Czarnowski, ennington, Vermont, native who has worked or Doxiadis Associates, was the public library or Princeton, New Jersey, at right. Plan for ambridge, England, a teamwork project with . S. Fraker Jr. and A. H. Peake, showed "for te first time how the whole fabric of present ambridge would regenerate" to accommodate nlarging demands. View across Christ's Pieces reen, below.

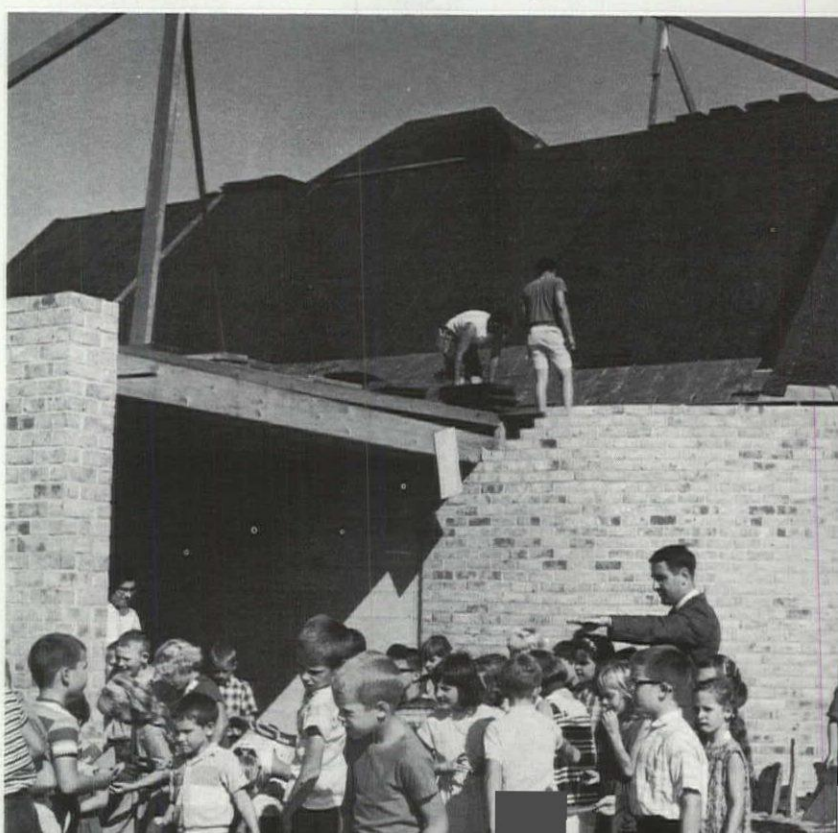


HERE IS THE CHURCH AND HERE IS THE STEEPLE

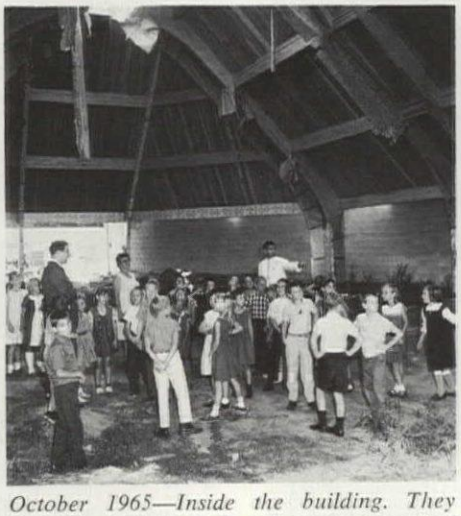
When the congregation of Faith United Presbyterian Church, Medford, New Jersey, got ready to build, its members had a site adjoining the grounds of the Haines Elementary School and the services of Hassinger & Schwam. Architect Herman Hassinger AIA, conscious of efforts by The American Institute of Architects to present the story of the profession to groups of all ages, decided that the evolution of the church building from concept to finished reality would provide a very practical demonstration of architectural services for the students at Haines—especially the second-graders whose classroom windows looked out on the church site. With the cooperation of the school principal and the pastor of the church, he proceeded to put his plan into action. The photos on these pages, together with excerpts from Hassinger's diary, tell the story.

May 1965—First trip to the school. I talked a little about architecture, told children that a building is sort of like a cake—plans and specifications and the recipe. We showed them slides of the proposed church but found they could more easily identify with the model.

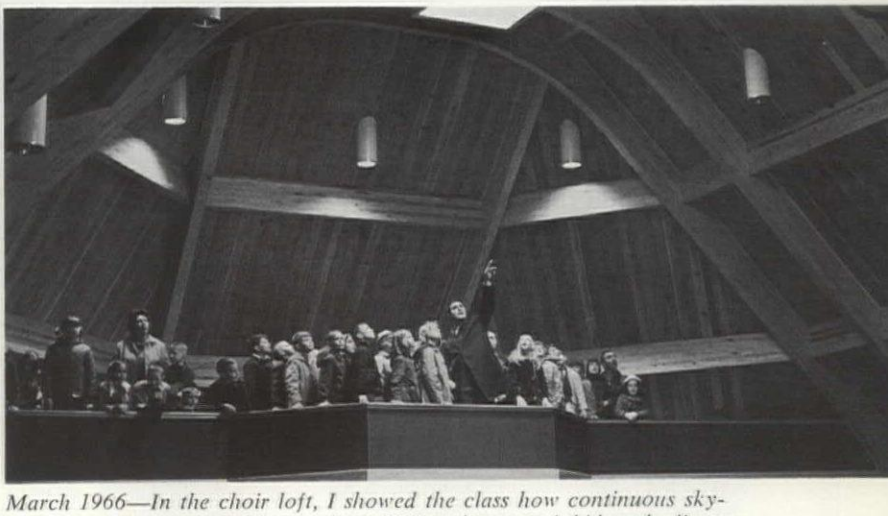
September 1965—Church has grown—kids, too. They're third-graders now. They were fascinated by the diversity of materials; especially liked the slate when we told them it had been a muddy ocean floor millions of years ago. Each child took home a souvenir scrap.



June 1965—Returning to class after a site visit. Kids were deligted to learn that many of their fathers' jobs are directly or indirectly related to architecture. We told them what to look for this summer as the structural frame and walls of the church go up. Several posed the client's classic question: "When will it be done?"

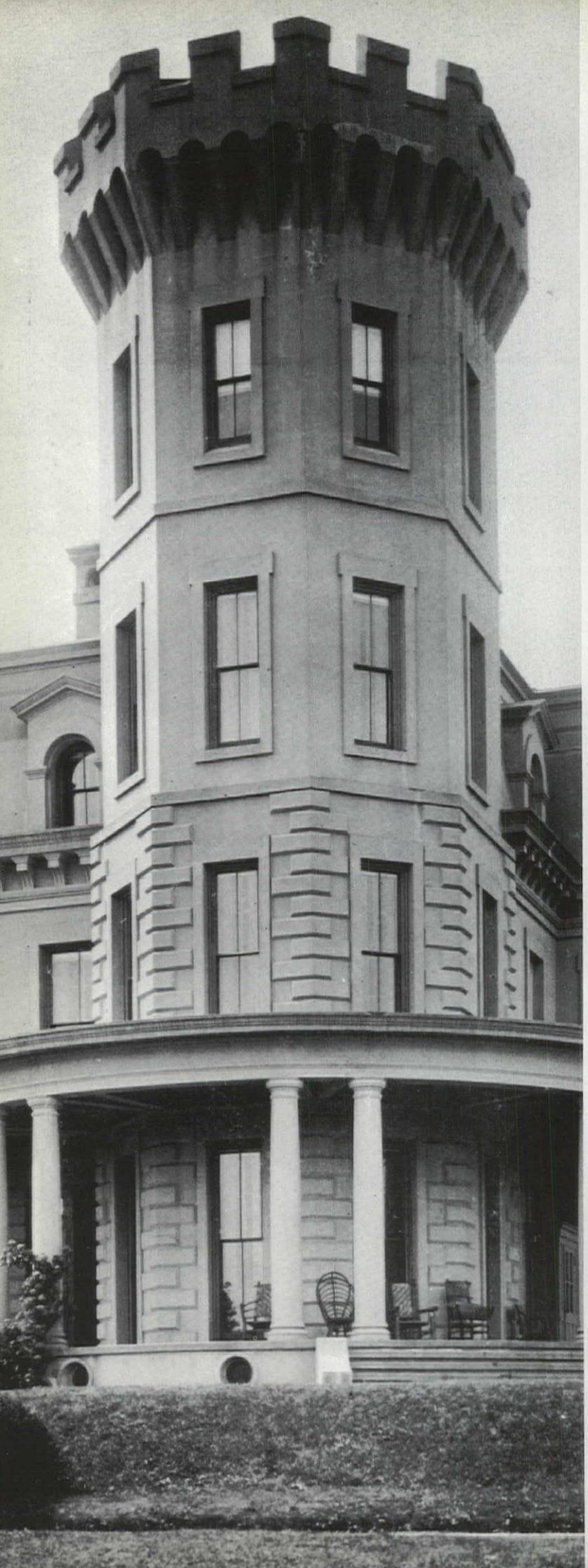


October 1965—Inside the building. They were amazed by colored-paper wrappings still on laminated members and by the fact that the floor was unpoured. "Three months ago, this was a cornfield," we reminded them.



March 1966—In the choir loft, I showed the class how continuous skylight provided natural illumination. We've discovered kids ask direct questions—"What is that? What's it made of"—and want straight answers. When they asked, "Why did you do it that way?" I said, "Because I like it that way."

April 1966—The job is finished, and with it our informal course in elementary architecture. The 7- and 8-year-olds have been great—just emerging from a self-centered world and wanting to know about things.

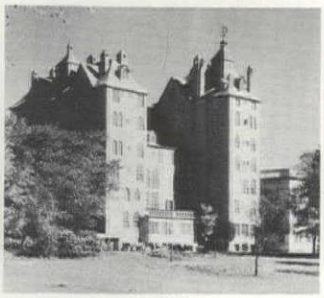


CONCRETE COMES OF AGE

More architects have used concrete with greater freedom and imagination since 1950 than in all the previous 100 years, thanks to major developments in structural design and new methods of fabrication and construction. Part of the credit can be shared by the Portland Cement Association, the Chicago-based organization which is celebrating its 50th anniversary year in 1966. Backed up by the largest and most completely equipped laboratories of their kind in the world, PCA serves as a clearinghouse to narrow the lag beween research and actual field application of improved techniques. The following four articles—touching on historical highlights, codes, design and technology—have something to say about the past but, more significantly, point the way to the future.

The first application of tilt-up concrete in a multilevel structure is used to build a three-story hotel in Arizona in 1910.

1914: Bucks County Museum, designed and erected during a two-year period at Doylestown, Pennsylvania, without services of an architect, engineer or contractor, and with the help of only one skilled worker—a boss carpenter who directed the labor of scores of young neighborhood farm hands. Dr. Henry



1914

Chapman Mercer, lawyer and collector of colonial implements and tools, planned his 115-foot-high structure from the "inside out," often building on the spot around the exhibit materials. He may have been the innovator of double-glazed picture windows with concrete casements outside and wood frames inside. (Dr. Mercer received the AIA Craftsmanship Medal in 1921 for his work in ceramics.)

1920

1920: Bahai House of Worship, Wilmette, Illinois, probably the most ambitious architectural concrete project of its time and under construction until 1949. Louis J. Bourgeois, who studied the form and details of the temple by means of a large and minutely faithful clay model, had envisioned a dome of sculptured stone, but its cost would have been impossible.

1922: Mayan Theater, Los Angeles, designed by Morgan, Walls & Clements with large panels of deeply incised detail formed against molds of wood blocks and plaster.

The first lightweight aggregate concrete block is produced in 1923.

1922

1926

1926: The Parthenon, Nashville, an exact duplicate of the Greek structure and the sole relic of the Tennessee Centennial Exposition in 1897, restored by Russell E. Hart. As one critic put it, "What this project lacked in originality, it fully made up in scholarship and ingenuity."

A temporary structure—dairy barn—at the Chicago World's Fair is built with a multiple-barrel shell roof in 1932, and folded concrete shells appear for the first time on US buildings four years later.

1939

1953

1939: National Naval Medical Center, Bethesda, Maryland, enclosed with 400,000 square feet of precast concrete panels in 500 different shapes. Paul Cret was consulting architect for the Navy designers of the 20-story structure, a forerunner of what was to happen in the 1950s and '60s.

Hyperbolic paraboloids and the lift-slab method both make their appearance in the US in 1950, with prestressing of concrete beginning the following year.

1953: War Memorial Center on a 40-foot cliff overlooking Milwaukee and Lake Michigan, Eero Saarinen's first major exploration of reinforced concrete, along with the MIT Kresge Auditorium.

1956

1959

1956: Guggenheim Museum on New York City's Fifth Avenue, probably Wright's most daring project, a combination of his early addiction to bold horizontal masses and his later fascination with circular forms.

1959: TWA Terminal at John F. Kennedy Airport, New York, another Saarinen work, with four interlocking vaults which act on surface-resistant principles.

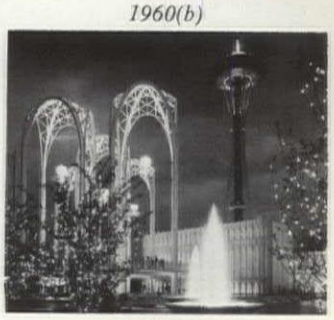
1960(a): Benedictine Priory and School of St. Mary and St. Louis, an imaginative arrangement by Hellmuth, Obata & Kassabaum of two levels of thin double-curved barrels which intersect to form a circular auditorium on a hilltop just out of St. Louis.

1960(b): Marina City, the tallest reinforced concrete structure in America, designed by Bertrand Goldberg FAIA for a downtown Chicago site. Its twin 588-foot-high cylindrical cores, topped by climbing cranes, leaped skyward three floors at a time, while the helical ramps of the garage areas and pie-shaped apartment floors followed along.

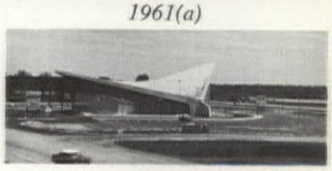
1961(a): Federal Science Pavilion, planned for Century 21 Exposition and now part of the Seattle Center, one of Minoru Yamasaki's fanciful expressions in precast concrete.

1960(a)

1960(b)



1961(a)



1961(b)

1961(b): Edens Theater, Northbrook, Illinois, largest single saddle shell built to date in the US. Perkins & Will devised a 4-inch-thick shell with its gradually thickened edge ribs to span 221 feet over the columnless interior of the 1,350-seat structure.

Construction starts in 1965 on the Lake Point Tower in Chicago, which will supplant 1000 Lake Shore Drive Apts. as the world's tallest concrete building upon completion. Schipporeit-Heinrich & Graham are the architects. ■

What the ACI Code Means to the Architect

BY PAUL F. RICE

Changes in building regulations governing use of reinforced concrete can simplify the architect's task, make construction easier, speed up field work, save money.

ARCHITECTS and engineers 60 years ago recognized the potential of reinforced concrete for economy, fire resistance and general utility.

There was, however, no unanimity regarding design procedures using the material. Individual engineers developed and patented widely differing "systems" for flat-slab construction, and wary building departments required proof-testing or performance bonds before issuing a building permit.

Each city had its own independently developed building code; vendors of building materials produced their own structural designs, including the cost in the price of the material. The architect had little contact with, and virtually no control over, the structural designer.

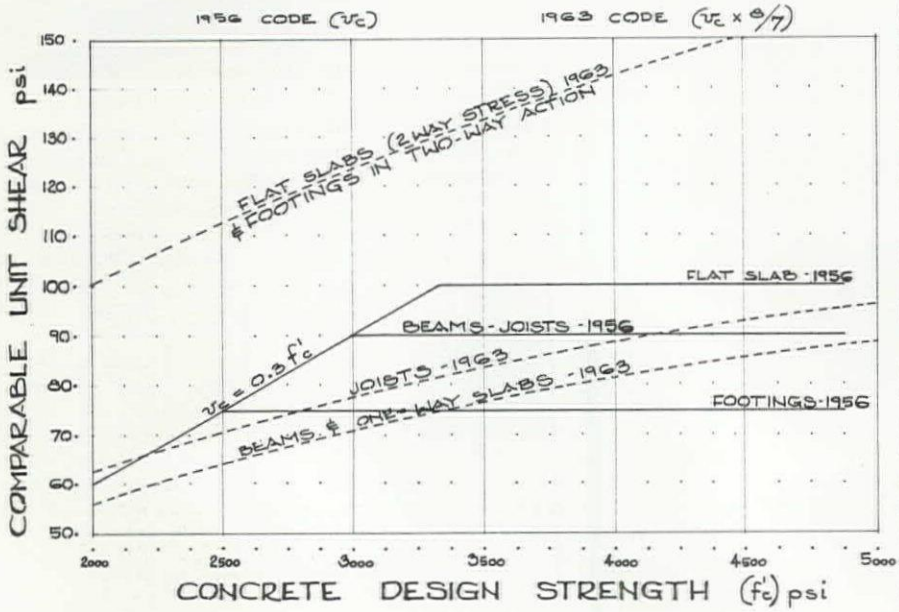
Spurred by this confusion, and by economic pressures which were slowly forcing utilization of reinforced concrete on a uniformly safe basis, a joint committee was formed in 1904 with representation from The American Institute of Architects and five other professional and manufacturing organizations.* The 1916 report of the joint committee incorporated the first nationwide standards relating to safe and economical use of reinforced concrete.

As frequently happens, technology ran well ahead of cumbersome committee procedures, and in the years which followed, it became impossible for the joint committee to keep its code abreast of current research and development. Gradually the committee delegated its code-writing function to the American Concrete Institute, with the result that its code has become virtually the standard in the United States. (Since 1960, it has also been largely followed in Canada and, with the addition of earthquake provisions, in Mexico City.)

In addition to its use in most of the national model codes, the ACI code is also used in most of the newly created state codes, either by reference or—where local regulations forbid such adoption by reference—by inclusion in full.

Promulgation and adoption of each new revision to the ACI code is generally rapid; occasionally, however, cities (including New York and many West Coast municipalities) write their own codes by copying the greater part of the ACI code and then incorporating special requirements. This necessarily delays adoption of revisions. Thus in New York the 1956 ACI code, with modifications, is still in effect; however, the city is working toward adoption of the 1963 edition.

*American Concrete Institute; American Railroad Engineers Association; American Society of Consulting Engineers; American Society for Testing and Materials; Portland Cement Association.



1963 ACI Code

In the 1956 code, allowable stresses for concrete were very simply expressed as fractional ratios of the concrete's breaking strength in compression. Allowable unit shear, for instance, was 0.03; concrete-to-steel bond stress was 0.1.

As the trend toward higher-strength concrete became more firmly established, however, it was found that these simple ratios of shear and bond strengths to the compression breaking strength of the concrete became less accurate. For example, designs for shear in concrete joists under provisions of the 1956 code are approximately the same as those in the 1963 code for concrete of one strength: 4,000 psi (see graph below).

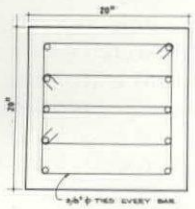
Up to 3,000 psi, the 1956 code gave shear strength as a flat 0.03 of the breaking strength in compression. For all higher-strength concretes, shear was limited to 90 psi (the same as that for 3,000-psi concrete). In the 1963 revision, the relationship of joist shear to compression strength is a curved line falling below the old straight-line arrangement up to 3,000 psi concrete. It then crosses the old limiting straight line of 90 psi at about the 4,000-psi concrete level. In other words, the 1963 code generally gives slightly larger allowable stresses in joist shear for higher-strength concrete. For concrete strengths below 4,000 psi, lower shear stresses are allowed.

For example, the architect or engineer wanting minimum joist size might now have to use higher-strength concrete, which would happily produce other benefits: stiffer floors and the elimination of compression steel. Thus the overall effect on economy would not be greatly altered, even though the design would be different. The

EVOLUTION OF CODES, DESIGN METHODS AND PRACTICE

As shown by comparative designs from CRSI Design Handbooks: Vol. I, *1956 Code* (discontinued) vs. Vol. II, *1963 Code Working Stress Design* and *Columns by Ultimate Strength Design* (scheduled for release Dec. 1, 1966).

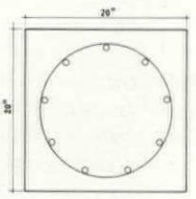
Problem: Select a reinforced concrete column for a total load of 185 kips (95 kips dead load, 90 kips live load) acting with an eccentricity of 10″



f'_c = 3,750 psi
f_y = 50,000 psi
10 = #10 bars

Steel lb/ft	
Verticals	43.0
Ties	4.0
Total	47.0

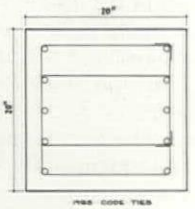
Square Tied Column—1956 (WSD)



f'_c = 3,750 psi
f_y = 50,000 psi
9 = #11 bars

Steel lb/ft	
Verticals	47.82
Spiral	18.1
Spacers	2.1
Total	68.02

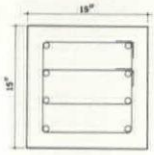
Square Spiral Column—1956 (WSD)



f'_c = 3,750 psi
f_y = 60,000 psi
10 = #8 bars

Steel lb/ft	
Verticals	26.7
Ties	2.0
Total	28.7

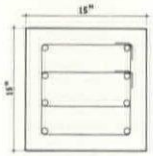
Square Tied Column—1963 (WSD)



f'_c = 3,750 psi
f_y = 60,000 psi
8 = #11 bars

Steel lb/ft	
Verticals	42.5
Ties	2.0
Total	44.5

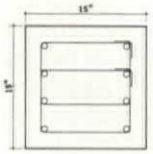
Smaller Column—1963 (WSD)
Same Strength Steel & Concrete



f'_c = 5,000 psi
f_y = 75,000 psi
8 = #11 bars

Steel lb/ft	
Total	44.3

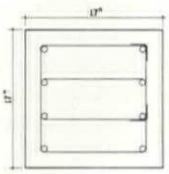
Minimum Size Column—1963 (WSD)



f'_c = 3,750 psi
f_y = 60,000 psi
8 = #11 bars

Steel lb/ft	
Total	44.3

Minimum Size Column—1966 (USD)
Lower Strength Steel & Concrete



f'_c = 5,000 psi
f_y = 60,000 psi
8 = #10 bars

Steel lb/ft	
Verticals	34.4
Ties	1.8
Total	36.2

Minimum Size Column—1966 (USD)
Same Strength Steel & Higher Strength Concrete

gist of the 1963 revision is therefore to encourage use of higher-strength concrete in structural elements such as joists, where shear is an important factor, and to give a higher safety factor against brittle (shear) failure.

USD Permits Design Economy

The concept of ultimate strength design (USD) was first introduced in the 1956 ACI code revision. By 1963, detailed code requirements had been completed to permit presentation of USD as a full method. It was integrated as one of two alternate methods, the other being the older working stress design (WSD).

Some consideration has been given toward making USD the *only* method in the proposed 1970 ACI code revision. However, it is almost certain that the application-limiting WSD method will still be carried in the next code to permit a smoother transition from the old to the new.

USD permits maximum design economies, since its formulas are based on the actual strength of reinforced concrete—as opposed to WSD formulas which try to relate the behavior of materials to some preconceived hypothesis, such as the theory of elasticity.

Unless the architect or engineer goes to USD, he cannot realize the major economy available through application of high-strength reinforcing steels. For example, using WSD, 60,000-psi yield-point steel is permitted a working stress of only 24,000 psi. If USD is used —under which working stress is not specifically stated but varies in relation to the live-load-to-dead-load proportions—comparable permissible stress might be 30,000 to 32,000 psi. At the same time, permissible shear is reduced for more safety against brittle failure.

In preparation of the 1963 ACI code, a great deal of work was done to assure architects and engineers that prescribed designs, under

Technical director of the Concrete Reinforcing Steel Institute, the author was with the Portland Cement Association as structural engineer for five years and the American Concrete Institute as technical director for four.

severe overloading, would insure ductile behavior of a reinforced concrete structure. Such behavior is desirable because reinforcement yields gradually, warning the building owner and occupants against further overloading and, finally (again, gradually), deflecting past the point of usefulness if overloading continues. Ideally, such a design never "fails" in the sense of abrupt, outright collapse but only in the technical sense of excessive deflection.

For this reason, the new code has prescribed higher safety factors against concrete failure in shear, bond or compression, and the code has a more uniform but lower safety factor against the yielding of steel. (This latter factor is based on the yield point of the steel and not on its much higher ultimate strength.)

Lightweight-Aggregate Concretes

A current matter of concern to architects is the use of lightweight aggregate concrete. Lightweight aggregate is a synthetic substance manufactured from various raw materials. Its production has become a very big business in the last 15 years; the new material is widely accepted and generally available.

The 1956 ACI code was rather vague about utilization of lightweight aggregate; no specific safety provisions applicable to its use were included.

For the 1963 code, it was necessary to develop a special test for lightweight aggregate concrete to determine its allowable shear value. Many such concretes, for example, are capable of withstanding only two-thirds of the shear forces that comparable-strength ordinary concrete could bear. A few of the lightweight aggregates, it should be noted, are equivalent in strength to normal-weight aggregate concretes.

The special splitting test that was developed was designed to establish the correct shear allowance for each manufacturer's lightweight aggregate concrete.

Thus lightweight aggregate concrete may now be employed with a greater degree of confidence in various applications, such as in shell construction where dead weight is a major factor. The tonnage of reinforcing steel required in shells can then be reduced even more for greater economy.

New methods of concrete control to insure dependably greater strengths are of particular interest in shell roofs because high-strength concrete is quite important in reducing deflection of shells. Deflection determines the time—and sometimes the order and method—of removing formwork from the shell.

High-Strength Reinforcing Steels

Once high-strength steels have been made available in an area, local practitioners take advantage of these steels to achieve construction economies. For example, in such metropolitan areas as Baltimore, Chicago, Cincinnati, Cleveland, Denver and Washington, acceptance of high-strength reinforcing steels has been particularly rapid.

In the southeastern region—including Florida, where design against hurricane wind forces is important—the use of high-strength steels is likewise growing at a fast pace. Most urban areas report a similar trend. Difficulties are imposed by additional design limits required to insure ductile behavior for stress-reversal (earthquake) overloadings on the West Coast.

Application of high-strength steels is also lagging in the New York City area, where, as previously noted, the 1956 code is still basically the statutory code.

Architects and engineers cannot be expected to use the 1963 code or any subsequent revision in all of their daily work until design aids are available to them. The Concrete Reinforcing Steel Institute's *Design Handbook* (Vol. II) and the American Concrete Institute's *Design Handbook* are the two best-known manuals currently available. Portland Cement Association publishes some load tables which are applicable to special situations. Then, too, there are handbooks produced by individuals, but these have limited purposes and are usually not comprehensive.

Load Tables Via Computer

When a new code raises allowable stress and permits more economical construction, a number of the larger and more progressive engineering organizations can immediately put their own computers to work. There has been a recent trend among such organizations to compute their own load tables for the type of design problems that crop up most frequently in their work: load tables for columns and floor systems, if they design multistory apartment buildings; elements of industrial jobs or power plants, if these are the structures in which they specialize.

Not every firm, of course, can afford a computer. Some of the smaller organizations, or older engineers not familiar with computers, may never use them. One possibility which may be attractive to the smaller engineering firm is the computer service organization. The engineers simply take their program to these companies—in English and with formulas worked out on a slide rule—and they will provide a load table for the range of allowable stresses prescribed.

It may be that, in the future, the engineer won't have to wait for handbooks every time a new code is issued; he'll just get his own set of load tables from the nearest computer service organization. Perhaps future design handbooks may consist of standard computer programs.

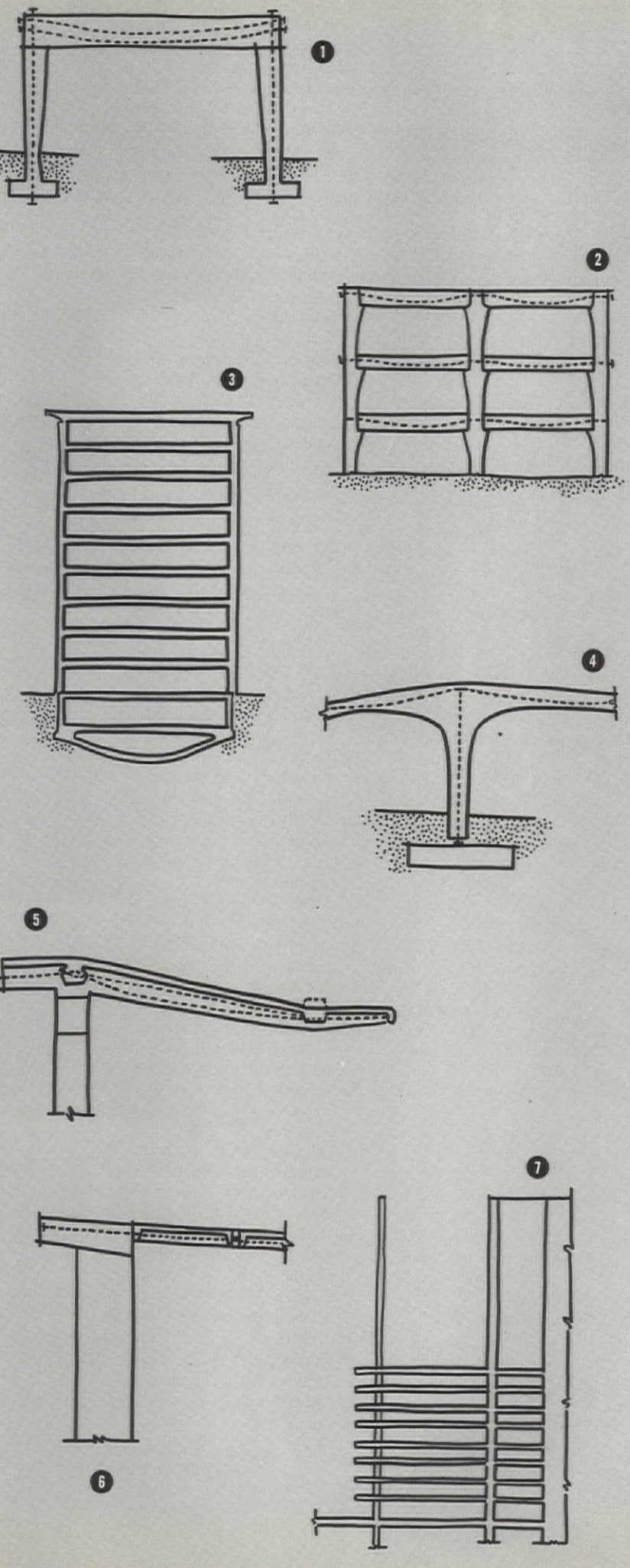
New Developments

To achieve uniformity of, and greater safety in, a finished structure, the 1963 ACI code recognizes certain recent technological developments within the reinforcing steel and concrete. For example, modern cements have higher early strengths. Consequently, the concrete construction industry has turned to the use of higher-strength concretes. The ACI code makes provision for these.

As readymix plants install automated controls, more sophisticated, statistically based specifications for control of concrete strength become possible. The code provides for their application.

As far as steel placement goes, there are limits to the feasibility of requiring watchmaker accuracy in placing reinforcing steel. Not that such accuracy would be impossible; rather, it would be uneconomical in view of the variations in formwork, steel strength and concrete strength. Actually, placement limits in the code are realistic limits that can be achieved in the field, and are reasonable in view of the variations in the component materials.

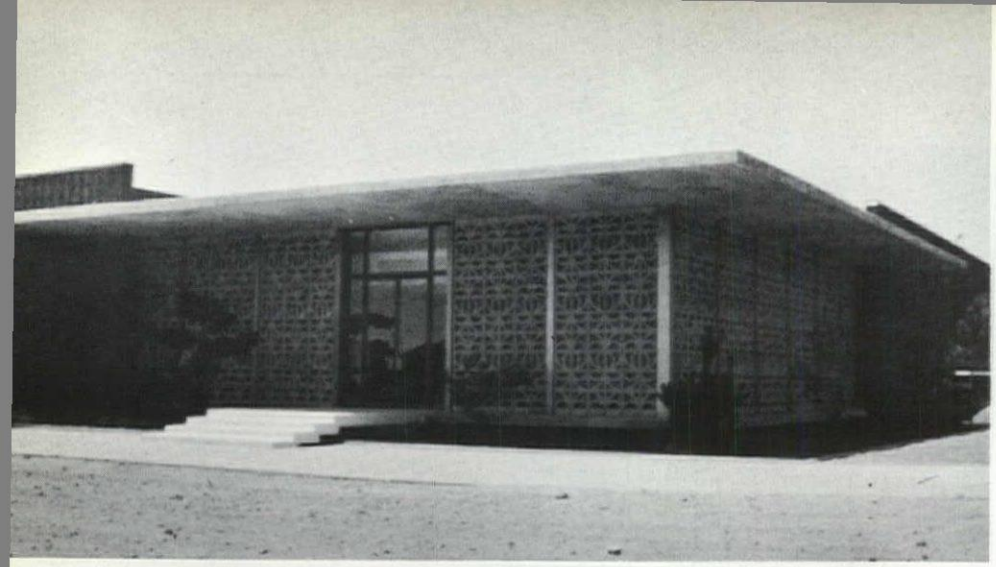
Ordinarily, the ACI code is not of direct concern to the architect; he does not ordinarily apply its detailed rules, formulas, etc. But because the structural engineer with whom he works will provide him with a selection of designs, all based on allowances in the latest code, the architect is indirectly concerned by development of new codes. He is always directly concerned with the "best buy" in construction for his client. ■

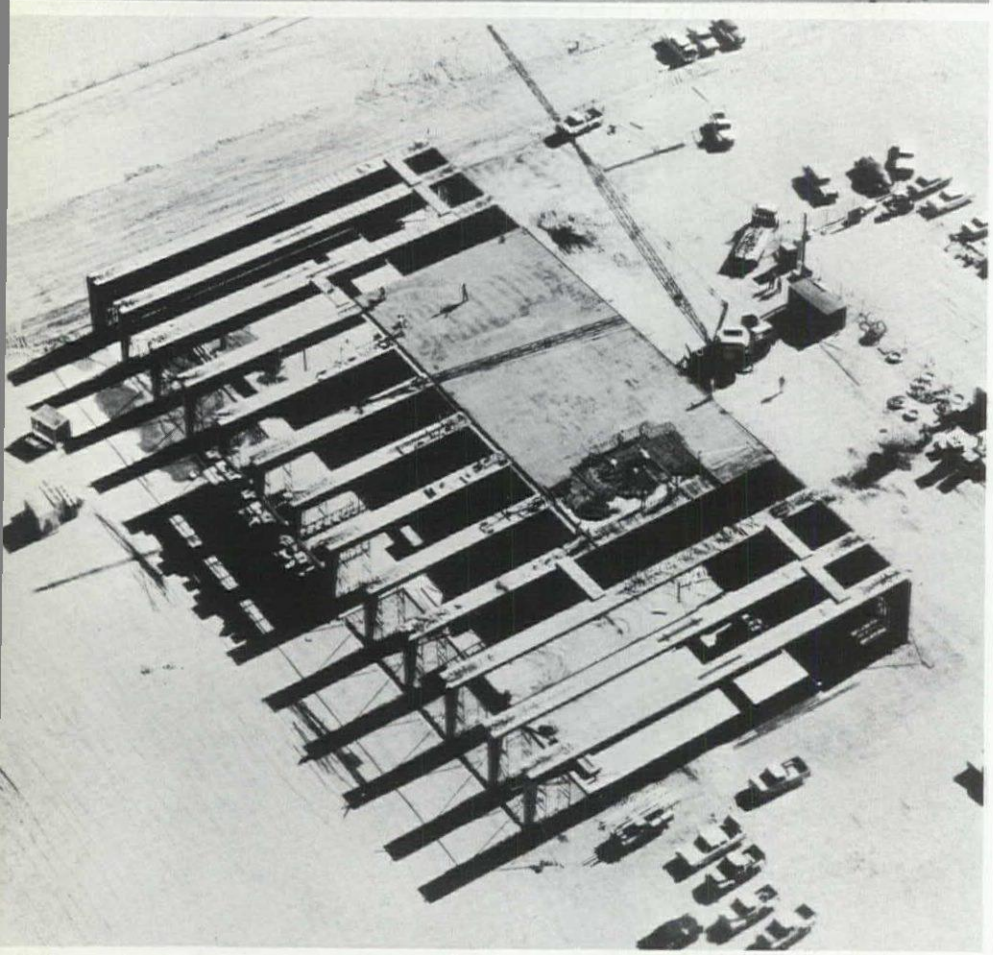


Concrete Comes of Age

Milestones in Prestressed Concrete by T. Y. Lin

Professor at the University of California, Berkeley, structural engineer and acknowledged pioneer in prestressed concrete technology, T. Y. Lin has selected seven projects engineered by him and his consulting firms which represent significant developments in the state of the art. The economics and safety of prestressed concrete structures have been proven beyond the shadow of a doubt, according to Lin. However, the total integration of the structural meaning and potential into architectural forms is only beginning to be explored. A new concept in the balancing of loads and the control of forces in structures is emerging, and this promises new proportions in terms of design. Longer spans at lower costs, taller structures with strong resistance to wind and earthquakes, durable elements and flexible layouts now are available to architects who visualize concrete as a principal building material greatly strengthened by prestressing with high-tensile steel. To Lin, the following projects are only a prologue to greater advances. When the basic advantages of prestressed concrete can be incorporated into the planning stages, then architects can conceive new forms to meet the exacting demands and bold visions necessary for the future of architecture.





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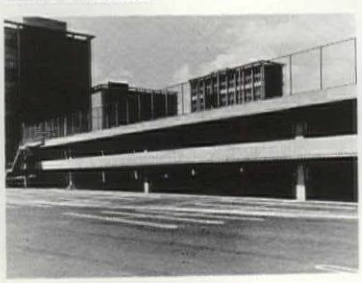
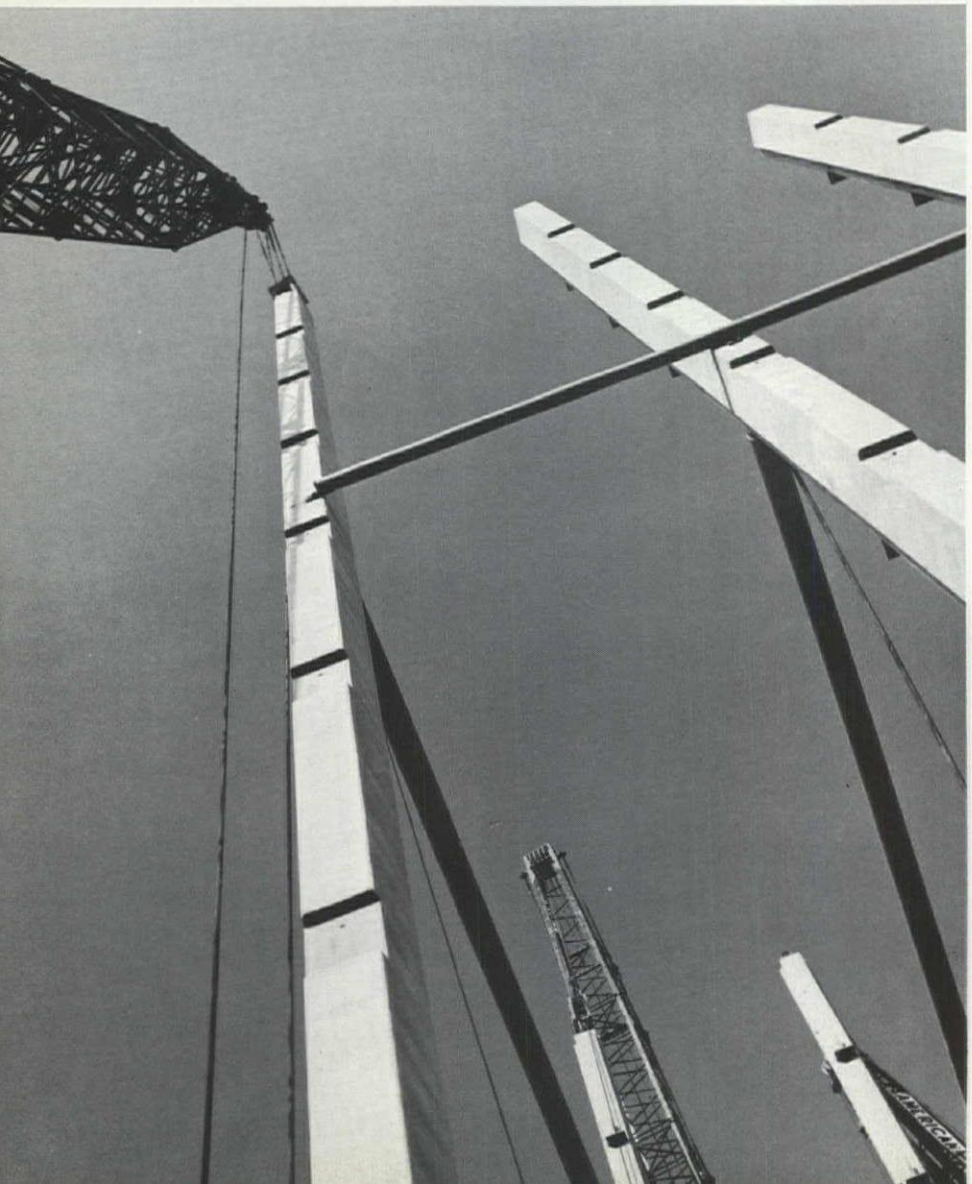
Telecomputing Facilities, Chatsworth, California: T. Y. Lin & Associates, structural engineers. Upward prestressing balances weight of 120-foot precast T-beams which frame the building. Additional prestressing was applied to balance weight of in-place post-tensioned concrete roof slabs. Roof deck is a parking area without membrane.

❷

University of California Parking Structure, Berkeley: Anshen & Allen, architects; T. Y. Lin, Kulka, Yang & Associates, structural engineers. Precast elements were connected to form continuous beams (connection detail shown in construction photo). Precast prestressed elements permitted 60-foot spans, fewer columns; thus available parking space was increased by 5 percent. First cost of structure was also 7½ percent lower than alternative reinforced concrete design with 30-foot spans, more columns.





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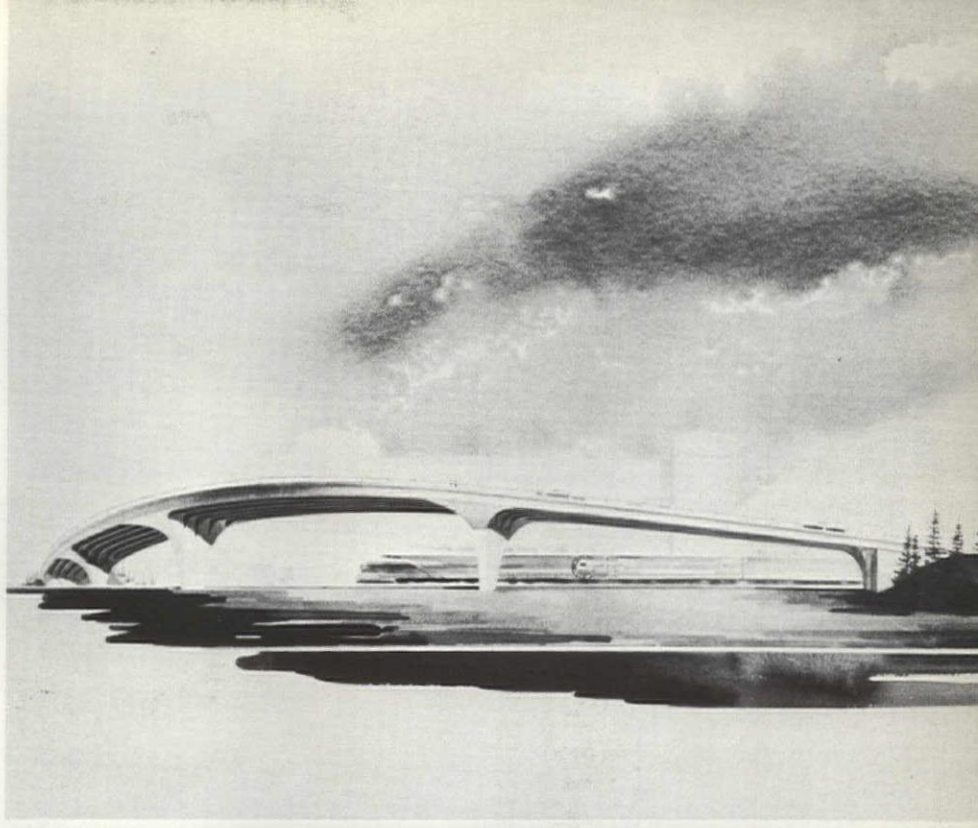
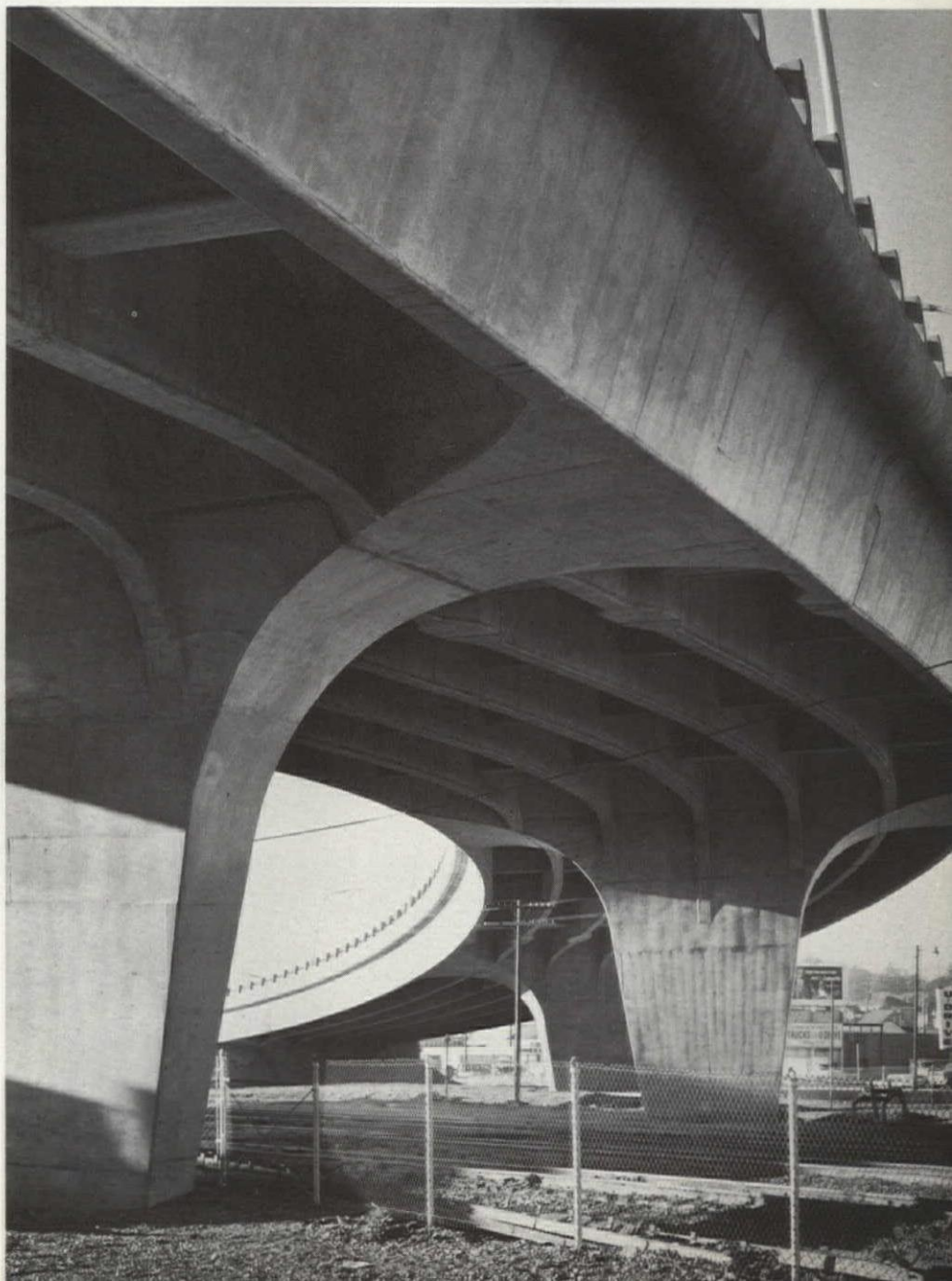
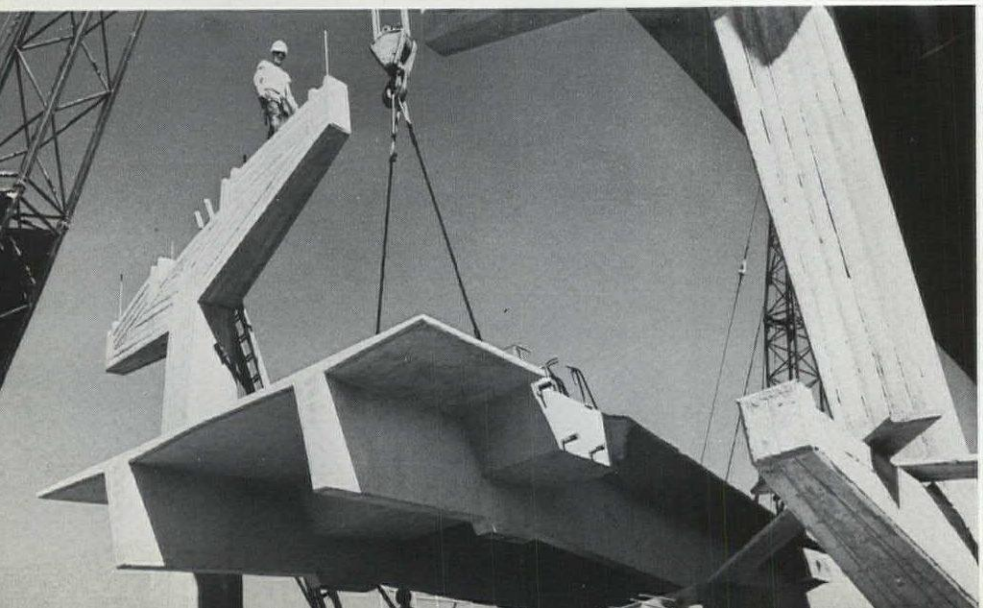
University of California Office Building, Davis: Gardner A. Dailey FAIA, architect; T. Y. Lin, Kulka, Yang & Associates, structural engineers. Entire building used essentially three types of precast components — nine-story columns (each cast in one piece), two-story wall panels and channel-shaped floor sections. Grooves in wall-panel sections were used for visual interest. Building, 36x127 feet, contains no beams, girders.

23rd Avenue Bridge, Oakland: Kaiser Engineers and John Carl Warnecke & Associates, architects; in joint venture; T. Y. Lin, Kulka, Yang & Associates, structural engineers; Lawrence Halprin & Associates, landscape architects. Close coordination between engineers and architects throughout the project resulted in a bridge which fulfills the demand for beauty and economy. Program stipulated "a structure of outstanding design to stimulate redevelopment of the surrounding area." Cast-in-place curved bridge rests on three sculptured piers, all prestressed in three dimensions for stability.







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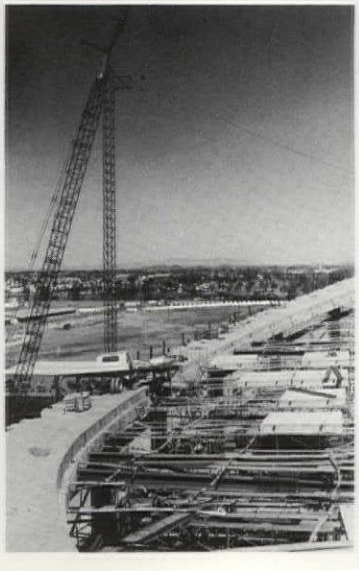
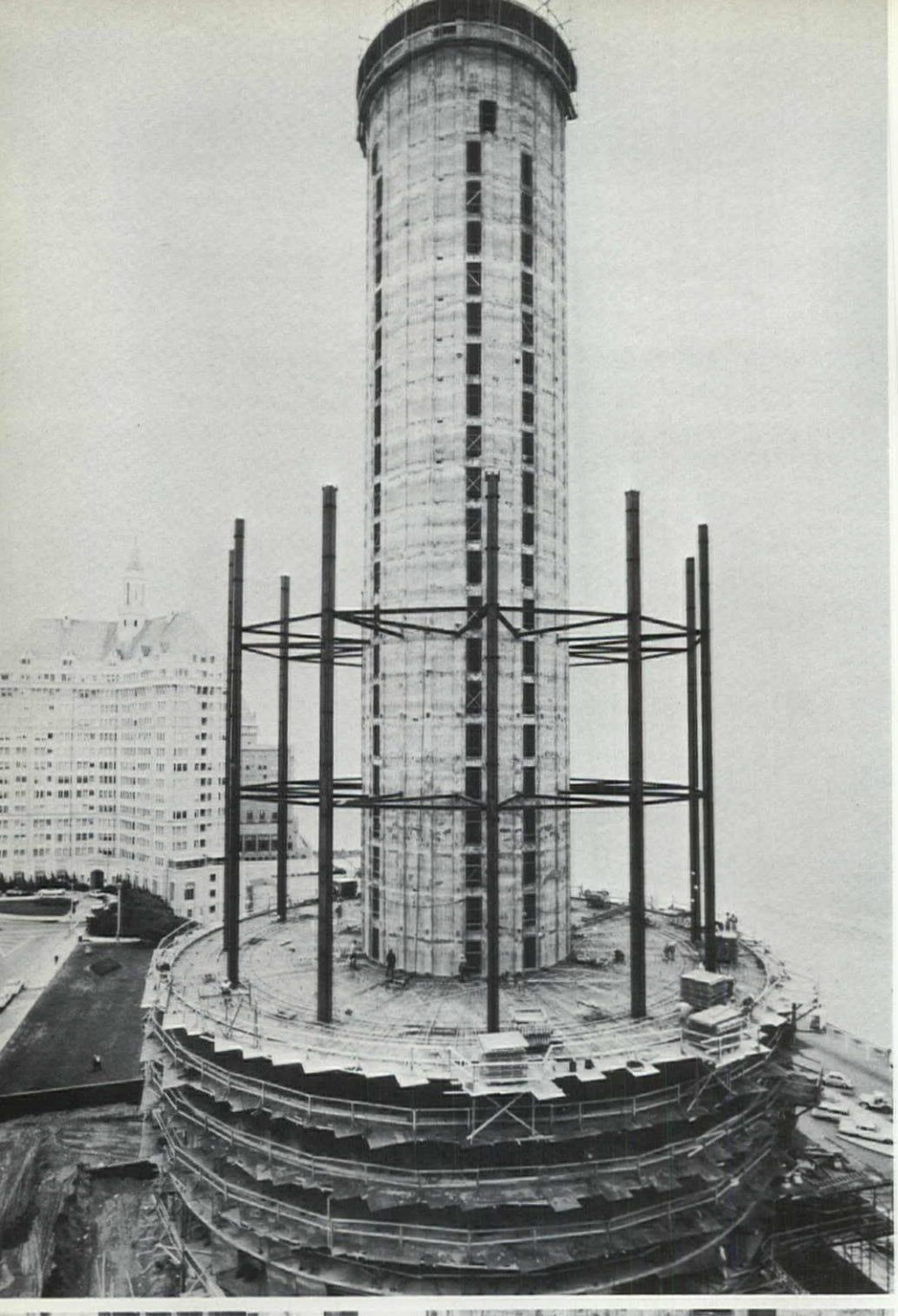
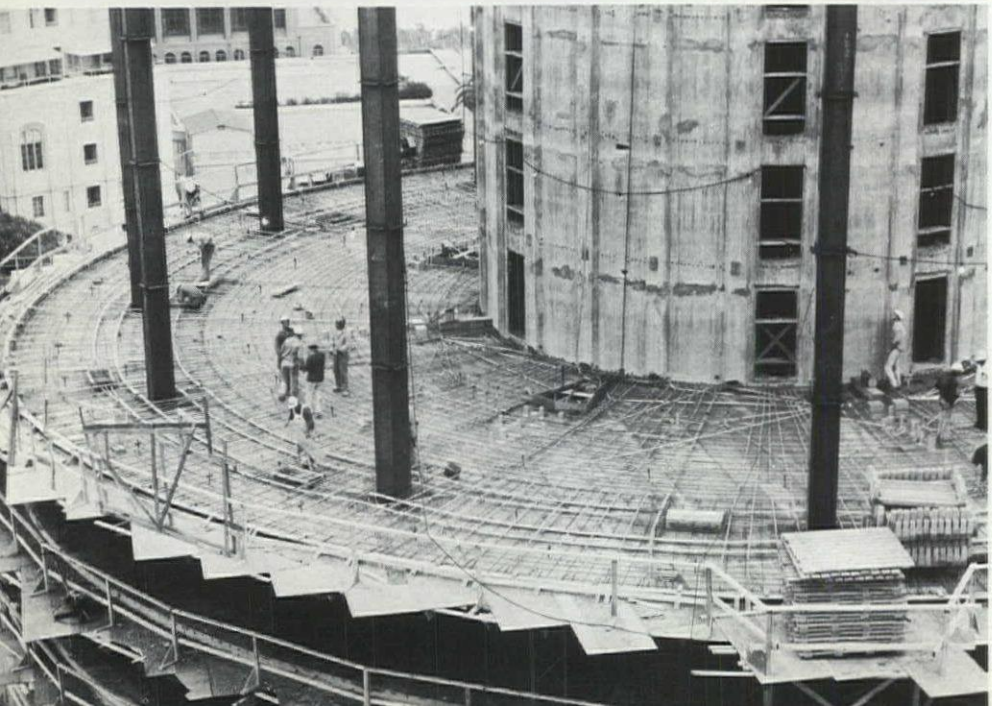
Convention Center, Phoenix: Perry Neuschatz AIA, architect; T. Y. Lin & Associates, structural engineers. The structure, 200 feet in diameter, consists of 40 precast "pieces of pie" tied to a central tension ring. Special shapes were cast in reusable forms, eliminating almost all formwork and falsework.

6

State Fair Coliseum, Phoenix: Leslie J. Mahoney AIA, architect; T. Y. Lin & Associates, structural engineers. Coliseum roof is a circular hyperbolic paraboloid 380 feet in diameter, post-tensioned in two directions. Precast pieces of one shape were used for the shell surface (visible in construction photo), thus effecting savings on intricate formwork which would otherwise be required. Intricate computer analysis helped to make the design safe and economical.







Tower Apartments, Long Beach, California: Carl B. Troedsson, architect; T. Y. Lin & Associates, structural engineers. Central core enclosing elevators (visible at top of construction photo) was slip-formed first, then surrounded by a circle of steel columns tied to the core by post-tensioned floor slabs. The 34-story tower, tallest prestressed concrete building to date, is designed for high earthquake resistance.

Concrete Design with Expansive Cement

BY JAMES F. SIMMS

To the architect, contractor and owner, the use of shrinkage-compensated cement offers a significant step in concrete performance.

A PERENNIAL PROBLEM of architects and engineers working with portland cement concretes has been the tendency of such compounds to crack as a result of drying shrinkage. Design, therefore, has had to be based on the assumption that cracking would occur as the concrete dried and aged. It is now possible to aid this problem by using the newer expansive cement.

At early ages conventional concrete is highly susceptible to micro cracking because it is in tension and has a very low tensile strength. As it ages, conventional concrete attains increasing tensile stress along with increased tensile strength. When the stress exceeds the strength, drying-shrinkage cracks occur.

The basic purpose of a shrinkage-compensated (expansive) cement is to overcome the drying shrinkage inherent in standard concrete, and thus minimize cracking. The graph illustrates the behavior of a shrinkage-compensated, calcium sulfoaluminate expansive cement concrete, compared with that of standard portland cement concrete.

Both undergo shrinkage; however, the expansive concrete has been subjected to an initial expansion which compensates for later shrinkage. Expansion is slight, about that which would occur as the result of a 60-70-degree change in temperature. The expansion is restrained by reinforcing steel, and the steel is thus placed in slight tension. With the steel in tension, expansive concrete is in slight compression—the opposite of the usual condition of portland cement concrete. (An expansive cement can be formulated merely to compensate for the drying shrinkage phenomenon, or it can be used to produce a concrete which will become self-stressed by chemical means.)

By causing shrinkage-compensated concrete to remain in minor compression, ideally throughout its life, tensile stresses can be prevented and drying-shrinkage cracking cannot occur. If less-than-optimum field conditions exist, the maximum potential of expansive concrete may not develop and it may go into minor tension at later ages. However, if the tensile stress remains less than the tensile strength, drying shrinkage cracks can still be prevented.

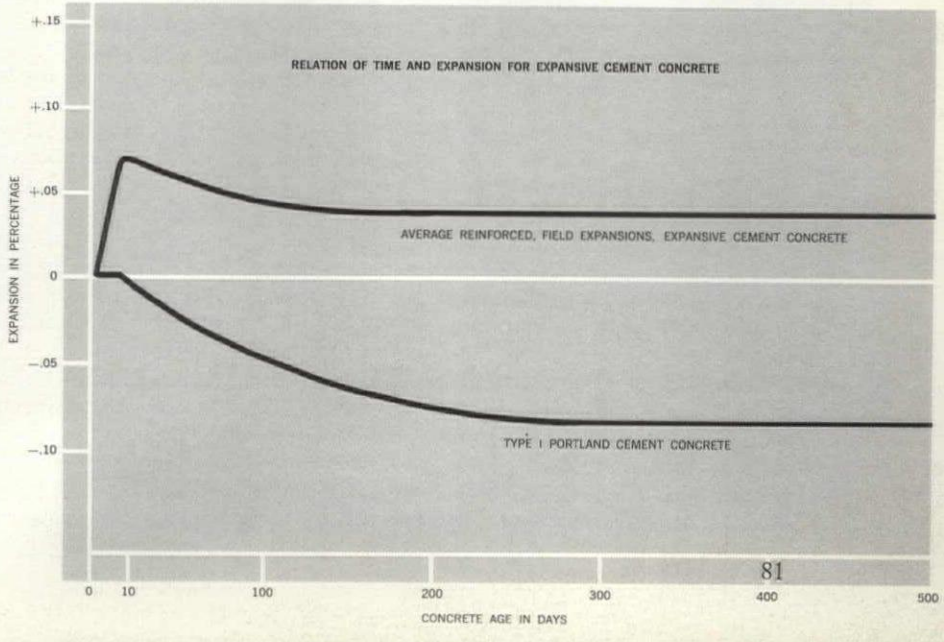
Generally, expansive cements are of three types. ACI Committee 223 (expansive cements) has designated these types as follows: Klein Cement,* developed by Alexander Klein of the University of California; Mikhailov Cement, of Russian origin and High C_3A-High SO_3 Cement. Only Klein Cement, a calcium sulfoaluminate type, has become commercially available in this country. Adjustments in raw material composition permit variations in the rate and level of expansion of the finished cement.

The physical and chemical properties of calcium sulfoaluminate-type expansive cements are generally similar to those of standard portland cements.

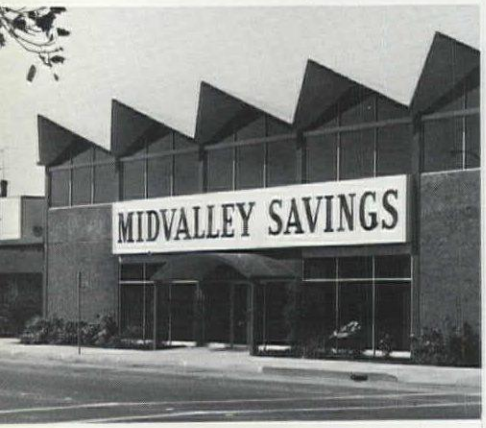
When evaluated as expansive concrete, the early and long-term strength characteristics are similar to those of portland cement concretes. Time of set, flexural strength and modulus of elasticity are also comparable. When used with various aggregates, both lightweight and normal weight, performance

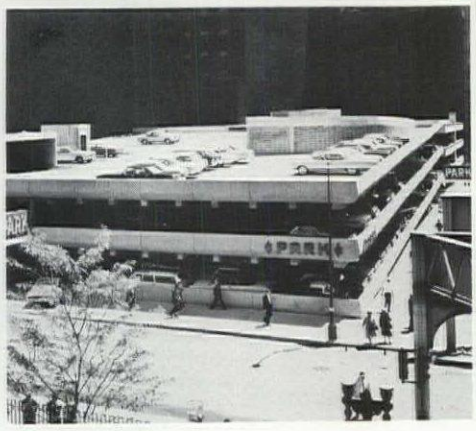
*Klein Cement, a patented composition, is controlled by the Chemically Prestressed Concrete Corp. and is marketed under the registered trademark "ChemComp" shrinkage-compensated cement.

Comparison of volume changes in shrinkage-compensated cement concrete and portland cement concrete (3.5 sacks per cubic yard). Zero represents no change.



The author is director of technical service for Chemically Prestressed Concrete Corp., Van Nuys, California.





Specific applications of shrinkage-compensated cement are illustrated by Pasadena's Fedco Department Store (tilt-up panels); Yuba City's Midvalley Savings and Loan Association Building (folded plates); Chicago's Monroe-Wells Parking Facility (flat slabs).

parallels that of the portland cement concretes.

Recently published studies by the Portland Cement Association show the shrinkage-compensated cement concrete to be at least as freeze-thaw resistant as portland cement concrete. Scaling resistance was shown to be slightly better than that of standard concrete. Limited investigations have shown the bond strength of shrinkage-compensated concretes to be significantly higher than that of portland cement concretes.

Generally, shrinkage-compensated cement is applicable in any reinforced concrete. No design changes are necessary. However, many of the construction practices now used to minimize shrinkage can be eliminated. Specifically, the use of a checkerboard pouring pattern, limiting the size of concrete placements, and use of sawed joints for shrinkage control are unnecessary. Concrete mix design procedures are the same as those employed with standard concretes. Field practices are similar.

Although economics must be discussed in rather general terms, owing to the variations inherent in construction projects, certain economies are obvious. In addition to eliminating such construction practices as the sawing and caulking of joints mentioned above, major economies can be realized by obviating the need for coatings or built-up roofing on exposed decks to insure watertight roofs—a necessity with standard concretes where provision must be made for drying shrinkage cracking. (Eliminating built-up roofing may also permit a more esthetically appealing design.) Long-term maintenance costs can be significantly affected also, by eliminating the need for repair of shrinkage cracks.

Cost of the commercially available expansive cement concrete, on a nationwide basis, is generally 3 to 6¢ higher per square foot than that of conventional concrete. However, field experience has shown that construction and maintenance savings more than offset the higher initial cost.

At this writing, some 2 million square feet of slab-on-grade and well over a million square feet of structural concrete have been placed using shrinkage-compensated cement. Obviously expansive concrete has not yet been utilized in all possible applications. In the 200-plus projects on which expansive cement has been used, successful applications include slab-on-grade, roof decks, parking garages, tilt-up construction, highways, ornamental concrete, grouting applications and gunite. Three projects will illustrate specific applications.

Over 3½ years ago, the folded plate roof for Midvalley Savings and Loan Association, Yuba City, California, was designed by Ronald A. White AIA. It was the first project to use shrinkage-compensated cement. The double-folded plate was executed in concrete without any waterproofing material. Cast in place, the 100x43-foot area has a varying thickness of 3-6 inches. Concrete was placed at a 3-4 inch slump, burlap-cured and showed an average compressive strength of 4,080 psi at 28 days. Although roofing was not used, the building remains watertight today.

Chicago's Monroe-Wells Parking Facility, a four-level garage with a 313-car capacity, was constructed in 1964. The 100,000 square-foot structure has 37-foot spans with 12-foot cantilevers in one direction, and 51-foot spans with 18-foot cantilevers in the other. The flat slab design has lightweight concrete beams with normal-weight slabs and columns. No roofing was placed on the exposed top deck. All concrete was designed for 4,000 psi at 28 days. Average 28-day compressive strength for the 5.5 sack normal-weight concrete was 4,400 psi, and for the 6.0 sack lightweight concrete, 4,500 psi. After two winters of exposure, the structure illustrates the superior crack- and leak-resistance of shrinkage-compensated cement concrete.

Paul R. Williams FAIA designed the Fedco Department Store in Pasadena, California, using shrinkage-compensated concrete throughout. In addition to the 114,000-square-foot store area, there is a two-level, 112,000-square-foot parking structure accommodating 445 cars. The store area was designed with tilt-up panels, some 31x24 feet in size. The major advantages of expansive concrete in panels are resistance to drying-shrinkage cracking and savings in construction time. Tilt-up panels are frequently required to dry or undergo shrinkage prior to lifting, and closure strips are not placed until the panels have undergone additional shrinkage. With expansive cement concrete panels, no waiting is necessary other than the usual time allowed for strength development.

The success of such projects is beginning to point the way to a new era in concrete technology, when design need not take into account the phenomenon of drying-shrinkage cracking. ■

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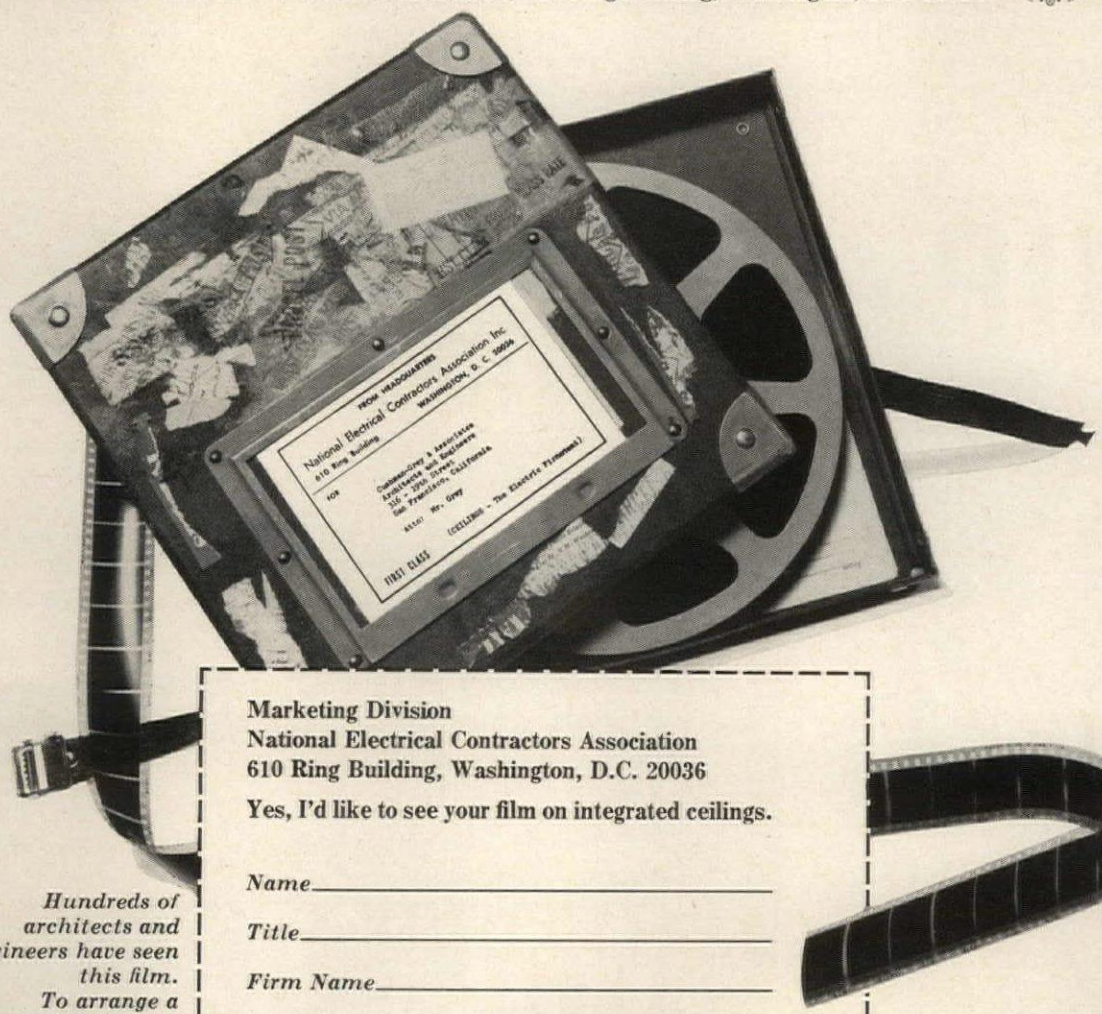

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AIA-106

Report from Princeton

NOW MIDWAY in its assigned duration of two years, the AIA Education Research Project will develop over the year ahead curricula tentatively rooted in a 2-4-6-8 approach.

"Although specific new curricula and course descriptions will be included in the recommendations of the project, they are intended as illustrations of a method rather than a model to be copied by the schools," Robert L. Geddes AIA, project director, explains in a recent progress report.

The 2-4-6-8 arrangement is described in a section of the report which says:

"A first draft has been prepared of a projection for the overall general structure of environmental design education. This draft is intended as the basis for continuing discussion and analysis during the coming year . . . and will be developed into one of the final recommendations of the project.

"The projected structure visualizes a coordinated series of academic programs for technicians (2 years) technologists (4) professionals (6) and specialists (8). It is designed to encourage the training of a broad spectrum of skills to graduated levels of professional responsibility without restricting the diversity of the approach to education among the schools.

"This scheme will allow people to enter the field from a number of diversified preparatory paths; to change direction and emphasis during their academic careers without severe penalties; and to reach many different kinds of stopping points in their education before employment."

Geddes points out that the diversity characteristic of environmental design education in America is expected to continue but methods for defining objectives, describing techniques and evaluating results will have been "clearly established."

Geddes, dean of the School of Architecture at Princeton University, is assisted in the $100,000 project by Bernard P. Spring AIA, senior research architect, Princeton. Architectural schools across the nation also have been involved in the undertaking in one way or several. To date, the Geddes report indicates, considerable information from the schools, their faculty members and their students has been gathered and examined.

Architects, too, have been part of what Geddes describes as concentrated efforts during the first year toward "the clarification of the problems and objectives of environmental design education." This fall, however, the scope is being widened to include clients and members of other design professions.

The report tells of planned meetings with "representative clients" and education consultants "in order to further clarify the needs and directions for change."

To date, however, it is the schools that have had by far the most involvement with the project. Many of the schools, influenced by the work of the research staff as

Continued on page 92

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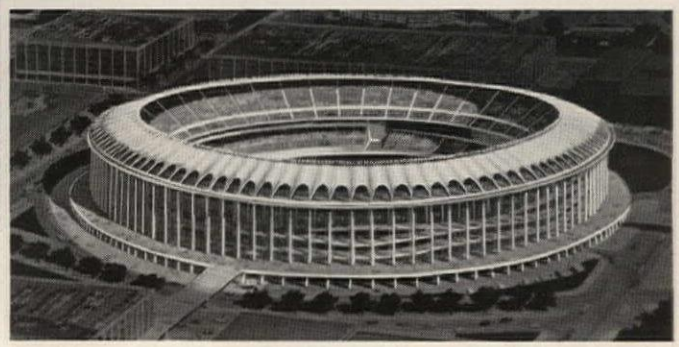
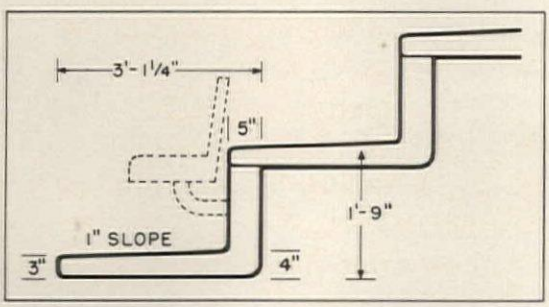


Busch Stadium during construction showing precast, prestressed seat deck slabs running all the way around both decks.



Prestressed angle slabs used as seat decks have a 1" slope for proper drainage.

In the seventh inning of the 1966 All Star game in St. Louis, 50,000 baseball fans will take their stretch standing on precast, prestressed concrete slabs fabricated and delivered on schedule by Wilson Concrete Co. These seat deck slabs (see cut), were precast of lightweight concrete prestressed with 3/8" strand. They are broom-finished to provide non-slip footing when wet.

The July 1966 game sets a rigid construction timetable that emphasizes advantages of precast, prestressed sections: they can be fabricated off-site, well in advance . . . without consideration of bad weather . . . and delivered on precise schedules to the site.

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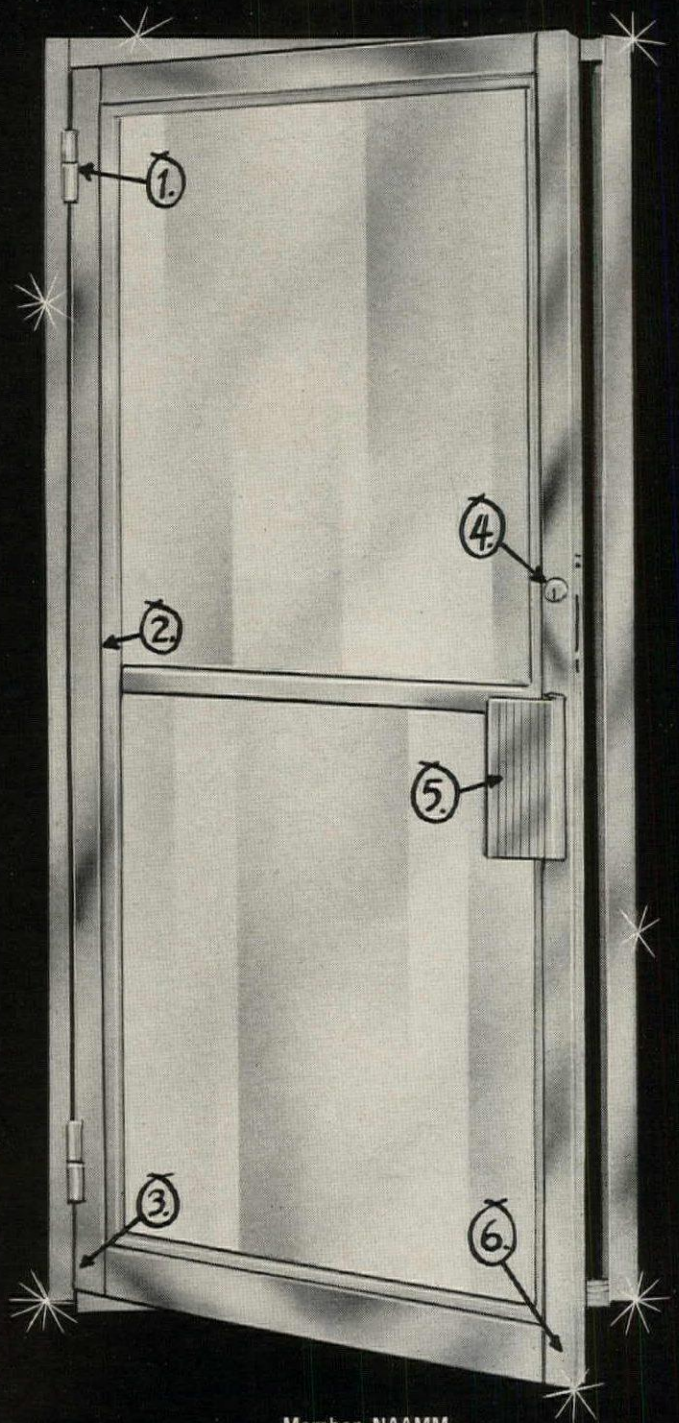

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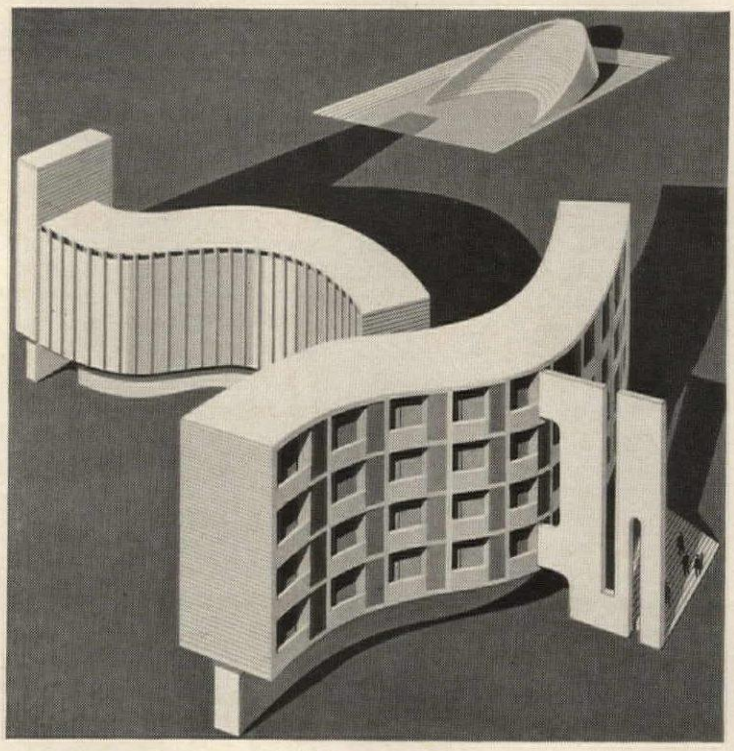

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For further information on communications planning, see Sweet's Architectural File 33a/Be and Sweet's Industrial Construction File 19f/Be.

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Report from Princeton *from p. 88*

well as by the increased dialog developing between themselves, are working out curriculum changes or hastening the implementation of changes already considered.

The report says the project has defined major problem areas in architectural education, developed a preliminary "structure" for education, enlisted the cooperation of some 60 schools in the project, charted 113 curricula (existing and proposed) from 79 schools, obtained statements from representatives of 70 schools, conducted a study of design education developments in England, made grants available to eight schools for studies of project interest, held conferences with architects and obtained records or reports of salient discussions among students at 11 schools.

Project plans entail the continuation of many of these activities, among them the conferences with architects, over the coming year.

The major problem areas as delineated by the project are *continuity*, or education on the nature of the environment beginning in high school to continuing education for the practicing environmental designer; *scope*, which involves a balance between breadth of understanding and depth of skill; *method*, or the widening of scope without excessive extension of time in training; *reality*, or the practical difficulty of keeping in balance preparation for dealing with today's problems, flexibility to meet the challenge of change, and a vision to anticipate the future; *number*, or the problems attendant to the development of designers sufficient in number to serve society's needs.

Grants of varying amounts totaling $15,000 have been offered to eight schools to help finance special studies which Geddes says "are aimed at the crystallization of educational objectives in specific areas."

St. Louis' Washington University, for example, is investigating technological education in the schools. Virginia Polytechnic Institute will prepare detailed descriptions of an introductory two-year sequence for architectural students.

Oklahoma State University is involved with another sequence study as pertaining to an integrated program; the University of Kentucky with a joint architectural-engineering curriculum in environmental design; the University of New Mexico with a rational basis for determining form; the University of Oregon and the University of California at Berkeley with analysis of a new, rigorous program of programming and problem solving; the University of Virginia with objectives and methods of research architecture in a program combining the social and physical sciences.

One of the architect contacts the project has made, according to the Geddes report, was a day-long conference with 20 leading architects. All participants during the meeting filled out questionnaires, and Geddes said analyses of these gave "a rather clear picture of the changes in academic training and apprenticeship that this group of practitioners would like to see.

"There was great emphasis on the need for more intensive training and specialization in areas of practice beyond what is commonly called conceptual design. In a roundtable discussion, each participant gave his views of the most significant issues that should be considered in planning curriculum change." ■

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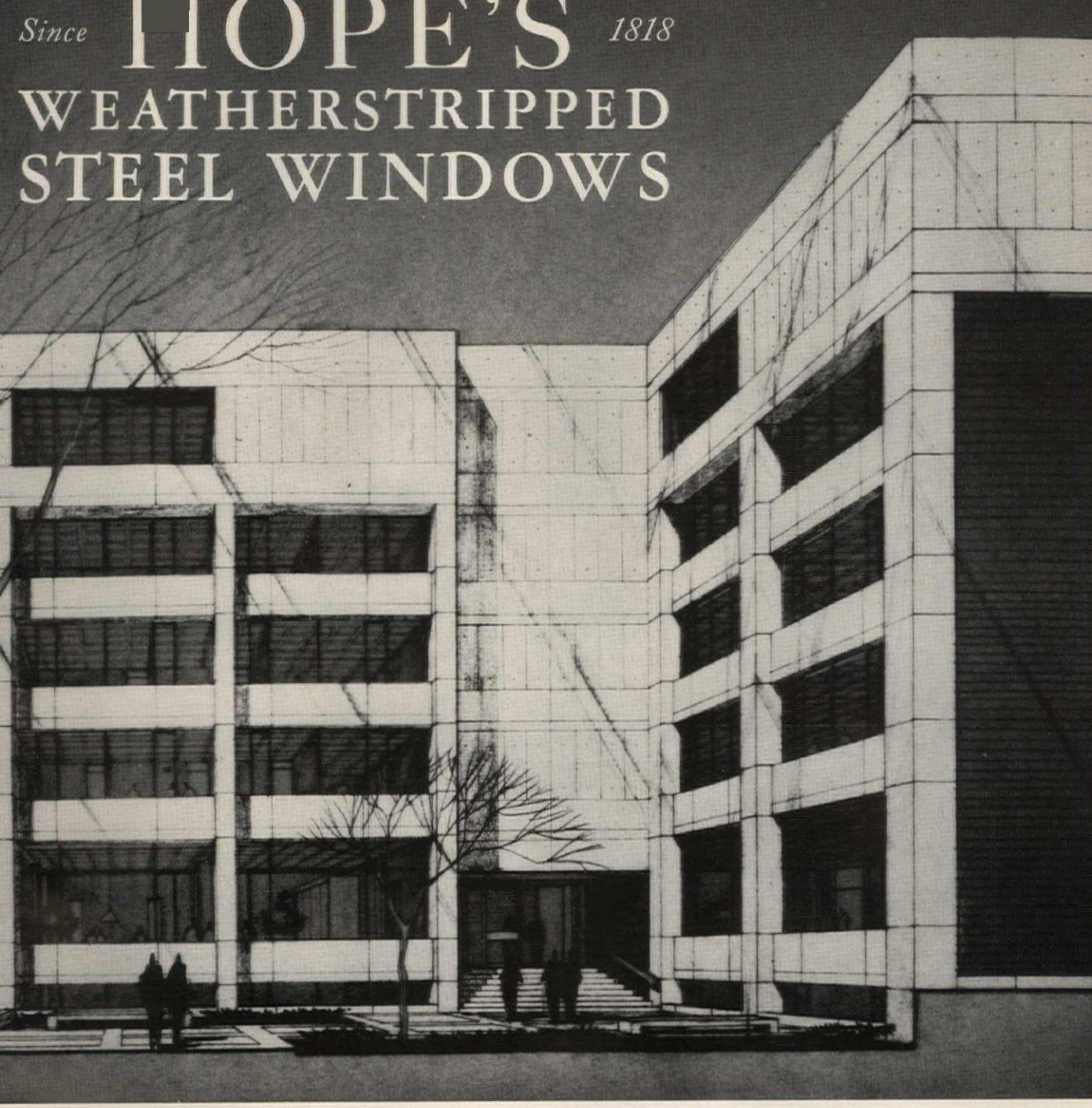

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Comment and Opinion *from page 8*

vowed to get the city back on its feet by getting the people back on theirs. If we can walk in space, they said, why can't we have space to walk in? They built shopping plazas and campus-type neighborhoods, they airconditioned the sidewalks, they introduced benches, protective covering and geraniums. Small electric cars were made available on the pedestrian malls for people who liked the idea of walking but refused to become involved.

The next step was sheer genius. Since much of the money available to improve the cities was earmarked for highways, the latter were located where they would clear out slums and blight, and they were used to protect and insulate neighborhoods and industrial parks. Elevated highways were banned. For the people knew that when highways were elevated, neighborhoods were depressed, but when highways were depressed, neighborhoods were elevated.

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But it came to pass that while the old cities were being rebuilt, the urban population continued to grow and sprawl, and the slums were being transported to the suburbs. The whole countryside was becoming a shambles of billboards, banners, beer parlors and barbecued beefburgers. Another hundred million city dwellers would in one generation demand new accommodations than had been built in all the nation's history.

Then the top men in charge of cities began to look around at the 99 percent of the country that was hardly being used. There were places where the climate was cool,

Continued on page 98

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Comment and Opinion *from page 94*

the mountains high and the recreation opportunities good both winter and summer; and there were places that had industrial potential, research capabilities, resource endowments and not too many people. And in an age of air transport and satellite communications, these places that were once peripheral were now practically convenient.

They Lived Happily: So the people selected a thousand locations where new cities should be built or existing small towns enlarged. It was the purpose of this "national plan for cities" not only to preserve sites for urban settlement, but also surrounding areas in forest and farm, in state and national parks. Then joint public-private corporations designed and built the planned communities that were pleasant to live in and easy to move around in.

When the urbanite saw the sparkling new towns and the beauty of the restored cities, they could hardly believe their eyes. Now they saw it was possible to be urbanized and civilized as well as motorized and mechanized. For they had learned four basic rules for solving the problems of urbanization:

1. The principal problem of cities is not how to move but how to live.

2. Improving the conditions of living can do more than anything else to reduce the need for moving.

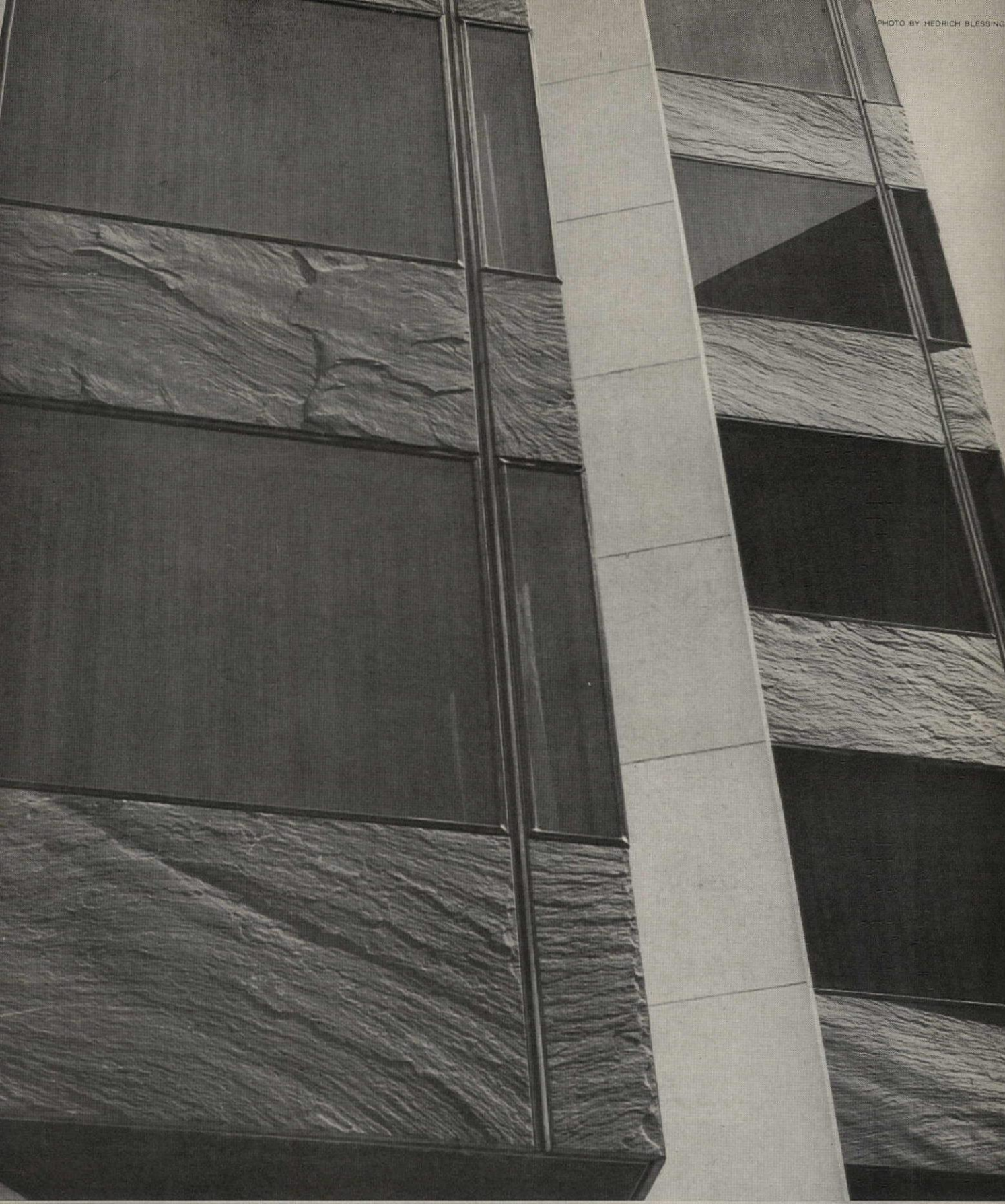
3. But providing transportation is not just a matter of getting things moved; it is also a major means of improving the urban environment.

4. Looked at in this way, transportation has ceased to be a problem, because technology and systems techniques have made it a solution.

Then the urbanites burst into laughter to think how stupid they had been, and they thanked all the people in public and private life whose efforts had made the urban revolution possible. And they called themselves the Grateful Society.

But there were some urbanites who refused to laugh or even to be grateful, and they stood around in small groups shaking their heads and wondering if our country is so rich, they said, why were the cities so poor? And to this day, no one has been able to answer that question. ■

For a free reprint of this fable, circle No. 1 on the Architects Information Service card; for quantity prices, write the Information Service Department, AIA Journal, 1735 New York Ave. N.W., Washington, D.C. 20006.



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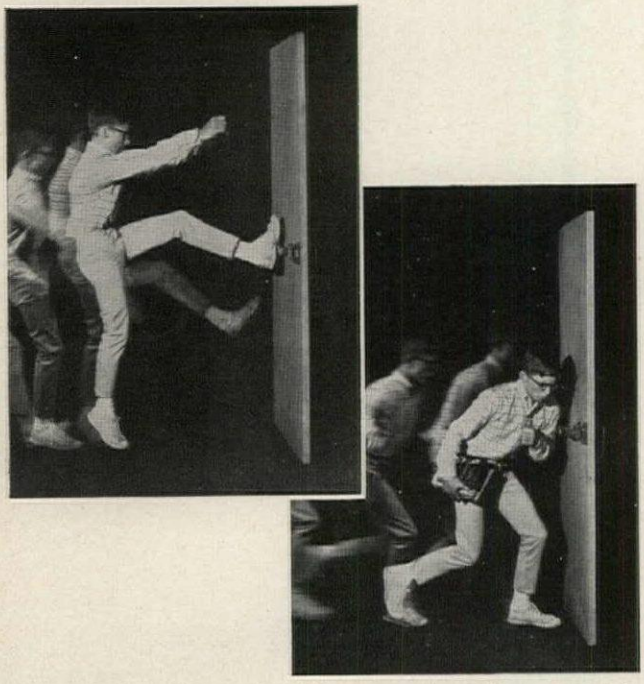

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AIA 106

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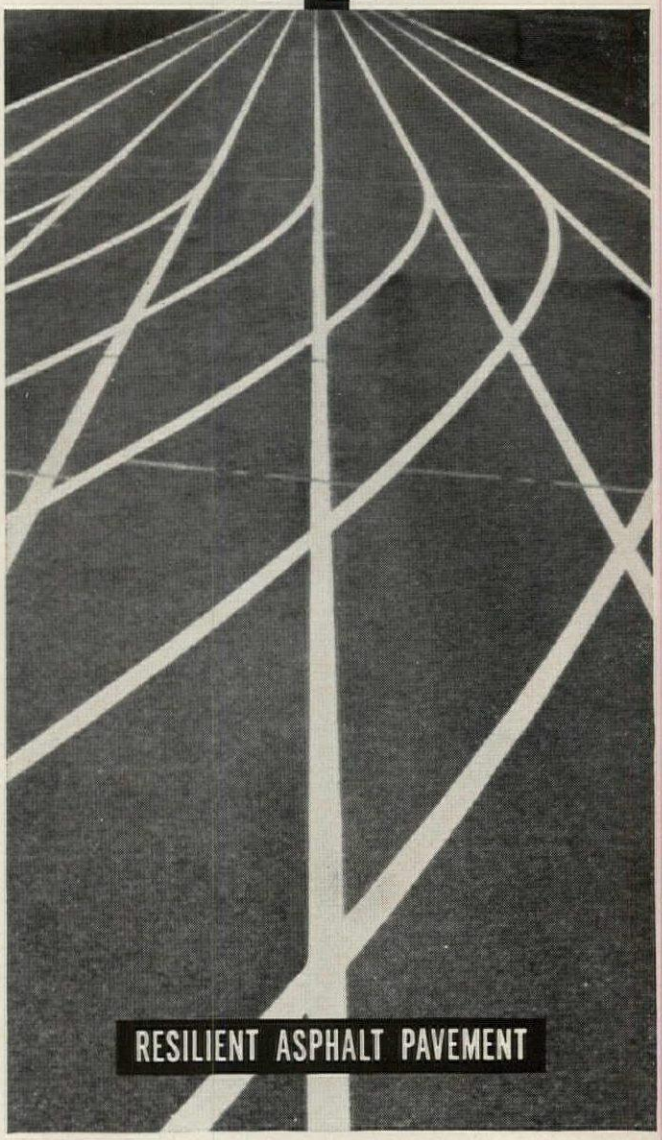

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CALENDAR

National

Oct. 24-28: American Concrete Institute Fall Convention, Jung Hotel, New Orleans
Nov. 15-17: Building Research Institute Fall Conference, Mayflower Hotel, Washington, D.C.
May 14-18: AIA Annual Convention, New York Hilton, New York

AIA Regional and State Conventions

Oct. 6-9: East-Central Region, Brown Hotel, Louisville, Ky.; New York State Association of Architects, Whiteface Inn, Lake Placid; California Council, Monterey County Fair Grounds, Monterey
Oct. 7-9: New England Region, Sturbridge Village, Mass.
Oct. 12-15: Western Mountain Region, La Fonda Hotel, Santa Fe, N.M.
Oct. 13-15: Architects Society of Ohio, Carrousel Inn, Cincinnati; Louisiana Architects Association, Jack Tar Capitol House Hotel, Baton Rouge
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. 2-4: Texas Society of Architects, Texas Hotel, Fort Worth
Nov. 3-5: Central States Region, Lassen Hotel, Wichita, Kan.

AIA Committees and Related Meetings

(At the Octagon unless otherwise noted)
Oct. 7-9: Esthetics, Cincinnati
Oct. 10: International Relations
Oct. 20: Research for Architecture, St. Louis
Oct. 20-21: Architect-Researcher Conference, St. Louis
Oct. 24: Architects Seminar, Atlanta
Nov. 9-12: Council of Commissioners
Nov. 18: ACSA Board, New York
Dec. 5-7: Board of Directors

International

July 3-8: UIA Congress, Prague

Competitions

UIA-approved, international competition for library, University College, Dublin. Registration ends Dec. 1; projects due May 29. For information: Competition Registrar, University College, Earlsfort Terrace, Dublin, Ireland.

Tours

Architects Grand Air Treks of Treasures of Egypt, the Middle East and Baghdad, 22 days each, departing New York and Washington, D.C., Oct. 28, Dec. 16, Jan. 27, Feb. 24 and March 31. Arranged for AIA members, their families and friends, by United States Travel Agency Inc., 807 15th St. N.W., Washington 5, D.C. Trek director is Capt. John E. Smith, Jr., general manager of the agency, and the professional staff director for the first trek is Dr. Francois Bucher of Princeton University's Department of Art and Archaeology.

LETTERS

Galbraith on Gas Stations

EDITOR:

I am supervising architect for the American Oil Co., the operating firm for Standard Oil of Indiana. It occurred to me that John K. Galbraith's remarks at the Denver AIA convention [reported in the September AIA JOURNAL] were not completely in order.

Statements like his deserve the courtesy of some contact with an oil company department which has the problem being criticized. Such a department would be ready to inform him of the issues at stake and the steps the oil company is taking to improve the situation. Both Jules Gray AIA, working with the Pure Oil Division of Union Oil of California, and myself feel some statement by oil company architects and marketing management might be worthwhile. We feel too many of such glib comments have little basis in fact and give no credit to the continuing efforts of the oil companies to upgrade and improve their image.*

It is my contention that housekeeping is the biggest problem. Most of our stations are not company operated. The private operator has rules and regulations which in reality are recommendations for prohibiting pennants, weather-beaten signs, etc. But no practical way of enforcement has been evolved up to this point.

GEORGE TERP JR., AIA
Flossmoor, Ill.

* ED. NOTE: This letter was received prior to our August publication of Stanley D. Breitweiser's "An Oilman Talks Esthetics," which covers the very issues raised by Mr. Terp.

Architects as People

EDITOR:

Wherever I speak these days—on the lecture platform, in committee meetings, in classrooms—I find myself answering provocative and exceedingly debatable questions related to the profession of architecture.

How often I wish we as architects would use our mouths with the same clarity of expression as some do their pencils in the transfer of ideas, instead of as a mere display of ostentatious professionalism. How I wish we would in creating the environment apply ourselves with the same intensity and altruism, remove the abstracted idea of thousands, stop thinking in terms of packs of people, relate more to the single human being.

Unorthodox methods of communication are required in school. The techniques of a Danny Kaye and a Leonard Bernstein are prerequisites; a simple, human directness is essential. A brief refresher course in blockbuilding and dollhouse familiarity are great tools; they help the remotest and shyest child quickly pass the state boards, and you've got 25 or 30 little architects on your hands in no time, with all that implies.

Don't fall into the trap of consciously teaching, preaching or sermonizing. Have the kids experience each major thought; involve them all, even if it means just looking at a scale or piece of tracing paper (yellow, not white).

In showing slides, make sure something good in design is related to something bad or ill-conceived. Stay away from money talk at all grade levels. High school kids are preoccupied with this and the security area. Handle it simply and honestly but underplayed—no drama. They'll supply all the standard theatrics.

If the discussion is slightly overdone in this area, that's all they walk away with. The educational requirements tend to unsettle them, as well as the added three years of apprenticeship. The "Fountainhead" image still dominates. Lump education, creativity and Gary Cooper together and you'll see their eyeballs do a slow frug.

This second go-around is most gratifying with the kids. The effects of the third-grade introduction are obvious—along with their own observations of architecture since then. The knowledge of the same-level students who did not get any earlier exposure to any architectural concepts is markedly negligible, as well as the obviously longer length of time to break the ice.

THEODORE BRANDOW, AIA
Philadelphia, Pa.

PHOTO CREDITS: Baltazar Korab—p. 45; Michael Honos—p. 47 (bottom); PIP/Connie Eriksen—p. 50; Stockpile/Ewing Krainin—p. 53 (upper left); Philip Gendreau—p. 53 (upper right), p. 54 (upper left, lower right); PIP/Vittorio Verri—p. 54 (upper right); Alexandre Georges—p. 54 (lower left); Mary Sinclair—p. 55 (upper) p. 56 (lower); PIP/Giovanni Massara—p. 55 (lower); Brown Bros.—p. 56 (upper); Lawrence S. Williams—pp. 64-65; Orlando R. Cabanban—p. 67; T. Y. Lin & Associates—p. 74 (bottom); Paul Lin—p. 75 (lower left, upper right); Gabriel Moulin—p. 76 (upper left); R. Dolman—p. 76 (lower left); Morley Baer—p. 77 (upper left, lower right); Julius Shulman—p. 78 (upper, middle); Markow—p. 79 (middle); Bob Adams—p. 79 (left, lower right);

Conventions Are a Host City...

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The 99th annual convention —and the biggest ever— of The American Institute of Architects convenes in the New York Hilton with a number of front-page personalities on hand for the May 14-18 sessions. The East Ballroom is packed for the opening as Francis Cardinal Spellman gives the invocation and New York's Governor Nelson A. Rockefeller greets the architects (corporate members: 1,738) and guests (total registration: 5,120). They hear four major addresses and participate in three workshops, one of which includes a report on the AIA Education Research Project. The delegates elect

and they attend the Honor Awards Luncheon where AIA President Charles M. Nes Jr., FAIA presents medals and Hon Awards to 20 buildings (*see* July AIA JOURNAL) five the work of Skidmore, Owings & Mer They are welcomed to the Building Products Ex by the Producers' Counc president and view professional displays. The College of Fellows ho its Convocation (Norman Schlossman, FAIA, chanc Paul R. Hunter, FAIA, chairman, Jury of Fellows And the ladies have their own program, co-sponsor the Women's Architectura Auxiliary and the Women' Architectural League.

and Lots of People...

and Places to Go...

Art museums, old and new, make gracious and visually nourishing settings for two well-attended and traditional social events—the President's Reception and the F. W. Dodge Party. The latter, a glimpse of which is seen through a piece of contemporary sculpture, is held at the new Whitney Museum of American Art which was designed by Marcel Breuer, FAIA, and Hamilton P. Smith, AIA. The Metropolitan Museum of Art is the scene for the President's Reception. Convention-goers, occupying the entire first floor, mingle with one another and with representatives of past ages. With so many conversation pieces there is much to discuss and enjoy. At the reception line, Institute President and Mrs. Charles M. Nes Jr. greet the throng of well-wishers. Still another social event takes conventioners by boat down the Hudson and up the East Rivers. This one is eye-serving, too, offering spectacular nocturnal views of the city that never sleeps. It is a cold night for a boat ride and while some huddle, others warm up the energetic way.

L-M STYLED MERCURY units in Kohls' Shopping Center, Racine, Wisc.

Architect: JORDAN MILLER and GEORGE WALTZ, Milwaukee, Wisc.
Electrical Consultant: E. W. WILKE, Milwaukee, Wisc.
Contractor: MAGAW ELECTRIC, Milwaukee, Kenosha and Racine, Wisc.

FOR A HARMONY OF STYLING AND A MELODY OF COLOR

LINE MATERIAL HIGH ILLUMINATION OUTDOOR LIGHTING

400-1000 WATTS MERCURY AND METALLIC ADDITIVE • 20,500-90,000 LUMENS
2.0 MAINTAINED FOOTCANDLES AND ABOVE

BEAUTY AND STYLING

You can add an expression of architectural design with the beauty of styling and color of Line Material outdoor lighting fixtures. Choose the architectural effect you desire with L-M fixtures styled by the noted industrial designer, Jean Reinecke. This fresh, crisp styling affords lighting installations with daytime beauty as well as nighttime lighting excellence.

EFFICIENCY, ECONOMY

You're assured of the most efficient lighting with Line Material luminaires. Each has been engineered to provide optimum usable light. You also realize optimum economy with L-M fixtures. Long, trouble-free life is assured with all-aluminum construction and L-M's manufacturing care. In addition, accessible interiors mean easy, fast installation and maintenance.

COMPLETE LIGHTING

You can simplify organization of your entire lighting job with Line Material. In addition to luminaires—all poles, ballasts, brackets, lamps, wiring, and power supplies are available. You can obtain service and engineering assistance from your L-M Authorized Distributor. He's backed up by an L-M Field Engineer and an L-M Lighting Engineer...technical experts anxious to serve you.

LINE MATERIAL'S COMPLETE OUTDOOR LIGHTING LINE ALSO INCLUDES MEDIUM, MEDIUM-SOFT AND SOFT ILLUMINATION

TURN PAGE

CHOOSE THE STYLE AND COLOR FOR THE JOB FROM L-M'S HIGH ILLUMINATION LINE . . .

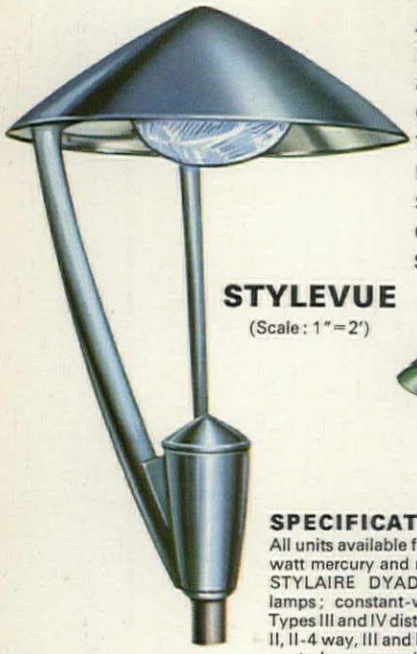
FOR SHOPPING CENTERS • PARKING AREAS • AIRPORTS • AMUSEMENT PARKS • MALLS • RECREATIONAL AND LARGE OUTDOOR AREAS • STREETS • HIGHWAYS • WHITEWAYS AND ROADWAY ENTRANCES

400-1000 watts mercury and metallic additive • 20,500-90,000 lumens

2.0 maintained footcandles and above

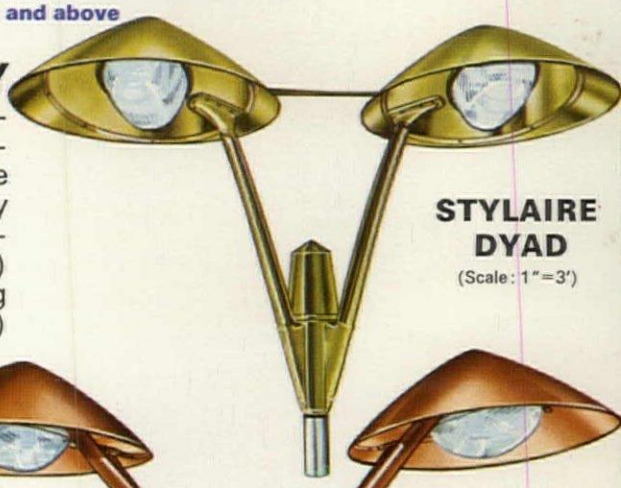
STYLED MERCURY

Available in 4 dramatic, sweeping designs for application variations. Available in 9 decorative colors. Plus over-all economy with 1) internal ballast eliminating external ballasting, 2) standard pole top mounting eliminating support arms, and 3) shorter poles.

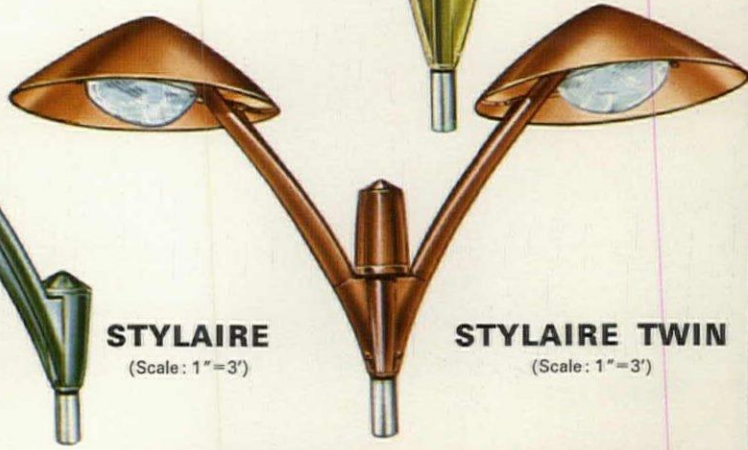


STYLEVUE
(Scale: 1"=2')

STYLAIRE
(Scale: 1"=3')



STYLAIRE DYAD
(Scale: 1"=3')



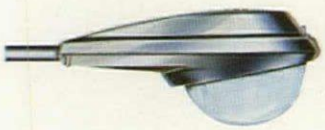
STYLAIRE TWIN
(Scale: 1"=3')

SPECIFICATION
All units available for use with 400-, 700-, and 1000-watt mercury and metallic additive lamps except the STYLAIRE DYAD which is only for 1000-watt lamps; constant-wattage or reactor ballasts; IES Types III and IV distributions for 1000-watt; IES Types II, II-4 way, III and IV for 400-watt luminaires; photocontrol accommodation.

STYLESHIELD (Scale: 1"=2')

The same sweeping style as Styled Mercury; modern appearance plus excellent illumination. Used separately, or in combination with Styled Mercury. Available in a choice of 9 decorative colors. Designed for mounting on 2-inch supports or davit poles with a 2-inch tenon.

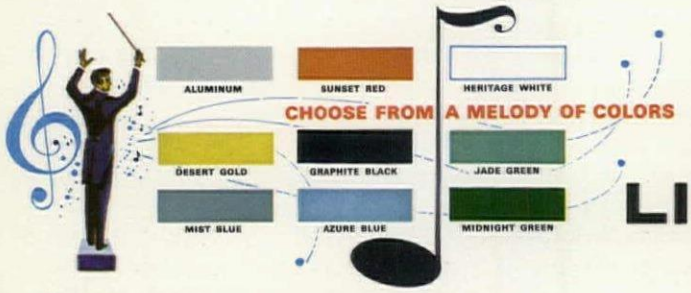
SPECIFICATION
All units available for use with 400-, 700-, and 1000-watt mercury and metallic additive lamps; IES Types III and IV distributions for 1000-watt; IES Types II, II-4 way and III for 400-watt luminaires; photocontrol accommodation.



UNISTYLE (Scale: 1"=2')

Efficient, modern appearance plus superior lighting performance. Available in aluminum finish only. Designed for 1¼-inch or 2-inch supports. Installation economy is achieved with 1) internal ballast, 2) independent leveling assembly, and 3) one-piece lower housing that readily removes for installation ease.

SPECIFICATION
Available for use with 400-watt mercury and metallic additive lamps; internally mounted constant-wattage, high-reactance, reactor or constant-current ballasts; IES Types II, II-4 way and III distributions; built-in photocontrol receptacle.



FOR COMPLETE INFORMATION on Line Material's line of outdoor lighting contact your L-M Distributor or write Line Material Industries, Milwaukee, Wisc. 53201.

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LINE MATERIAL®

McGRAW EDISON

INDUSTRIES

McGRAW-EDISON COMPANY

Octagon Observer from page 13

HONORS, APPOINTMENTS: AIA Past President Leon Chatelain Jr. FAIA is this year's recipient of the Distinguished Service Medal Award, given to the Washington, D.C., citizen who has contributed the most outstanding service to the community by Washington's Cosmopolitan Club.

Richard V. Scacchetti resigned as administrator of the National Council of Architectural Registration Boards and is now production manager of Media Statistics, a marketing research firm in Silver Spring, Md. . . . Herbert Rosser Savage AIA of Miami has been reappointed by Gov. Haydon Burns to a new term on the Florida Development Commission. . . . The Danish Architectural Association's Medal of Honor was presented to Louis I. Kahn FAIA for his contributions as a teacher and practitioner. . . . As Institute president, Morris Ketchum Jr. has become a member of the Secretary of Commerce's National Advisory Committee on Highway Beautification.

Lynn M. F. Harriss, ASLA executive director, has been made a Fellow of the society. . . . Ralph C. Kempton FAIA recently retired secretary of the Ohio Board of Examiners of Architects, was honored at a Recognition Banquet by architects from Columbus and throughout the state. . . . Leonard J. Currie AIA dean of the College of Architecture and Art at the University of Illinois at Chicago Circle, spoke on housing and planning at the First Inter-American Seminar on Cooperative Housing in Santiago, Chile. . . . Columbia University has picked a 1940 graduate of the School of Architecture, Vincent G. Kling FAIA, alumni trustee.

EDUCATION / Campus Notes from Coast to Coast

The University of Arizona College of Architecture, which recently received full accreditation, begins its eighth year of operation in a new building designed for a maximum enrollment of 350 students and the 18 members of the faculty. . . . Prof. Aly S. Dadras AIA has been appointed chairman of the Department of Architectural Technology,

Continued on page 22

Modern Door Control by

LCN

Closers concealed in head frame

Hugo Winkenwerder Forest Sciences Laboratory
University of Washington, Seattle

Grant, Copeland, Chervenak, A.I.A. & Associates
Architects

LCN CLOSERS, PRINCETON, ILLINOIS

Construction Details on Opposite Page