

AIA JOURNAL

NOVEMBER 1972



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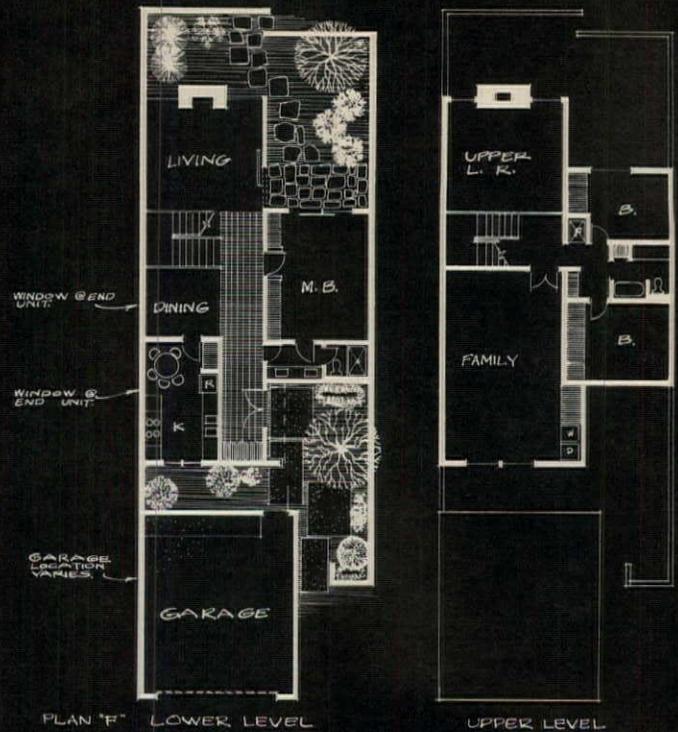
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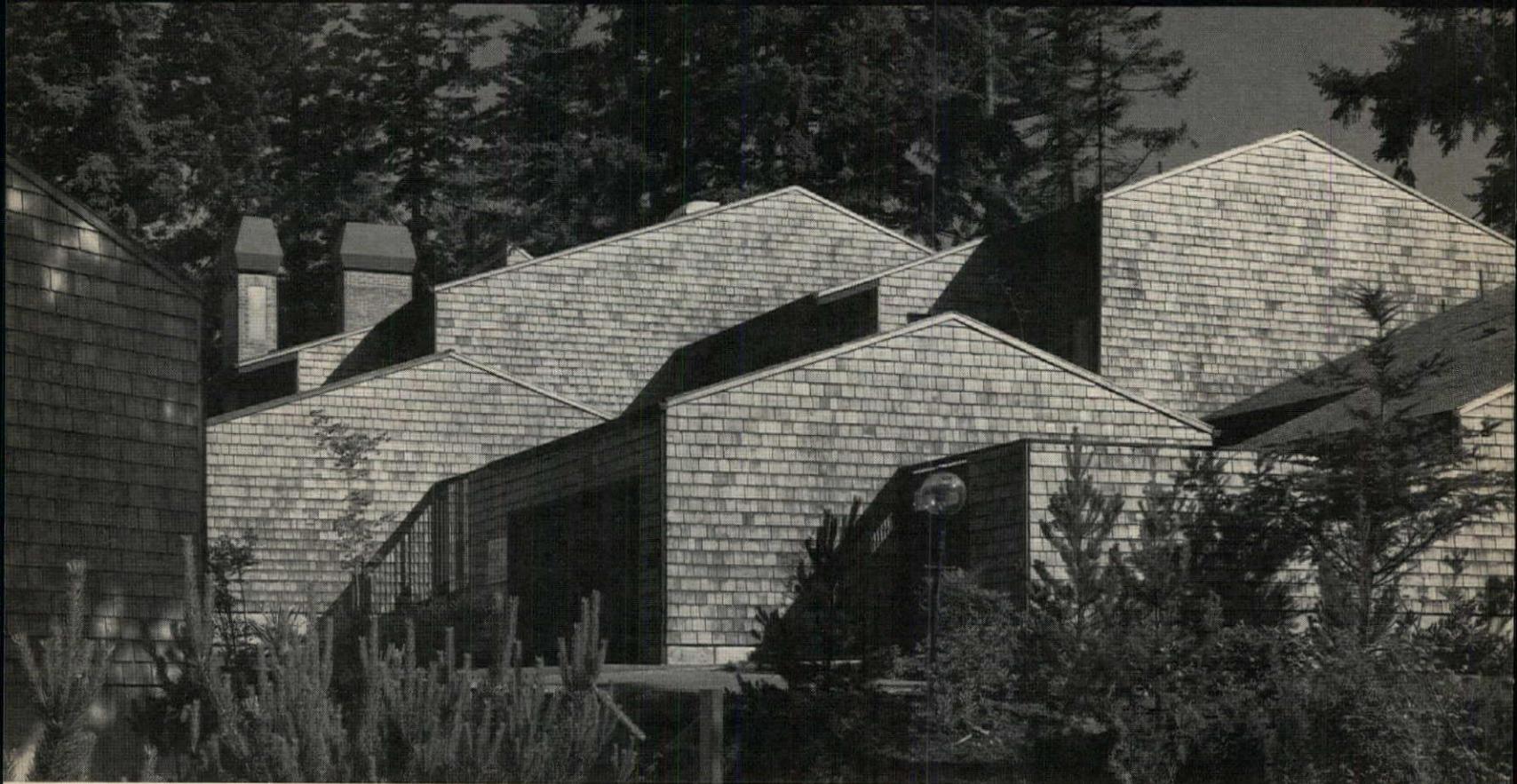
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AIA JOURNAL

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COVER: Art Museum of South Texas, Corpus Christi, Texas. Cast-in-place white cement concrete, scaled. Philip Johnson & John Burgee. Photograph by Ezra Stoller (p. 23).

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VOL. 58, NO. 5

comment and opinion

THE TREMBLING TRUTH ABOUT EARTHQUAKES: Seismologist David J. Leeds, who is associated with a Los Angeles engineering firm and is a member of the Earthquake Engineering Research Institute, chides architects and engineers outside of California and Nevada for paying too little attention to quakes and the damage to life and property that they produce. He points out that great quakes may be few and far between in the eastern portion of the United States but that their shock waves tend to travel farther and cause destruction over a broader area when they do occur. Western shocks have high attenuation which causes severe damage near the epicenter and less at a distance.

Not California, Leeds asserts, but the New Madrid, Missouri/Memphis, Tennessee, region is "the greatest danger spot in the US in terms of expected size of shock, lack of preparedness, possible damage and potential loss of life." Other areas prone to high intensity quakes include Seattle, Tacoma, Salt Lake City (where a tremor was felt just in September, as was the case in southern Wisconsin/northern Illinois), Charleston, South Carolina, Boston, Buffalo and Syracuse. Leeds reminds us that a series of shocks that hit New Madrid in 1811-12 and one that struck Charleston in 1886 "are listed among the greatest quakes in recorded history." Indeed, a person feels a healthy respect for quakes when pondering the fact that the New Madrid disaster caused 30,000 square miles of land to fall 6 to 16 feet.

There have been 40 damaging quakes in California in the last century. Since the one that hit that state's San Fernando Valley with a wallop on February 9, 1971, engineers and scientists from a number of disciplines have been seeking to find better ways of erecting structures that can withstand violent quakes and reduce destruction. There have been many conferences and government reports issued which have considered a variety of topics from geological hazards to disaster insurance to the emotional problems of those who survive the experience.

Experts have issued warnings. Among them is Karl V. Steinbrugge, professor of structural design at the University of California in Berkeley, who has stated that the likelihood of a collapse is increasing because code requirements for the design of earthquake-resistant highrise structures have not kept pace with changing construction practices. An extremely hazardous building that meets legal requirements can still be designed and erected. In the report *The Santa Rosa, California, Earthquake of October 1, 1969* (US Government Printing Office, 1971), Steinbrugge urges local governments to correct inadequacies in building codes and to eliminate existing hazards in projects which conform to present regulations. What is required, according to an article called "Seekers for Safer Shelter" in *Steel Facts* (No. 213), is a structure that has a capacity to absorb energy without collapsing.

At least one writer on the San Fernando Valley quake asks that we try for a perspective on the subject. "We probably worry and fret out of proportion about them," he comments, pointing out that in the history of California 1,000 lives have been lost in quakes and property damages have equaled about \$1 billion. "Big numbers," he concedes, "but they average out to less than \$10 million a year." Fires, he reports, "kill 16 times as many people and cost over 10 times as much." All this may be true, but who is to put a value on those lost lives? And even fewer lost lives demand still more planning for better seismic safety. **ROBERT E. KOEHLER**

ACKNOWLEDGEMENTS

- | | |
|---|----------------------------------|
| 7 — above, R. N. Khanna | 32 — Precision Photography |
| 8 — above, Lawrence S. Williams, Inc. | 33 — left, Joseph W. Molitor |
| 8 — below, courtesy National Gallery of Art | 33 — right, David Hirsch |
| 18 — Balthazar Korab | 38 — Bob Jacobson |
| 21 — Neil Sauer & Associates | 39 — above, Joshua Freiwald |
| 22 — C. Wade Swicord | 40 — above, William Crawford |
| 23 — right, Orlando R. Cabanban | 41 — above, Stephen F. Rosenthal |
| 24 — Alexandre Georges | 41 — below, Jeremiah O. Bragstad |
| 25 — Gerald Ratto | 42 — above, Joshua Freiwald |
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| 31 — above, Ezra Stoller | |

NEXT MONTH

The December issue offers a varied menu, indeed. To begin with, we extend the season's greetings, architecturally speaking, by illustrating how 10 or so professionals offer salutations. Some architects, of course, make it a habit of designing their own cards while others rely on special collections or simply select stock items which they feel are appropriate for the respective offices.

In other articles we present:

- a list of suggestions to help architects save energy requirements for buildings through their own designs
- a personality sketch of S. Scott Ferebee Jr., FAIA, who will assume the presidency of the Institute next month
- a look at the Seattle Center, the site of the World's Fair in 1962, which vividly demonstrates that a temporary complex can be transformed into a worthwhile permanent facility near the heart of the city
- a psychologist's view of how environments respond to user needs—in this case what is referred to as people's art
- an appraisal of building automation, or centralized control of a building from a single operator's console
- an assessment of the role of the British quantity surveyors, a team of whom recently visited this country
- a description of the new AIA computer-based accounting system, part of our Practice Aids series.

ASIDES

We note with more than passing interest a photographic retrospective of the work of AIA Gold Medalist Walter Gropius, supported by the Graham Foundation and circulated by the International Exhibitions Foundation of Washington, D. C., to institutions of higher learning and major museums in the United States and Canada. Right now it is on exhibit at Columbia University, running through November 15.

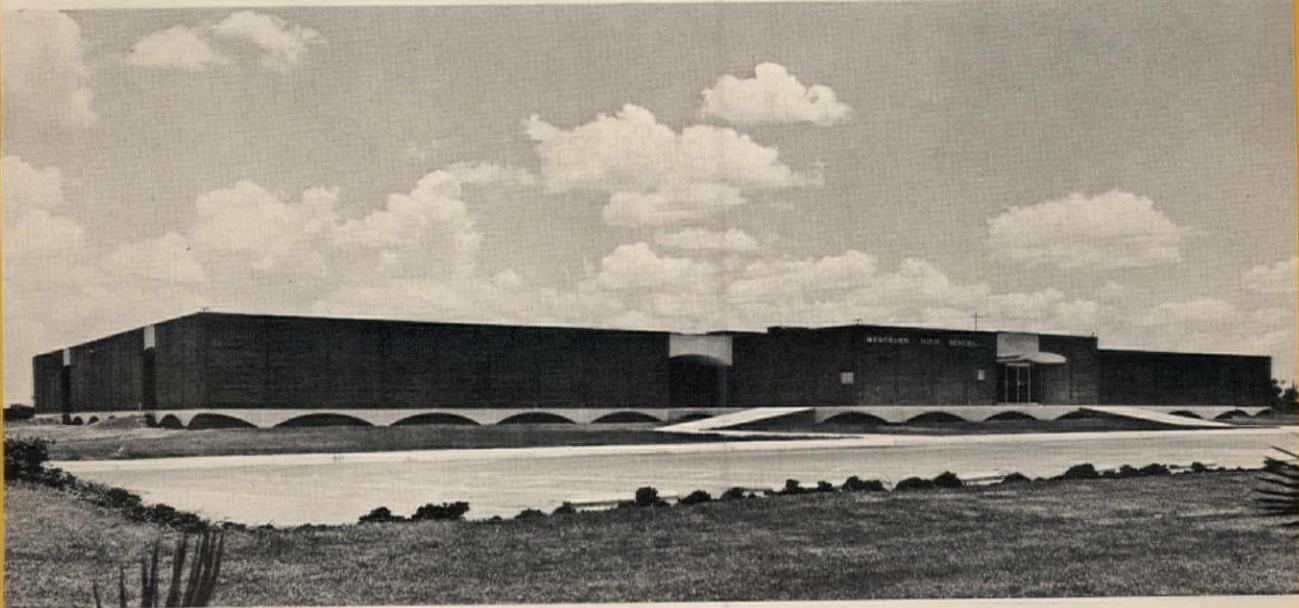
The more than 200 photographic panels are complemented by scale models and color slides. An illustrated catalog, prepared by the architect's widow, Ise Gropius, with an introduction by James Marston Fitch, professor of architecture at Columbia, is available.

The work shown ranges from a prototype factory at the 1914 Werkbund exhibition in Paris to a model of the Total Theater, one of the architect's most influential, though never constructed, buildings.

The exhibit has been arranged by Mrs. Gropius, The Architects Collaborative of Cambridge, Massachusetts, and the Bauhaus Archive in Berlin. A 1971 version was shown in Berlin and Zürich. The present one was designed and constructed by TAC for circulation in America, where Gropius lived, worked and taught from 1937 until his death in 1969.

The opening page of the 1919 program for the Bauhaus, which Gropius founded that year, expressed the interdisciplinary approach which he explored: "Together we desire, we design and we create the new building in which architecture, painting and sculpture are one complete unity." □

Electric Heating/Cooling System Leads to Cost and Space Savings In Year-round High School



Mercedes High School, Mercedes, Texas, has six self-contained units built around an air conditioned mall.

PROJECT: Mercedes High School, Mercedes, Texas.
ARCHITECTS: SHWC Inc., Harlingen, Texas. **CONSULTING ENGINEER:** Joe C. Hammitt, Harlingen.

DESIGN CHARGE: To design, on a 30-acre tract, a high school for approximately 1200 students, to be built in two stages; Stage I to provide 37 teaching stations, administrative offices, and a library and Stage II to provide additional classrooms, a student center, a cafeteria, and music rooms.

DESIGN RESPONSE: Architectural firm SHWC, Inc.'s design for Stage I (completed in 1967) is a handsome structure of bronze-colored brick that has six self-contained units built around an enclosed air conditioned mall. A feature of the design is a raised platform of concrete arches and ramps that follows the outline of the complex. The school's 60,194 sq ft of floor space is divided as follows: Unit A contains the administrative offices; Unit B, the mall; Unit C, the library; Unit D, homemaking and science rooms; Unit E, commercial and foreign language classrooms; Unit F, vocational facilities; and Unit G, language arts. Stage II, now under construction and scheduled for completion

in late 1972, will add four new self-contained units to provide a combination cafeteria and student center, additional classrooms, and a music building.

The school's all-electric climate control system was designed to make it possible to use the facilities all year round. The Stage I facilities are divided into ten independent zones, each with its own air handling unit and system of ducts. Heating is accomplished by multistage electric duct heaters. Cooling is provided by chilled-water equipment in eight of the zones and by direct-expansion units in the others. The zoning is designed so that the chilled-water equipment can be shut down during those summer months when most of the building is unoccupied. The direct-expansion systems handle the cooling needs of those facilities that remain open.

Stage II facilities will also be heated and cooled electrically, the architects report, and add that the choice of electric space conditioning equipment is making expansion of the school much more economical in addition to providing greater freedom of design for the architects and increased comfort for the occupants.

SEE REVERSE SIDE FOR DETAIL INFORMATION

1 CATEGORY OF STRUCTURE:
Educational—High School

2 GENERAL DESCRIPTION:
Area: 60,194 sq ft
Volume: 600,000 cu ft
Number of floors: one
Number of occupants: 1200 students
Number of rooms: 37 teaching stations, plus of-
fices, etc.
Types of rooms: general, business, language
arts, foreign language, homemaking, science
and vocational classrooms, administrative of-
fices, library

3 CONSTRUCTION DETAILS:
Glass, single
Exterior walls: 10" brick and block cavity wall;
U-factor: 0.26
Roof and ceilings: built-up roof on lightweight
concrete fill over steel deck, suspended acous-
tical tile ceiling; U-factor: 0.17
Floors: concrete slab
Gross exposed wall area: 13,500 sq ft
Glass area: 1200 sq ft

4 ENVIRONMENTAL DESIGN CONDITIONS:
Heating:
Heat loss Btuh: 1,180,000
Normal degree days: 844
Ventilation requirements: none
Design conditions: 25F outdoors; 75F indoors
Cooling:
Heat gain Btuh: 2,460,000
Ventilation requirements: none
Design conditions: 100F dbt, 78F wbt outdoors;
75F, 50% rh indoors

5 LIGHTING:
Levels in footcandles: 20-100
Levels in watts/sq ft: 1-4
Type: fluorescent and incandescent

6 HEATING AND COOLING SYSTEM:
The school is conditioned year around by ten in-
dependent ducted systems, each equipped with
electric duct heaters and served by its own air
handling unit. Eight of the air handlers are of
the water-coil type and are supplied by one 36-
ton and one 110-ton packaged chiller. The re-
maining air handlers have direct-expansion coils
supplied by one 10-ton and one 25-ton rooftop
air-cooled condensing unit.

7 ELECTRICAL SERVICE:
Type: underground
Voltage: 277/480v, 3-phase, 4-wire, wye
Metering: primary

8 CONNECTED LOADS:

Heating & Cooling (181 tons)	348 kw
Lighting	125 kw
Cooking	24 kw
Other	34 kw
TOTAL	531 kw

9 INSTALLED COST:*

General Work	\$434,082	\$ 7.21/sq ft
Elec., Mech., Etc.	224,662	3.73/sq ft
TOTALS	\$658,744	\$10.94/sq ft

*Building was completed 11/67

10 HOURS AND METHODS OF OPERATION:
Regular school hours, ten months a year; sum-
mer school classrooms and administrative of-
fices only during June and July.

11 OPERATING COST:
Period: 1/69 through 12/69
Actual degree days: 709
Actual kwh: 610,674*
Actual cost: \$11,601.05*
Avg. cost per kwh: 1.9 cents
*For total electrical usage excluding non-electric
water heating.

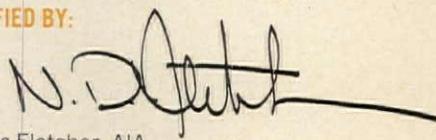
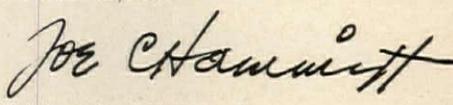
Month	Degree Days	Demand	kwh	Amount
1/69	195	154	57,654	\$ 957.69
2/69	98	156	57,162	955.28
3/69	157	154	54,510	923.11
4/69		387	73,980	1,349.80
5/69		371	39,192	976.32
6/69		151	15,906	397.64
7/69		198	16,398	466.88
8/69		405	61,296	1,249.96
9/69	6	406	69,312	1,311.62
10/69	18	387	56,142	1,171.42
11/69	127	152	63,918	1,023.59
12/69	108	152	45,204	817.74
TOTALS	709		610,674	\$11,601.05

12 FEATURES:
Each zone features independent regulation of
temperature by means of wall-mounted heating/
cooling staging thermostats. On heating, the
thermostats control the operation of the multi-
stage duct heaters. On cooling, the thermostats
control three-way modulating valves in the chilled-
water systems and the condensing units in the
direct-expansion systems.

13 REASONS FOR INSTALLING ELECTRIC HEAT:
Preconstruction estimates indicated that the op-
erating costs for both electric and gas systems
would be about the same. The electric system,
however, would cost less to buy and install, would
occupy less space, and would not require either
flues or provision for combustion air supply.

14 PERSONNEL:
Owner: Mercedes Independent School District
Architects: SHWC, Inc.
Consulting Engineer: Joe C. Hammitt
General Contractor: Donald Ferguson
Electrical Contractor: H & H Electric Co.
Mechanical Contractor: Coastal Engineering Inc.
Utility: Central Power & Light Company

15 PREPARED BY:
Milam Gerick, Industrial Sales Engineer, Central
Power & Light Company

16 VERIFIED BY:

Norris Fletcher, AIA

Joe C. Hammitt, P.E.

NOTICE: This is one of a series of case histories of buildings in all structural categories. If you are an architect or consulting engineer; an architectural or engineering student; an educator; a government employee in the structural field; a builder or owner, you may receive the complete series free by filling out the strip coupon at the left and mailing it to EEA. If you are not in one of the above categories, you may receive the series at nominal cost.

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Delegates from 73 Countries Gather at the 11th World Congress of the UIA in Bulgaria

People the world over "await new ideas and conceptions" from architects, as well as "new solutions which will raise architecture to a still higher level and will help improve the organization and structure of leisure and recreation," said Todor Zhivkov, President of the State Council of Bulgaria, when he officially greeted delegates to the 11th World Congress of the International Union of Architects. The six-day meeting, attended by some 2,500 delegates from 73 countries, began ceremoniously on September 25 at the Palace of Culture and Sports in Varna, Bulgaria.

The resort city on the Black Sea was an appropriate place for the congress, the theme of which was "Architecture and Recreation." Old Roman baths, dating from the second century, are one of the city's archeological sights and testify to its long-standing concern for an architecture for leisure.

Delegates from the AIA to the business meeting preceding the congress were Max O. Urbahn, FAIA, president of the Institute; William Corlett, FAIA, a member of the AIA Committee on Architecture for the Arts and Recreation and also of the International Relations Committee; S. Scott Ferebee Jr., FAIA, president-elect of the AIA; Maurice Payne, AIA, head of the Institute's Division of Design and International Relations; William L. Slayton, Hon. AIA, executive vice president of the AIA; and Daniel Schwartzman, FAIA, second deputy president of the



S. Scott Ferebee Jr., FAIA (right), the AIA delegates to the UIA World Congress and other dignitaries gather at the US Embassy in London to honor Lord Kenneth McKenzie Clark (left). Known throughout the Western world for his TV series "Civilization," Clark receives his honorary membership in the AIA.

UIA. The delegation was accompanied by Fay DeAvignon, president of the Association of Student Chapters/AIA.

The assembly heard reports on the subject of architecture and recreation from the various national sections of the UIA. Before the meeting, the Bulgarian section had sent an inquiry to all national sections. The answers reflected general trends as well as na-

tional characteristics of leisure time activities in the respective countries. Representatives of the Bulgarian section aimed at making "the unification of some terms and concepts" one of the tasks of the congress. The reports from the national sections, expected to be published soon in a single volume by the Union of Bulgarian Architects, were the subject of discussions at the plenary sessions and in the working groups of the congress.

The report of the US section, authored and edited by C. Ray Smith, AIA, for the AIA Committee on Architecture for the Arts and Recreation (see p. 59), was presented to the UIA congress by Corlett. Entitled "The American Endless Weekend," it was excerpted in the September AIA JOURNAL. An AIA film on the same subject premiered in Varna.

The congress program included an architectural exhibition, a festival of films, a competition for architectural students and an exhibition of books and periodicals. There were 151 designs from 33 countries in the student competition. American students winning recognition were Alberto Bertol and Guillermo Ariscor of the California State Polytechnic College in San Luis Obispo, who received the prize of the French Society of Architects Certificated by the Government. The Unesco prize of \$3,000 was awarded to V. Kirpichev, a student at the Moscow Institute.

A packed house of students from all over the world, including Miss DeAvignon and Denis Lamoureux of Rensselaer Polytechnic Institute, met on September 26 in what is reported as a "lively and enthusiastic" session. Jurors of the student competition met with them to answer questions in response to the students' objecting to the criteria used to determine winners of the student competition. The consensus of the students was that there is a vital need for an international exchange of ideas and concepts of education. They determined to work toward the formulation of a world organization of students which would be recognized as an integral part of the UIA.

The General Assembly of the UIA, meeting in Sofia for three days prior to the World Congress in Varna, re-elected Schwartzman as second deputy president of the UIA. USSR architect Georgi Orlov, who was made an honorary Fellow of the AIA in 1972, was named president.

At the adjournment of the Varna meeting, Ferebee continued to Russia for the cultural exchange program sponsored by the US Department of State. Slayton joined Rex Whitaker Allen, FAIA, former president of the AIA, in Dubrovnik, Yugoslavia, where both attended the second International Conference on Architectural Registration on October 5-7.



Diplomatic Corps official Stull (right) and Fuller discuss airports in New Delhi, India.

AIA Gold Medalist Fuller Praised At Diplomatic Dinner in India

"When I learned that Dr. Buckminster Fuller would be in New Delhi for some weeks advising the government of India on the design of 'painless airports,' it seemed like a good idea to offer him and some of his friends this opportunity to get together," said Lee T. Stull, chargé d'affaires ad interim of the US Diplomatic Corps in India at a recent dinner honoring Fuller at the Roosevelt House in New Delhi.

"Descended from eight generations of Boston clergymen and attorneys, Dr. Fuller is a scientist, mathematician, architect, inventor, photographer, engineer. It leaves me breathless, literally and figuratively," commented Stull. Saying also that Fuller averages 200,000 miles of flying a year, the diplomat called him "a marshal of the airways." He quoted the *New York Times* description of Fuller as "Jules Verne plus Albert Einstein."

Continuing his eulogy of the 1970 AIA Gold Medalist, Stull declared that "youth has faith in him. Earlier this evening my 17 year-old daughter was ebullient about the great man who had spoken at her school today—none other than Dr. Buckminster Fuller. A mind-stretching, or as my daughter put it, a mind-blasting experience."

In October Fuller made his base of operations at the University City Science Center in Philadelphia. Bryn Mawr, Haverford and Swarthmore Colleges and the University of Pennsylvania in cooperation with the center have arranged for him to carry on his writing, lecturing and studying there. Presidents of the four educational institutions and the center said that "Fuller will serve the academic and economic communities of the Philadelphia region as a continuing source of ideas, criticism and research." His residence "will help us to achieve objectively effective understanding between the scientists and nonscientists."

Homebuilders Will Hear Three Architects At AIA-Sponsored Seminar in Houston

Selected through a competition conducted by the AIA Housing Committee, three members of the Institute will participate in a presentation before the annual convention of the National Association of Home Builders in Houston in January.

Describing a typical housing project from conception to consummation will be Robert

W. Hayes, San Francisco, on programming; Abba I. Polangin, Bethesda, Md., on sketches; and Edward H. Fickett, FAIA, Los Angeles, on working drawings.

This marks the fifth consecutive year that the Housing Committee will have had its own presentation at the NAHB convention, whose registration is expected to exceed 50,000 for the five-day program. The world's largest exhibit of appliances, equipment and building materials will be shown concurrently in the Astrohall.

Other seminars and workshops devoted to planning and related topics will be organized by NAHB's Institute for Environmental Design, which has a new director, architect Eugene Kramer. He has just returned from two years in England where he was a lecturer at architectural schools in Portsmouth and London. His long-term research examining the parallels between the development of American architecture and the cultural environment has received grant support from the National Endowment for the Arts.

Kramer succeeds Polangin, now director of planning for Stottler, Stagg & Associates and its affiliate, Brevard Engineering Company, in Hyattsville, Md.



This mockup depicts the new national headquarters and showcase center of the National Association of Home Builders. Construction will begin soon on a triangular site west of Thomas Circle in Washington, D.C. Designed by the Philadelphia firm of Vincent G. Kling & Partners, the \$4 million structure will have 80,000 square feet of space.

Nation Honors Frederick Law Olmsted; Major Exhibition to Be Circulated

Frederick Law Olmsted is perhaps best known for his landscape architecture and for his advanced theories on city planning. Of equal significance are his pioneering efforts

for national parks. This year the nation is honoring the sesquicentennial anniversary of his birth with exhibitions of his work.

The National Gallery of Art in Washington, D.C., is holding a major exhibition which illustrates some of Olmsted's finest esthetic achievements. In addition to drawings and other original Olmsted materials, the exhibition focuses attention on his work in parks and cities by means of Circle-Scan photography. More than 50 panoramic images of Olmsted's work are projected on a screen 34 feet in diameter and 10 feet high. The exhibition opened in October and will be on view through January 7.

Appearing simultaneously is an exhibition at the Whitney Museum of American Art in New York City which emphasizes primarily Olmsted's work in and around that area.

Entitled "Frederick Law Olmsted/USA," the exhibition was organized for the National Gallery by the American Federation of Arts and the Olmsted Sesquicentennial Committee (see p. 55 for book reviews by the committee's chairman). The exhibition will be circulated subsequently to major museums throughout the country. The intent of the exhibition, said J. Carter Brown, director of the National Gallery, "is to emphasize Olmsted's extraordinary contributions to the nation's visual heritage. We wish to salute Olmsted during his sesquicentennial year as one of America's most prescient and sensitive artists."

Plans for Building Team Conference 3 Call for April Meeting in Chicago

In 1971 Robert F. Hastings, FAIA, then AIA president, and Robert F. Darling, then president of the Producers' Council, Inc., issued a joint statement which outlined plans for a major and national conference and exposition to serve the nonresidential construction market (see May '71, p. 8). They called the action a positive move to accommodate changes occurring in the construction process, providing an annual gathering place for all members of the building team.

The first two meetings of the Building Team Conference, in 1971 and 1972, were held in conjunction with the annual convention of the AIA. The 1973 conference will depart from this practice with plans being made for it to take place at the Drake Hotel in Chicago on April 11-13.

Sponsored by the Producers' Council, the conference's activities will be under one roof,

allowing for closer communication among all building team participants. The council declares that "interest is strong" and that "an unusual and outstanding program" is planned for Chicago.

Far-Reaching Property Act Becomes Law, Aimed at Aiding Historic Preservation

President Nixon recently signed into law a surplus property act which permits free transfer to the states or cities where they are located of surplus historic federal buildings. Heretofore, such buildings could only be used for nonrevenue-producing purposes. The new law, which amends the 1949 Federal Property and Administrative Services Act, now lets private developers lease the buildings.

"Under the new law," said President Nixon, "the states and localities will be able to use the surplus federal buildings as centers for urban commerce and tourism. They will be able to preserve the historic buildings, to cherish them and to use them as active facilities that will raise sufficient revenue to keep them well maintained. . . . Any excess revenues will be used for parks, recreation and other local historic preservation projects."

Arthur F. Sampson, acting director of the General Services Administration, recently told a group of citizens of St. Louis that President Nixon became "interested in preservation through the St. Louis Post Office, and we have always thought of it as a prototype for the whole country." Present plans for the adaptation of the historic structure to modern use (see Aug., p. 51) call for its possible conversion by a private developer into a hotel and restaurant with a shopping area of specialty boutiques. Unused tracks underneath the building run to within a mile of the airport, and the basement may be used as a transit station.

PCI Cites 10 Projects in Awards Program As Jury Praises High Quality of Entries

Eight structures and two bridges have been named winners in the 1972 Prestressed Concrete Institute Awards Program. "The large number of high quality entries made the jury's task a difficult one," said Max O. Urbahn, FAIA, president of the AIA and chairman of the jury. Serving with Urbahn were Herbert Beckhard, AIA, of Marcel Breuer &

continued on page 10



The landscaping of Stanford University shows how Olmsted allowed for the buildings to be "in orderly and symmetrical" relation to each other.

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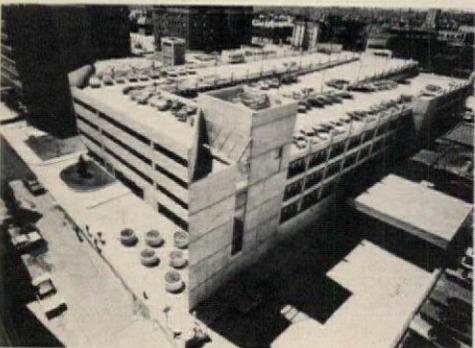
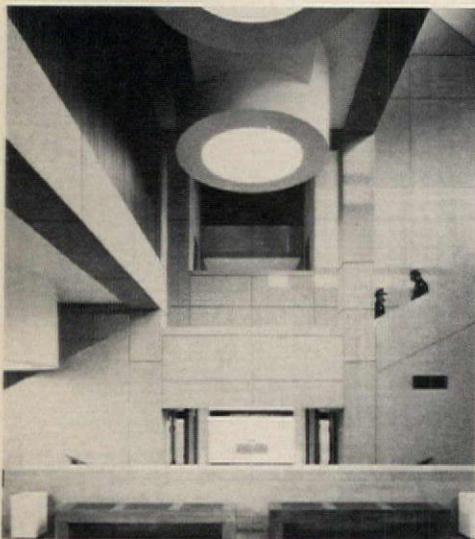
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Associates; Jean-Louis Lalonde, president of the Royal Architectural Institute of Canada; Thomas M. Niles, past president of the American Society of Civil Engineers; and J. Calwell Wilson, president of the National Society of Professional Engineers.

This year's winners are: University of Lethbridge, Project 1, Lethbridge, Alberta, Canada (architects: Erickson/Massey Architects); Student Living Center, University of Delaware, Newark, Del. (architects: Charles Luckman Associates); Spokane County/City Public Safety Building, Spokane, Wash. (architects: Walker/McGough/Foltz/Lyerla); Cleveland Clinic Foundation parking garage, Cleveland (architects: Flynn, Dalton, Van Dijk & Partners); Ross Humanities & Social Sciences Building, York University, Downsview, Ontario, Canada (architects: Gordon S. Adamson & Associates; Searle, Wilbee, Rowland; Shore, Tilbe, Henschel, Irwin); D. B. Weldon Library, University of Western Ontario, London, Ontario, Canada (architects: Ronald E. Murphy and John Andrews, consortium for this project); Administrative & Research Center, Plough, Inc., Memphis (architects: Gassner/Nathan/Browne); Walt Disney World monorail, Orlando, Fla. (structural engineers: ABAM Engineers Inc., in association with Wheeler & Gray); East Fork Chowchilla River Bridge, Mariposa, Calif. (architects: California Division of Highways Bridge Department); San Francisco International Airport Terminal elevated roadway (architects: San Francisco Airport Architects, a joint venture of John Carl Warnecke & Associates and Dreyfuss & Blackford).



Organization Helps Students Prepare For the New NCARB Licensing Exam

For those people who are preparing for the new National Council of Architectural Registration Board examinations, assistance may be obtained from Architectural License Seminars. This organization's sole purpose is to provide study aids specifically for architectural license examinations.

The current seven-part examination will be offered in December and in June, and all materials available from ALS are geared to this examination. The program includes updated home study courses and handbooks. Also, ALS will conduct intensive one-day crash seminars in Atlanta on December 1, in New York City on December 2, in Chicago on December 3 and in Los Angeles on December 9. The registration fee of \$37.50 includes the *ALS Study Guide*, admission to the day's sessions, lunch and coffee breaks. Candidates who have already bought the study guide may attend the seminar by paying an additional \$22.50.

For further information, write ALS, P.O. Box 64188, Los Angeles, Calif. 90064.

Council Unites Building Code Officials To Speak in Unison on National Matters

The full governing bodies of the Building Officials and Code Administrators International, the International Conference of Building Officials and the Southern Building Code Congress have established the Council of American Building Officials. The council will provide a means for building code officials in the US "to speak through one voice on matters of national importance."

Under the bylaws of the new council, the members of the governing boards of each sponsoring organization will serve as trustees. Between meetings of the board, the affairs of the council will be managed by a nine-member executive committee composed

Among the PCI award winners are the Spokane County/City Public Safety Building (top left); the Cleveland Clinic parking garage (bottom left); and the Administrative and Research Center, Plough, Inc. (below).



of three members from each of the participating organizations; the executive directors of the three organizations will serve as ex officio members.

The council has appointed representatives to serve on special working groups of the National Conference of States on Building Codes and Standards to develop model state legislation for a mobile home standard act; an act for the education and certification of code enforcement officers; and a statewide construction standards act. The council agreed to offer to provide the secretariat for NCSBCS.

Action has been taken by the council to initiate or expedite the following specific projects: 1) process the *One- and Two-Family Dwelling Code* as a standard through the procedures of the American National Standards Institute; 2) sponsor the development of model performance standards that will complement the requirements of the *Basic Building Code*, *Southern Standard Building Code* and *Uniform Building Code*; 3) sponsor national research activity to provide a single approval agency for manufacturers of buildings, components, systems or materials who wish to market nationally, and invite the Canadian Standards Association's Building Officials Advisory Board to participate; 4) adopt the *Uniform Fire Prevention Code* as a standard for all three organizations, subject to satisfactory copyright arrangements; 5) develop a model mechanical code; 6) develop a model plumbing code; 7) investigate the feasibility of developing a mobile home code that is consistent with the principles set forth in the *One- and Two-Family Dwelling Code*, eliminating the double environmental standards that presently exist between mobile homes and factory built houses.

New Jersey Architects' Convention Examines 'The State of the State'

State government today is "where the action is" in the opinion of the president of the New Jersey Senate. "When problems are being solved, the chances are good that state government is deeply involved in the solutions."

Keynoting the annual convention of the New Jersey Society of Architects at the Playboy Club at Great Gorge, McAfee, Senator Raymond H. Bateman (R-Somerset) went on to say: "State government is aware of two of the biggest problems facing our state before the turn of the century: population and the environment. Both of these will have an effect on our institutions and on our way of life. It's going to be necessary to provide both adequate services for the population and a decent environment."

The architects, who elected Edward M. Kolbe Jr. of Cherry Hill as their new president, awarded two special citations in line with the theme "The State of the State." The recipients were Dr. Paul N. Ylvisaker, former commissioner of the New Jersey Department of Public Affairs, and Van B. Bruner Jr. of Haddontownship, who will become a national vice president of the Institute in December.

Currently the dean of the Graduate School of Education at Harvard University, Dr.

continued on page 51

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Demolishing Some Myths

by MURIEL CAMPAGLIA
Administrator
Public Relations Department

When businessmen talk about their architects, what do they say? The answers may surprise a lot of people—including architects. They can be found in a booklet which is sent upon request to prospective clients who respond to the AIA's current series of national advertisements.

The first ad in the series, "Four Myths About Architects," appeared on September 12 as a full page in the *Wall Street Journal*, and on September 16 in *Business Week*. Barely two weeks later, more than 1,300 people had written to request the booklet. Most of the requests are on the letterheads of commercial and industrial firms, the market to which the ad was directed.

The ad took on some of the more prevalent myths about architects: that they are irresponsible about time and money; that percentage fees tempt them to run up costs; that they "care more about the way it looks than the way it works." It cited a few specifics to refute the myths and invited readers to write to the AIA for a copy of "10 Businessmen Talk About Their Architects" to find out more.

The second and third ads, published in the same media on October 11 and 28, offer the booklet under the headlines, "Before You

**Before you start building,
read this booklet.**



Start Building, Read This Booklet," and "Why Call an Architect if All I Need Is Four Walls and a Roof?" The copy in the third ad goes on to say that in some cases four walls may be one too many, citing the case of an architect-designed, three-cornered building that serves its users' needs better than a traditional rectangle would.

The advertising campaign was developed by Case & McGrath Inc., of New York City, after several months of research and attitude

sampling during which the agency surveyed clients and asked a random sample of architects how they feel the public looks upon the profession.

The architects' consensus was that while potential clients may figure that they'll get a "better" building (meaning "more esthetically pleasing") from an architect, they fear that the price in time, money and ulcers may be too high.

Case histories were developed, using the clients' own words, to document situations in which architects were able to bring buildings in on time or ahead of schedule, within the budget and, in some cases, even help the client get a fresh perspective on his business operation in the process.

To insure maximum exposure for the three ads, AIA chapters and state component organizations are being encouraged to run the ads in local newspapers and in component publications which go outside the AIA membership. Reproduction proofs of the ads are available for the purpose, and components may substitute their own names and addresses for the AIA national headquarters address for local use. Copies of the booklet will be furnished also to components without charge for use in filling requests.

The first phase of the campaign was directed primarily at business and industrial clients, both because of the large share of the construction market which such clients represent and because of increasing inroads into their field by package builders and manufacturers of pre-engineered buildings.

Phase 2 planning may include other segments of the market for architectural services, such as school and hospital boards, church building committees and the like.

Response to the first ad has been gratifying not only in terms of volume of response but qualitatively as well. While the majority of respondents have simply requested the booklet, a surprising number have taken the trouble to compliment the AIA on recognizing some of the profession's image problems and taking constructive steps toward a solution.

There have also been a few challenges. One reader wrote, "I'm a firm believer in all the myths. Send your booklet and convince me that I'm wrong."

The booklet has been sent. Let's hope that he's convinced—and that his next architect will keep him so. □

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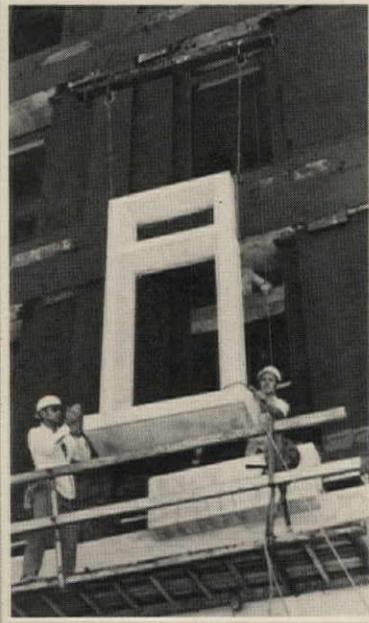
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The success or failure of architectural concrete starts on the drawing board. Only careful preconstruction planning will give a result worthy of good architecture, for no matter how great the design, a building will be ruined by dark lines, discoloration or variations on the exterior. Though it is a free-forming plastic material, architectural

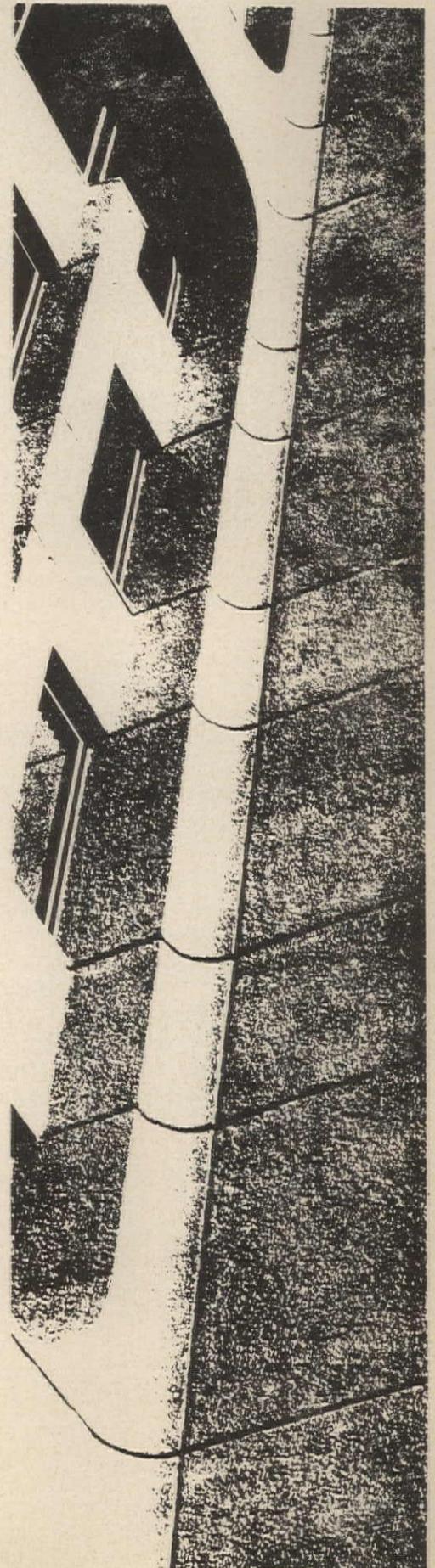
Ways with Architectural Concrete by JAMES M. SHILSTONE

concrete requires a discipline every bit as demanding as that for brick. A good architect will keep this in mind and make his design part of the solution rather than a major obstacle. In order to do so, he must have some basic knowledge of the medium.

During the first half of the past decade, there was a surge in the use of cast-in-place concrete as the primary architectural material. However, during the decade's latter part, architects had a cautious approach to the medium due to its potential pitfalls, and an apparent retrenchment occurred. It is time to take a look at the technical elements which make good results in architectural concrete attainable and bad results predictable.

The design itself is the key to the constructor's ability to produce in place that which is shown on the drawing. We don't mean to infringe upon creative design unless the design defies reasonable interpretation in the field; it is true that with an unlimited budget almost anything can be accomplished. We are concerned with the more routine commissions.

In order to understand the recent retrenchment, we must look to the past to see when and how the surge started in the





A sample of a practically perfect match between precast and cast-in-place work is the Highway Safety Research Facility at the University of Michigan, Ann Arbor. It started with local investigation, which revealed that most of the area's coarse aggregate contained pyrites which might cause rust staining on the concrete surface. One supplier was searched out for his method of minimizing this possibility. Similarly, a supplier of sand was chosen for his care in washing away fine particles which otherwise gave the local concrete a muddy appearance. Finally, one brand of cement was found to be warmer than the others in the vicinity. A standard 4-foot-wide plywood form was chosen, but with the anticipation that special forms up to 10 feet could be ordered. Joints

cast-in-place architectural concrete—or simply architectural concrete. Probably Le Corbusier's Carpenter Center at Harvard University, along with several European projects, triggered the marked interest among designers in this country. If there was a specific turning point, it seems to have come with I.M. Pei's Kips Bay apartment complex in New York City, though there were a number of other projects in the planning and building process about the same time. Outstanding achievements can be attributed to Eero Saarinen, Marcel Breuer, Minoru Yamasaki, Paul Rudolph, Gordon Bunshaft, Philip Johnson and many others. As the trend became identifiable, architectural concrete evolved almost with the speed of a fad, but certainly it cannot be classified as such because the objective demonstrates the basic tenet of good architecture through truthful expression of the structure.

Of special importance is the fact that the designs of the architects listed have no continuity in approach. Each is distinctive. Had the same architects designed the same structures in other materials, they would have been distinctly different, but they would still have been designed for construction with a recognition of the discipline necessary for the basic material.

Part of the beauty of concrete is that it is a free-forming plastic, like putty in the hands of the architect. He can use it to shape as he desires. However, it is this fact which has caused the greatest difficulties with architectural concrete. "Free-forming

between adjacent pieces of forming material were articulated, as were the tie holes. The shop at the rear of the building called for flexibility, and therefore it was decided that this part of the work should be precast. This was done on the site by tilt-up methods. The sloping window sill was nonstructural; its reinforcing steel and 4-inch thickness at top made casting it in place practically prohibitive. The sills were cast on the slabs behind the windows and then rolled into place. Harley, Ellington Associates, Inc.

On the preceding page is shown the Tennessee State Office Building, Memphis, of cast-in-place abrasive blasted gap-graded mix. Gassner-Nathan-Browne Inc.; associated architects: Haglund & Venable.

plastic" has no connotation of the discipline required for consistently good results.

Most of our finest examples of architectural concrete have taken advantage of the free-forming plasticity of the material but show complete recognition of the intense discipline it requires. There are other projects for which this discipline was not a major consideration, and this is evident in poor results. Unfortunately, their designers frequently attribute the deficiency to the contractor's lack of knowledge. This may have been part of the problem, but in many instances the project was doomed to failure before the plans were in his hands.

By poor results are meant the details of finishes, not the total architectural concept. An excellent architectural work can have poor detail execution. We have seen this point cause confusion when an architect likes the appearance of a building and wants the finish duplicated. But he has not noticed that the finish was almost a failure technically. The contractor's exact match will not satisfy the architect just because there is different architecture involved. Some of the finest design-oriented architects have succumbed to this tendency. They look at the total architecture, and the contractors and laymen look at detail.

Some disciplines are critical to the successful achievement of architectural concrete detail. The architect is by education not only trained to utilize the possibilities of a material but also to observe its limitations. Without recognition of the latter, any material could be improperly applied.

First of all, the architect must recognize the marketplace conditions of the concrete industry. To work within these is a distinct advantage while their denial can cause major construction difficulties.

Concrete is normally considered a local material with all of

Mr. Shilstone is president of Architectural Concrete Consultants, a Division of General Portland Inc., Dallas. In 1965 his article "Architectural Concrete: A Close-up Look," appeared in the November issue of the AIA JOURNAL. The present article can be found in a companion piece, but addressed to the man in the field, in the current November issue of *Concrete Construction*.

its ingredients taken from the earth native to the area of the project. Geology, therefore, sets certain standards for each part of the country. The American Society for Testing and Materials has developed broad standards which can be reasonably achieved in most sectors, but these limitations do not consider the detailed needs of the architect for an individual project.

The major portion of concrete sold is structural, so producers have little inclination to procure special materials. The industry looks upon a total market. Seldom is a single project of such a magnitude that it would make the difference between a profitable and unprofitable year. Each producer, therefore, can readily deny an architect's objective by submitting a proposal completely outside reasonable budgetary limitations. The cooperation of the producers is clearly an essential element in achieving an objective and this should be enlisted before the job is bid.

There are no industry standards for architectural concrete to which the architect can refer or which a contractor will accept. Therefore, each project must be governed by its drawings and specifications and rest on the merits of the contract documents.

The concrete industry is more concerned with the economics of its individual components and the structural character of its end product than with visual appeal. Minimal attention has been paid to the elements which will influence the fine details of architectural finishes. Products are developed, manufactured and distributed on the basis of mass consumption; major manufacturers have little interest in limited quantities or highly specialized materials.

The standard of the concrete form is the 4x8-foot sheet of plywood. Other sizes lack the volume demand; therefore their availability is negligible. There are technological reasons for variation in concrete finish result opposite the butt joint, and consequently the jointry between adjacent pieces of plywood is almost as demanding as the mortar joint between adjacent pieces of brick. An attempt to change the size of the basic product would be almost as difficult as to change the dimensions of a brick for a single job.

Without prior architectural concrete experience, concrete constructors have little technological background other than for structural concrete. An assumption of experience level can therefore be misplaced.

Design Keys

The key to effective design lies with the initial recognition that concrete is a free-forming plastic material. Next, there must be constructability incorporated in the design. Long, slender sections generally require compensating heavy reinforcement, which leaves little room for the contractor to do his work effectively to meet the architect's finish objective. The designer should appreciate this problem and conceive straightforward and reasonable construction methods rather than base them on hopes. The resulting design will be a part of the solution rather than the major obstacle.

The need for repetition of member sizes is increasing. Over the next decade, it is anticipated that the growth in carpenter force will be almost negligible. Quality forms will have to be

constructed to allow maximum reuse with minimal carpenter input. Even without a carpenter shortage, the changing of forms is costly.

In other words, the best results can be produced with a systems building approach, and it must be well organized. This presents a limitation of concrete flexibility but the economics have to be considered.

The design should determine appropriate construction methods. If an illogical method is specified, it is quite likely that either financial or constructability results will be adversely affected. The architect who specifies that a thin nonstructural member be cast-in-place rather than precast purely for philosophical reasons can seriously hurt the result. Through efficient planning and fabrication, precast and cast-in-place work can be made to match.

Local Investigation

Each section of the country, as pointed out, is influenced in its modern concrete by past geological happenings. For efficiency, the architect should investigate the area where a project is to be located. It has happened that a finish specified required a select gradation of a special coarse aggregate, a nonstandard sand and a cement from a distant source. Though each individual product may have been inexpensive, real difficulty was encountered when it was found that no ready-mix producer in the area had a rail siding and that none had a surplus silo for the special cement; the aggregate bins were limited in number and were used for constantly supplied concrete ingredients. Unless early local investigation is made, conditions like these are generally found within a week before bid time. In such cases, the concrete usually will be quoted somewhere around \$150 per cubic yard in the mixer truck and the designer will have to make a last-minute change to meet his budget.

What may seem to be a large project for the architect may represent only a small volume demand for producers. Cement is the prime example of their lack in interest to change from routine production. Thirty thousand cubic yards of architectural concrete (project size of over \$100 million) would seem to be a great deal, but look at it from the cement manufacturer's point of view. A reasonable mill can produce enough cement for about 4 million cubic yards of concrete a year. The 30,000-yard job might take up to three years to construct, so the demand in the cement company would be for only 10,000 cubic yards a year. There is little interest at any price.

Other local influences are: ordinances limiting abrasive blasting; shortages in certain crafts; overall quality of workmanship in concrete construction in the area, and a certain know-how in the local workman. These are the facts with which the designer must work. If he ignores them, he can expect difficulties.

Concrete Mixes

There are no established methods for the art of developing concrete mixes which may reasonably be expected to produce the architectural results desired. The recognized industry procedure for design of structural concrete mixes is the American Concrete Institute's Standard 211. This has been developed to

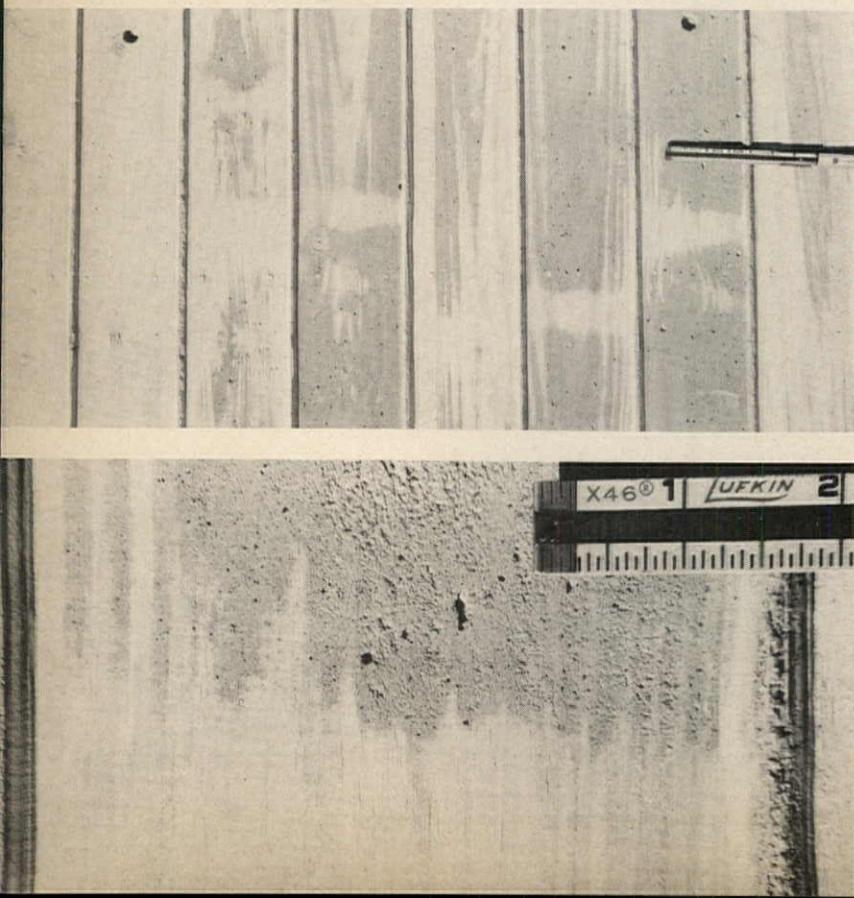
meet the needs of routine concrete to be used for just about everything—it's a general catchall.

However, the principles of ACI 211 can serve as a good base for preparation of architectural concrete mixes for those who appreciate the architectural objectives, but the specified quantities can on the other hand be in direct contradiction to these objectives. We consider that the amount of coarse aggregate as provided by ACI 211 is certainly not in the best interest of any architectural concrete; it should be increased to give it a better performance under proper mechanical vibration. Also, under proper mechanical vibration and compaction, there will be fewer blowholes than would be present in an overmortared mix, which tends to cling to the forms and prevent the escape of air.

ACI 211 is designed to be acceptable for flat slab construction, but a mix design for architectural purposes seldom must serve the needs of troweling for flat slabs. Why is it justifiable then to follow the principles of designing the mix for this objective? An architectural concrete mix must meet certain criteria established by the architect. But it must also meet and, probably foremost, comply with requirements of the structural engineer to maintain the structural integrity of the building.

Wet mixes tend to segregate more readily than do dry mixes, and with heavy vibration of a wet mix there can be particle separation at the concrete surface which will appear as a dark area on the finish, much like a hard-troweled surface which shows blotchiness due to late finishing. The dark, blotchy areas found on surfaces cast with high slump concrete seldom are apparent in drier, less than 3-inch slump mixes.

Unknown influences can affect untreated, board-formed concrete. Unsealed wood previously exposed to the elements leaves the concrete dark; banding material, shielded from the sun, shows up in light stripes. Close-up shows that the lighter concrete is smooth, the dark is porous.



The problem of mixes is normally left to others and is not a prime concern to the architect. However, he must have the capability at least to raise questions or introduce factors mentioned, as they are important for the proper development of a project. The architect should seek a consultant experienced in architectural concrete or personally investigate various approaches to mix designs. When the finish dictates that a certain particle size be present, the mix design should aid in that solution. This is a technological process; if done nontechnically, cracking, spalling, low strengths and blotchiness of finish may result.

Forms

In any architectural concrete project, the form work must be superior to that for structural concrete. The omission of details in form requirements has been one of the problems that has caused poor quality architectural concrete in the past decade. If a high quality concrete mix is placed within an inferior grade of forming, it will definitely be downgraded.

Form liners include not only wood boards, textured plywood and woodlike sheets of plastic but also fiberglass reinforced plastic, extruded plastic, polyvinyl chloride and the elastomeric. There is little need in discussing the two first-mentioned materials except to warn against the sugar content of raw wood. Though the boards may be sealed, the sealers may be broken down by the sugars. The result will be a finish which instead of fairly reproducing the wood will tend to dust, and the texture will be removed by hand brushing. Spring growth is especially critical for this purpose. Minimal sugar-bearing wood should be carefully selected and properly sealed.

Unknown influences can adversely affect the appearance of untreated board-formed concrete and be beyond the control of the contractor. An excellent example was encountered in the construction of samples for the Fourth Financial Center in Wichita, Kansas, by the Skidmore, Owings & Merrill Chicago office. The early finish objective samples cast by the general contractor, Martin K. Eby Construction Co., Inc., presented some interesting results. Concrete in contact with certain boards was dark, with others light. Where it was dark, there were unexplained horizontal bands. The conclusion was reached that the boards which caused this discoloration had been exposed to the elements while on top of a stack and that a banding material shaded a portion of the boards from the sunlight and ultraviolet. The exposed portion affected the concrete by the sugars drawn to the surface by the sun and possibly by opening the pores to absorb more of the concrete. Where the concrete is light, there is almost a glazed condition; where it is dark, there is a porous surface which we feel was caused by a portion of the concrete skin actually becoming impregnated in the absorptive board and removed with the form.

The best control for color consistency of architectural concrete comes with use of nonabsorbent forms. With a controlled form, as-cast concrete surfaces can be treated by a number of methods to achieve different finishes. We prefer to work with the controlled condition rather than to hazard the unknown variables which can be encountered with natural unsealed wood. Wood

can be sealed to make it nonabsorbative, but the sealers tend to break down after a few uses of the form.

Nonabsorbing extruded and cast plastic form suppliers provide a vast potential for versatility with inexpensive stock items. Many of these can be used in the as-cast surface or in combination with distressing techniques.

The really exciting potential of form liners lies with the polyvinyl chloride in the elastomeric. These materials can be fabricated in various degrees of hardness. As a result of the flexibility possible, undercut such as would be present with the knots of barn lumber can be produced without spalling.

Though these products have not been in the marketplace long, experience indicates that there is a greater surface drag on the concrete with these than with harder forms, resulting in increased blow holes or minor surface porosity. Caution should be exercised in the handling of this type of form because of its bonding to the structural forms. The liner may ripple unless there is a good bond to the base form. It may be desirable to have the product delivered with a plywood backing already attached. In some cases, the manufacturers of the polyvinyl chloride material suggest that no release agents be used. We suggest caution here. The elastomeric may be found generally to have a greater reuse factor to compensate for their occasional higher cost. However, a match between forms of this nature and well-sealed boards can be accomplished to allow use of the less expensive wood in areas of little or no reuse. The architect should note that price of polyvinyl chloride and elastomeric forms is governed by the weight of the product. A thin liner with projecting texture is more economical than a thicker liner with recessed texture.

In any as-cast surface one of the most important factors is selection and application of the release agent. A statement in the specifications that this be a nonstaining material is of little value. Few products can be applied under most conditions without discoloring concrete. The care with which the release agent is applied can make the difference between a good job and a blotchy one. Most discoloration of concrete attributed to the cement and ready-mix concrete variations are really caused by variations in form absorption and release agent application.

Leak-free forms are especially important for architectural concrete construction. Where leakage occurs, honeycomb and dark lines around the edge of the honeycomb will be present. When in doubt, gasket! Butt joints between plywood not covered by tape or rustications will range from no effect on the concrete to dark lines. Surface skin removal by distressing techniques will frequently accentuate the appearance of the lines. This is uncontrollable. It appears that no amount of tightness will prevent this from happening.

Taping of butt joints of plywood must be carefully executed. The configuration of the tape will be translated to the architectural concrete surface with textures less than a medium abrasive blast. The safest rule is to articulate the occurrence of these joints.

The form ties are an important consideration for the forming system. There is a tendency for most architects to use the cone snap ties. The installation of these must be very carefully



The Pet, Inc. International Headquarters Building, St. Louis, shows the reproduction of abrasive blasted board texture possible with glass reinforced plastic form liners. A. L. Aydelott & Associates.

done. Leakage can occur around them if they are not perfectly seated. The holes for the cones appear to us to be exaggerated beyond the needs. There are other methods of tying which the architect should consider, such as the tapered bolt, which will be completely removed from the concrete. Another type is the "super-tie," a tapered pin through each side of the form connected by a threaded piece of metal which will remain embedded in the concrete. The tie hole can be made sufficiently small to prevent leakage around these tapered pieces. Further, these adjustable, high-strength bolt ties facilitate the installation of subsequent forms in holding them tightly to the concrete of the previous casting and help prevent leakage.

Finishes

There are over 200 million potential architectural concrete finishes in this country. Among these should be some that will satisfy even the most discriminating designer. Finishes may be classified in two primary categories: as-cast and distressed. Respectively, their subcategories are: smooth and textured; and abrasive blasted, fractured, combination and chemically retarded.

For as-cast (as defined by its name), all types of forming materials and form liners are used. Due to rising problems of ecology and dust created by other finishing techniques, we must develop better knowledge of this type of finish and plan its effective construction in the future. Surprisingly, in many ways the



Valencia Community College, Orlando, Florida, repeats its exterior as-cast boarded surfaces in the interior. Hellmuth, Obata & Kassabaum; Stevens & Walton; Murphy, Hunton & Shivers.

as-cast finish is among the most difficult to achieve, and hardest of all is a uniform, smooth, large flat area of gray concrete.

Such a surface is what we would classify as "unforgiving." Any variation will be conspicuously obvious and therefore undesirable. Any large flat surface to be left in the as-cast condition would be better cast against textured forms either with boards properly treated or one of the multitude of form liners available. The texture should be such that minor variations in the surface would be secondary to the variations within the textured finish.

While some of the variations in large expanses of walls would similarly be present in columns and beams, they would be secondary to shadows between these columns and beams. Therefore, smooth as-cast solutions can be effectively achieved in this type of design.

The Pet, Inc. International Headquarters Building in St. Louis designed by A. L. Aydelott & Associates is an excellent example of the faithful reproduction of sandblasted board texture possible with a fiberglass reinforced plastic form liner. During early design studies, actual sandblasted boards were used but it was obvious that these would cause difficulty during construction. Variations in moisture absorption by the wood plus moisture-caused expansion would result in grain becoming imbedded in the concrete or spalling of the surface upon stripping of the forms. Fiberglass reinforced plastic forms proved eminently successful. Some may disagree with the "honesty" of this texture and dislike the repetition of configuration floor after floor, but an "honest" but spalled and blotchy alternative would certainly not be the answer for a corporate headquarters.

The color of a finished surface must be related to the color

of the cements today. When an architect sees a three-year-old or older structure cast with a certain cement, he should not think that he can get the same color in any shorter period.

Old concrete in some large metropolitan areas are of a warm value though the local cements are notoriously unattractive grays. After much study we have drawn the conclusion that this warm hue was caused by the reaction between atmospheric pollutants and the oxides of iron in the concrete. As we decrease pollutants, this change may not occur. Architects, therefore, should not expect this transition to take place in the future but should build it into the design.

The distressed surfaces are: abrasive blasted, fractured, combined and chemically retarded. The latter, of course, is not a physical technique but it can produce effective results for exposed aggregate.

The most commonly used system is abrasive blasting (also called sandblasting though sand is not necessarily the best abrasive). Cities prohibiting this method are increasing monthly. Before deciding on this technique, architects or their consultants should investigate the latest round in ordinances and check future ones which might shut down a job while under construction. For long-range projects, processes which violate ecological considerations should not be chosen.

There are four primary degrees of abrasive blasting:

1. A brush blast scours the concrete surface to remove minor discolorations caused by release agents, curing compounds, etc. Hardly any sand is exposed. This work can be done with low pressure and fine sand.
2. Light abrasive blasting develops a texture somewhat like a

coarse sandpaper and exposes primarily fine aggregate with a few pieces of coarse aggregate.

These two degrees of abrasive blasting must be looked upon architecturally as part of a total. There will be variations influenced by the concrete surface hardness and impact patterns of the abrasives. The overall result will be effective but will not stand up under close scrutiny or provide hoped-for tolerances.

3. Medium abrasive blasting removes the surface mortar to such an extent that the particles of the coarse aggregate will start to protrude. An uneven distribution of the coarse particles or even a sparsity of the particles can cause undesirable results. Particle hardness will be important as it can affect abrasive size selection and place a timelimit on performance of the work. Soft particles may tend to erode at the same rate as the mortar with certain abrasives, pressures and concrete strength-conditions. The earlier the blasting, the better.

4. A heavy blast leaves the coarse aggregates as the predominant surface material. To achieve uniform distribution, the so-called gap-graded mix design approach to concrete with special sand gradations must be used. This frequently violates standards of the American Society for Testing and Materials.

Abrasive blasting should be done as early as possible after

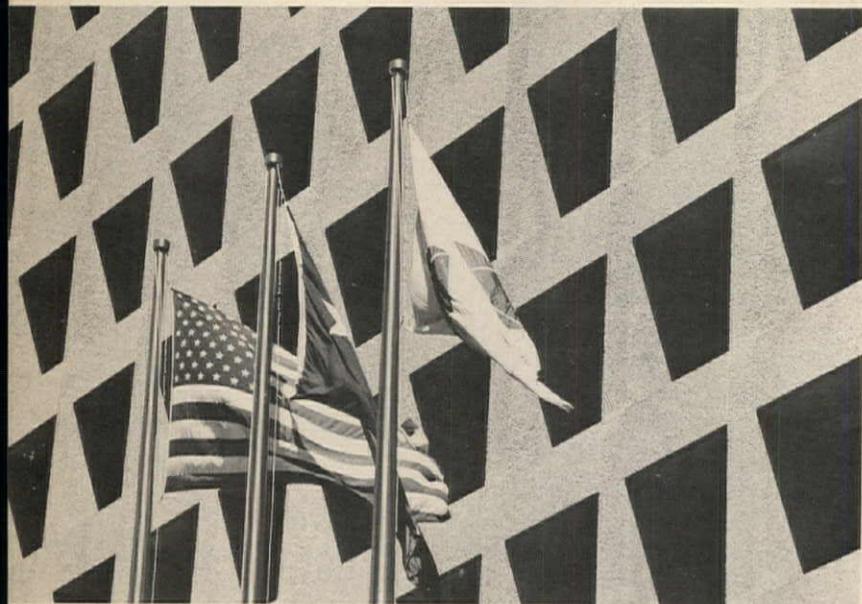
the casting and certainly within 48 hours. Here again, hardness of the coarse particles can be critical. Alternatives to the gap-graded methods are the Arbeton process (invented by the author) and the pressure-grouted system. The former was used in One Main Place, Dallas; American Can Corporation Headquarters, Greenwich, Connecticut; and Georgia Pacific Corporation Office Building, Portland, Oregon, all by offices of SOM. The pressure-grouted system is primarily used in Norway where the architectural techniques applicable to it were perfected by architect Erling Viksjø. These processes are used with aggregate sizes of $1\frac{1}{2}$ to $\frac{3}{4}$ inches and larger.

Several fracturing techniques are referred to by the architectural profession under the general term "bush hammering." Actually, there are three primary classifications: scaling, bush hammering and jack hammering. The scaler, a pneumatic tool of about $4\frac{1}{2}$ pounds, has three chisels which strike some 7,000 blows a minute. They nibble the surface for a pleasing effect but do not produce a major texture (*see cover*). The bush hammer is a meat tenderizerlike tool which may be hand, pneumatically or electrically operated. The broken stone effect achieved has a moderate texture. The jack hammer is heavy and may use either a single-point or a chisel-point tool. The characteristics of the



Kemper Insurance Office Building, Low Grove, Illinois, shows light abrasive blasted, combination precast and cast in place concrete (above). Welton Becket & Associates.

Tulane University Library, New Orleans, has cast-in-place abrasive blasted, gap-graded mix working structures (left). Window units and rail are precast, chemically retarded exposed aggregate. Nolan, Norman & Nolan.



One Main Place, Dallas, uses Arbeton method for the cast-in-place columns; beams are precast (above). Skidmore, Owings & Merrill; associate architects: Harwood K. Smith & Partners. Houston Independent School District Central Administration Building, Houston, has central court with cast-in-place white cement reconstituted stone concrete, jack-hammered and light abrasive blasted (below). Neuhaus & Taylor.

coarse aggregate, the strength of the concrete and the texture desired can dictate the shape of the tool. The cast-in-place work of the Houston Independent School District Central Administration Building by Neuhaus & Taylor is an excellent example of a jack-hammered finish.

In any fracturing technique, the best application is to large expanses of concrete. Corners can be a problem as workmen may spall them at irregular intervals, making them jagged. Each job requires special care and planning as to how corners should be treated.

Of them all, the jack-hammered surface is probably the most forgiving and tolerant to construction variations. The primary undesirable variations which cannot be readily obliterated in jack-hammered concrete are the dark lines opposite the junction of untreated or unsealed butt joints of the forming material. Such variations as form boat-patch discoloration, improper release agent application, bellying of forms, minor lift lines and honeycomb, surface blowholes and the like are generally eliminated. This is a technique where concrete placing workmanship



does not have to be outstanding; the primary cost impact is that of the finish process, which can range from \$1.50 to \$2.50 per square foot.

Another process which can be allied with the fracturing techniques is tooling or chiseling of a surface in a directional fashion for a carefully controlled texture. I. M. Pei has used this process extensively; examples are the Everson Museum of Art, Syracuse, the National Center for Atmospheric Research, Boulder, Colorado, a residence, Fort Worth, Texas, and, by a slightly different process, L'Enfant Plaza, Washington, D.C. The first three projects were accomplished by laying a grid over the concrete and holding this in place with the form bolt connections. The chisel was then raked through the open places in the grid. At L'Enfant Plaza, a series of fixed-head pneumatic hammers were mechanically lowered over the wall.

For combination finishes ribbed-type forms or form liners are generally employed. The ribs are then fractured by various techniques, even abrasive blasting. Other interesting applications have evolved, including the use of a smaller rib, bush-hammered along the leading edge, as used by Rex Whitaker Allen on the Alta Bates Hospital, Oakland, California. More recently, plastic has been extruded for closely spaced ribs, allowing but a notch between them. The concrete is then raked by a bull chisel to knock off the rib. This gives a strong linear effect and provides a bold texture economically. It is also a forgiving surface in that the variations become lost within the texture. The imagination is the sole limitations of combination finishes.

Retarders must gain prominence in exposing aggregate due to the ecological limitations being placed on abrasive blasting. Several projects have used the technique effectively, but the word "retarder" should be sufficient warning in itself to indicate that it must be used with caution. The process involves the application of a proprietary product to the form, and then casting concrete within the form. A chemical reaction between the portland cement and the retarder slows down the setting of the concrete. If the forms are left in place sufficiently long, the concrete will harden as any other concrete. Time, temperature, cement factor, absorbency of the forming material, buildup of chemicals associated with reuse of forms and several other factors influence the depth of etch. Obviously, this process must be used only under close control. When it was first applied to cast-in-place work, the forms had to be stripped within 24 hours. Some of the newer products have produced successful results with the forms remaining in place for up to two weeks. Every project will be different and the tolerances to stripping must be proved by tests before starting the building.

While most product manufacturers color-code the retarders for various depths of etch, it is suggested that the specific mix be tested with several. Contrary to abrasive blasted texture where the depth of blast is a function of the size of the aggregate, retarders are measured by surface skin removal. A 1/4-inch removal for 3/4 to 3/8 size of aggregate would produce one type of texture; the results with the same product with a 1 1/2 to 1 3/4 inch aggregate would be entirely different.

Here again, there are no standards. Product prices fluctuate



Alta Bates Hospital, Oakland, California, combines reeded and hammered finish on cast-in-place walls. Flat surfaces are lightly abrasive blasted, window units acid etched. Rex Whitaker Allen & Associates.

considerably. The selection of the product should be based on multiproduct tests and the decision made on results, not price.

Efflorescence

In order for the architect to make sound decisions regarding mixes, finishes, forming and release agents, a better understanding of the chemistry of portland cement concrete is helpful. When portland cement and water react, one of the products is calcium hydroxide, which is water soluble. Part of this white substance is conveyed to the surface of the concrete by the water of convenience as it evaporates; the more water, the greater the calcium hydroxide deposit on the surface. When nonabsorbative forms (including sealed wood forms) are used, concrete cast against them will be of light color. When using absorbative forms, the calcium hydroxide is partially removed as it seeps with the moisture into the basic form. Unfortunately, we know of no way at this time to control absorption other than to prevent it. As a result, concrete cast in absorbative forms will be blotchy in color.

The calcium hydroxide will react with the carbon dioxide in the atmosphere to form calcium carbonate. This is the technical name for efflorescence.

Repeated wetting and drying cycles can cause more calcium hydroxide to be brought to the surface of the concrete, which has been said to bleach with time. This may be so to a minor degree but the primary process is that of uniform efflorescence. This phenomenon can be observed in many concrete structures by comparing the exposed face of a beam with the soffit. It may be said that the ultraviolet does not attack the soffit, but the effect of the drip line or natural drainage lines will show up.

It is also being found that in some regions, salts in the natural aggregates create chemical conditions within the concrete

which accentuate the formation of efflorescence. More study is being undertaken on this subject.

Efflorescence can be considered objectionable by some but we feel that it should be evaluated as a mellowing of the structure which minimizes visual variations, giving patina to the concrete.

The qualities of concrete cast in past years are often brought up and questions are raised about the inability to produce similar qualities today. We believe that this is mostly due to the patina of old concrete. Over a period of years, we have watched projects mellow which contained highly visible lift lines. Due to the coating of the dark materials visible in lift lines, they have become the same color as the concrete and are much less objectionable.

This process therefore dictates that concrete is a light material. The efflorescence is present with white cements but of course white on white shows little change. Otherwise the concrete can be basically gray, buff or tan. If darker concretes are proposed and are an important element to the design, it will be necessary to seal them and then clean and reseal as the building ages and the original sealer disappears.

Most of the calcium hydroxide will migrate to the surface during the construction period. The building should be cleaned by brush blasting or chemical cleaning before occupancy. There will be later efflorescence, but only to an acceptable degree.

Detailing

When low slump concrete is used, the contractor must have the necessary space to place and consolidate it. There have been attempts to cast concrete in walls with double curtains of reinforcing steel and the total wall thickness ranging from 6 to 8 inches. The result is frequently a disaster. How is a contractor going to put a 1 3/4-inch vibrator (which we classify as a small unit) into the space between the steel to achieve any desirable degree of compaction?

To do a good job, a contractor casting a wall 15 to 20 feet high needs 5 inches of clear space between reinforcing steel. Due to tolerances of ACI and actual field variations, this would under many conditions be reduced to 4 inches. The design should be for 5 inches, however. Without this space the field crew will have difficulty placing the concrete. When this happens, the architect can expect honeycomb, lift lines or other undesirable variations in the finished concrete surface.

Though the structural engineer may anticipate a need of 8 inches for certain load-bearing conditions, it is essential to facilitate constructability and therefore increase walls to a minimum of 10, probably 12 inches. Careful planning of the reinforcing steel detailing can make the difference in a design that is constructable or turns out to be a monster. One effective procedure for wall design is to place the horizontal steel outside the vertical steel.

Where the steel prevents placement, bundling of both vertical and horizontal bars should be considered. Welding or proprietary splicing devices are desirable to eliminate lap splices, which can cause many problems, even preventing the flow of everything in the mix except the grout.

When drawings are examined to determine constructability, blockouts and large inserts must be considered from the point of view of the man on top of the forms trying to place the concrete and vibrators into these forms. He must have clear vertical working space to produce the results desired. When a concrete member reflects a series of repetitious interruptions, such as for instance lift lines in a wall, the reason can generally be traced to work conditions. To obtain the best results, the vibrator must be inserted into the concrete 12 inches on center. If the placement

spaces are 5 feet apart, there is no way that the two lifts of concrete can be recombined without leaving distinctly visible lines on the surface.

Where blockouts are necessary, provisions should be made for the casting of concrete through ports in the back of the forms or through the bottom of the blockout. Where piping is to be installed, coring is preferable to blockouts if the latter will cause problems to the placement or consolidation of the concrete. It may be necessary to core only a few of the holes.

Regardless of the design quality and finish objective coming from the man in the office, the ultimate visual results will be governed by the work space given the man in the field.

Samples

There are four sample categories. In order of use, they are: the design development sample, the finish objective sample, the mockup and the building itself. Each must be used only for its specific purpose. Use of samples for the wrong purpose can cause severe disagreement between architect and contractor.

The initial samples should be small and are generally cast face down under laboratory conditions. These should be for design development only as the conditions of casting, the concrete mix and the conditions of construction are not comparable. Next is the finish objective sample, which should be 18 to 24 inches square and cast by the method proposed for construction on the job; i.e., if this is vertical, the sample should be similarly cast. The designer should recognize that there will be variables and anticipate lesser uniformity than shown in the sample. Seldom will a sample be perfectly matched for an entire casting. It is too small to show all the variations which can be expected. An owner would probably not accept such a finish if all the variations were shown in the sample. The meaning of each sample should be clarified with the contractor.

If the designer uses another building as a finish objective sample, he should examine the finish carefully and completely eliminate the relationship of this to the architecture. The contractor will totally disregard the architecture and analyze square foot by square foot to see what will be acceptable for the job under construction. If the sample building cannot stand up under this close scrutiny, don't consider this practice.

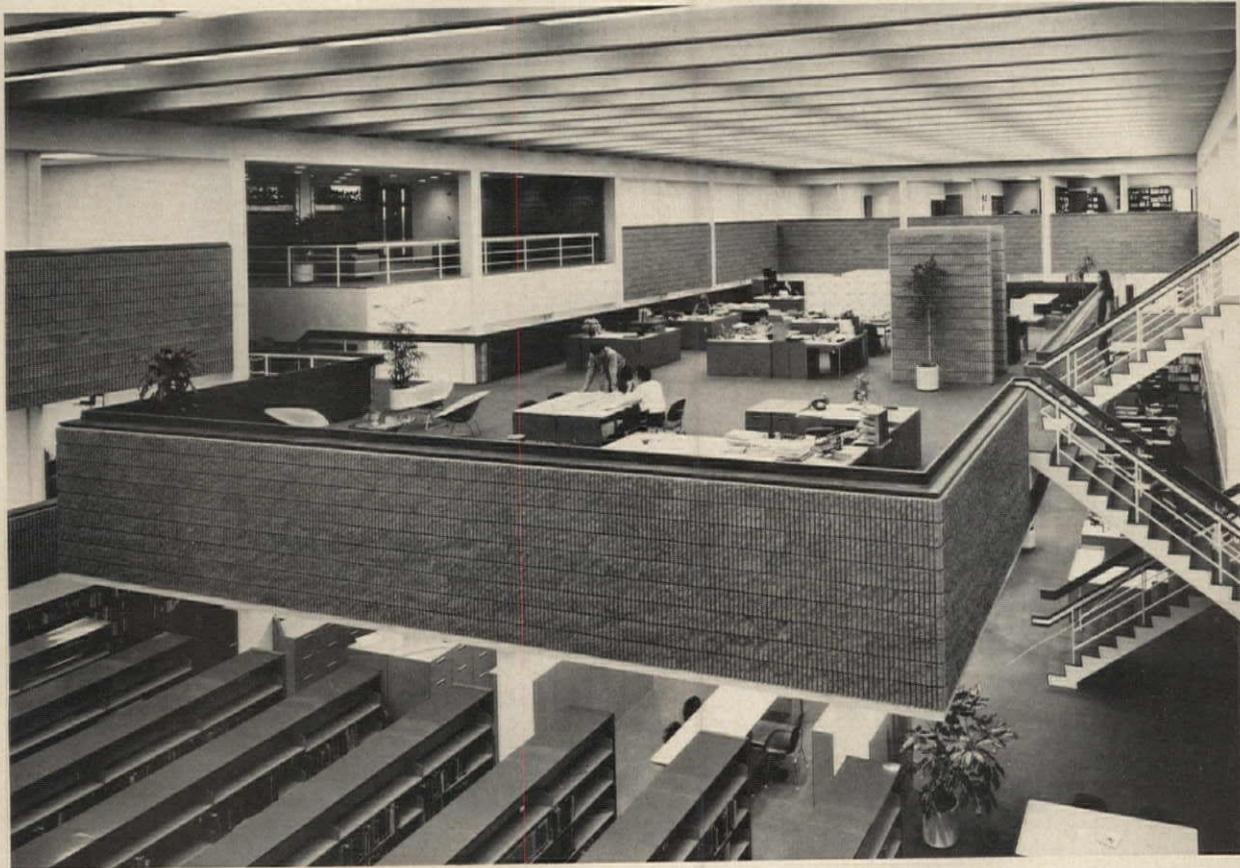
The standards of acceptability should be determined in the contractor's mockup. At this point all the most difficult details of construction should be tested and the quality of the contractor's work verified to assure that it comes within the tolerances of the finish objective. The quality of workmanship of the mockup should be very good, but when we serve as consultants we hope that unacceptable variations will occur in the mockup so that they may be used to show the contractor that lesser than high quality workmanship will not be tolerated. Perfect mockups have been known to cause difficulty when workmen try to find the lower limit of the effort necessary to achieve the results. Unfortunately, these "tests" appear on the building and are forever thereafter present. The mockup should be entirely completed. In the rush of business, designers sometimes examine only a small section of them. No final decision should be made by the architect until the contractor has laid down his tools and the mockup has been completed.

The final sample is the building itself. Each casting is a mockup of the casting to follow. Trends in forming and construction techniques must be observed to determine if there has been slippage in the quality control. If such is the case, it should be corrected before the next casting is started. Further deterioration of workmanship will be rapid if not corrected. □

PRACTICE

SMS Architects is a 24-member firm in Connecticut whose direct response to its organizational problems has brought about a closely knit team.

PROFILE



American Education Publications (Xerox Corporation), Middletown, Connecticut, has two office levels surrounding a library and "floating" mezzanine. Principal in charge: A. Raymond von Brock, AIA; designer: Robert C. Steinmetz, AIA.

A Firm That Gained Strength Through Transition

SMS Architects in New Canaan, Connecticut, has gained in strength through reduction in numbers, paradoxical as it may sound. The present staff of 24—11 of whom are architects—is of a size and in a locale which enable it to keep completely informed about all the firm's ongoing projects and thus provide backup under any and all circumstances.

A couple of years back when SMS found itself with too large a staff, too much space, too many barriers between the staff in that space, and in a city where traffic was becoming too messy for comfort, the partners decided it was time for a change. The direct approach to problem solving, which shows in their design solutions, came through also in the way the four partners faced the firm's organizational problems. The steps they took were drastic, even painful, but nevertheless necessary in order to keep on delivering quality work and to maintain a satisfied and inspired staff. Consider these points:

- a reduction in numbers in less than a year from 36 to 24

- a move from an office tower in busy Stamford, Connecticut, to a renovated warehouse in the almost sleepy residential town of New Canaan 10 miles away.
- a change of the office layout from one that separated principals from staff to one that is just about completely open.

Over the preceding three years, the number of partners had dropped from seven to four, and the name of the firm changed, though over a longer period of time, from Sherwood, Mills & Smith to The SMS Partnership to SMS Architects.

"After the metamorphosis we have been through, we find that we are more efficient, that we are truly working as a team," says Carrell S. McNulty Jr., FAIA, who has been with the firm since six days after his graduation from Columbia University in 1950, longest of the four partners. "After the integration of physical spaces a new spirit has swept over us — over principals as well as staff."

From his small, ground floor office, McNulty can view

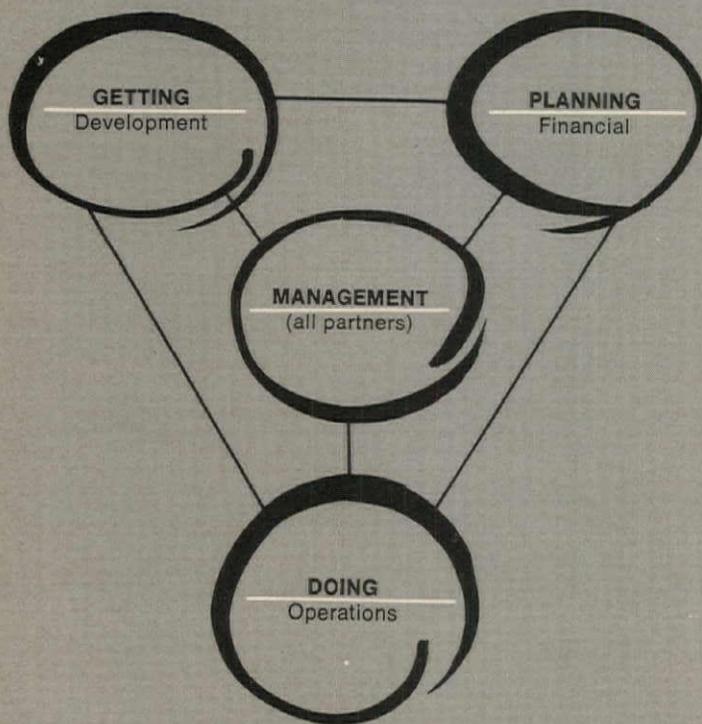
STAFF BREAKDOWN

Partners	4
Associates	5
Project architects	3
Controller	1
Specification writer	1
Interior designer	1
Field supervisors	3
Draftsmen	2
Clerical	4
	<hr/>
	24

GROSS BILLING PERCENTAGES

(1971-72 fiscal year)	
Industrial	57
Primary/secondary school	34
College/university	3
Public	2
Housing	2
Religious	1
Other	1
	<hr/>
	100

ORGANIZATION CHART



Partners von Brock, Mills Jr., Taylor and McNulty (from left) get together for an informal session of the type that the open office layout invites. While colorful, with exposed rafters and bright red ducts, the SMS quarters still yields to people and lets activity make it lively.



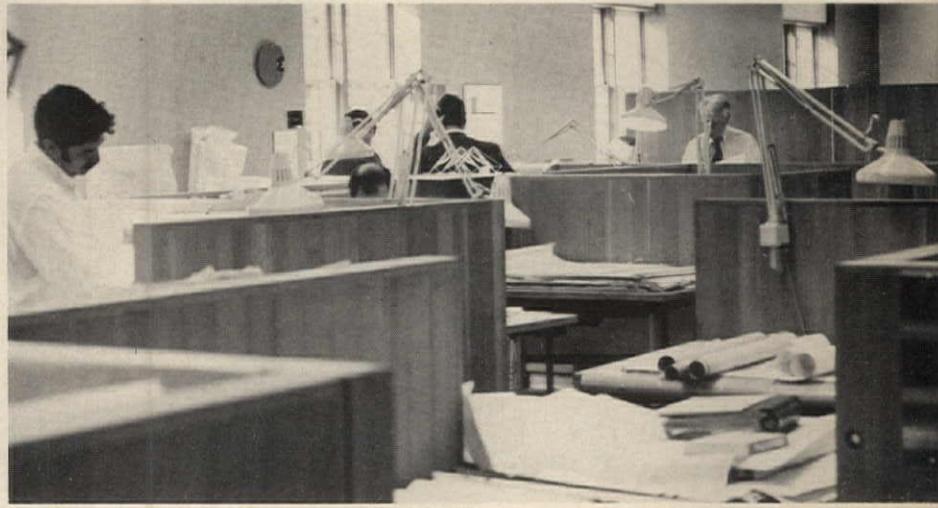
a lazy New Canaan street through the window, and through his door opening he sees a drafting room that hums with life. In their Stamford office, the then seven partners were physically separated from the rest of the staff by the central core of elevator shafts and services, a situation that also prevented any feeling of unity. In contrast, the present office layout invites integration. When the bright blue door of the earthy-hued SMS building swings open, there's the nerve center of the whole operation in full view. Though there are low partitions for a minimum amount of privacy, everybody knows what the other guy is doing.

Besides McNulty, two of the other partners, Gray Taylor, FAIA, and A. Raymond von Brock, AIA, have separate rooms, though with doors that never close. The fourth partner, Willis N. Mills Jr., AIA, is out in the open. As chief designer he prefers this close relationship to other architects and staff.

In its long path to New Canaan the firm has left behind over 800 structures of all sizes and varieties. From a one-room operation with a part-time secretary, SMS grew in 10 years to a 40-man organization under the leadership of the three original partners — Thorne Sherwood, FAIA, Willis N. Mills Sr., FAIA, and Lester W. Smith, FAIA — who had met while in the service during World War II and founded the partnership in 1946. They started out, as architects usually do, with single-family houses. Then a school project came along in 1948. This became the first of a series of educational facilities, a fact which brought the firm the stamp of school designer. Today, this image is no longer valid since the types of work have spread out to embrace all kinds of structures.

Four associates were named in 1955, among them McNulty and von Brock, who had come aboard in '52. But the firm was loosely organized, each partner caring about his own job, living to design rather than designing to live. Clearly, in a business-oriented world a more business-oriented leadership was needed.

In 1958 a management consultant firm was called in



whose study of SMS left a number of changes in its wake. Four junior partners were named, among them McNulty, who became chief draftsman; von Brock, who took on the job of office manager; and Taylor, who had joined the firm in '54 and whose field became research and services planning. The fourth was Thomas A. Norton, AIA, who took charge of public relations.

The setup, with clearer delegation of duties and authority, was an improvement over the old system but nevertheless it didn't work out. It broke down almost immediately.

Nonetheless, commissions came in at a crisp clip and the personnel increased to 60. For several years educational facilities laid claim to a whopping 50 percent of the work; in fact, more than 150 such projects have come off the SMS boards to date. SMS-designed schools are scattered throughout the metropolitan areas of New York, New Jersey and Connecticut. Low-slung, spread out and working with the natural site characteristics, early SMS schools became trendsetters for the suburban learning institutions and among the forerunners of the flexible schools — and the winners of a long list of awards and citations.

Work became completely diversified during the '60s for several reasons: Foremost was the wish of the partners to venture into other fields. Next, a former school superintendent who had been in SMS employ working on school commissions retired in '63, a time that coincided with the drop in suburban school construction funds. At this time too came the resignation of Norton, who went out on his own.

But business was brisk and awards and citations kept coming in, not for schools alone but for projects such as the Southern New England Telephone Company Microwave Tower and Communications Building in New Haven; Buster Brown Textile Corporation, Greenwich, Connecticut; and the Hudson River Museum and Branch Library in Yonkers, New York. Of the latter, *New York Times* critic Ada Louise Huxtable wrote that it is "a lesson in how sensitive, sophisticated architectural design can serve the purposes of a com-

munity museum, which are both simple and enormously complex."

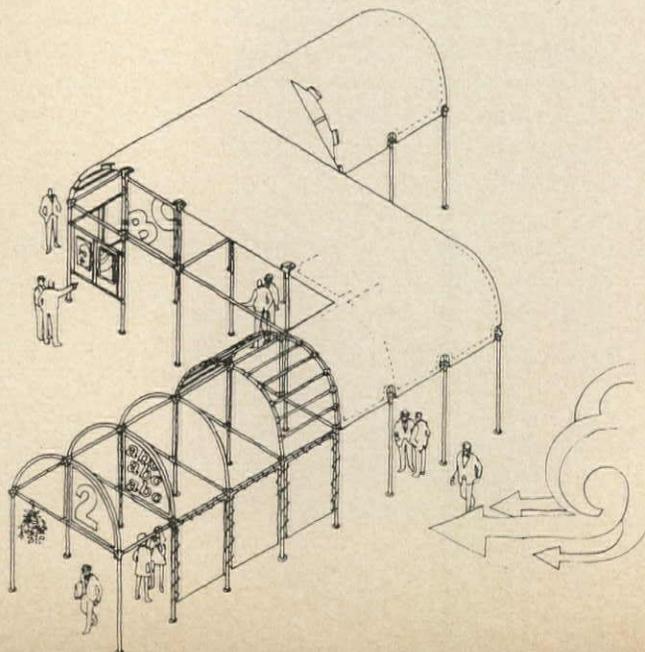
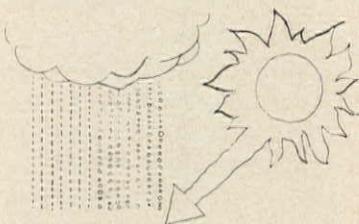
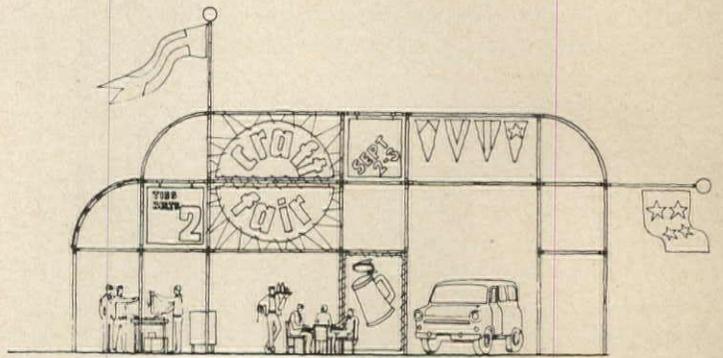
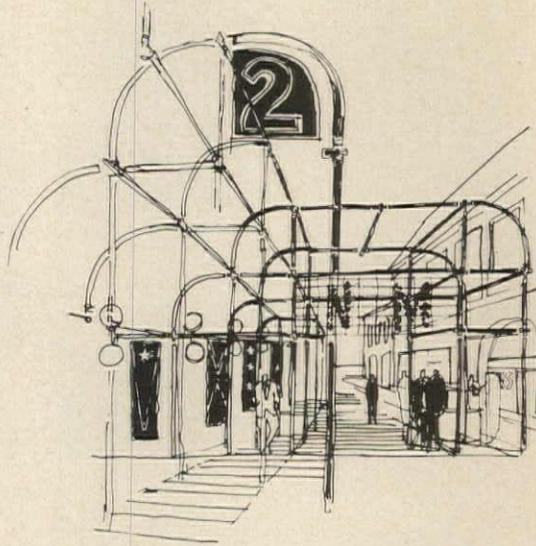
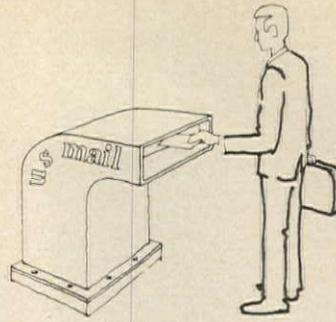
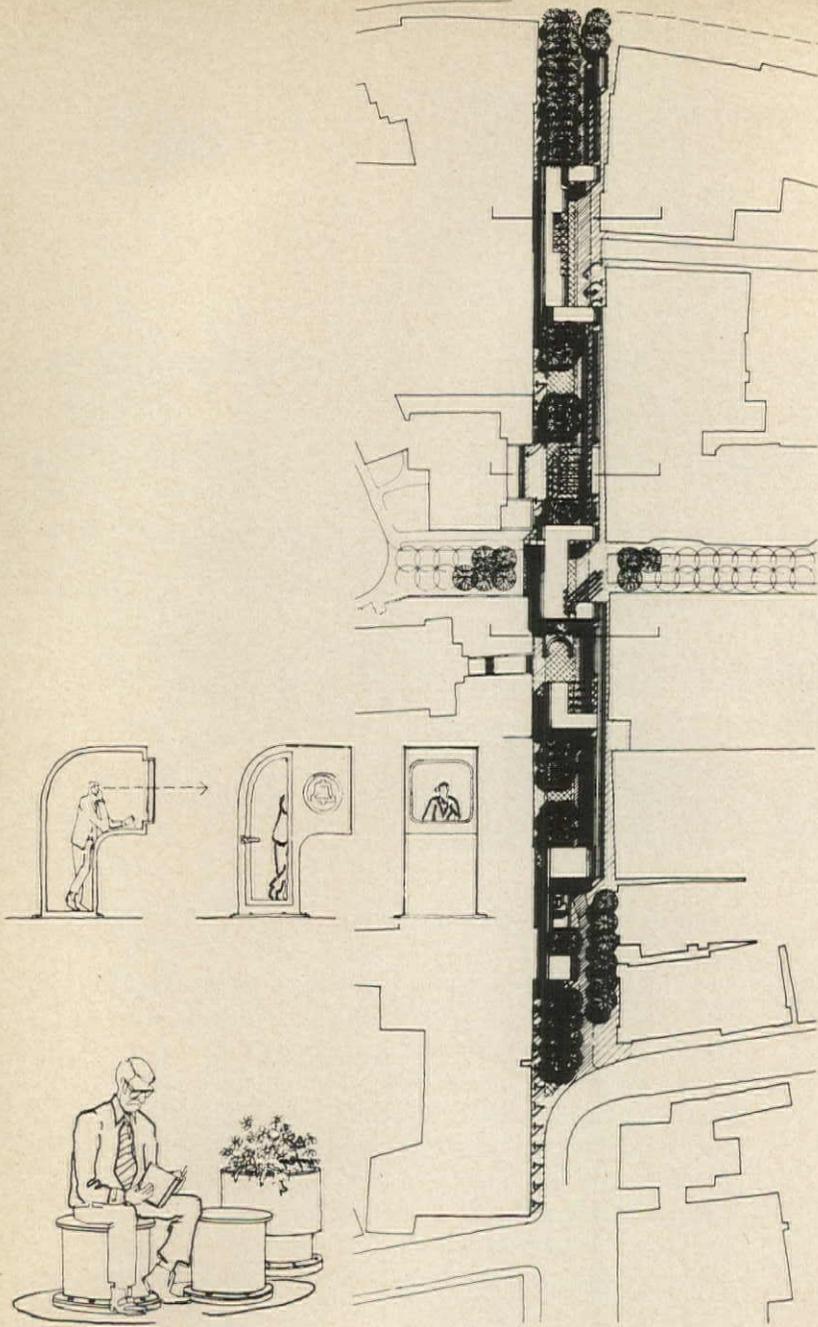
When the lean years in construction set in in the late '60s, they took SMS pretty much by surprise. Virtually all new business had come through contacts and from reputation. The dependence on referrals now left the firm unprepared for the fewer jobs available and, as a consequence, sales dwindled. Obviously, the firm had a bad case of what has been all too common among architects even recently: total devotion to design, even at the risk of bungling internal budgets and schedules. The philosophy seemed to be that work should come naturally and that everything would work out somehow.

"These years taught us something," says McNulty. "We learned how to be lean, how to respond. And we learned from the Case Company study, *Economics of Architectural Practice*. In 1970 we incorporated the practice to set up a situation where we could expand, and to get a vehicle for a broader base of equity ownership in the firm, with financial benefits commensurate to business."

About this time the Connecticut Chapter AIA, of which McNulty was then president, arranged for a management consulting firm to give a "selling and telling" seminar. Sell the consultants did, for the SMS partners decided to call them in for further discussion. "Your firm lacks overall coordination," they were told. "The partners are working in isolation without adequate communication, as if there were separate practices within the firm."

The partners didn't go along with all of the viewpoints in the consultants' report, but it was a catalyst anyhow: Though there was disagreement among the partners how to reorganize, there was full agreement that a reorganization was due and on the goals of such a move. The year was 1971, and they had arrived at a major crossroad.

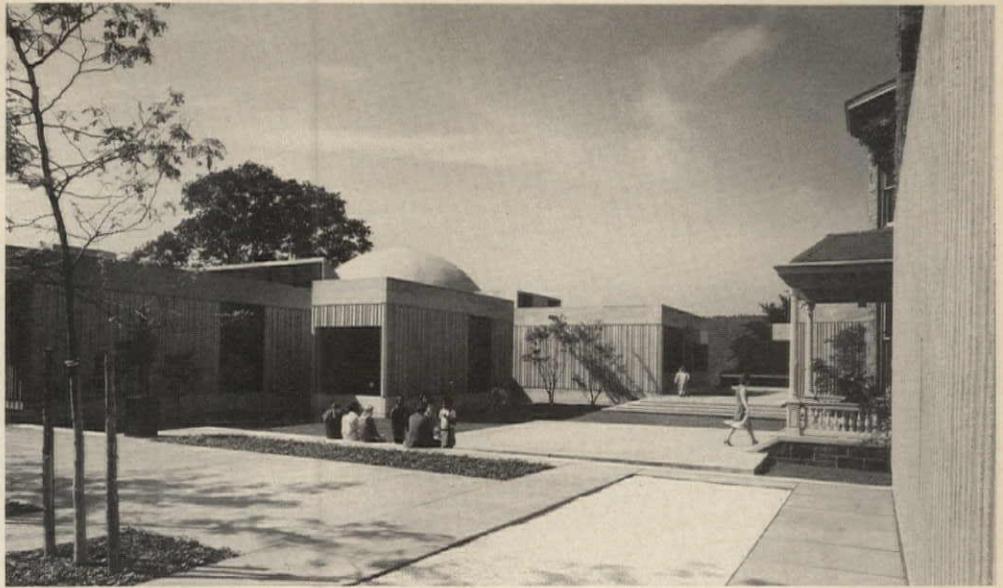
The number of staff was now 36. The workload was slack and the inevitable had to be faced: layoff of people. In a firm where hiring and firing was not the practice but where employees stayed on to become almost ingrained parts of the



practice, it was a traumatic experience but necessary to stay afloat. With the smaller staff, the Stamford quarters were too large. To leave them would be no hardship; they were counter-productive anyhow, dividing the whole operation rather than promoting a team spirit, splitting up physically, as they did, partners and staff.

McNulty and Mills Jr., who had followed in his father's footsteps and joined the firm in '63, set out to seek a suitable new location. Stamford was out since traffic, in rush hours especially, strangled its arteries. When they came across a vacant warehouse near the center of New Canaan, they knew they had found their new base. It offered a number of advantages: It would be designed for use of SMS as the only tenant; fewer miles would be driven by the staff daily and none in heavy traffic; there would be free parking for all. In the long run the overhead would be lower, although the expense for the renovation was carried by SMS. And above all, the new open layout of work spaces would give a feeling of unity within the firm and contribute to a team spirit.

But life in the suburbs has even a broader meaning for the staff, most of whom grew up and live in the New Canaan vicinity and therefore have a greater stake in the well-planned development of the entire area. With such backgrounds, they



State Street Semimall, New London, Connecticut (across page), is suggested by the city's Redevelopment Agency in order to revive the central business district. A series of linked canopies are proposed to create open spaces which will function as a "marketplace" and gathering point, drawing potential customers away from nearby suburban shopping centers. The canopy covers and framework will change with requirements but the theme will always reflect New London's maritime history. Principal in charge: Carrell S. McNulty, FAIA; designer: Robert C. Steinmetz, AIA.

Hudson River Museum, Yonkers, New York (right), next door neighbor to a Victorian mansion and sited on a slope, has two exhibition levels. Under the 40-foot dome is a 135-seat planetarium; below this is a lecture hall for 275 with a terrace overlooking the river. Principal in charge: Willis N. Mills Sr., FAIA; designer: Willis N. Mills Jr., AIA.

feel that they can contribute more meaningfully to such a growth.

New Canaan would have a few disadvantages, but not enough to worry anyone: It wouldn't offer any variety of places to have lunch nor the large department stores that Stamford boasts. It would take more effort to see attorneys or accountants, but the town has direct train connections to both Stamford and New York, and the station would be practically in SMS's backyard. And anyhow, the firm has learned that architects generally visit clients rather than the opposite and that a busy architectural workshop is more impressive to a client than an opulent showroom.

When moving time came last spring, the staff was down to 24. None of the original partners came along: In '69 Sherwood had retired; Mills Sr. had had a heart attack in '70 and consequently wanted to step back; and Smith had retired in '71.

The organization today, headed by McNulty, von Brock, Taylor and Mills Jr., functions like this:

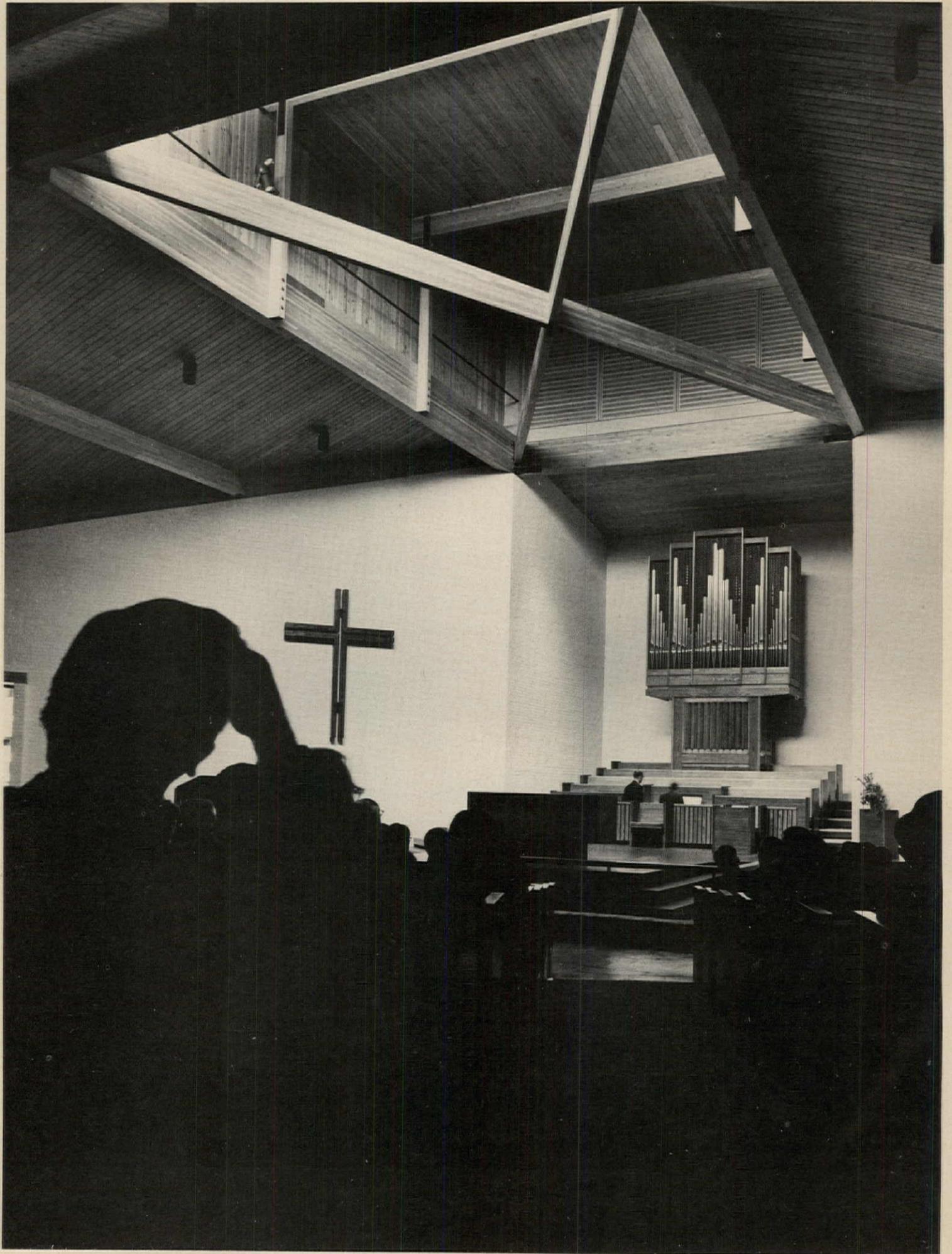
At the nucleus is a management committee, membered by all four partners who make the final decisions on all policy matters, do the long-range planning, study new ventures, and monitor the work of three other committees. These, referred

to as doing, planning and getting, are set up as follows:

The Operations Committee, run by von Brock, Mills Jr., Theodore E. Felker, AIA, and Robert C. Steinmetz, AIA, is responsible for programming, design, production and supervision and all that goes with it. The committee sets time schedules, frequently telescoping them particularly for corporate clients where early occupancy is a must. For example, the recently completed headquarters for American Educational Publications in Middletown, Connecticut, a subsidiary of Xerox Corporation, was occupied in approximately 18 months from the completion of programming and approval of schematics. Felker, who came to SMS in 1956 and is now an associate, was project manager.

In his position as chief designer, Mills Jr. sees to it that no arbitrary and costly changes are made late in production. He reviews each design with the partner in charge of a project, whereas formerly the reviews were held with all partners present, an expensive and time-consuming process.

For cost control, the committee prepares estimates for the client at four stages during project development, i.e., at the program stage, based on programmed area on a per square foot basis; at the schematic phase, based on actual plan area and comparative cost data; at the design development phase;



St. Matthew's Episcopal/Wilton Presbyterian Church, Wilton, Connecticut, is a joint project which includes independent worship spaces for two congregations and combined educational, administrative and meeting spaces. Principal in charge and designer: Willis N. Mills Jr., AIA.

and midway through final drawings, the latter two based on quantity labor and material takeoff. The firm often guarantees to redraw at its own expense if the final approved budget is not met.

For quicker means of in-office procedures, SMS uses fast track scheduling wherever feasible, particularly in corporate work, and MASTERSPEC is used for references and text. But, says Louise Rowell, who is in charge of specifications and has been with SMS since 1947, "We specifically edit and supplement them for each project to make sure that it is pertinent to any specific job." Ms. Rowell has also established her own data bank.

The firm has made use of computers both in-house for business record keeping and by telephone for specifications. At present an off-line computer is used for payroll accounting. This also produces the needed cost control data.

The Financial Planning Committee is headed by McNulty, von Brock and controller Betty J. Perper. At the outset of each year it introduces an annual operating plan. It reports

which includes McNulty, Taylor and Felker. This produces an annual development and public relations plan for the Management Committee; it sees to it that leads are recorded properly and that personnel are assigned early to potential ones. McNulty spends about 40 percent of his time on this effort, and Taylor about 20. Felker is also strongly involved, while Ida Larsen, McNulty's personal secretary, is assistant to the committee. "In fact," says McNulty, "she rides herd on all of us. She keeps a master file of prospect information, which each person sends her — in longhand — every time he comes across a lead. She keeps a "tickler folder" and reminds us every time a contact should be renewed." Another objective is to involve to some extent as many of the staff as feasible in business development, but final interviews are still in the charge of a specifically assigned partner. An out-of-office effort to increase sales is made through the Washington, D.C., architectural consultant firm of Gaio Associates, Ltd.

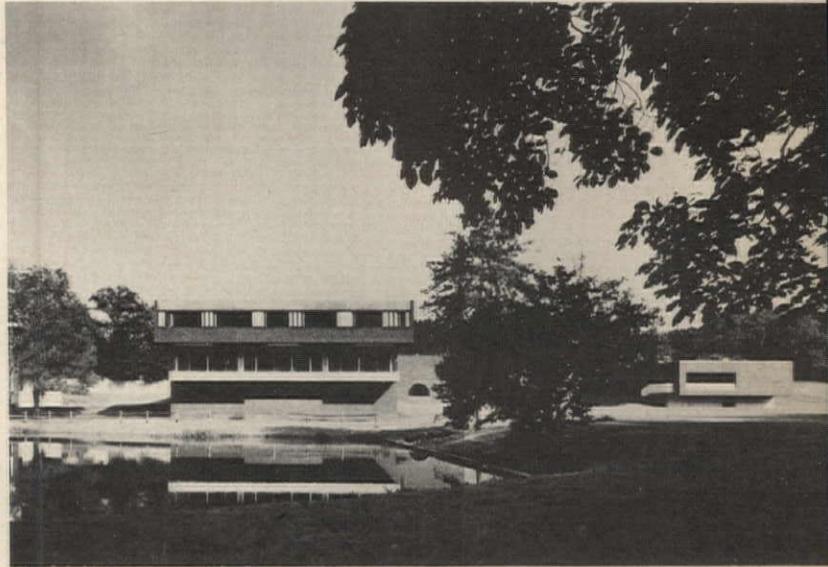
The partners hold a monthly meeting (presence mandatory); every other month they meet with the associates and



Systems Development Laboratory, International Business Machine Corporation, Poughkeepsie, New York, has cantilevered top floor and punched fenestration to break up monolithic appearance of the 464x224-foot structure. Principals in charge: Willis N. Mills Sr., FAIA; A Raymond von Brock, AIA; designer: Willis N. Mills Jr., AIA.

on the firm's financial status monthly to the Management Committee and also makes proposals for long-range planning, retirement benefit plans, etc. This year a new employee retirement plan has gone into effect. Furthermore, equity ownership is being offered to the professional staff, another factor that will inspire a still stronger team spirit. And instead of "partner" in charge, the use of "principal" in charge is encouraged to get away from the partner/associate relationship.

Finally, there's the Business Development Committee,



Greenwich Academy, Greenwich, Connecticut, is located on a 24-acre campus in the center of town. The master plan for the 400 girls' school was started in 1960, siting the buildings around a natural pond. Pedestrian access is between the buildings and also through them by open passages. Principal in charge: Gray Taylor, FAIA.

quarterly with the staff. In order to disturb the work routine as little as possible, they try to schedule all three meetings on the same day.

The essence of the organizational change is that individual authority is limited and that the partners as a group control the firm policies, with strong participation from all of the professional staff to enhance the team spirit.

No longer, then, as might have happened in the firm's earlier days, can a partner bring in a project independently

that would be a money loser though a personal pleaser. "Sure, we may still lose money on a job," says Taylor, "but that's because of our 'to do better' attitude, which hopefully all architectural firms have. With a 'knock-it-out' philosophy all jobs could show a profit. I think a poll of the office personnel would reveal that they like the 'do better' philosophy; it gives everyone a feeling of self-esteem to be able to contribute to our individual and collective standards of professional performance."

On the other hand, there are times when a money-loser is accepted deliberately. If the partners feel that they can do an excellent job which will lead to other work, they are willing to spend the money. An example is the New London Mall, a project just now getting underway with Steinmetz as designer. Steinmetz, an associate who has been with SMS since 1964, is the recipient of several awards for his designs.

Each of the partners has his special interest area. "This diversity is constantly fostered," says von Brock, "and because of it, we are able to keep a fresh approach to design which would be difficult if we were to specialize in any one building type."

McNulty, probably more than anyone, keeps up the firm's tradition of AIA participation. A former head of the Connecticut Chapter, he was chairman of the national Urban Planning and Design Committee during 1971 and is still active on the committee. He is presently chairman of Connecticut's Southwestern Regional Housing Task Force and a member of the Governor's Task Force on Housing. His main interest in jobs is in urban design and in systems and industrialized processes. The New London project is particularly close to his heart, and so is a research and development project SMS has completed under a winning Department of Housing and Urban Development Operation Breakthrough Type B Proposal. The Modular Integrated Component Assemblies for Housing, or Micah, is a prefabricated industrialized system for the interior of living units. It is completely standardized,

but it can be applied in a wide range of housing types, even to the rehabilitation of existing housing. McNulty is principal in charge of the Micah project, and Steinmetz is designer.

Von Brock's interests in AIA affairs center around office practice, and he is presently chairman of the Connecticut Society of Architect's Office Practice Committee. He is happiest when involved in large corporate work; presently he is in charge of a \$12 million American Telephone and Telegraph project now under construction in Worcester, Massachusetts.

The not-too-small, not-too-large projects are Taylor's favorites, say, those around \$400,000 to \$500,000, where the client is on a very personal basis and one can deliver design with individuality. "But," he says, "part of the fun being in practice is to make the less attractive jobs attractive and worthwhile. I hope this attitude is evident in the service we give our clients too. For instance, many offices turn contractors' requests for extras over to the owner without questioning. We question all credits and extras to see that the owner isn't being raped." Taylor, an ardent defender of the natural environment, is active within the AIA and involved in his community in this field.

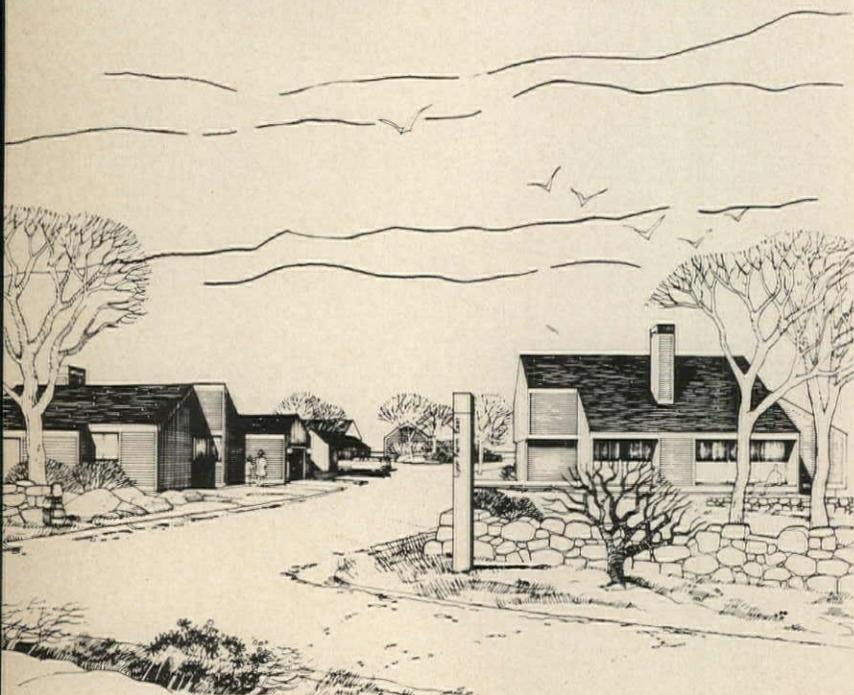
Mills Jr. shares Taylor's liking for the not-too-large jobs and is completely satisfied in the suburb, especially in New Canaan and vicinity, where he grew up. Specifically, he enjoys the versatility the suburb provides and the fact that people who live there recognize and value environmental qualities. "When the suburbs built schools, we designed them. Now, they are building lowrise corporate structures, communications centers, recreational facilities, and condominiums with more open space."

He serves as a trustee for his hometown's (Wilton, Connecticut) Historical Society and also as co-chairman of the town's Environmental Council. He just completed five years in the elective position of selectman on Wilton's Board of Selectmen. This involvement has taught him a great deal about human behavior in committee work, he says, and also about the public attitude toward selection of architects and, what's equally important, what the public wants from them. He is deeply concerned that there seems to be "less and less architecture in off-the-shelf shelter for the lowest price. What we look for," he explains, "is a dynamic balance between man's physical and spiritual needs. We regard architecture as a social art. Of course, this doesn't mean that we should refrain from finding less expensive, quicker means to produce. Quite the contrary."

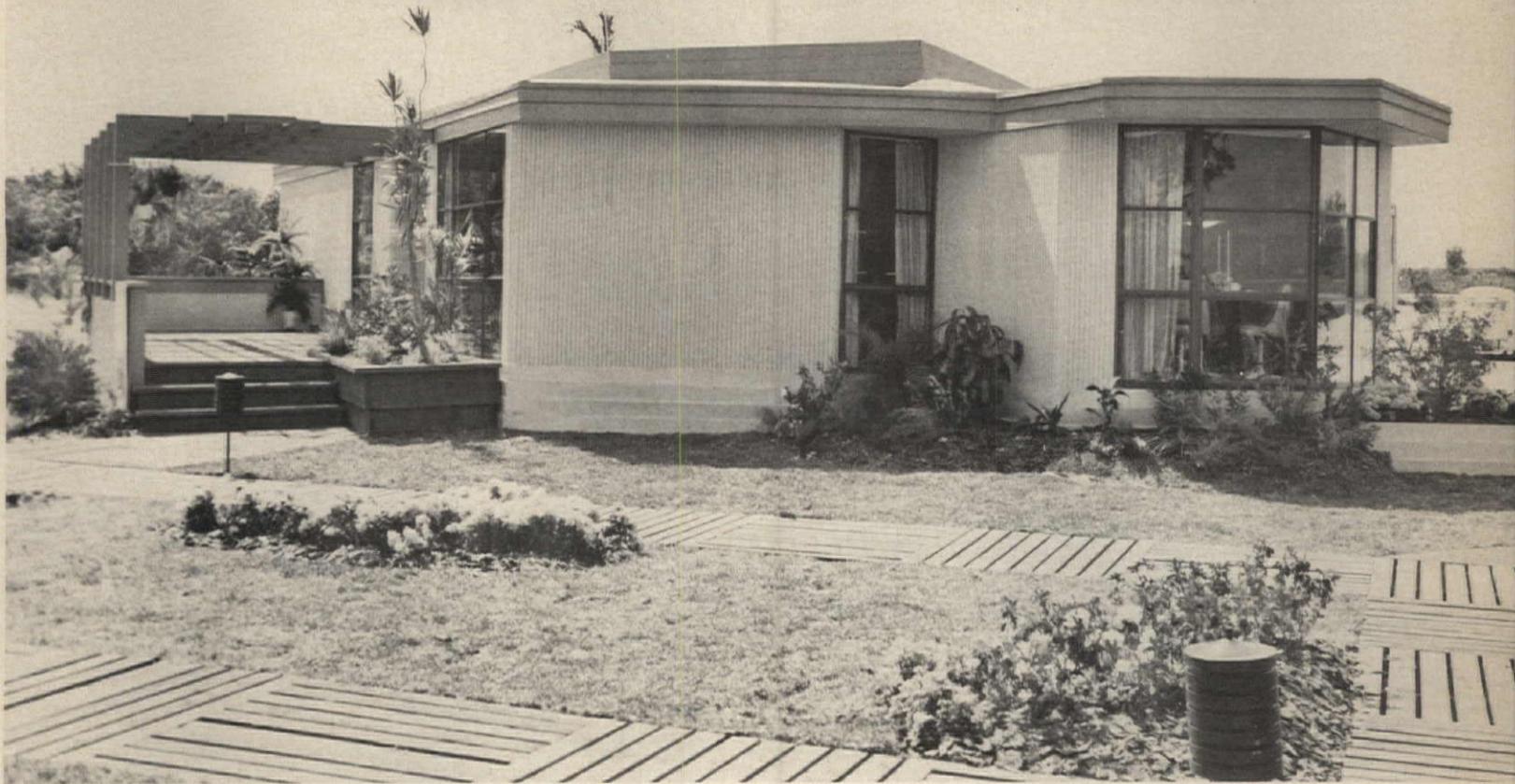
The SMS principals feel that they are well on their way — a way that wasn't always easy — to the point where they will offer expanded services and compete with anyone not only in design quality but in efficiency and innovation. Already, a separate interior effort has been established, headed by Frances E. Wilson, who is currently president of the Connecticut Chapter of the American Institute of Interior Designers. Her department was earlier part of SMS and headed by Ms. Mills Sr., with Ms. Wilson as assistant. Today, although Ms. Wilson is on the SMS payroll, she has a separate letterhead and accepts work outside the SMS firm.

The principals can visualize a future where SMS would have two sister companies. With the partners as leaders, the three organizations would be the architectural firm, a construction management firm and an interior design firm. When the time comes they could contribute greatly to each other's knowledge and efficiency and, the partners know, this would again generate a still stronger team spirit.

BESS BALCHEN



Lyon Farm, Greenwich, Connecticut, is a 201-unit condominium under construction. Almost one-third of the 120-acre site is deeded to the town for a park and open space. Buildings are placed around courtyards with 8 to 12 in each group. Principal in charge: Willis N. Mills Jr., AIA.



This "doublewide" model for National Homes is designed by The Frank Lloyd Wright Foundation, as are the interiors in the following pages.

The Mobile Home Industry Viewed by an Architect

by VERNON D. SWABACK

Some people have been inclined to look upon mobile homes as poor relations of so-called conventional housing. But increasingly the potential of quality design in modular dwellings is being realized. Consequently, some radical changes in the mobile home industry can be expected in the near future.

For the past six years The Frank Lloyd Wright Foundation has been independently researching and working with manufacturers of both mobile and modular homes. Our idealism and enthusiasm for the potential of the manufactured housing industry have undergone some rather brutal moments and have been disciplined by knocking our heads against the religion known as "the bottom line." One manufacturer summed up his sense of values by saying, "I believe in motherhood—if it sells!" In spite of this, we remain convinced that the '70s is the time when it will be possible to end the crippling polarity between design and production.

The entire housing endeavor has been victimized by this polarization. At one pole we have had the products of contractors and mobile home manufacturers which at best are hygienic but dull and uninspiring. At the other are the architects who continue to create lonely works of art with absolutely no mass production possibilities. We deserve and will get something better.

The new ingredient is the informed consumer who is no longer content with the achievements of the past. He has a taste

of progress in many things and now expects this quality to be reflected in his housing. Concerned architects have been convincing manufacturers that this new climate makes it immensely profitable to invest in the future and do it in a better way. A fast changing market has otherwise complacent manufacturers looking cautiously at what lies ahead.

The immediate future for mobile home sales constitutes a rosy picture. Last year there were 496,570 shipments; for 1972



the number should increase to a record-breaking 585,000. The next five years will see demographic changes favorable to the current mobile home market with the largest age group increases in purchases being under 35 and over 55 years of age. Seventy-five percent of all Americans prefer single-family dwellings and about half of these, if for no other reason than economics, are looking at mobile homes.

The manufacture, sale and utilization of mobile homes is the greatest inadvertent experiment that the mass shelter industry has ever seen. It has demonstrated what is possible when arbitrary restrictions are kept to a minimum. Before we get too pleased with this experiment, however, we should note that it has been a built-in time bomb for everyone concerned.

The meteoric rise of the mobile home industry, as it skimmed the cream off a market with no competition, is a condition of the past. The next 10 years will see a greater demand for increased quality in housing. There is no question that the consumerism movement will exert pressure on the industry. Mobile home manufacturers have traditionally discounted any serious threat from modular production. However, in spite of its low profile on Wall Street, the modular industry is making significant strides. There were 29,000 three-dimensional modular dwellings produced during 1970. Last year this figure was doubled. Reasonable predictions for this year place modular production in excess of 100,000 units, with another 300,000 housing units produced which involve significant factory production of panels and components.

In the early 1900s Frank Lloyd Wright stated that architecture was the blind spot of the nation. He demonstrated that architectural values were nothing abstract. They were real and could be felt by the ordinary citizen. These ideas have found their way into the marketplace.

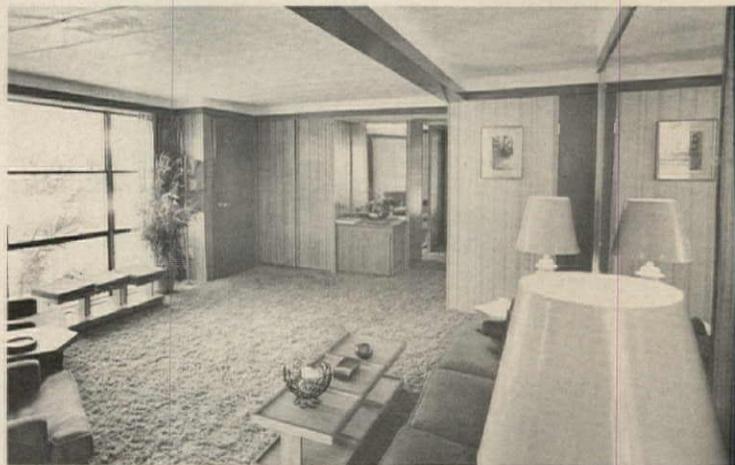
There are four influences which will be acting on the mobile

Mr. Swaback is an architect associated with The Frank Lloyd Wright Foundation. His observations are adapted from a keynote address given at the 1972 Southwest Mobile/Modular Home Show in Dallas, where mobile homes designed by the foundation for the National Mobile Homes division of National Homes Corporation were displayed.

home industry during the '70s which are either totally new or are of greatly increased intensity:

1. Greater awareness of the public for quality in housing and a predictable amount of consumerism lawsuits to make this awareness felt.
2. Competition from unleashed modular production and the increased scale of conventional builders.
3. More uniform considerations concerning financing, taxation and land use. There will be significant legislation aimed at removing artificial barriers to industrialized housing.
4. Last but not least, a totally new awareness of the quality of architectural design.

All this is to say that design quality and imagination are going to have to be essential factors in the continued growth of the industry. It has not been so in the past, and the result is the negative image which haunts the industry in spite of increased production. Manufacturers are going to have to spend some money on design if they want to survive the next 10 years. If the mobile home industry capitalizes on its nationwide system of manufacturing, distributing and marketing, it can enjoy a true advantage by introducing imaginative and carefully conceived prod-



ucts to provide "better" rather than "cheaper" units. If the industry continues to exploit its present market, it will soon decline.

Most industry projections show a lessening in the percentage of growth starting about mid-decade. There is no mystery about this. The mobile home industry has experienced a dramatic growth. All dramatic growth industries eventually reach a period of maturity which is accompanied by a leveling off of sales, *unless* the growth industry succeeds in revitalizing its product.

For the mobile home industry, this period of maturity will

occur in the mid-70s and will coincide with new competition which it may or may not be able to dominate. No one has yet written the rules. All we know is that starting at the mid-decade there will be a vigorous battleground in which all shelter suppliers compete for the attention of the informed consumer who has increased buying power and a determination that his housing should deliver far more exciting provisions than possible in the past.

Architects and planners are interested in the mobile home industry for two reasons. First, it has clearly demonstrated that it fills a need where all other provisions have failed; second, the mobile home product lends itself to innovations which would be far more difficult to program into on-site construction.

The housing industry has suffered from a lack of cooperation and organization. Individuals as well as corporate entities are hampered by a lack of funds. But, while focusing on problems such as codes, zoning and labor restrictions, we have overlooked the most crippling disability of all: a thorough lack of imagination. The message needs to be stated clearly. We face a cataclysmic change in our housing patterns which can either be an irreparable loss for humanity or the brightest spot on the environmental horizon.

The mobile home industry is in for a period of rapid change. Transformations that may be expected in the near future are:

1. Mobile home dealers and park developers will give up the fiction that the appearance of mobility remains a necessary component in mobile home living. Much of the unfavorable image



surrounding mobile homes has resulted from trying to promote the concept of mobility long after it ceased to be a reality.

2. Inasmuch as mobile homes spend less than 1 percent of their useful life on the highway, they will be renamed. We have suggested the name "production dwellings" as being both accurate and open-ended enough to embrace the new potential of the industry.
3. Mobile home parks will begin to be replaced by planned unit developments in which the land under the unit is owned by the occupant and the common garden areas are maintained by a homeowner's association. Mobile home subdivisions currently represent only 3 to 4 percent of the total number of park spaces, but the trend is in this direction.
4. Average densities for the mobile home communities of the future will range from 4 to 6.5 units per acre.
5. The design of mobile homes has been cheapened by trying to use metals and plastics to imitate natural materials. Instead of the dreary look of fake wood paneling, we will have solid colors and beautiful bright patterns. Instead of plastic imitating stone,

it will be used intelligently, showing its own unique variety of shapes and textures. Instead of shiny aluminum or gloss painted metal siding, the units will feature matte-finished metal products rolled into shapes which not only increase their visual appeal but also give added strength. Mobile homes of the past have tried to imitate everything from Swiss chalets to English coach houses. In the future, they are going to just be themselves, and we will all be surprised to see how beautiful that can be.

There are those who see mobile homes as having no overlap with the modular market. Their contention is that there is a special kind of human being who is attracted only to mobile homes. This is nothing short of absurd. The entire manufactured housing industry is one market, separated only by price and performance. It is time to stop underestimating the ability of the consumer to make an intelligent decision. It is also time to stop being apologetic about factory production.

In the early 1900s, Henry Ford told us that we could have any color as long as it was black. One of the greatest contributions



of industrialization has also been one of its most surprising elements. Instead of standardized look-alike products, it has produced the greatest variety known to the mass market. As technology becomes more sophisticated, the cost of introducing variations declines.

There is every reason to be optimistic about the future. There has never been a better time for a combination of architectural considerations with increased production.

A few months ago The Frank Lloyd Wright Foundation and National Homes Corporation held joint press conferences in both New York City and Washington, D.C., to announce a new alliance between architecture and industry. It was a dream of Wright's that technology could be put in the service of human values rather than the other way around. In the early '30s he said, "I do not believe any architecture in the time of commercialism, of industrialism and of huge organization can be an architecture true to the spirit of those times unless it includes the use of all of these great tools of modern life."

There is a growing popular awareness that good design may no longer be dismissed as being too luxurious. Today's consumer is surrounded with evidence that it is a necessary ingredient for survival. Environmental awareness has entered the marketplace. We all know the word ecology, and we talk knowingly about the total environment. To implement the necessary goals, architects and planners are going to have to learn more about highly competitive markets; and the merchants are going to have to take their eyes off the bottom line long enough to realize that the world is turning and that the old tricks won't work any more. □

1972 DESIGN AWARDS for Nonprofit- Sponsored Low and Moderate Income Housing

Excerpts from the Jury Report

The jury has selected two developments in San Francisco and one in Minneapolis for top honors in the 1972 awards program for nonprofit sponsored low and moderate income housing. Initiated in 1970, the program is sponsored biennially by The American Institute of Architects, the Nonprofit Housing Center Inc. and the American Institute of Planners. In addition to the three Honor Awards, six other projects out of 69 entries were cited with Awards of Merit.

The jury, who gave specific consideration for planning which avoided or alleviated adverse environmental factors by means of site selection or building design modifications, included: Edward M. Burke, AIA, chairman; Norman D. Day, chairman of Urban Design Programs, University of Pennsylvania; Carlos Fernandez, housing director, Southwest Council of La Raza; Sherwin Greene, Department of Urban and Regional Planning, George Washington University; Dan Rambo, director, Nonprofit Housing Center Inc.; James M. Whitley, AIA; and student William Yudchitz.

The concerns of the jury were varied. They included the social and physical relationships of the housing developments to their adjacent communities, the scale and utility of the housing and the budget program decision-making process reflected in the end product. Above all, the jury was concerned with the contribution which the housing made to the dignity of the residents.

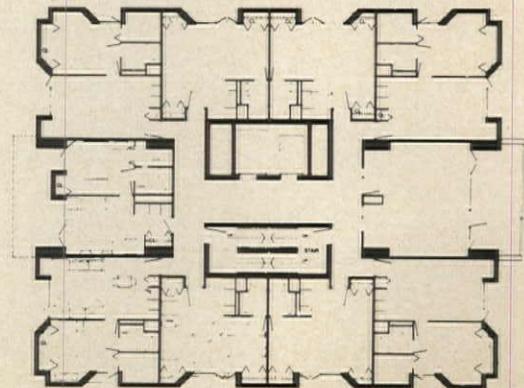
The jury was extremely impressed by the high quality of housing submitted. The architecture was good, refuting a widely held premise that housing for the low and moderate income citizen must look and be poor. This observation was particularly noteworthy as many of the sites appeared marginal. Development of nonprofit housing is difficult enough with good sites; gravel pit and flood plain sites make the job immeasurably harder.

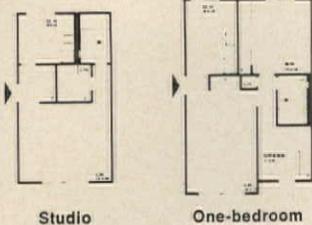
The jury was also impressed by the diversity of response within basic program guidelines to the divergent cultural, regional and local restraints on design. These factors made the selection of award winners difficult. Our final selections highlight qualities of excellence which we believe should be emulated in future housing developments.

HONOR AWARD

Ebenezer Tower, Minneapolis, Minnesota. **Architects:** Thorsen & Thorshov Associates, Inc.; **General Contractor:** Bor-Son Construction, Inc.

Jury Comment: The design approach is an extremely successful one in the architectural treatment of a residential tower. Emphasis on the functions within the building, a straightforward use of materials and refined detailing achieve a strong landmark quality. Interior planning promotes interaction of tenants by the elimination of long corridors which are common in this type of housing. Community spaces, easily visible and accessible from floor lobbies, are strategically located and invite their use for a variety of activities. Unit plans reflect a high degree of skill and sensitivity.

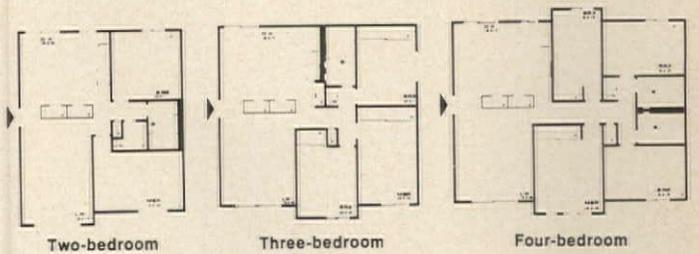




HONOR AWARD

Friendship Village, San Francisco, California. Architects: Bulkley & Szevich; **General Contractor:** Williams & Burrows, Inc.

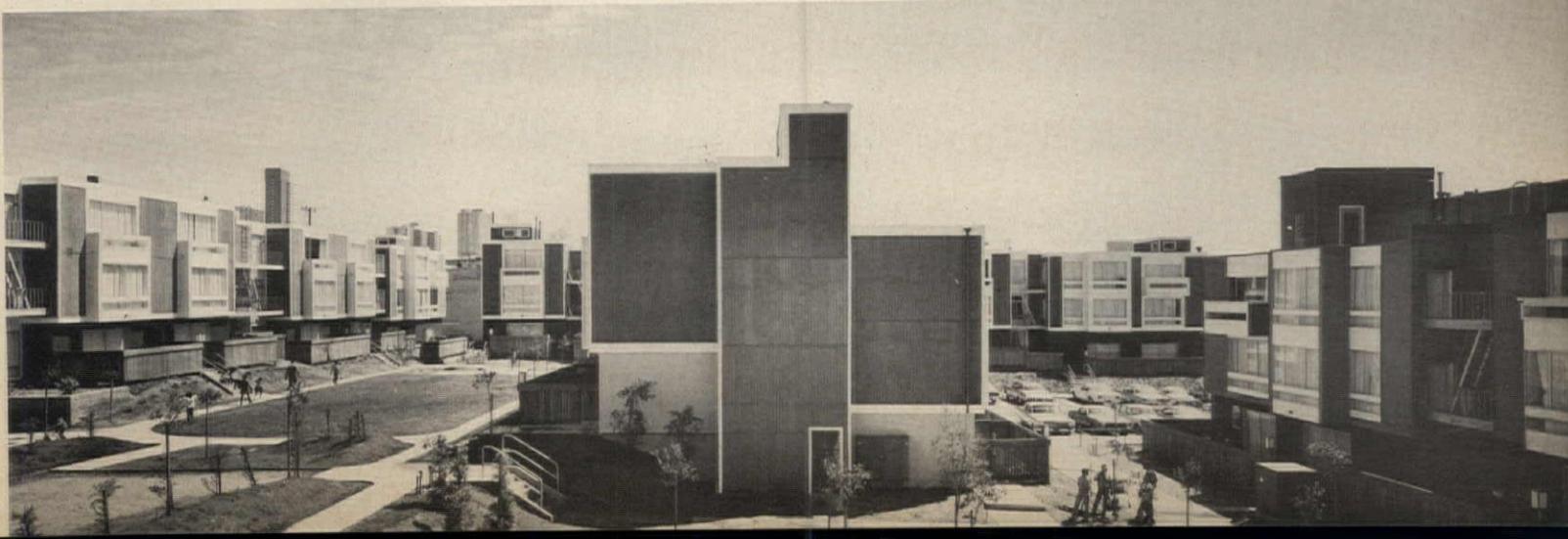
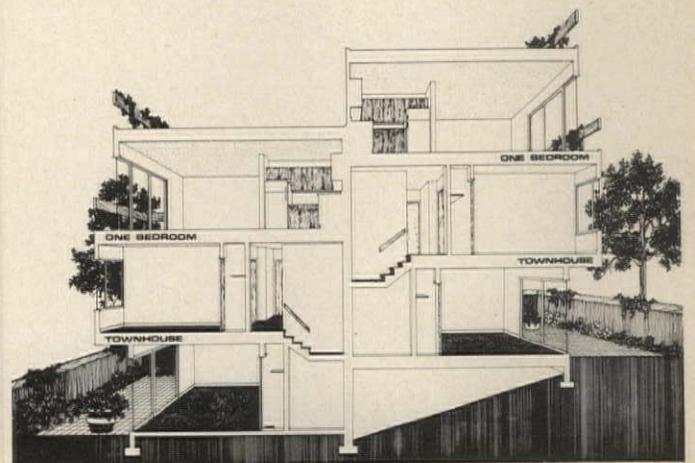
Jury Comment: The designer achieved an attractive, well-detailed and well-built housing development while preserving the streetscape of San Francisco's older and denser area. The massing of the project, as well as the selection of cedar shakes for siding, creates an intimate scale that is most appropriate for family living units. The site design provides an interesting arrangement in the distribution of parking areas, open space and controlled play space. All in all, the development appears to be a good place to live.



HONOR AWARD

Martin Luther King Square, San Francisco, California. Architects: Kaplan & McLaughlin; **General Contractor:** Winston A. Burnett.

Jury Comment: The project stands out above the several high density lowrise solutions submitted which are typical of much of the recent low income housing in San Francisco. The expressed preferences of the low income housing residents for private open space and "their own front door" have been successfully realized. The design solution employs interlocking townhouses and apartments and, through grade changes, creates a degree of privacy in exterior courtyards rarely achieved at the density of this project. The exterior materials and detailing are visually lively and yet restrained and pleasing in total impact. The site planning has kept autos confined to the perimeter, preserving as much of the block interior for pedestrians as possible. Deliberately restrained, the success of this project relies not on any one spectacular effect. It derives from the total effect of many design considerations and careful attention to workmanship.

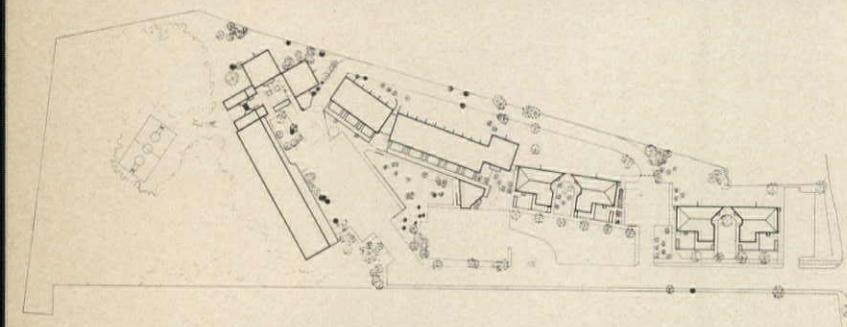




AWARD OF MERIT

Maplewood Terrace, Middletown, Connecticut. **Architects:** Charles W. Moore Associates; **Associate Architect:** Frank Gravino.

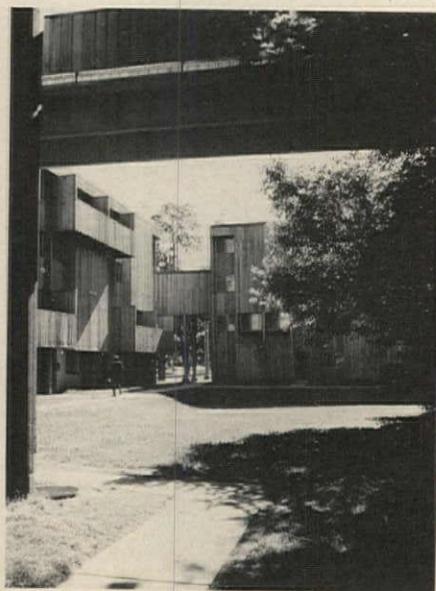
Jury Comment: This is a project that reads "neighborhood" in every sense of the word. The unregimented site arrangement of the buildings breaks down the scale of the complex into units to which the tenants can really relate. These quadruplex apartments also match the scale, shapes and feeling of the generous old houses that predominate the general area.

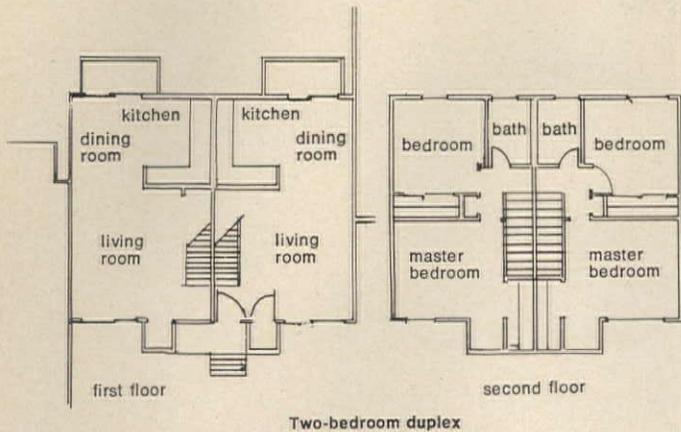


AWARD OF MERIT

Jamestown Homes, St. Paul, Minnesota. **Architects:** Williams/O'Brien Associates, Inc.; **General Contractor:** MJM Company.

Jury Comment: The solution represents an excellent response to site. The location of parking areas and natural topography provide buffer from the adjacent freeway. The fall of the land is utilized in a commendable application in resolving the difficulties in the design of the four-story building. Care was exercised in the retention of the landscape. A consistent use of materials achieves a strong continuity which ties the complex together.





AWARD OF MERIT

Village Park, Amherst, Massachusetts. Architects: Stull Associates, Inc.; **General Contractor:** Daniel O'Connell & Sons.

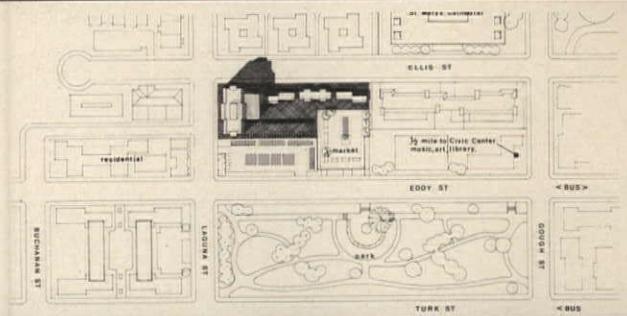
Jury Comment: This site was planned to concentrate the housing. The open meadow was used for development to preserve extensive natural forested areas. This blending with the site is one of its strong points. Parking is grouped at the periphery to function for a cluster of buildings; a pedestrian walkway feeds into the units, leaving a large green space on the opposite side. The clean use of natural materials helps the housing to blend into its wooded environment. This execution keeps the development from looking like a minimum standard project. The architectural forms themselves are fairly successful and are complex enough to cut down on apparent repetition.

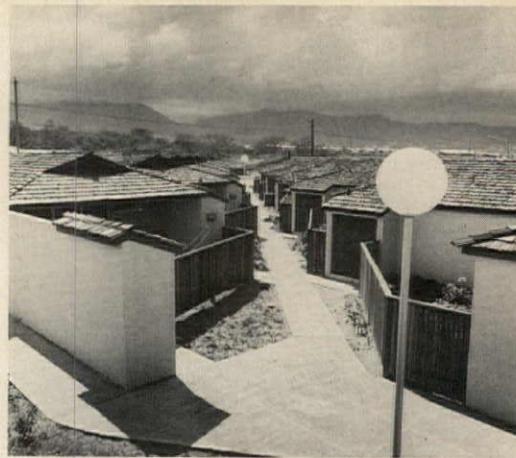


AWARD OF MERIT

Western Park Apartments, San Francisco, California. Architect: Thomas Hsieh, AIA; **General Contractor:** Williams & Burrows, Inc.

Jury Comment: The architect achieved a project that provides secure and quality housing for the elderly while keeping the dignity, individuality and social values of each tenant. The highrise tower and the three lowrise buildings are terraced well, taking advantage of the natural contours and harmonizing with the scale and character of the adjoining neighborhood. Extensive landscaped areas, patios, roof and private gardens effectively increase the project's desirability.





AWARD OF MERIT

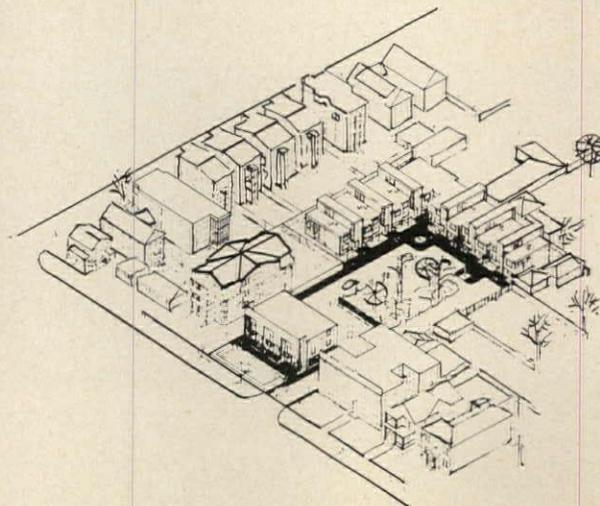
Hale Mahaolu Elderly Housing, Kahului, Maui, Hawaii. **Architects:** Hirshen & Partners; **Associate Architect:** Noboru Kobayashi, AIA; **General Contractor:** Fuku Construction.

Jury Comment: The merit of this housing development for the elderly lies in the designer's basic understanding of Hawaiian culture and its personal approach. Too many times such housing is demoralizing. There is definitely a great deal of pride in the users of this housing. It has good environmental qualities; each unit has its own garden, a view to the common area and orientation to the trade winds. This project establishes a personal and human scale by the close relationship of the people to the land. It was chosen also to show an alternative to the common idea that housing for the elderly always has to be a highrise. Architecturally, the project is not very sophisticated, but as a whole it works.

AWARD OF MERIT

Harmony House Co-op, New Haven, Connecticut. **Architects:** Louis Sauer Associates; **General Contractor:** Kapetan, Inc.

Jury Comment: The sensitive site planning achieved on a difficult location is impressive. The units are grouped in the rear portion of the site and achieve privacy and safe open space for children's activities while preserving existing trees. The combination of apartment and community space on the front of the site relates well to the rest of the neighborhood. The crispness and direct architectural design of the units achieve a striking quality in relationship to a natural treatment of the open space.

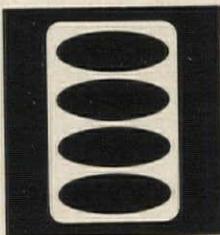


Today's Answer to Data Filing

by ROBERT ALLAN CLASS, AIA

UNIFORM CONSTRUCTION INDEX

A System of Formats for
Specifications
Data Filing
Cost Analysis
Project Filing



A standard now exists which will help the architect in filing and retrieving the vast quantity of information in printed paper or photographic form which inundates his office. The recently published *Uniform Construction Index* will soon provide the one standard data filing format for the construction industry.

Three-quarters of a million building construction products to keep track of? Inconceivable? Maybe. I read that while there were only a few hundred products that the architect needed to know about 50 years ago, today this figure is approaching 750,000! If each product required four pages of written description, this would amount to nearly 3 million pages of product literature. At 300 pages to the inch, this mountain of paper would need over 800 lineal feet of shelving to store it, or 400 file drawers.

As a comparison, the relatively compact Sweet's *Architectural Catalog File* currently contains about 16,000 pages of product literature (1,200 manufacturers, 1,600 catalogs, 4,500 classes of products) and takes up 3 feet of shelf space. A prototype library for architects' developed in 1969 contained 150,000 pages of product information from 1,800 manufacturers; one of the commercial microfilm construction libraries is approaching the 1 million-page mark with over 5,000 manufacturers represented. A five-year-old Canadian government survey indicated that 88,000 pages of construction information were stored in the average user's office; even this molehill of paper would represent 25 feet of shelf space, or 12 tightly packed drawers.

This sampling points up the construction industry's information explosion which gets worse every year as more products, systems and techniques are developed. The obvious way to cope with such a mass of information is to organize what is worth saving in a way that individual items may be easily extracted when needed. The necessity for an organizational framework is pressing, regardless of the form in which the information appears, whether on paper or hardcopy (loose or bound), microfilm or microfiche, tape, computer memory or cave paintings.

Sporadic research on sophisticated systems of access to design and construction information from automated equipment by such methods as performance criteria is being done, and the results occasionally emerge in bits and pieces. Methods of compressing information are being explored, but the truth is that the bulk of information will be in printed paper or photographic form for years to come, and that filing and retrieval will be by subject. So what can we do about it? Today's best answer is to use a single standard format for referencing all forms of construction information, thus simplifying the task of filing and retrieval and improving construction communications. This standard now exists. It is the data filing format in the newly published *Uniform Construction Index*.

Fifty years ago, recognizing even then that chaos was approaching, The American Institute of Architects published the first edition of its *Standard Filing System and Alphabetical Index*. It was a format for filing product literature, and many manufacturers imprinted "AIA file numbers" on their catalogs. A decade later, a companion document *AIA Filing System for Architectural Plates and Articles* was published which was principally a breakdown of building types, although it had a few pockets for

OBSOLETE

a limited number of related subjects. Both documents were updated periodically, with the final edition of each appearing in 1963 and 1956, respectively. Over the years these documents were in general use throughout the building industry.

Recognizing that its *Standard Filing System* was becoming obsolete, in early 1962 the AIA invited the Construction Specifications Institute to join with it in sponsoring a construction industry meeting to develop a more broadly based system. Later that year, the first Conference on Uniform Indexing Systems was held under joint sponsorship to discuss the development of a filing system for building product data based on specifications.

Although both organizations were developing systems which grouped related subjects in orderly arrangements, no agreement had been reached when CSI published in 1963 *The CSI Format for Building Specifications* whose format related subjects into 16 divisions for the purpose of specifications writing. Discussions on a filing system continued, and eventually divergent opinions were

recognized by the now familiar logotype of three ovals set in a square. Most information systems utilize the 16-division filing format, and Sweet's catalogs first used a transitional version in 1971.

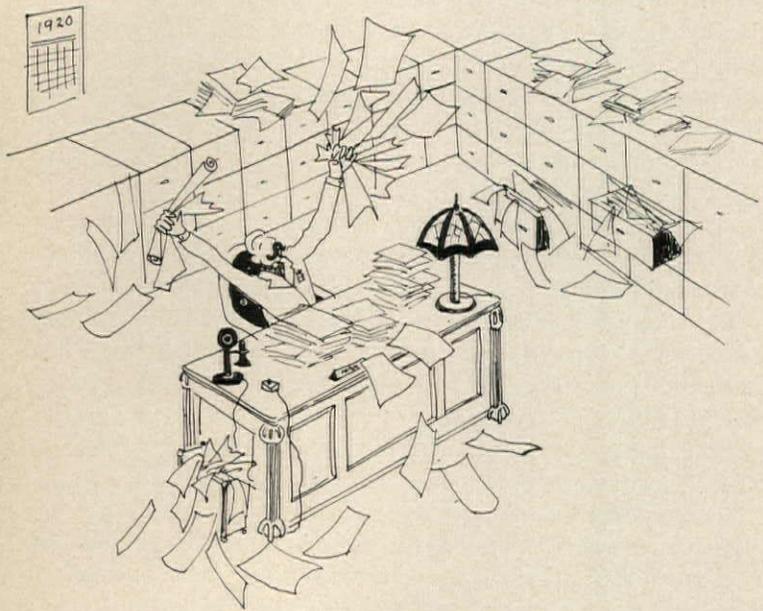
The AIA surveyed its membership in 1969 to determine if the *Uniform System* should be updated or if a new scheme would better serve the needs of architects. The response was overwhelmingly in favor of revision, and constructive comments were offered. Early in 1970 the copyrighters of the *Uniform System* convened the first of many joint industry conferences to revise the document, inviting broad participation by the various disciplines in the construction industry. The objective was to develop the system into an improved and more comprehensive guide to assist in construction communications and information storage and retrieval, maintaining it as a simple, logical and flexible industry standard. Consideration was given to experience gained in use and comments received since initial publication.

A Data Filing Committee developed a revised filing format, consulted with representatives of various organizations concerned with the process and made recommendations for adoption by the Joint Industry Conference. The committee also consulted with engineers and specialty contractors on mechanical and electrical divisions 15 and 16 to bring these subjects into line with current accepted practice. It recommended two major innovations in the data filing format:

1. Division 1 would be enlarged many times to provide comprehensive data filing capability for all disciplines on subjects relating to everything *not* incorporated into the construction. The additions and changes would represent a substantial departure from the original *Uniform System* in which division 1 filing titles were concerned principally with specifications subjects. Examples of subjects covered would include those relating to administrative aids for all disciplines, design and technical aids for architects and engineers, construction aids for builders and maintenance aids for owners.

2. Divisions 2 through 16 would provide the capability of grouping literature that describes principal products separately from that which deals with design or application considerations relating to these products and from literature of an accessory nature. The search function could thus be narrowed down to the selected one of these three areas within each heading.

Also in 1970 the Canadian Building Construction Index Committee was considering revisions to *The Building Construction Index*, a guideline for a project filing system based in part on the 16-division concept. As the documents of Canada and the United States had certain inherent similarities, it was determined to merge the documents of both countries into a single one. Consideration of revisions continued on a broader base with the Canadians contributing to the work of the key Data Filing Committee. A project filing format would be added to the three original and updated parts of the *Uniform System*, a new name selected to reflect both earlier documents and a new logotype representing the four parts of the combined revised document designed. It was agreed that the CSI would assume final editing and publishing chores for both groups. Thus in mid-1972 the new document was published under the title *Uniform Construction*



reconciled and agreement was reached to develop both a filing system and a cost accounting guide based on the concept of a 16-division specifications outline. The *Uniform System for Construction Specifications, Data Filing & Cost Accounting* was published by the AIA in 1966 for members of the Conference on Uniform Indexing Systems. The publication has gained wide acceptance as the single document which contributes the most to the improvement of construction industry communications, particularly in the technical area. To aid in the retrieval process, the AIA has encouraged manufacturers to imprint *Uniform System* classifications on the front cover of product literature and has provided a classification service to assist them. Such classifica-

Mr. Class, formerly a practicing architect, is currently serving the AIA as director of Technical Programs. He is secretary of the Uniform System Joint Industry Conference and a member of its key Data Filing Committee.

OBSOLETE

*Index: A System of Formats for Specifications, Data Filing, Cost Analysis and Project Filing.*¹

The new *Uniform Construction Index* is made up of four major parts. Part 1, Specifications Format, is the current edition of *The CSI Format for Construction Specifications*, updated to parallel changes in the Data Filing Format; its 16-division format provides a standard arrangement for uniformity in specifications writing. Part 2, Data Filing Format, provides headings for filing and retrieving product and technical literature and other informational material for the construction industry; its 16-division format parallels the Specifications Format insofar as maintaining a basic product-to-division integrity. Part 3, Cost Analysis Format, is an orderly arrangement of the units of work in a construction project, readily applicable to manual or computer processing techniques of construction cost analysis and recording; its 16-division format closely parallels the Specifications Format, with added 5-digit numerals. Part 4, Project Filing Format, provides headings for filing and retrieving correspondence and information pertaining to a specific project; its 4-division format is based on the major design and construction events of a project, with subjective subdivisions.

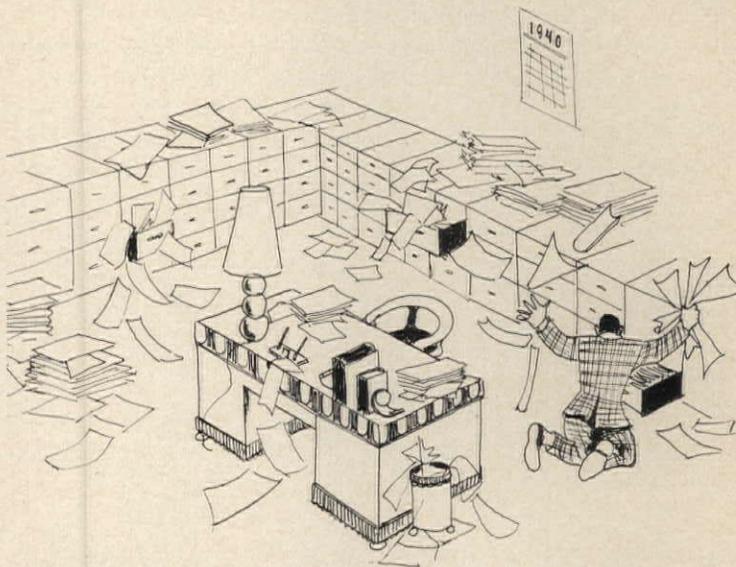
The first three formats (specifications, data filing and cost analysis) are all interrelated and are based on the same 16-division concept. This interrelationship is indicated in the Comparative Table of Contents and is implemented in the comprehensive Index of Key Words, arranged alphabetically and compiled to assist the user in locating subjects in any of these three formats. The terminology found in this document represents the common usage of terms prevalent in the construction industry in both the US and Canada. Hopefully, it will form the basis for future developments in advanced means of communication in the construction industry.

Consistent use of the two *Uniform Construction Index* filing formats, data and project, should solve the bulk of filing and retrieval problems of most offices. Note that these are filing *formats*, not filing *systems*. Choice of systems (for example, hard-copy, microfilm, microfiche, computer-aided and in various modes and combinations) is the prerogative of the user according to availability and cost, but the formats should form the common basis of the systems and should be applied consistently.

While we are looking forward to the day when a utopian comprehensive information and communication system will emerge for the construction industry, we must content ourselves with assorted bits and pieces. But we can tie most of them to-

gether through innovative use of the 16-division formats of the *Uniform Construction Index*. A good start has been made in the area of product information in the application of the 16-division concept. Some magazines, such as the annual directory issue of *Building Design & Construction*, use the concept to classify building products. More and more manufacturers are imprinting the classifications on the front covers of product literature. Bound collections of construction product literature employ the concept; for example, the regional *AEC Western Catalog & Reference File* has been using the 16 divisions for several years. Sweet's catalog files (architectural, industrial construction, light construction), which currently employ a transitional version, expect to be fully in compliance with the Data Filing Format of the *Uniform Construction Index* in 1974. Information systems which use the 16 divisions for microfilmed literature include IDAC System, Showcase Microfilm Library and Spec-Data II Microfilm File. Canada's new Construction Information System, scheduled to emerge in 1973 or '74, could benefit by using the concept.

Users of the *Uniform Construction Index* should study carefully both the introduction and the detailed text of each of the



formats in order to put the system to the most advantageous use. It should be noted that the formats have been designed for use by all disciplines connected in any way with the construction industry, including design professionals, specifiers, cost estimators, builders, contractors, subcontractors, material suppliers, installers, product manufacturers, building owners and managers and those in the ancillary disciplines of advertising, code enforcement, real estate, development, finance, insurance and the law. To make the document of ever-increasing use in future years, comments on the concept, use and application of the formats are solicited from users.

As the Data Filing Format will probably be used by the greatest number of people, some additional comments concerning its nature and use are in order. Reference to the accompanying compilation of data filing headings will assist in understanding the concept.

Part 2 of the *Uniform Construction Index*, Data Filing Format, basically maintains the product-to-division integrity estab-

¹ Copyright 1972 in USA and Canada by: The American Institute of Architects; Associated General Contractors of America, Inc.; The Construction Specifications Institute; Consulting Engineers Council of the United States; Council of Mechanical Specialty Contracting Industries, Inc. (Mechanical Contractors Association of America, Inc.); National Association of Plumbing-Heating-Cooling Contractors; National Electrical Contractors Association, Inc.; Sheet Metal and Air Conditioning Contractors' National Association, Inc.; Professional Engineers in Private Practice; National Society of Professional Engineers; The Producers' Council, Inc.; Specification Writers Association of Canada.

Not joining in the copyright but supporting use of the index at press time are: American Society of Landscape Architects; Association of Consulting Engineers of Canada; Canadian Construction Association; Canadian Institute of Quantity Surveyors; The Royal Architectural Institute of Canada; Sweet's Division, McGraw-Hill Information Systems Co.—US/Canada (a contributing organization of the Joint Industry Conference).

Copies of the *Uniform Construction Index* are available from the Publications Department, AIA, 1785 Massachusetts Ave. N.W., Washington, D.C. 20036. \$6.50, AIA members; \$8, nonmembers.

lished in Part 1, Specifications Format. The comprehensive headings of the Data Filing Format replace those of the following publications: 1) The filing system of the *Uniform System for Construction Specifications, Data Filing & Cost Accounting; Title One—Buildings*, published by the AIA for members of the Conference on Uniform Indexing Systems in 1966; 2) *The American Institute of Architects Filing System for Architectural Plates & Articles*, published in 1933; and 3) *The Standard Filing System and Alphabetical Index*, published by the AIA in 1920.

The Data Filing Format is based on the premise that there is only one correct location for each subject to be filed, even though certain products may be specified in more than one division or section of the specifications; such locations generally were determined by the most prevalent use of the products involved. Users will benefit from the uniformity inherent in the system by utilizing the divisions and headings without alteration. In one's own files, subheadings and additional headings may be employed if this would increase the utility of the format. Content examples are given in the *Uniform Construction Index* for the majority of headings. These examples are not intended to be exhaustive listings, but they may be used as a basis for users who wish to develop subheadings in certain areas of their filing systems. A major exception is the heading "Building Types" in division 1; no rec-



ommendations were made for groupings under this title in this edition of the index as this would be the subject of a separate detailed study.

It is recommended that users set up their filing systems by divisions, arranging all headings except "General Information" in alphabetical sequence. "General Information" should be used sparingly so as not to become a miscellaneous catchall which makes the retrieval process more difficult; its use should be restricted to literature related to more than one heading in a single division where one subject does not predominate. This general heading will be used rarely for officially classified literature and only when there is no available alternative. Users who elect to utilize subheadings of their choosing for selected categories should arrange these also in alphabetical sequence.

Division 1, which provides data filing classifications for

everything *not* actually incorporated into the construction, is generally not product related; so letter subscripts, as discussed below, were not recommended. However, if users find this concept helpful for their files, they are free to devise applications to suit their individual needs.

Technical divisions 2 through 16 provide data filing classifications for products to be incorporated into the construction and for information relating to these types of products. Improved retrieval capability is provided by the use of standard lower-case subscript letters following the division numeral. These letters ("p," "d" or "x") will be used following the division numeral to represent, respectively, the categories of **product, design/application or accessory**.

This concept, which is especially important as files grow and is explained in detail in the *Uniform Construction Index* text, permits separation of: 1) literature describing the characteristics of primary products manufactured by specific companies from 2) generic literature concerning design or application information relating to products and from 3) accessory literature relating to raw or basic materials used in product fabrication and to product installation devices.

As mentioned previously, manufacturers of construction products are being encouraged to imprint *Uniform Construction Index* classifications on the front covers of their product literature to aid in the task of filing and retrieval—and incidentally to assure that their literature can be found in the users' files, next to that of competitors. A public relations program to this end is gradually being undertaken. Users can assist in this effort by encouraging manufacturers' representatives who call at their offices to take the message back to their home offices. Two central agencies, one in the US and one in Canada, have been established to assign classifications to technical literature prior to printing and to issue instructions on proper application of them. The AIA operates the Uniform Construction Index Classification Service in this country, and in Canada this function is handled by the Specification Writers Association of Canada.

The AIA has prepared a pamphlet, *Technical Literature for the Construction Industry*, which is available to publishers of product literature without charge. It contains suggestions for preparing product and other technical literature and provides details of the classification service. The classification of a particular piece of product or technical literature is located vertically in the lower right and upper left corners of the front cover so that it can be easily seen in a binder or in a file drawer regardless of the direction in which it is filed. A blank space is provided below the heading for the user to insert his own subheading if desired. This form should be followed by the user in marking catalogs, articles and other technical and informational literature which has not been pre-marked. Markings may be made by hand or by typing directly on the piece to be filed or on a stick-on label. Catalogs containing a variety of subjects may be torn apart and marked with their proper headings.

Pre-marked literature will contain sufficient filing information for the great majority of users without the necessity of adding further detail. The first hierarchical level is the division numeral which indicates the broad grouping. Division titles are not

1 • GENERAL DATA

GENERAL INFORMATION
ASSOCIATIONS
BUILDING INDUSTRY RELATIONS
BUILDING TYPES
CODES/REGULATIONS
COMPUTER APPLICATIONS
CONSTRUCTION EQUIPMENT & TOOLS
CONSULTANTS/SPECIALISTS/SERVICES
CONTROLS
COST DATA
DESIGN ELEMENTS
DOCUMENTS & FORMS
ECOLOGY
EDUCATION
ENERGY CONSERVATION
HISTORY
INFORMATION SYSTEMS
INSTRUCTION MANUALS
INSURANCE
LEGAL AIDS
MAINTENANCE/OPERATIONAL
EQUIPMENT
NETWORK SYSTEMS
OFFICE EQUIPMENT
OFFICE MANAGEMENT
OFFICE SUPPLIES
PLANNING
PRESERVATION/RESTORATION/
REMODELING
PROGRAMMING
PROJECT DELIVERY METHODS
PROJECT DEVELOPMENT
PROJECT DOCUMENTATION
PROJECT FINANCING
PUBLIC RELATIONS
SAFETY
STANDARDS, BUILDING
STANDARDS, OFFICE
TAX AIDS
TEMPORARY FACILITIES

2 • SITE WORK

GENERAL INFORMATION
CAISSONS
DEMOLITION & CLEARING
EARTHWORK
FENCES & GATES
FOUNTAINS & POOLS
IRRIGATION SYSTEMS
LANDSCAPING
MARINE WORK
PAVING & SURFACING
PILE FOUNDATIONS
RAILROAD WORK
RECREATIONAL FACILITIES
SHORING
SITE DRAINAGE
SITE FURNISHINGS
SITE UTILITIES
SOIL TREATMENT
TUNNELING

3 • CONCRETE

GENERAL INFORMATION
CAST-IN-PLACE CONCRETE
(Design/Application information
only)
CEMENTITIOUS DECKS
CONCRETE ACCESSORIES
CONCRETE FORMWORK
CONCRETE MATERIALS
CONCRETE REINFORCEMENT
PRECAST CONCRETE

4 • MASONRY

GENERAL INFORMATION
MASONRY ACCESSORIES
MASONRY RESTORATION &
CLEANING
MORTAR
REFRATORIES
SIMULATED MASONRY
STONE
UNIT MASONRY

5 • METALS

GENERAL INFORMATION
EXPANSION CONTROL
FASTENERS & SUPPORTS
GRATINGS
LIGHTGAGE METAL FRAMING
METAL CASTINGS
METAL DECKING
METAL FABRICATIONS
METAL JOISTS
METAL STAIRS
METALS & ALLOYS
RAILINGS & HANDRAILS
STRUCTURAL METAL FRAMING

6 • WOOD & PLASTICS

GENERAL INFORMATION
ARCHITECTURAL WOODWORK

CONNECTORS & SUPPORTS
LAMINATED & PROCESSED
SHEETS
LUMBER
PLASTIC FABRICATIONS
PLASTIC LAMINATES
PREFABRICATED STRUCTURAL
PLASTICS
PREFABRICATED STRUCTURAL
WOOD
SIMULATED WOOD
STOCK MILLWORK
WOOD TREATMENT

7 • THERMAL & MOISTURE PROTECTION

GENERAL INFORMATION
CLADDING/SIDING
COMPOSITE BUILDING PANELS
FLASHING
INSULATION
MEMBRANE ROOFING
METAL ROOFING
PREFORMED WALL & ROOF
PANELS
ROOF ACCESSORIES
ROOFING SPECIALTIES
SEALANTS
SHINGLES & ROOFING TILES
TRAFFIC TOPPING
VAPOR BARRIERS/RETARDANTS
WATERPROOFING &
DAMP-PROOFING

8 • DOORS & WINDOWS

GENERAL INFORMATION
ENTRANCES & STOREFRONTS
GLAZING
GLAZING ACCESSORIES
HARDWARE & SPECIALTIES
METAL DOORS & FRAMES
METAL WINDOWS
SPECIAL DOORS
SPECIAL WINDOWS
WINDOW WALLS/CURTAIN WALLS
WOOD & PLASTIC DOORS
WOOD & PLASTIC WINDOWS

9 • FINISHES

GENERAL INFORMATION
ACOUSTICAL TREATMENT
ADHESIVES
CARPETING
CEILING SUSPENSION SYSTEMS
FLOOR TREATMENT
GYPSUM WALLBOARD
LATHING MATERIALS
PAINTING MATERIALS
PLASTER
PREFINISHED PANELS
RESILIENT FLOORING
SPECIAL COATINGS &
SURFACINGS
SPECIAL FLOORING
TERRAZZO
TILE
WALL COVERING
WOOD FLOORING

10 • SPECIALTIES

GENERAL INFORMATION
ACCESS FLOORING
CHALKBOARDS & TACKBOARDS
COMPARTMENTS & CUBICLES
FIREPLACES
FLAGPOLES
GRILLES & SCREENS
IDENTIFYING DEVICES
LOCKERS
LOUVERS & VENTS
PARTITIONS
PEDESTRIAN CONTROL DEVICES
PEST CONTROL
POSTAL SPECIALTIES
PROTECTIVE COVERS
SCALES
SPECIALTY MODULES
STORAGE SHELVING
SUN CONTROL DEVICES
TELEPHONE ENCLOSURES
TOILET & BATH ACCESSORIES
WALL & CORNER GUARDS
WARDROBE SPECIALTIES

11 • EQUIPMENT

GENERAL INFORMATION
ATHLETIC EQUIPMENT
BANK & VAULT EQUIPMENT
BUILT-IN MAINTENANCE
EQUIPMENT
CHECKROOM EQUIPMENT
COMMERCIAL EQUIPMENT
DARKROOM EQUIPMENT
DETENTION EQUIPMENT
ECCLESIASTICAL EQUIPMENT
EDUCATIONAL EQUIPMENT

FOOD SERVICE EQUIPMENT
INDUSTRIAL EQUIPMENT
LABORATORY EQUIPMENT
LAUNDRY EQUIPMENT
LIBRARY EQUIPMENT
LOADING DOCK EQUIPMENT
MEDICAL EQUIPMENT
MORTUARY EQUIPMENT
MUSICAL EQUIPMENT
PARKING EQUIPMENT
REGISTRATION EQUIPMENT
RESIDENTIAL EQUIPMENT
THEATER & STAGE
EQUIPMENT
VENDING EQUIPMENT
WASTE HANDLING EQUIPMENT

12 • FURNISHINGS

GENERAL INFORMATION
ARTWORK
CABINETS & STORAGE
FABRICS
FLOOR MATS
FURNISHING ACCESSORIES
FURNITURE
RUGS
SEATING
WINDOW TREATMENT

13 • SPECIAL CONSTRUCTION

GENERAL INFORMATION
AIR SUPPORTED STRUCTURES
INTEGRATED ASSEMBLIES
INTEGRATED CEILINGS
PREFABRICATED BUILDINGS
RADIATION PROTECTION
RADIO-FREQUENCY SHIELDING
SOUND & VIBRATION CONTROL
SPECIAL PURPOSE ROOMS &
BUILDINGS
SWIMMING POOLS
TOTAL ENERGY SYSTEMS
(Design/Application information
only)

14 • CONVEYING SYSTEMS

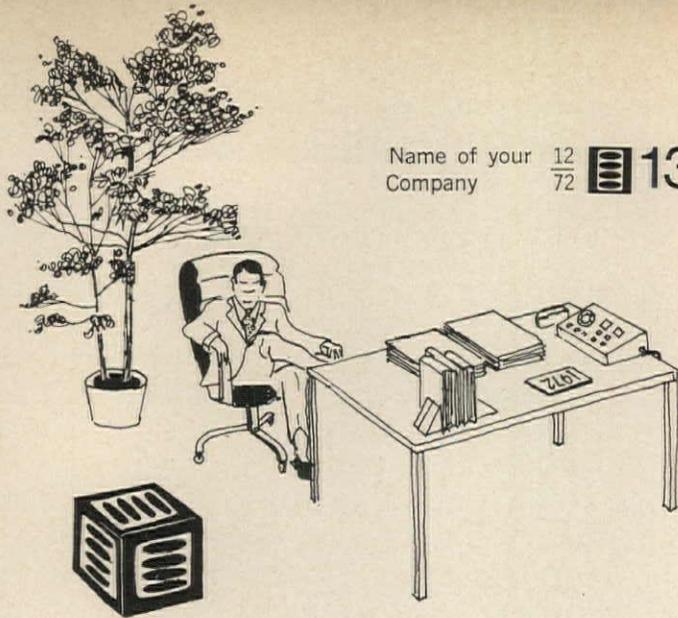
GENERAL INFORMATION
CONVEYORS & CHUTES
DUMBWAITERS
ELEVATORS
HOISTS & CRANES
LIFTS
MOVING STAIRS & WALKS
PNEUMATIC TUBE SYSTEMS
POWERED SCAFFOLDING
TURNABLES

15 • MECHANICAL

GENERAL INFORMATION
AIR DISTRIBUTION EQUIPMENT
AIR TREATMENT EQUIPMENT
COMBUSTION EXHAUST
EQUIPMENT
FIRE PROTECTION EQUIPMENT
FUEL HANDLING EQUIPMENT
HEAT EXCHANGERS
HEAT GENERATION
HEAT PUMPS
HVC TERMINAL UNITS
LIQUID WASTE EQUIPMENT
MECHANICAL CONTROLS
MECHANICAL INSULATION
MECHANICAL SUPPORTING
DEVICES
MECHANICAL VIBRATION
ISOLATION
PIPING & SPECIALTIES
PLUMBING FIXTURES & TRIM
PUMPS & COMPRESSORS
REFRIGERATION EQUIPMENT
SELF-CONTAINED HVC UNITS
SPECIAL PIPING SYSTEMS
(Design/Application information
only)
TANKS & BASINS
VALVES
WATER SUPPLY & TREATMENT

16 • ELECTRICAL

GENERAL INFORMATION
COMMUNICATIONS
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POWER GENERATION
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PROTECTIVE SYSTEMS
RACEWAYS
SERVICE & DISTRIBUTION
WIRING DEVICES



used. The second level is the heading in capital letters indicating the general subject. These titles were chosen to be easily recognizable and to relate directly to the subject matter as opposed to using a meaningless, hard-to-remember, inflexible numbering system. The third level is the lower-case letter subscript to the division numeral which separates primary product literature from design/application and accessory information.

If the user chooses to use subheadings in some instances, this becomes the fourth level; otherwise, the fourth level is the name of the manufacturer printed with the classification. Thus four levels of classification information will be indicated on every piece of pre-marked literature. The user is free to add a fifth level of information by the use of subheadings of his choosing, if he requires this degree of detail. He also may add other headings within the alphabetical sequence in his own system, if he finds need for them. An additional piece of information within the classification is the month and year of issue for the benefit of users in keeping their files current. Officially classified literature is identified by the new logotype of four ovals set in a square, each representing one of the four parts of the *Uniform Construction Index*.

The changeover from *Uniform System* classifications to *Uniform Construction Index* classifications will be gradual and relatively easy as the format changes have been kept to a minimum

to reduce the possibility of disruption. Literature bearing one or the other designation will be in use for a time, but as literature is reprinted the old designations will phase out. Users whose filing systems are set up on the *Uniform System* format will probably file literature imprinted with *Uniform Construction Index* designations under the closest appropriate headings where there has been an actual title change. When the time comes to change to the revised format, older literature worthy of retention can have a new stick-on title applied. Users who employ other systems or formats are encouraged to change to the *Uniform Construction Index* format as this will fast become the one standard data filing format for the construction industry. New pre-marked literature will relate only to this format.

All normal methods of filing hardcopy material may be used when employing the *Uniform Construction Index* classifications. Most books normally found in the office library can be classified in the data filing format and incorporated into the overall information system. Hardcopy data and materials in other forms can live side-by-side in any user's filing system if they are all identified under the same format.

The AIA commends the use of the *Uniform Construction Index* to its members and others in the construction industry. It hopes that the universal use of the system inherent in the index will lead to a new era in construction communications.

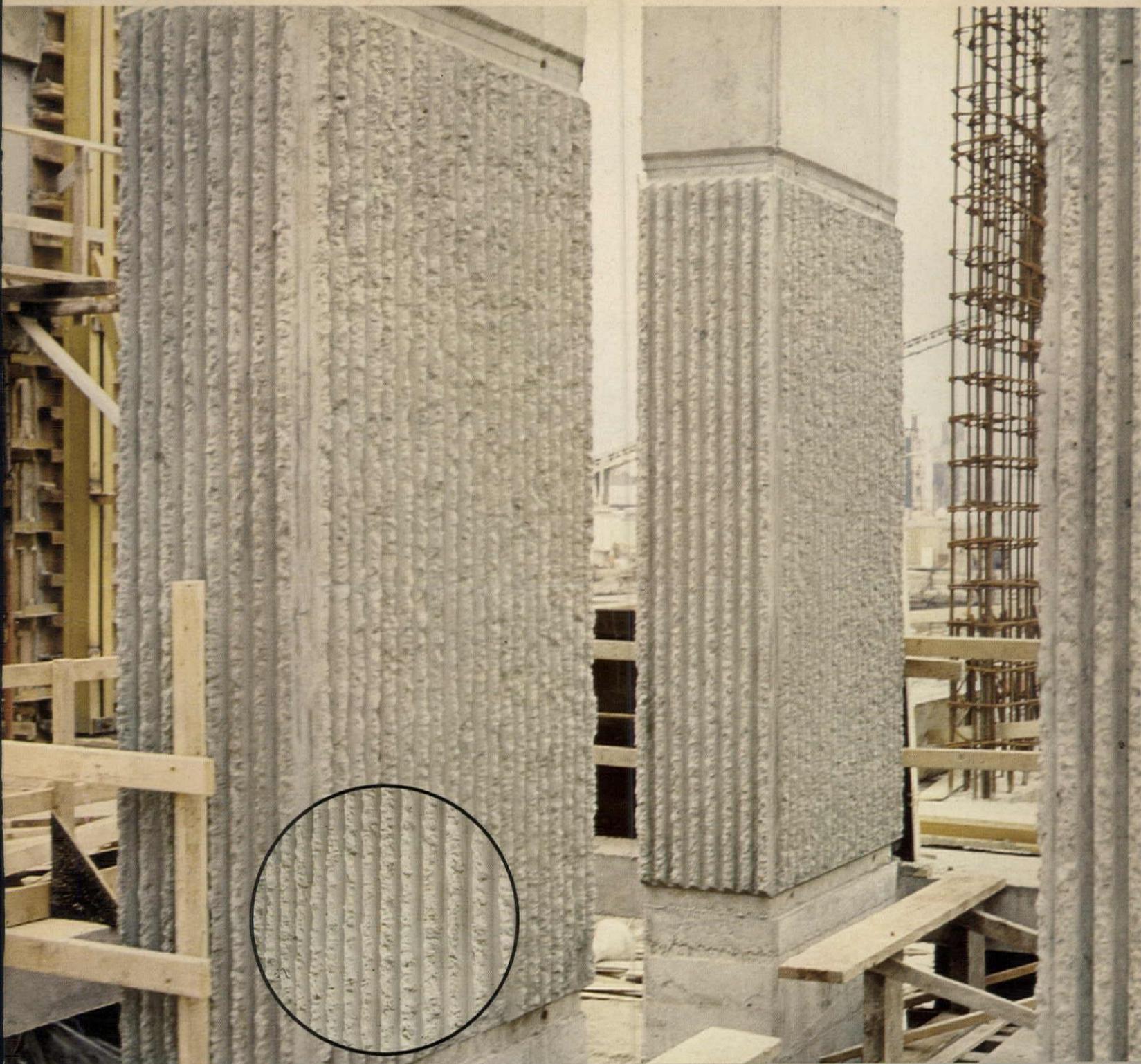
Aids in Preparing Product Literature

Several documents and programs have been developed to provide guidance to building products manufacturers for preparation of product literature. These include:

- *Technical Literature for the Construction Industry* (AIA Document E101): a new pamphlet prepared by the AIA as a general guide to effective presentation of technical data on building products. This document is designed to encourage excellence in manufacturers' product literature worthy of preserving; contains specific suggestions on content, organization and presentation; provides details of the Uniform Construction Index Classification Service. Single copies are available free to product manufacturers.
- *Sweet's GuideLines*: a series of documents developed by Sweet's Division of McGraw-Hill Information Systems Company cooperatively with design professionals and manufacturers as a guide to a uniform approach to product information. Currently numbering over 200 individual detailed documents on specific product categories, the series provides uniform guidelines on format, content and terminology without sacrificing individuality of presentation. The series is designed to increase the comprehensiveness and usefulness of product literature to the user at different stages in the evaluation and selection process. Single copies in a specific

category are available to product manufacturers without charge, as is consultation on application of the document.

- *SPEC-DATA Technical Literature Program*: an interrelated program administered by the Construction Specifications Institute based on a compact standard 10-point format for evaluating, comparing, selecting and specifying products, complementing conventional product literature. Under a standard agreement, the manufacturer prepares the text and publishes the SPEC-DATA sheet, and CSI staff provides editorial services and distributes the sheets to the CSI membership. The copyrighted program encourages periodic updating of information by limiting the time that distribution of the sheets may be made by the manufacturer.
- *Guide to the Preparation of Construction Product Literature*: a new document currently under development by the Specification Writers Association of Canada. Publication is scheduled for late this year.
- *Construction Industry Advertising and Product Literature Conference*: a periodic conference administered by the Producers' Council, Inc., to provide a forum for exchange of information and discussion of current techniques in product literature for building products manufacturers.



architect: Dalton Dalton Little and Newport
director of design: Norman Pertulla, AIA

Park Centre, Cleveland, Ohio

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Minnesota Sizes Up Its Firms

A survey conducted this year by the Minnesota Society of Architects revealed that 20.7 percent of its member firms are one-man offices. "We make no statement that other states are not similar to ours, but this recent evidence was accumulated and assembled with thoroughness," says Louis R. Lundgren, FAIA, a member of the AIA Board of Directors from the North Central States Region.

Early in 1972 the Minnesota Society of Architects AIA prepared and distributed a questionnaire to the 195 firms in the state who employ one or more MSA members. The purpose of the study was to determine how Minnesota architects are distributed by office and what the office size is.

A roster of employees was requested of each firm surveyed, as well as information regarding the position, training, etc., of each employee. In April each firm was telephoned to verify and update the information received earlier and to obtain facts from those firms who had not responded to the initial questionnaire. Data was received on the total number of employees from 193 of the firms and on the number of architecturally related professional employees from 195 of the firms.

For the purposes of the study, "total number of employees" refers to *all* employees, including part-time and secretarial staff. The term "architecturally related professional employees" refers to principals of the firm, architects, draftsmen, et al., but excludes such categories as engineers, student help and secretarial staff. Organizations employing architects, such as universities, technical schools, government offices, etc., were eliminated from the survey, leaving only so-called architectural firms.

The results of the study show that in MSA member firms the average number of total employees is 10.1. The median number of total employees is four; half the firms have four or fewer employees. Twenty-one or fewer individuals are employed by 93 percent of the firms. All but one firm have fewer than 90 employees.

MSA firms have an average of 5.9 architecturally related professional employees. The median number is three, i.e., half the firms have three or fewer such employees. Eighty-two percent of the firms have fewer than eight architecturally related employees, while 99.3 percent have fewer than 32 architectural employees. Forty member firms, or 20.7 percent, consist of one man; 51 firms, or 26.1 percent, have only one architecturally related employee. □

TOTAL NUMBER OF EMPLOYEES			
No. of employees	No. of firms with that total	Percentage of firms with that total	Cumulative percentage
1	40	20.7	20.7
2	17	8.8	29.5
3	21	10.9	40.4
4	22	11.4	51.8
5	15	7.8	59.6
6	19	9.8	69.4
7	9	4.7	74.1
8	5	2.6	76.7
9	2	1.0	77.7
10	1	0.5	78.2
11	5	2.6	80.8
12	2	1.0	81.8
13	7	3.6	85.4
14	2	1.0	86.4
15	1	0.5	86.9
16	2	1.0	87.9
17	3	1.6	89.5
18	2	1.0	90.5
19	3	1.6	92.1
20	1	0.5	92.6
21	1	0.5	93.1
22	0	0.0	93.1
23	2	1.0	94.1
24	1	0.5	94.6
25	0	0.0	94.6
26-30	1	0.5	95.1
31-35	1	0.5	95.6
36-40	2	1.0	96.6
41-45	2	1.0	97.6
46-50	0	0.0	97.6
51-55	1	0.5	98.1
56-60	0	0.0	98.1
61-65	0	0.0	98.1
66-70	0	0.0	98.1
71-75	0	0.0	98.1
76-80	0	0.0	98.1
81-85	1	0.5	98.6
86-90	1	0.5	99.1
91-459	0	0.0	99.1
460	1	0.5	99.6
460+	0	0.0	99.6
1,955	193		

TOTAL NUMBER OF ARCHITECTURALLY RELATED PROFESSIONAL EMPLOYEES			
No. of architectural employees	No. of firms with that total	Percentage of firms with that total	Cumulative percentage
1	51	26.1	26.1
2	26	13.3	39.4
3	33	16.9	56.3
4	20	10.3	66.6
5	17	8.7	75.3
6	8	4.1	79.4
7	5	2.6	82.0
8	0	0.0	82.0
9	8	4.1	86.1
10	7	3.6	89.7
11	1	0.5	90.2
12	0	0.0	90.2
13	5	2.6	92.8
14	2	1.0	93.8
15	2	1.0	94.8
16-20	3	1.5	96.3
21-25	4	2.0	98.3
26-30	1	0.5	98.8
31-35	1	0.5	99.3
36-213	0	0.0	99.3
214	1	0.5	99.8
214+	0	0.0	99.8
1,158	195		

Ylvisaker is a member of the AIA National Policy Task Force which drew up proposals for land use and regulation in the United States. As chairman of the Institute's Community Services Commission, Van Bruner has been added to the task force this year.

Boston Wins AIA Special Commendation, Excellence of Government Center Cited

"A model of how urban renewal, when imaginatively conceived and carried out, can bring new vitality and beauty to a city," states the AIA about the Boston Government Center. The 60-acre complex of government facilities, private offices and commercial structures and extensive landscaped pedestrian areas has won for Boston an AIA Citation for Excellence in Community Architecture. The citation was presented at the recent annual meeting of the New England Regional Council of Architects.

Recognizing the center's "profound social, economic and esthetic achievements," the Institute commended especially John F. Collins, Boston mayor from 1960 to 1968; Edward J. Logue, director of the Boston Redevelopment Authority from 1960 to 1967; and I. M. Pei, FAIA, the center's chief planner.

The planning of the center, which is now 90 percent complete, was begun in the mid-1950s. Placed in the hands of the Boston Redevelopment Authority in 1960, with Pei commissioned to produce a master plan for the complex, the center has many amenities for the people who work in and visit it.

The focal point of the center is Boston's City Hall which was designed by Kallman, McKinnell & Knowles with work carried out in association with the architectural firm of Campbell, Aldrich & Nulty and the structural engineering firm of LeMessurier Associates, Inc. It won an AIA Honor Award in 1969.

Seminar for Architects in Industry Lays Base for Closer Relationship with AIA

"We have yet to develop an effective method of communicating as a profession with the corporate client. Those of our profession who have joined corporations have carried virtually the whole communications burden for the profession; and at least until now, the AIA has made no special effort to support them in their unique professional roles."

This statement, made by Institute President Max O. Urbahn, FAIA, to some 50 architects working in corporations and industry, showed them that such communication is at last underway. They had met at the AIA-sponsored Seminar for Architects in Industry at Columbia, Md., to discuss common problems and to hear from practitioners in firms designing for industry: George T. Heery, AIA, Atlanta, one of the founders of the AIA's Commerce and Industry Committee 11 years ago; Philip J. Meathe, FAIA, Detroit; and Norman C. Zimmer, FAIA, Portland, Ore.

"Can the AIA help architects in industry achieve their professional objectives? Can architects in industry help the AIA equip its members in private practice to perform ser-

VICES that are commissioned by corporate clients?" Urbahn asked. The seminar was an important start of a two-way communication, participants agreed, and decided to meet again next year. For further information on the committee's activities, write to Maurice Payne, AIA, director, Building Design Programs at AIA Headquarters.



The temple with its soaring spires at six corners will dominate the Maryland landscape.

New Mormon Temple Under Construction Responds to Rapid Growth of Church

The Church of Jesus Christ of Latter-Day Saints is building a \$15 million temple on a 57-acre site in Kensington, Md., about a half-hour drive from downtown Washington, D.C. It will be ready for use by the 250,000 Mormons east of the Mississippi River in the spring of 1974. The closest temple now is the one in Salt Lake City; others are situated in Ogden, Provo, Logan, Manti and St. George, Utah, and in Arizona, California, Hawaii, Canada, England, New Zealand and Switzerland. The new temple in Maryland is considered essential for the growing membership of the church.

The temple is the design of a group of Mormon architects: Fred L. Markham, FAIA; Harold K. Beecher, AIA; Henry P. Fetzer, AIA; and Keith W. Wilcox, AIA. They worked under the general direction of Church Architect Emil B. Fetzer, AIA. The building will be constructed with an exterior surface of white Alabama marble and will have spires of varying heights at each of its six corners. Similar to the temple in Salt Lake City, a statue of the Angel Moroni will be on the highest spire. It is the work of sculptor Avard Fairbanks.

Filing Accessories to Be Available

Aids for architects to file literature under the new *Uniform Construction Index* (see p. 43) will soon be available. Based on the 16-division data filing format, complete kits of filing aids are in process of preparation. They will include divider tabs, labels, drawer identification cards and instructions. For further information, write Harold E. Keller, Filing Accessories Co., P.O. Box 321, San Gabriel, Calif. 91778.

Newslines

■ **Homer Delawie, FAIA**, of San Diego has been named the distinguished alumnus for 1972 by the School of Architecture and Environmental Design, California Polytechnic State University, San Luis Obispo.

■ **Urban growth policy** is analyzed in a new publication of the Urban Land Institute. A survey of federal and state legislation in 1970 and federal legislative and executive developments in 1971 is presented in *National Growth Policy: Legislative & Executive Actions 1970-71*. Written by Norman Beckman and Bruce E. Langdon, the research monograph may be purchased from ULI, 1200 18th St. N.W., Washington, D.C. 20036. The price is \$5 for ULI members, \$7 for nonmembers.

■ **Louis I. Kahn, FAIA**, upon whom the AIA bestowed its Gold Medal in 1971, has been elected an honorary fellow of the Royal Institute of the Architects of Ireland.

■ **About \$1,500 in scholarship funds** has been raised by the Southern California Chapter of the Architectural Secretaries Association as the result of a fashion show brunch. Approximately two-thirds of the money will benefit an architectural student at California Polytechnic State University; the rest will go to the AIA Students' Educational Fund, Los Angeles.

■ **John R. Joyner** has been named executive director of the American Institute of Planners. He was formerly deputy director, Office of Urban Services, National League of Cities/US Conference of Mayors in Washington, D.C.

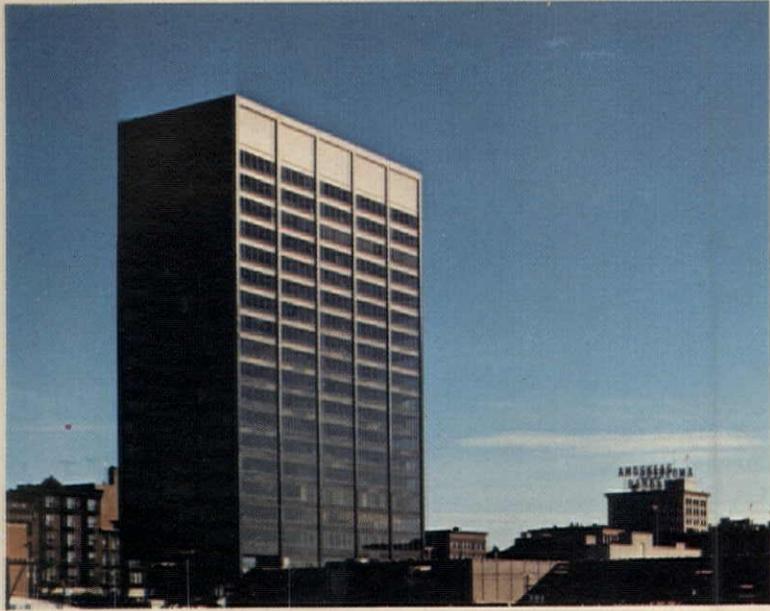
■ **The Ford Foundation** has established a \$2 million Energy Policy Project to conduct a comprehensive analysis of issues involved in creating national energy policy. Two independent consultants, John E. Gray, who is former chairman of the board of NUS Corporation, and Charles R. Owens, who served as an economic consultant for the Cost of Living Council, have been appointed to produce an analytical study of decision making within the energy industries as it affects US energy policy.

■ **The first videotape** in the new series "Profile of an Architect" has been released by AEF Video Software Inc. The first offering is about the life and work of John M. Johansen, FAIA, of New York City. The series is designed to provide students with a knowledge of "the major architects of our time." For additional information, write AEF Video Software Inc., P.O. Box 182, Planetarium Station, New York, N.Y. 10024.

■ **Two hundred 35 mm slides** have been added to the Guild for Religious Architecture's collection on contemporary religious architecture and art. Its slide library now numbers 3,850 slides and was developed primarily through the efforts of Robert L. Durham, FAIA, of Seattle. The slides are approximately

continued on page 54





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Soaring into the sky above Manchester, New Hampshire, is the tallest building in northern New England.

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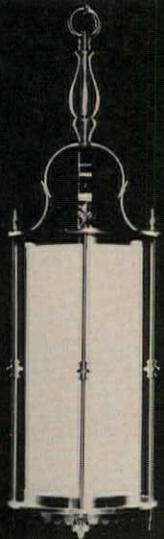
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outlook from page 51

priate for showing lay committees interested in new structures and are available on a rental and/or purchase basis. Selections may be made from a catalog which will be sent on request. Write GRA, 1777 Church St., N.W., Washington, D.C. 20036.

■ **Fifteen young talented photographers** living in the Baltimore/Washington, D.C., area had their work exhibited recently at the University of Maryland Art Gallery in College Park. Among them was Neil Maurer, a staff associate in the AIA Public Relations Department, whose photographs have been published often in the AIA JOURNAL.

■ **The National Fire Protection Association** has published a 1972 edition of *Standard for Chimneys, Fireplaces and Vents* (NFPA No. 211). The price of the 40-page publication is \$1.25. Also available for \$1.25 in a 1972 edition is *Standard on Incinerators and Rubbish Handling* (NFPA No. 82) which pertains to fire-safe installation and use of residential, commercial and industrial incinerators. Copies may be obtained from NFPA, 60 Battery-march St., Boston, Mass. 02110.

■ **Eugene T. Austin**, former senior associate in a Washington, D.C., management consulting firm, has been appointed the first director of the Environmental Protection Agency's Division of Urban Affairs.

■ **The renovation of three historic buildings** in Nebraska has been underwritten with grants totaling \$124,011 by HUD. Two of the structures, the Old Presbyterian Church and the Fontenelle Bank-Courthouse, are in Bellevue; the third is the Burlington Railroad Depot in Papillion.

■ **M. Wayne Stoffle**, AIA, of New Orleans has been appointed by Secretary of Defense Melvin R. Laird to the Executive Committee, National Committee for Employer Support of the Guard and Reserve. The architect joins 19 other prominent Americans on the special board which was established by President Nixon to bolster the "total force" concept of national defense.

■ **Inexpensive books and pamphlets** of direct assistance to the architect are available from the American Association for Health, Physical Education and Recreation, 1201 16th St. N.W., Washington, D.C. 20036. A catalog will be sent upon request. Two recent publications are *Dance Facilities and Dressing Rooms & Related Service Facilities for Physical Education, Athletics & Recreation*.

Associate, New Orleans Chapter AIA

Estelle Clair Faget, known by her many friends as Stella, served the New Orleans Chapter AIA as its executive secretary for some 20 years. As an expression of its gratitude for her work on its behalf, the chapter made her an honorary associate member in 1962. Miss Faget died on October 2. The pallbearers at her funeral were six past presidents of the chapter.

Versatile Shaper of Familiar Objects, Pioneering Industrialist, Author

Scarcely a home or office in this country is without a product designed by Henry Dreyfuss, one of the nation's pioneering and most prolific industrial designers. His work included telephones, vacuum cleaners, typewriters, cameras, television sets, clocks, farm equipment, pens, airconditioners, radios and many other items. He is quoted as saying, however, that he was most proud of the prosthetic devices he designed for war victims shorn of limbs.

Also a design consultant for airplanes, ocean liners and trains, Dreyfuss designed trademarks and revamped the format of magazines. He retired in 1969 but work has been continued by his firm Henry Dreyfuss Associates in South Pasadena, California. In recent years he spent a great deal of time on his international dictionary of graphic symbols recently published under the title *Symbol Sourcebook* (see Aug., cover and p. 31). He was the author also of *The Measure of Man* and *Designing for People*.

The designer was found dead at his home in South Pasadena on October 5, along with his wife, the former Doris Marks, who had been closely associated with the development of his career since 1929 and to whom he had been married for 42 years. Authorities reported that the double suicides were the result of carbon monoxide poisoning.

Dreyfuss, who was 68 years of age at the time of his death, served on many boards, including that of the Ford Foundation. He was a member of the faculty of the California Institute of Technology and of the University of California at Los Angeles. His *Symbol Sourcebook* was officially endorsed by the Institute.

Deaths

EDWIN H. ADCOCK
Los Gatos, Calif.

WALTER M. DOLE
Ferdale, Mich.

JOHN T. DOYLE
Decatur, Ill.

WILLIAM B. EATON
Atlantic Beach, Fla.

ABNER C. HOPKINS
Jacksonville, Fla.

JOHN WHARTON HUMPHREYS
Atlanta

WILLIAM J. MODIN
New York City

HORACE C. MONTGOMERY
Watertown, N.Y.

HENRY V. POPE
Delray Beach, Fla.

IRWIN V. ROBISON
Dodge City, Kan.

FRANKLIN H. SMITH
Bay City, Mich.

JOHN N. TILTON
Ithaca, N.Y.

MCKENDREE A. TUCKER
Atlanta

MAXIMILIAN UNTERSEE
Alhambra, Calif.

WILBUR W. WURST
Dayton, Ohio

Frederick Law Olmsted and the American Environmental Tradition. Albert Fein. New York: George Braziller, 1972. 180 pp. \$10 hardbound, \$3.95 paperbound.

Olmsted in Chicago. Victoria Post Ranney. Chicago: Donnelly, 1972. 40 pp. No price given.

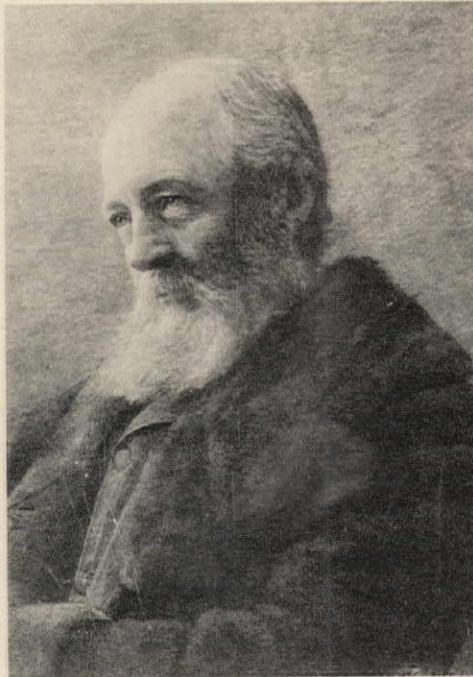
In some 25,000 words and with 105 illustrations, Albert Fein has provided a succinct biographical sketch and critique of the career of Frederick Law Olmsted Sr. (1822-1903), often described as the founder of the profession of landscape architecture. The sesquicentennial of Olmsted's birth is being celebrated this year, culminating in simultaneous exhibitions at the National Gallery of Art, Washington, D.C., and the Whitney Museum of American Art, New York City.

Olmsted, of course, was much more than landscape architect. He was abolitionist, scientific agriculturist, public health administrator, city planner, publisher, economic analyst, social philosopher. But it is not necessary to go on to illustrate Fein's difficulty: making his limited effort match the greatness of his subject.

This much said, one should further point out that the definitive biography of Olmsted by Mrs. Laura Roper should appear within the next year, and the publication of a five-volume edition of Olmsted papers edited by Charles C. McLaughlin has been announced by the Johns Hopkins Press. Until these in-depth studies are available, one can only suspect that much of what Fein has provided is already obsolete. It can more firmly be asserted, however, that it does little to advance what is already known. It is especially disappointing that the quality of reproductions and the general presentation are so poor — qualities important to the work of a designer, and not forgiven by the book's low price.

What one wants to know is whether Olmsted was really a designer and artist or simply a social philosopher and clients' man whose parks were given their form by others, perhaps by those German and Austrian landscape gardeners he systematically recruited and imported who were entrusted with the supervision of the Olmsted designs and later with the administration of the parks he created.

Olmsted's relations with Calvert Vaux, John Olmsted, Frederick Law Olmsted Jr., H. H. Richardson and Charles Eliot are decisive and must be illuminated before we can arrive at any more definitive estimate of Olmsted's creative work. The architectural design of bridges, park pavilions, boathouses and other structures continues to tease in its relationship to contemporary architecture. It does not clarify our understanding of Central Park in New York City or the Paine House in Waltham, Massachusetts, to be told that they are products of team design.



In the earlier sketch of Olmsted's career by Julian Gy. Fabos, Gordon T. Milde and V. Michael Weinmayr, *Frederick Law Olmsted Sr., Founder of Landscape Architecture* (Amherst: University of Massachusetts Press, 1968), that was recently reissued in a paperback edition, we encountered a basic problem that continues to plague Fein: the inadequacy of the fundamental records in the Olmsted office in Brookline, Massachusetts, when it comes to determining who designed what; whether what was sent out from Brookline was what was built; who directed the translation of the design into the final product; and what subsequently happened and whether the work as it is seen today is what Olmsted had designed and directed.

To fill the gap, one must turn to local records as well as to other sources. This is of particular importance if one wants to understand with a view to preserving Olmsted's work and of adapting it to contemporary needs and interests. We have a glimpse of the promise of such local investigations in the recently published monograph *Olmsted in Chicago*, by Victoria Post Ranney. Similar studies are needed in Louisville, Kentucky; Buffalo; Detroit; Albany; Washington, D.C.; and at larger scale in Boston and New York City.

Olmsted in Chicago is concise, historically accurate and informed, and beautifully presented by the outstanding Chicago printing house which has obviously taken pains and pride in its work. Already this is a collector's item.

Unlike Fein's *Landscape into Cityscape: Frederick Law Olmsted's Plans for a Greater New York City* (Ithaca, N.Y.: Cornell University Press, 1967), which provided an edi-

ted version of the relevant documents and the historical views, Mrs. Ranney's work is an essay dealing with the planning and landscape design of the model suburb of Riverside (1868) where Walter Creese believes Ebenezer Howard's garden city idea was inspired; the South Park system (1869); Drexel Boulevard (1870) and other city planning features; and the "total environment," the Chicago World's Fair (1893).

This more personal view is informed further by an awareness of the plight of the contemporary Chicago parks, their mirror of the surrounding city with its overcrowded slums, its addicts, its crime and delinquency. The eight-page inset of contemporary photographs by Ken Allison provides both a sensitive description of the natural environment of the South parks and an indelible record of present occupants and use. The enduring art of Frederick William MacMonnies and Lorado Taft is juxtaposed with the innocent faces of the city's black South Side and the unpruned, neglected witnesses of its original landscape art. Here one has seen the problem: the contrast of the great potentiality of nature and the historical past, and the inexorable social and economic realities of the contemporary city and its demands.

The Olmsted of a century ago could not have been an urbanologist, an environmentalist, an ecologist nor hardly a landscape architect or a planner. He was a pioneer. No short and simple view can illustrate this fact, and Fein is wise to limit his effort to opening up the exciting perspectives of this seminal American artist who was at once so future oriented and so much a creature of his time. FREDERICK GUTHEIM, HON. AIA

Chairman
Frederick Law Olmsted Sesquicentennial
Committee
Washington, D.C.

Shelter and Subsidies. Henry J. Aaron. Washington, D.C.: The Brookings Institution, 1972. 238 pp. \$7.95 hardbound, \$2.95 paperbound.

Aaron, a senior fellow at the Brookings Institution in Washington, D.C., has produced a searching and authoritative description and critique of the federal government's various programs through which housing is subsidized. Indeed, he has done more, for he deals also with the workings of normal Federal Housing Administration mortgage insurance, Veterans Administration home loan guarantees, the Federal National Mortgage Association and the Federal Home Loan Bank Board. All are institutions which facilitate and influence mortgage financing but do not supply direct subsidies.

There is also a discussion of the national housing goals under which in 1968 the Congress pledged the nation to build 26 million housing units for the benefit of low and moderate income families. Aaron also provides brief but interesting discussion of the merits of a housing allowance plan in which housing subsidies are paid directly to poor families as a substitute for the present system in which the subsidy is tied to a particular housing unit.

While there is nothing new in this book,

except the author's attempts to calculate who gets how much subsidy for housing, architects interested or involved in federally assisted housing programs will find it a clear and informative source on how the various programs and institutions work.

The author's conclusions include the observation that the objectives of US housing policy are vague and ill-defined; that the national housing goals are based on inadequate statistics and imperfect analysis and that the prospects for achieving them are dubious; that the group receiving the largest housing subsidy (\$7 billion a year) is the middle and upper class homeowner through tax deductions on mortgage interest and property taxes, a subsidy for which Aaron can find no justification; that the FHA and VA mortgage insurance programs have created a revolution in liberalizing mortgage terms; that FNMA and the FHLBB improve the operation of the mortgage market and insulate housing from tight money policies and promote stability in the residential construction industry; that low rent public housing has finally gained political acceptance after 20 years of uncertainty and that the program is suffering from increasing proportions of problem families among its tenants; and that US housing policy relies heavily upon filtering, which means that new government subsidized construction goes largely to middle and moderate income families with the poor being housed with secondhand houses which have been sold by initial occupants and depreciated in value.

This book not only provides an excellent description and analysis of government housing programs but also identifies many of the broad questions concerning the direction of public policy which are now debated widely. It is a worthwhile contribution to the housing literature.

M. CARTER MCFARLAND
Director
AIA Housing & Urban Programs

Lloyd Wright, Architect: 20th Century Architecture in an Organic Exhibition. Santa Barbara, Calif.: University of California, Art Galleries, 1971. 101 pp. \$7.25.

A monograph-catalog prepared for an exhibition in 1971 organized by David Gebhard and Harriette Von Breton for the Art Galleries, University of California, Santa Barbara. The introductory essay is a perceptive assessment of the work of an architect who knew the advantages and disadvantages of being the eldest son of Frank Lloyd Wright. Gebhard says that it is difficult to appraise Lloyd Wright's work, but "his greatest accomplishment has been to produce an architecture which unites and transforms the imagery of high and low art, and far more than any other single architect he has sensed the tremendous possibility open to architects in southern California (and elsewhere as well) in using the natural resources of the terrain, vegetation, water and air to create a radically new man-made world which continues and does not destroy the environment itself."

Italy: The New Domestic Landscape. Edited by Emilio Ambasz. New York: Museum of Modern Art, 1972. 432 pp. \$15 hardbound, \$8.95 paperbound.

This handsome book which surveys recent design development in Italy was published in conjunction with a major exhibition at New York City's Museum of Modern Art.

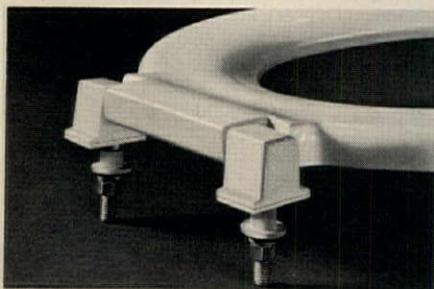
Italy today is a dominant force in product design. Its high quality and diversity are documented here. Perhaps the most significant aspect of the exhibition and its catalog is that Italian designers are changing the focus of their attention from beautifully designed objects to man's total environment. Other designers, however, have despaired of bringing about social change through design and have turned their energies to political efforts. This publication deals with these developments and demonstrates a spectrum of conflicting views.

The architect and planner will be interested in the dozen environments specially commissioned for the exhibition, each of which is accompanied by a statement in which the person or group responsible for the project presents his position regarding the present and future role of design.

The book also contains historical and critical articles by distinguished Italian critics and art historians. There are also essays by Emilio Ambasz, the editor, who has been a professor of architecture at the Carnegie Institute of Technology and the Hochschule für Gestaltung in Ulm, Germany, and is

continued on page 58

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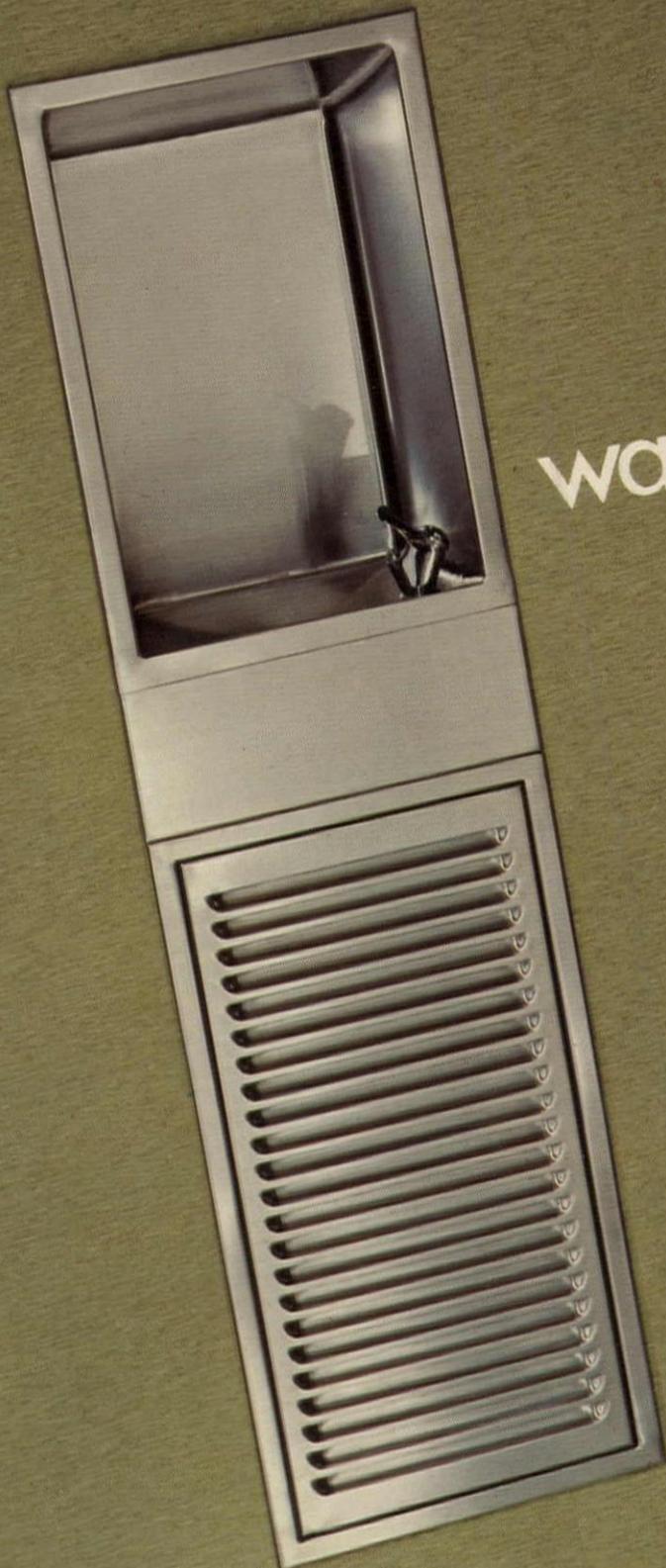
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presently curator of design at the Museum of Modern Art. In his summary, he concludes that design encompasses "all the processes whereby man gives meaning and order to his surroundings and his daily patterns of life. Without claiming to solve everything, design can nevertheless move man toward an authentic realization of himself."

Modern Architecture in Finland. Asko Salokorpi. New York: Praeger, 1970. 64 pp. \$4.50.

A neat little book to take with you if you are going to Finland. The author traces the influence of Finnish architects upon everything from building materials to furniture design to town planning.

Town Plan for the Development of Selb. Cambridge: MIT Press, 1970. 75 pp. \$15.

The town of Selb in Bavaria, West Germany, is known as "the city of porcelain" because of the number of porcelain manufacturing firms within its precincts.

Selb has a population of 20,000. This exceedingly handsome publication is of interest to the planner because Selb is a small town and there are relatively few such in-depth plans for a town so small. The town planning section is the work of Walter Gropius and The Architects Collaborative, Inc., and the traffic planning is by Kurt Leibbrand and Verkehrs-und Industrieplanung GmbH. Gropius's statement on "The Core of the

Town as Center of the Planning Concept" is a worthy document within itself. "The final aim of successful planning," he wrote, "is to raise the standard of town life, thereby expressing—practically and esthetically—the pride of its inhabitants. . . . If the core of a town is given a new form in accordance with the social and economic changes of our period, it will strengthen the future cultural and material life of the town; it will increase the sense of unity in the life of the community which it serves, and will lessen the feeling of loneliness in the individual by giving him the opportunity to participate and find intimate exchange with other citizens."

Letters of Horatio Greenough, American Sculptor. Edited by Nathalia Wright. Madison, Wis.: University of Wisconsin Press, 1972. 456 pp. \$22.50.

Greenough, who lived in the 19th century, was an architectural theorist as well as sculptor and author. His letters, collected here, date from early 1825 and extend to November 1852, most of them written while he was studying in Europe. They give his opinions on politics, religion and art; they also tell of his struggles with governmental commissions.

Ecocide—and Thoughts Toward Survival. Edited by Clifton Fadiman and Jean White. Santa Barbara, Calif.: Center for the Study of Democratic Institutions, 1971. 192 pp. \$6.95.

Most of the material published in this book resulted from a conference on the

threat of ecological crisis held at the Center for the Study of Democratic Institutions in 1970. Thirteen writers examine the fundamental causes of the environmental deterioration and suggest solutions.

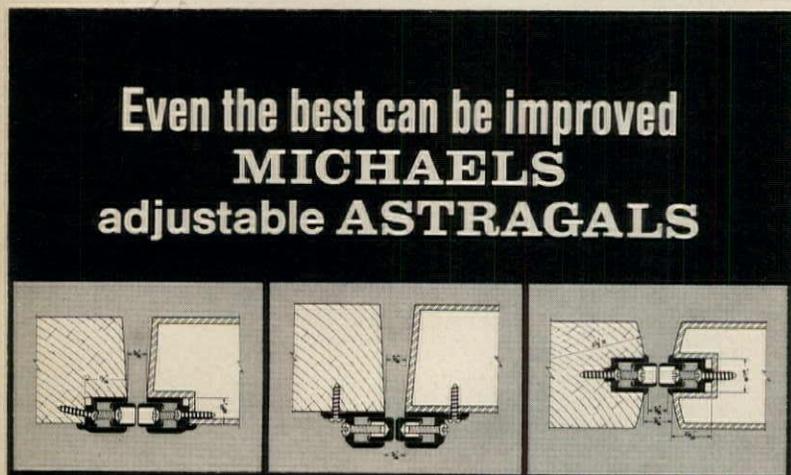
How to Appraise Commercial Properties. Peter C. Robinson. Englewood Cliffs, N.J.: Prentice-Hall, 1971. 250 pp. No price given.

This book uses the investment analysis method to determine the value of commercial property. This consists of making tests for the most likely profitable use, of setting up techniques and procedure for market analysis and income capitalization and of finally determining value through the income approach and a comprehensive market study of "the property's magnetism."

Divided into two parts, the book first covers the principles and approaches in evaluating commercial properties. The second part demonstrates techniques and procedures, and there is specific information on how to appraise retail stores, shopping centers, office buildings, apartments, motels and service stations. The author has covered his subject comprehensively.

Wrought Iron in Architecture. Gerald K. Geerlings. New York: Scribner's, 1972. 202 pp. \$10.

Published first in 1929, this book is still useful for the architect who wants examples from many countries of excellent work in wrought iron. The illustrative material is supplemented by brief historical data. □



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In 1960, The MIT Press published Kevin Lynch's *The Image of the City*, a widely influential book that explored the differences between one's personal sense of place and "official," "objective" maps. In his new book, *What Time Is This Place?*, he takes a complementary view of the human sense of time, a biological rhythm that follows a different beat from most "official," "objective" timepieces. The center of his interest is on how this innate sense affects the ways we view and change—or conserve, or destroy—our physical environment, especially in the cities. Beyond this, the book reveals that the sense of time and the sense of place are inextricably meshed: Time-place is a continuum of the mind, as fundamental as the space-time that may be the ultimate reality of the material world.

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American Architecture Comes of Age:

European Reaction to H. H. Richardson and Louis Sullivan
by Leonard K. Eaton

The author authenticates the influence of Richardson and Sullivan on a number of European architects, including Adolf Loos in Austria, Karl Moser in Germany and Switzerland, Eiel Saarinen in Finland, Ferdinand Boberg in Sweden, Hendrik Berlage in the Netherlands, and Sir John James Burnet in England. About 140 illustrations compare the work of these and other European architects with the buildings erected on the other side of the ocean by their two greatest American counterparts during this period.

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Regarding the 'Endless Weekend'

I would like to make a clarification about the article which carried my byline in September. The real credit belongs to the numerous members of the AIA Committee on Architecture for the Arts and Recreation who spent many long hours gathering the data and to C. Ray Smith, AIA, who wrote the comprehensive study that bears the title "The American Endless Weekend."

My contribution lay in excerpting from that text and adding my own conclusions as well as gathering the host of slides which were generously supplied by members. This was presented as a committee report at the Houston convention and subsequently printed in the AIA JOURNAL.

Naturally, my edited version had to be slanted to fit the pictures on hand, and I am sure that the committee members are pleased to have their efforts noted. On their behalf I thank you. Nevertheless, I know that we all hope the complete study will soon be available.

WILLIAM L. ENSIGN, FAIA
Washington, D.C.

Shadows of Doubt About Lighting

The present energy crisis provides a compelling reason for reevaluating the illumination levels recommended by the Illuminating Engineering Society and for looking at some relevant facts before we make up our minds as to a sound national policy on lighting levels.

The first set of facts relates to the IES and whom it represents. It is true that the membership of the society includes some architects, engineers, educators and ophthalmologists, but the bulk of the membership is made up of individuals whose livelihood results from the sale of either electric power, light bulbs or lighting fixtures.

The society's slate of national officers and regional vice presidents has been consistently dominated by persons employed by suppliers of lighting fixtures and components and by power companies. Over half of its income is derived from industrial companies who are sustaining members of the IES; from associate members who need no professional educational criteria; and from revenues earned by lighting industry advertisements in its monthly magazine *Lighting Design and Application*.

Finally, in the 1970-71 annual report of IES, its executive vice president expressed great concern over increasing the income of the society so that it can do a better job of doing the things "that the industry (sic) wants us to do." Based on these facts, it is my opinion that the IES is a trade association of the light and power industry masquerading as a professional society, and its recommendations should be viewed in that perspective.

The second set of facts relates to the ac-

ceptance of the IES standards since 1958/1959. Many of us with memories as good as Robert T. Dorsey's (*see* June, p. 24) do not remember that lighting users "were demanding better lighting than was called for by the old standards." What we do remember is the fact that IES recommendations took a quantum jump in 1958-59 (from 30 footcandles for all classrooms to a range of 70-150 footcandles depending on task).

We also remember an intensive promotional campaign by IES officers that continued through the '60s when speeches were made on "How to Sell the Tremendously Growing Lighting Market" through higher IES lighting levels, so that we, "the electrical engineer, manufacturer, distributor, electrical contractor, utility and the ultimate buyer will all benefit." Moreover, the new IES levels were central to strong promotional efforts made by the power companies.

Based on these facts, it is my opinion that the IES levels were *forced* upon the American public by the light and power industry working effectively through its quasi-professional body, the IES, which was supported by an army of local agents made up of light and power sales personnel and abetted by the electrical engineer whose compensation also is directly related to the amount of money required to meet the electrical portion of the contract. The concept of "the more light, the better" serves to enrich all segments of the industry except the public.

The third and largest shadow of doubt arises over the relationship between the vision research sponsored by the IES and reported to the public after being adjusted by "engineering judgment" and the behavior of whole human beings in the real world.

Because the eye is so central to all our thought and instinctive processes, it is nearly impossible—and quite possibly meaningless—to separate out and study factors of physical performance as though they were independent of the total physical and psychological process of perception and understanding. Even measuring the physical performance of the eye inevitably involves assumptions and the application of "field factors." The Blackwell findings, on which the IES recommendations are based, are far more dependent on such judgments than on experiments involving human beings in the process of working or learning. Indeed, IES vision research seems to be based primarily on the way in which optical instruments perform and are only tenuously related to the behavior of human beings in their normal environment.

In contrast, the few studies that have attempted to approach the problem of visual performance from a nonmechanistic pan-human view—such as the work of Miles Tinker and even the IES supported Hawthorne experiments of the early '20s—have all emphasized the relative unimportance of light levels in human behavior. *continued on page 62*

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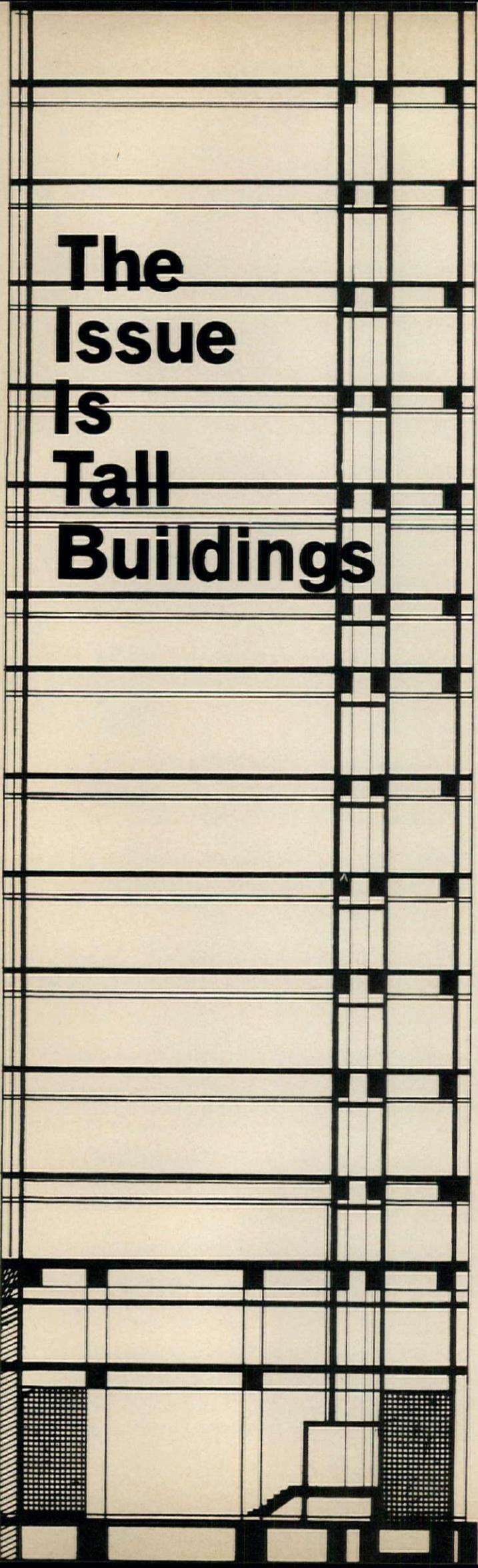
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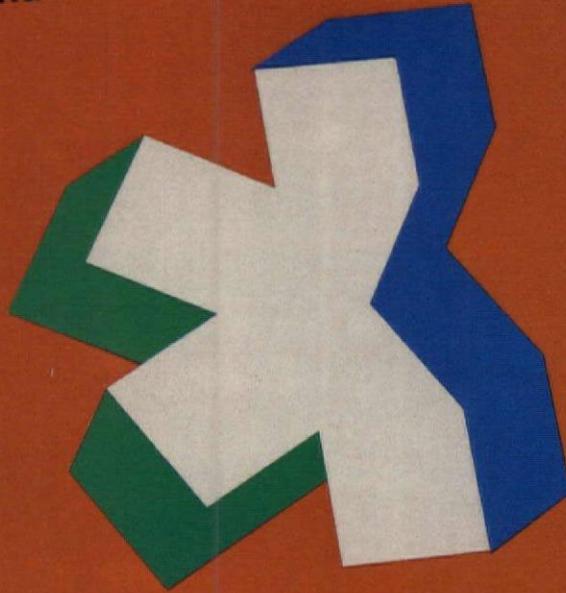
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It is my opinion that there is a great need for a contrary minded source of research into visual performance that could carry out multidisciplinary investigations into this aspect of human behavior and present its findings freed from commercial pressures.

Briefly, I would like to comment on some of the suggestions which Dorsey brings forth as ways to make the most efficient use of energy. It is hard to square the recommendation for "designing lighting for the seeing tasks expected" with the general practice of assuming that the most difficult task may have to be performed at optimum efficiency throughout the space—a practice that is surely reinforced by the 1972 IES Handbook which prescribes 70 footcandles as the minimum for reading pencil writing at any time in any plane.

Dorsey seems surprisingly willing to make allowances for daylighting. Daylighting is, of course, included separately in the handbook but largely ignored both in design practice by engineers who seek 70 footcandles uniformly throughout classroom spaces without regard to daylight, and by code-enforcing authorities who typically make no allowance for daylight and cite the IES as the source of their regulations.

Further, the generation of more lumens per watt is a triumph of the lamp industry and a challenge to the fixture industry. We poor human beings have put up with a lot of cold blue fluorescence, funeral green mer-

cury and gold-dust sodium light in the name of progress. Perhaps it is only nostalgia that longs for the pre-1939 days of low artificial light levels and the comfortable color of incandescent lamps. If, however, 30 footcandles of general illumination, some of which is daylight, is all that is needed for 95 percent of school and office tasks, the economies of high heat generating and power consuming light systems might evaporate.

I agree with Dorsey that this seems not to be the time to compromise on the logical and proven functions of lighting. Under the impact of the energy crisis, the point that should not be compromised is that it is undesirable to use energy for nonessentials. The shadows of doubt that surround the validity of the minimum lighting levels must be removed and any excessive recommendations repealed. Reasonable averages should be provided rather than those for the fastest possible performance of the difficult task without regard to the frequency or probable location of its occurrence.

If the IES is indeed a professional society independent of the promotional objectives of the power/light and fixture industry, the removal of these doubts should receive its highest priority. Perhaps the public interest would be served better if there were some permanent well-funded center for the study and evaluation of the sensory environment, the development of criteria and the education of architects, engineers and the public. Independent of commercial interest and support, such a center's work would be objective.

The establishment of such a center should be accepted as a primary responsibility of the AIA. Too many years ago the architectural profession abandoned its responsibility for the design of the luminous (visual) environment of buildings and left it to the mercy of commercial interests and those who lack design training and the courage to value judgments. Under the impact of the energy crisis, there is an opportunity to recapture control of the luminous environment and the design judgments that are essential to its creation.

Moreover, the AIA should declare a moratorium on participation with the IES on any activities, particularly in the creation of standards, where the net effect is to cloak a lot of "what the traffic will bear" orientation with the mantle of AIA endorsement.

Individual members of the AIA likewise have an obligation to abandon the crutch of IES numbers and to use their own judgment and experience tempered by awareness of the ecological problems ahead. It is in the public interest for architects to be increasingly jealous of the encroachment upon their design responsibilities, especially those made by the unholy combination of public officials, real estate operators, electrical engineers, light and power companies, lighting manufacturers, electrical contractors and all the others who use IES standards to imply that anything less is damaging, unproductive or obsolescent.

WILLIAM M. C. LAM
President
William Lam Associates, Inc.
Cambridge, Mass.

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events

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Jan. 11-13: Grassroots Conference East, Statler Hilton Hotel, Washington, D.C.
Jan. 18-20: Grassroots Conference Central, Royal Orleans Hotel, New Orleans
Jan. 22-24: Grassroots Conference West, Mountain Shadows Motel, Scottsdale, Ariz.

National

- Nov. 23-26:** Association of Student Chapters/AIA Convention, University of Colorado, Boulder, Colo.
Dec. 3-6: National Symposium on the Planning and Design of Correctional Environments, University of Illinois, Urbana/Champaign, Ill.
Dec. 17-21: Gerontological Society Annual Scientific Meeting, San Jeronimo Hotel, San Juan, Puerto Rico
Jan. 7-11: National Association of Home Builders Annual Conventon, Astrodome, Houston

Awards Programs

- Dec. 27:** Nomination forms postmarked, R. S. Reynolds Memorial Award for Distinguished Architecture Using Aluminum. Contact: Mrs. Maria Murray, AIA Headquarters, 1785 Massachusetts Ave. N.W., Washington, D.C. 20036.
Jan. 26: Entries due, Design in Steel Awards Program. Contact: American Iron and Steel Institute, Design in Steel Awards Program, 201 E. 42nd St., New York, N.Y. 10017.
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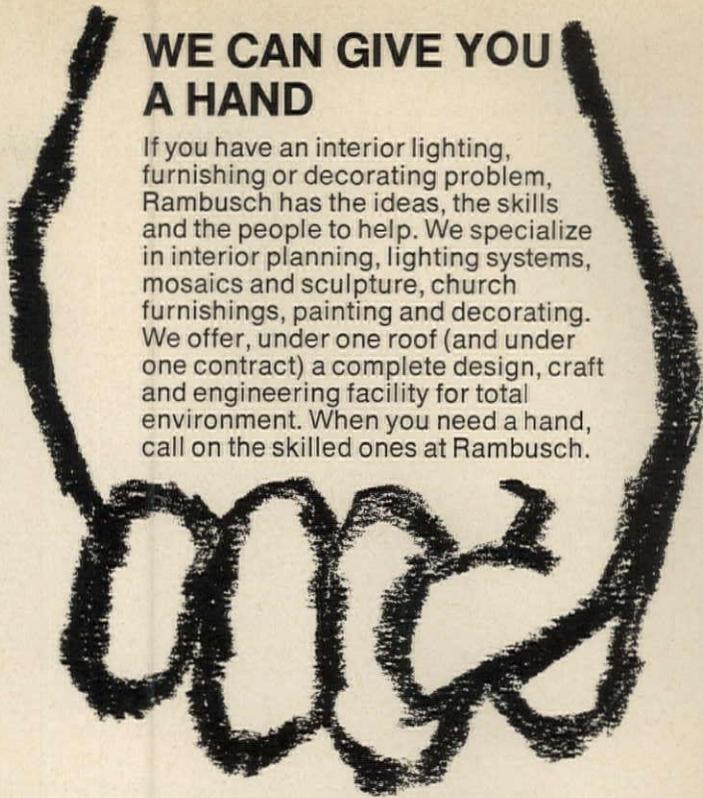
- Dec. 1:** Applications due, Fellowships for Women in the US in the Professions. Contact: American Association of University Women Educational Foundation, 2401 Virginia Ave. N.W., Washington, D.C. 20037.
Dec. 15: Applications due, White House Fellowships. Contact: Chairman, Commission on White House Fellows, Washington, D.C. 20415.
Dec. 31: Applications and submission of work due, Rome Prize Fellowships for 1973/74. Contact: Executive Secretary, American Academy in Rome, 101 Park Ave., New York, N.Y. 10017.

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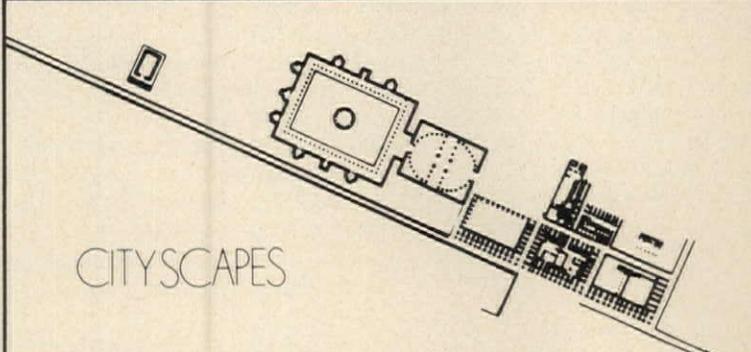
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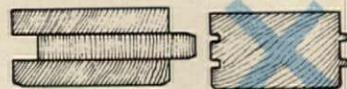
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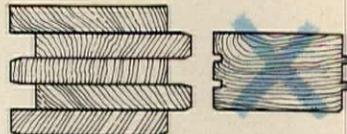
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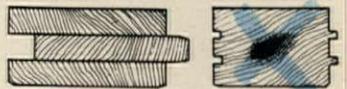
**ADVANTAGES OF
 LOCK-DECK®
 LAMINATED DECKING**



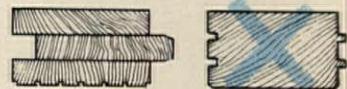
EXCLUSIVE: Lock-Deck consists of 3 or more kiln-dried boards, offset to form tongue on one side and end, groove on the other, laminated with weatherproof glue. We invented it.



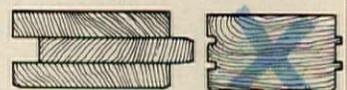
STRENGTH: Lock-Deck offers a range of E factors giving superior load-carrying values in spans to 20' or more in 5" thicknesses.



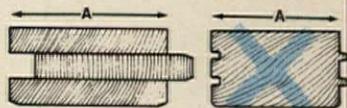
STABILITY: Each board in Lock-Deck is kiln-dried to 10-12% m.c. before lamination. This assures greater stability under all conditions.



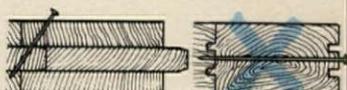
BEAUTY: One or both faces of Lock-Deck can be any desired grade, in a wide choice of species. Solid decking is limited in both grades and species.



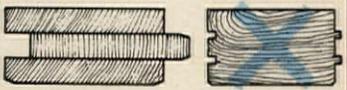
ECONOMY: In-place, finished cost of Lock-Deck is often less than solid decking due to speed of erection, factory-finishing, absence of waste, better coverage.



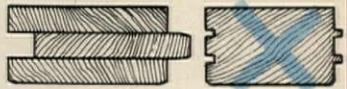
MORE COVERAGE: Offset tongue and groove on Lock-Deck gives more coverage per bd. ft. than machined solid decking.



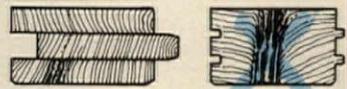
LESS LABOR: Lock-Deck installs quicker, using ordinary nails. Solid decking requires spikes, special fasteners or splines.



LESS WASTE: Offset end match, absence of twisting and few unusable shorts keeps waste well below that of solid decking.



VERSATILITY: Lock-Deck forms excellent load bearing or curtain walls as well as floors and roofs.



DURABILITY: Unlike solid decking, knots or checks can go through only one ply in Lock-Deck. Weather-proof glue and exclusive process make bond stronger than the wood itself.

Potlatch
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