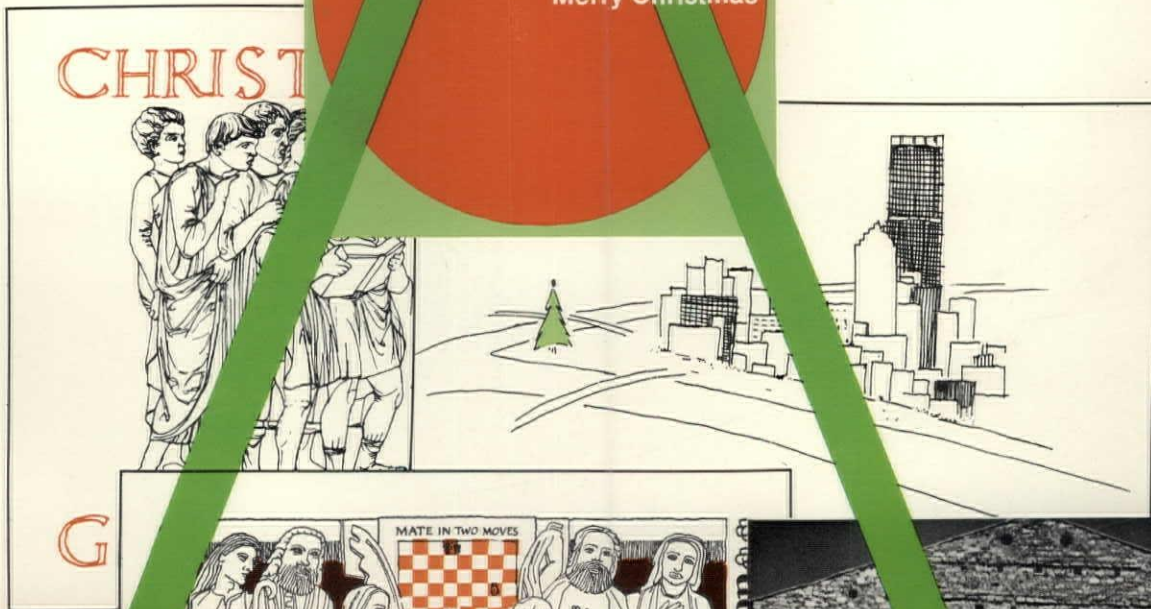
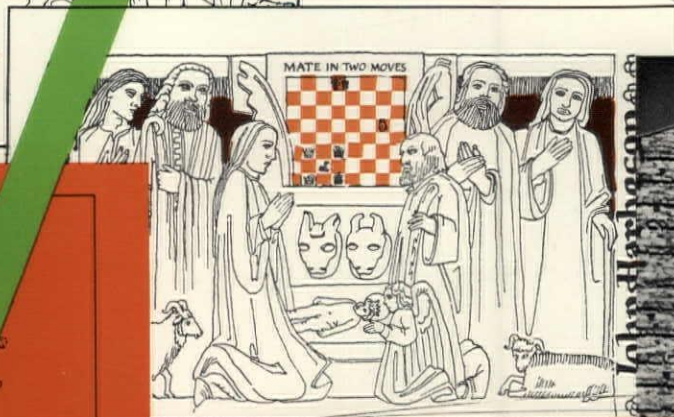


Merry Christmas

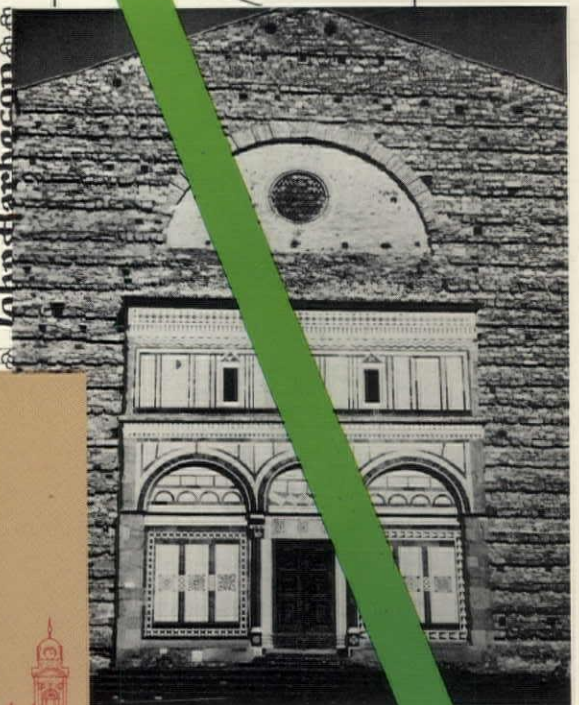
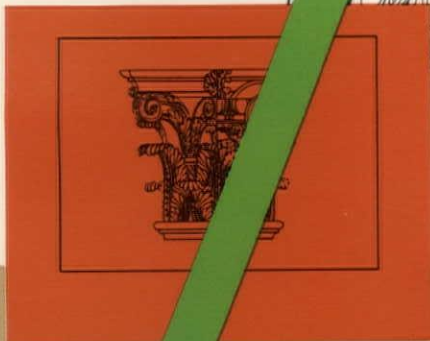


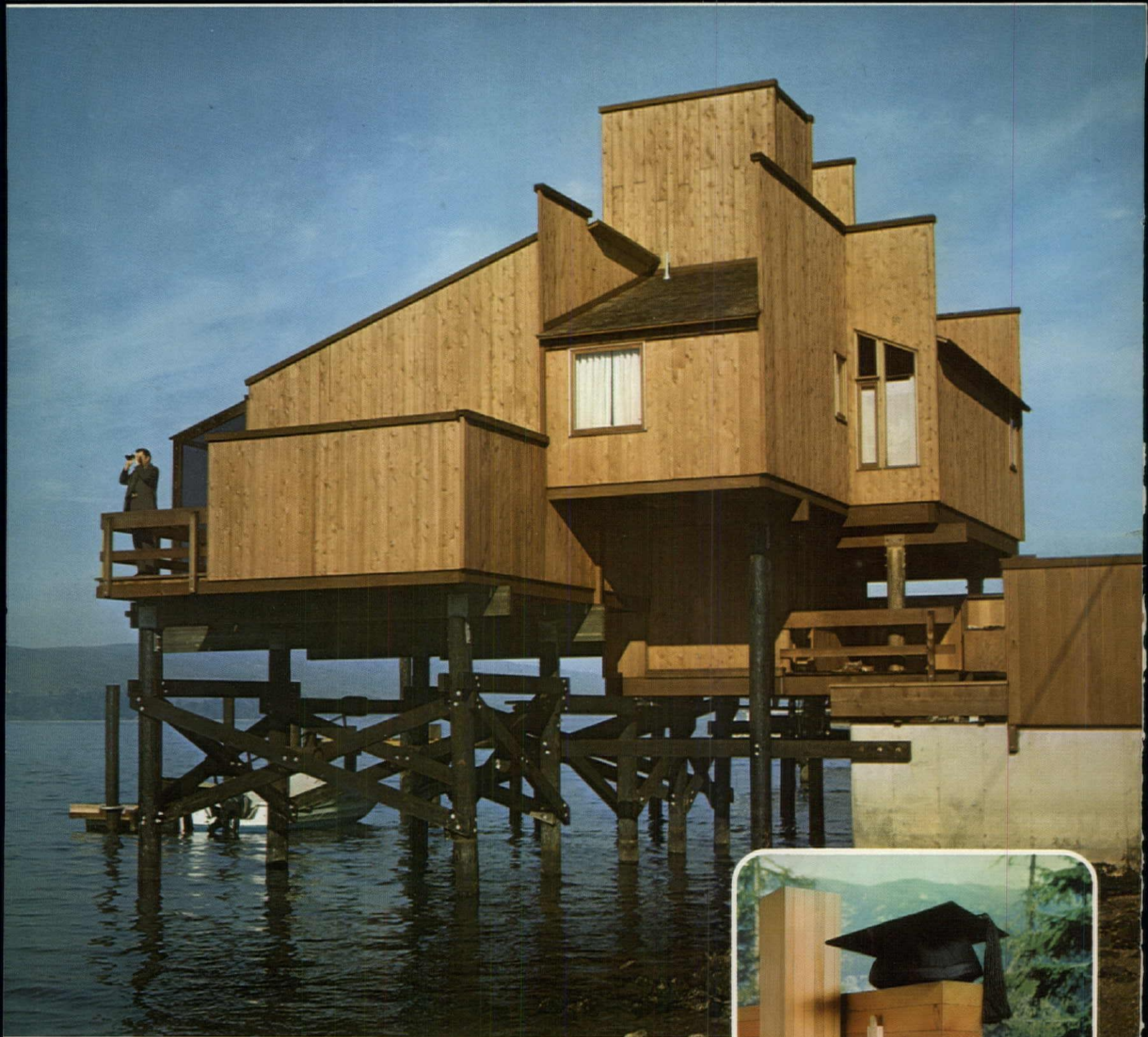
CHRIST

G



MATE IN TWO MOVES





Architects: Bulkley & Szevich, San Francisco

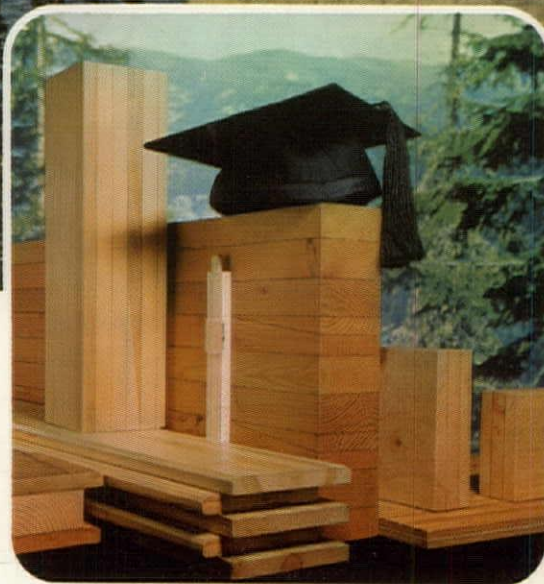
Engineered wood products that can match your imagination

This dramatic waterfront house uses Cedar Lock-Deck laminated decking to form both structural and finished wall and roof surfaces in one imaginative application.

Potlatch manufactures wood in countless forms, as strong and versatile as they are beautiful. They open the door to a whole new world of warm, natural designs that once had to com-

promise beauty for practicality.

The remarkable durability of Inland Red Cedar boards and decking gives interiors and exteriors a beauty that grows with passing years. Lock-Deck decking and laminated beams of superb Southern Pine combine outstanding strength with a unique clarity of appearance. The wonderful workability of Idaho White Pine gives charm



and permanence in countless solid and laminated forms, and solid hardwood panelings and floorings give durable, dramatic beauty. The wonderful world of wood is engineered to match your needs at Potlatch Forests, Inc., P.O. Box 3591, San Francisco, 94119.

Potlatch

The electrical promise of tomorrow needs the electrical contractor of today.

You can't beat the system: the electrical system, installed in your new buildings by a qualified electrical contractor. He has the best-trained manpower, workforce flexibilities, specialized equipment, awareness of local codes to do the job right. Right the first time. To help you avoid the number one reason cited by architects and engineers for systems shortcomings and failures in modern buildings. That reason, according to a recent national survey is . . . lack of understanding of systems complexities.

Your qualified electrical contractor understands complexities of electrical system application/installations as only a specialist can. He knows problems related to design requirements, local code restrictions and future power load demands. He can help solve those problems at the outset. So your electrical system functions efficiently, economically, reliably. To help heat, cool, light your buildings. To help power business machines and other equipment without fail. By making proper installations and allowing for future needs in the first place, he can cut your maintenance costs for years to come.

Or even eliminate the costly need of having jobs redone.

When a qualified electrical contractor installs your electrical system, he *guarantees* it . . . for one full year. It's a system you can't beat . . . for reliability.



National Electrical Contractors Association, Inc.
Washington, D.C. 20036



Owner: National Airlines. Architect: I. M. Pei & Partners, New York. Building Contractor: John Lowry, Inc., New York. Glazing Contractor: Collyer-Sparks Company, Inc., New York.

LOF helps National Airlines

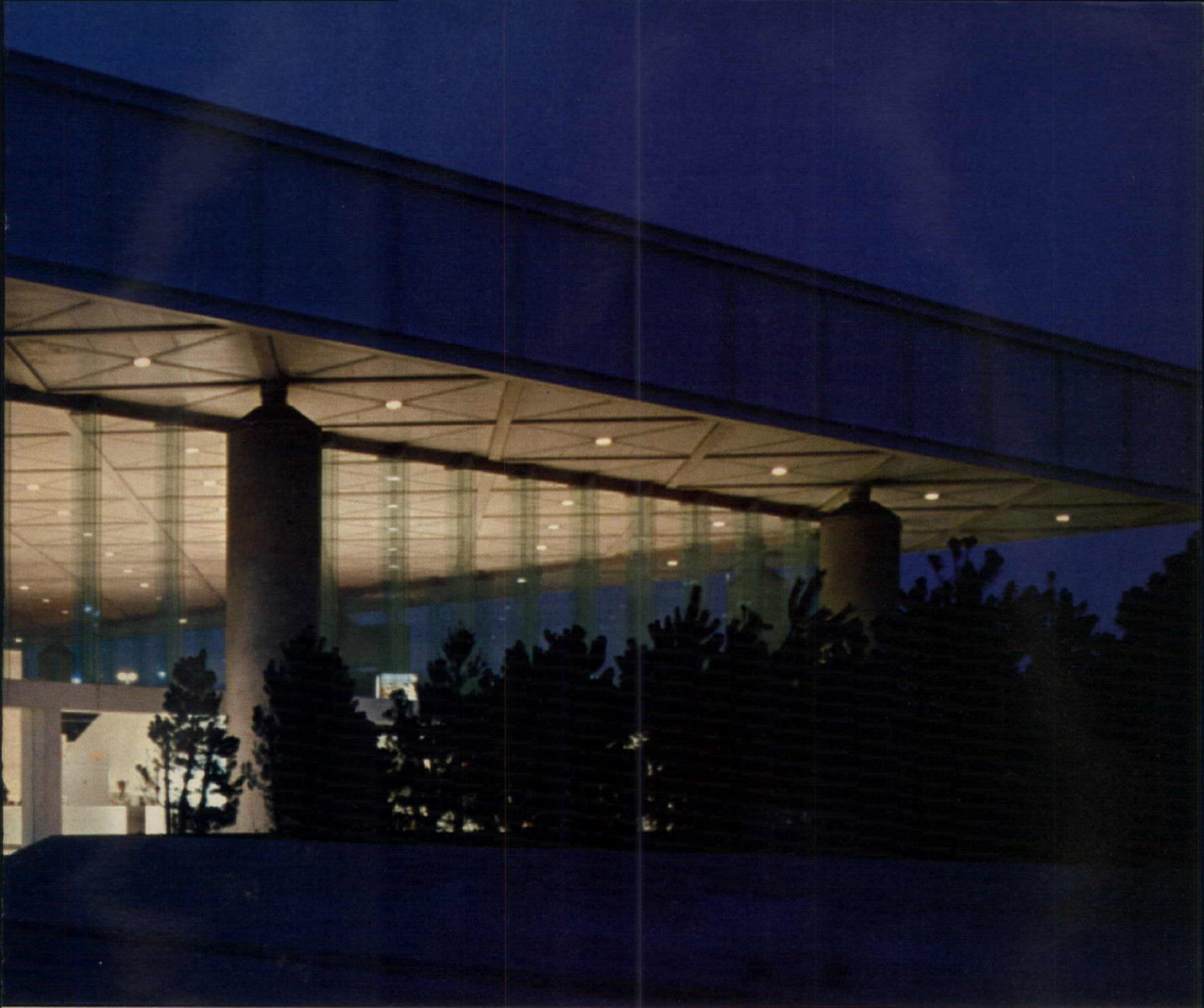
There's a lot to see at Kennedy International. And the architects who designed the National Airlines terminal make sure visitors see it all—through suspended clear plate glass.

To support this hanging glass curtain—more glass. Vertical glass mullions that keep the facade of the building light and transparent. Which is in keeping with architects I. M. Pei & Partners concept of the terminal: one of classic simplicity, an anti-

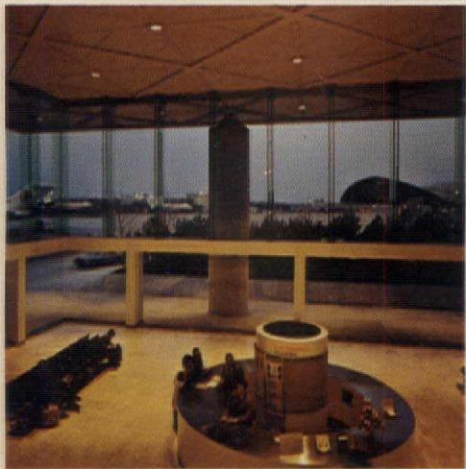
dote to the visual hodge-podge of unrelated structures at the airport.

Suspended glass braced by more glass is a new idea for an airline terminal, where jet blasts and high winds can raise havoc with a design concept.

The architects proved the terminal's "airworthiness" to the New York Port Authority by testing a full-scale mock-up against 140-mph winds. It passed with flying colors.



enjoy maximum visibility.



We supplied the heavy-duty plate glass for this "glass pavilion," in $\frac{1}{2}$ " $\frac{5}{8}$ " $\frac{3}{4}$ " and $\frac{7}{8}$ " thicknesses. As well as Tuf-flex[®] tempered glass for doorways and high traffic areas. The next time you're at this airport, give National's Sundrome Terminal a longer look. We think it represents an exciting new design concept for architects—and shows how glass walls work under somewhat adverse environmental conditions. Libbey-Owens-Ford Company, Toledo, Ohio 43695.

Making progress
in architecture



TO MEET YOUR INFORMATION NEEDS

AIA CONTINUING EDUCATION PROGRAMS

NEW AUDIO TAPE CASSETTES

For architects who want up-to-date, easy-to-use information on subjects which have a direct impact on architectural practice. The presentations (some include slides, and all are for use on standard equipment) have been developed from material supplied by experts. Topics include:

— "Office, Partnership, Consultant, and Architect Contracts." Guidelines for dealing with the legal problems and liabilities in architectural practice.

— "The Architect as a Land Developer." Information on the land development process. Includes example sheet.

— "Construction Contracts." Discusses the legal problems associated with the construction phase of office projects.

— "Air Structures." A review of a new space-enclosing method. Includes slides and a reference list.

— "Housing Systems." Concepts and examples relating to existing building systems for residential use. With slides.

REVIEW OF ARCHITECTURAL PERIODICALS — "RAP"

RAP is a cassette "magazine." Subscribers receive 12 monthly cassettes of material condensed from more than 50 sources: practice-related journals, news releases, newsletters, and reports. Subjects in November, 1972, included the part contract administration plays in effective cost control, the profit potential of housing factories, the role of public relations in the architectural firm, and an analysis of trends in correctional facilities.

ORDER FORM

Please send me:

OFFICE, PARTNERSHIP, CONSULTANT,
AND ARCHITECT CONTRACTS

Cassette:

- \$ 7.50 AIA Members
 8.50 non-AIA Members

CONSTRUCTION CONTRACTS

Cassette:

- \$ 7.50 AIA Members
 8.50 non-AIA Members

THE ARCHITECT AS A LAND DEVELOPER

Cassette, Example sheet:

- \$ 7.50 AIA Members
 8.50 non-AIA Members

AIR STRUCTURES

Cassette, 60 slides, reference list:

- \$16.00 AIA Members
 17.50 non-AIA Members

HOUSING SYSTEMS

Cassette, 67 slides:

- \$16.50 AIA Members
 18.00 non-AIA Members

REVIEW OF ARCHITECTURAL
PERIODICALS — "RAP"

12 Cassettes:

- \$54.00 AIA Members
 72.00 non-AIA Members

I want more information. Please send me brochures on the materials checked above.

name _____

address _____

city, state, zip _____

Orders must be accompanied by payment. Make checks payable to AIA. Return order form to:

CASSETTES

% Director, Continuing Education
AIA, 1785 Massachusetts Ave., N.W.
Washington, D.C. 20036

AIA JOURNAL

DECEMBER 1972

	SEASON'S GREETINGS — PROFESSIONALLY SPEAKING	13
	<i>The message carries more than just the good wishes; along goes the image of the sender or his firm</i>	
	PROFILE OF THE PRESIDENT	16
	<i>The Institute's new president, that is: S. Scott Ferebee Jr., FAIA, who takes charge this month</i>	
Fred S. Dubin	IF YOU WANT TO SAVE ENERGY	18
	<i>There are ways to do so, the means are ours; mostly, as suggested here, what it takes is more concern</i>	
Robert E. Koehler	AFTER THE FAIR IS OVER	22
	<i>In Seattle, it doesn't mean that the lights are out; 10 years later the fairgrounds are as sparkly as ever</i>	
John L. Kmetzo	WHEN COMPUTERS ASSUME BUILDING OPERATIONS	26
	<i>They will help conserve energy, improve maintenance procedures and warn against intruders and fire</i>	
Robert Sommer	PEOPLE'S ART	29
	<i>It's a witness of need for self-expression or a wish to communicate and should be treated accordingly</i>	
Brian Drake	A SCOTSMAN SURVEYS OUR COST CONTROL	35
	<i>He finds it a major deficiency in US practices and an area where the Scots have a great deal to offer</i>	
G. Neil Harper	COMPUTER-BASED FINANCIAL MANAGEMENT	39
	<i>It's new, it improves administrative and economic performance, and it's available through the Institute</i>	

DEPARTMENTS

Comment and Opinion	6	Letters	56
Outlook	8	Events	58
Institute Page	11	Advertisers	59
Books	50	Index	60

COVER: Christmas card tree by István Botond, AIA, whose wife Patricia had the idea for and did the piece on page 13.

Editor and Acting Publisher: ROBERT E. KOEHLER, Hon. AIA; *Managing Editor:* BESS BALCHEN; *Associate Editor:* MARY E. OSMAN; *Consulting Editor:* JAMES E. ELLISON, Institute Department of Education & Research; *Art Director:* SUZY THOMAS; *Sales Manager:* RICHARD J. SATOLA; *Production Manager:* GEORGE L. DANT; *Circulation Manager:* MICHAEL A. BENOIT

AIA JOURNAL, official magazine of The American Institute of Architects published monthly at 1785 Massachusetts Ave. N.W., Washington, D. C. 20036. Telephone: (202) 265-3113. **Subscriptions:** for those who are, by title, architects, architectural employees, and to those in architectural education (faculty and schools), and to libraries, building construction trade associations and building product manufacturers: basic rate \$5 a year, \$8 two years, \$4 to architectural students in the US, its possessions and Canada. For all others: \$10 a year in the US, its possessions and Canada; other countries to those who are, by title, architects: \$10 a year. All others outside the US, its possessions and Canada: \$20 a year. Single copy: \$2, payable in advance. Publisher reserves the right to refuse unqualified subscriptions. **Change of address:** Give Circulation Department both old and new addresses; allow six weeks. **Second class postage** paid at Washington, D.C. Microfilm copies available from University Microfilms, 300 N. Zeeb Road, Ann Arbor, Mich. 48106. Referenced in *Art Index* and *The Architectural Index*. © 1972 by The American Institute of Architects. Opinions expressed by contributors are not necessarily those of the AIA.®

VOL. 58, NO. 6

comment and opinion

SPOKANE LOOKS AHEAD TO ITS POST-FAIR LEGACY: The AIA JOURNAL this month returns to the site of the Seattle World's Fair happily to report what remains from that exposition held 10 years ago. I emphasize the word "happily" because the same word cannot be used generally for related happenings that have taken place in modern times. There have been exceptions, but more often they have become futile attempts to preserve exposition sites; and I sincerely believe that none of them can match what has transpired in Seattle. Spokane is taking a leaf from the book of its big sister on the other side of the state, but I will get back to that later.

First, let's take a brief look at some of the more recent public events to see what has been the outcome. The Olympic Games in Germany, of course, have left in their wake something very positive from a planning and architectural standpoint. As was indicated in the August issue, "the Olympic landscape will be a delightful leisure haunt for the people of Munich and their guests." *Time* magazine hit the nail right on the head when it wrote, "Once the Olympic flame is extinguished . . . the only certain winner in the 1972 Games is Munich itself." For the 1968 Games, Mexico City also erected some new facilities and designed its Olympic Village for permanent housing, but nothing on the scale that has been accomplished in Germany.

Regarding expositions themselves, Expo '67 in Montreal has made some efforts to keep the site in operation under the title "Man and His World" during the summer. Among the buildings that remain, by the way, is the United States Pavilion, Bucky Fuller's biggest dome, which has been transformed into the world's second largest aviary. On a smaller scale, Hemis-Fair '68 was in essence sparked by the riverfront development in San Antonio, Texas. The result has been a downtown urban renewal program within short walking distance of the Alamo and the Paseo del Rio—the river and walkway system.

And now it is Spokane's turn to do her thing, and the major city in eastern Washington likewise is utilizing a riverfront development and rehabilitation project as the backbone of the overall planning. Expo '74, which will open May 1 for a six-month run through October, will be keyed to "how man can live, work and play in harmony with his environment." Located on a 100-acre site adjacent to the heart of the city, the \$60 million fair will encompass two islands and the banks and falls and rapids of the cascading Spokane River. Intersecting railroads will be removed and bridges demolished to revitalize the area into the exposition grounds, with the post-fair legacy hopefully to be one of America's exciting urban park and civic center areas. Among the structures planned for future use is the Federal Pavilion (see Outlook) housing the US exhibit and later to become a recreational information center. The dimensions of the Expo theme have created a commitment to the Spokane River Basin Drainage project, a joint effort by Washington and Idaho involving 120 miles of river flowing through the two states. This is intended to serve as a model for water depollution activities and water quality management for the entire nation and perhaps the world.

As a final aside, it is noteworthy that the grounds are expected to be fully accessible for the handicapped. Davis E. Evans, site designer on the staff of Thomas R. Adkison, AIA, Expo '74 executive architect, has been working with such persons in designing the various grades and walkways, pointing out that all inclines throughout the main exposition area will be grades of 5 percent or less. Spokane indeed is moving in the right direction.

ROBERT E. KOEHLER

ACKNOWLEDGEMENTS

16—Neil Maurer

22—above right, Public Relations Department, Seattle Center, Bob Carver Photos

22—below right, Public Relations Department, Seattle Center, Royal Cardon

24—Dudley, Hardin & Yang, Inc.

25—above, second from above, second from below, Public Relations Department, Seattle Center, Bob Carver Photos

25—below left, Rowland Studio

25—below right, Dudley, Hardin & Yang, Inc.

NEXT MONTH

The theme of the January issue is a combination of "where we are" and "where are we headed" when it comes to tall buildings, which are springing up in increasing—some think alarming—numbers around the globe. Worldwide concern over the impact of tall buildings has found expression in the founding of an ongoing international conference on problems that follow in their wake, both technical and social. A structural engineer gives a rundown of building heights possible with present technology; other participants to the meetings treat subjects of special interest to architects; an overview sums up issues that may force planning of tall buildings in new directions while a group of professionals give their views and comments.

ASIDES

That some architects truly see the relevancy of the alliance of art and architecture was demonstrated on the West Coast recently in a letter written by John S. Bolles, FAIA. His comments were prompted by an acknowledgement from Whitson W. Cox, FAIA, president of the California Council AIA, upon a gift of 28 paintings by Bay area artists to the Oakland Museum by Bolles and his wife Mary. Some excerpts from the letter:

"What concerns me is the fact that very few architects that I know or that have worked for me, and very few of the young people who come out of our schools today, have any concept of the fact that art and architecture are closely allied.

"Even here in San Francisco we are having complaints from newspaper critics because of the lack of understanding of art and its relationship to architecture," continues Bolles, who has run his own art gallery in that city for a number of years.

"The Art Commission, like myself, tried to get art into the present structures as part of our initial thinking, the same as should be done with color, texture, landscaping and environment. Generally, there are no listeners. Following the years of my work in helping to found the California Council and serving as its first president, I became more interested in art and art education, and subsequently became a member of the board of the San Francisco Art Institute, as well as its chairman.

"In the total life of the Art Institute here, there have been about six architects who have served on the board, including the chairmanship. Timothy Pflueger, for example, brought Diego Rivera out of Mexico into San Francisco, and much of his architecture was developed around presentations of the Mexican school of that period. The most recent chairman of the board was John Merrill, who has just retired, and he, too, is an enthusiast for art in architecture and as a part of architecture.

"I believe my basic disillusionment is seeing so much art applied to architecture simply because the city ordinance requires that 1 percent of the total construction cost be allocated to art and that the architect remembers it as an afterthought." □



“So your trusses collapsed. At least celebrate the two of us qualifying for MBL’s group plan for professional corporations.”

Now that professionals can incorporate, we can offer firms of 2 or more employees Mutual Benefit’s special group plan for Incorporated Professionals.

Designed especially for architects, engineers, lawyers, accountants and other professionals who qualify, it has almost irresistible appeal—tax savings and low cost.

1. The plan gives employees life insurance up to \$150,000, with accidental death and dismemberment benefits.

2. The package provides long-term disability income to age 65, with monthly benefits to \$1,000.

3. Both the corporation and the individuals insured gain important tax advantages.

4. It is low in cost and liberal in benefits thanks to the high educational background and limited risk factor of professional groups.

Like to know more about our profes-

sional corporation group plan? We have a booklet entitled, “Incorporated Professionals Group Insurance Trust.” It’s free and yours for the asking. Just snip out, fill out and mail this coupon for your copy. With no obligation.

Director of Group Sales AIAJ8
 The Mutual Benefit Life Insurance Company
 520 Broad Street
 Newark, New Jersey 07101

Please send me a complimentary copy of the “Incorporated Professionals Group Insurance Trust” booklet and any other material you think may be helpful.

Name _____

Address _____

City _____ State _____ Zip _____

(This plan, or portions of it, not available in Florida, Ohio, Texas, Wisconsin.)

MUTUAL BENEFIT LIFE
A name to remember.

Presidential Reviewing Stand Designed by New Yorkers Is Competition Winner

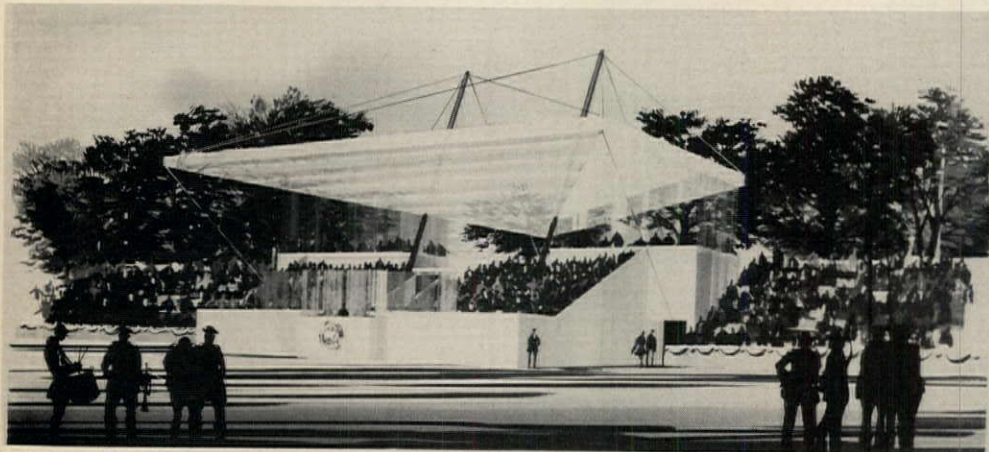
Poor & Swanke Partners of New York City are winners of the architectural competition for the design of the Presidential reviewing stand for the 1973 inaugural parade. Two additional designs, submitted by Robert B. Gordon of Washington, D.C., and by the team of Leland Gilmore, Keith D. Ray and Alan Storm of Beacham, Richardson, Williamson Inc., of McLean, Va., were designated to receive Certificates of Merit.

The competition, in which 61 designs were submitted, was conducted by the Washington Metropolitan Chapter AIA on behalf of the 1973 Presidential Inaugural Committee. Participation was open to all architects licensed to practice in the District and to teams of architects of which at least one member is so licensed.

A. Stanley McGaughan, FAIA, of Washington, D.C., served as professional adviser.

Jurors were Charles H. Atherton, executive secretary of the National Fine Arts Commission; William L. Ensign, FAIA, president of the chapter; Arthur Cotton Moore, AIA, chairman of the chapter's Commission on the Community; Archibald C. Rogers, FAIA, vice president of the Institute; and Graham W. Watt, Deputy Mayor of Washington, D.C.

"The stand projects the dignity of the Presidency while maintaining a lightness of architectural character appropriate to the temporary use of the structure and the festive nature of the inaugural parade," said the jury about the winning design. Poor & Swanke will receive an award of \$1,500 and will serve as design consultants to the architectural and engineering staff of Washington's Department of General Services in connection with the completion of the final plans and specifications for the reviewing stand.



The Presidential reviewing stand's winning design has both dignity and a festive buoyancy.

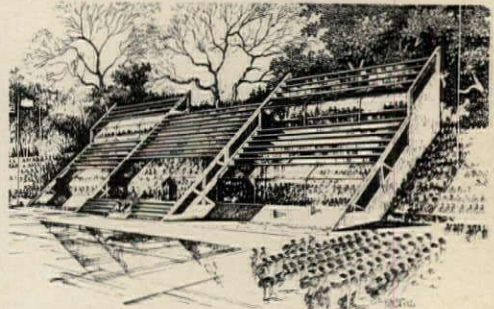
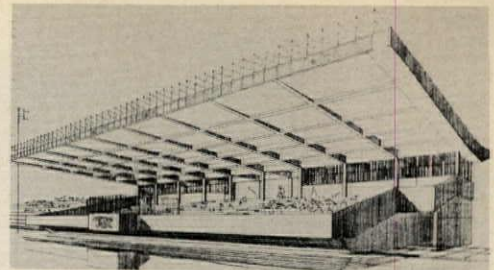
Brooks Bill Signed by President Nixon, Codifies Existing Government Practices

President Richard M. Nixon announced on October 30 that he had signed into law the Architect/Engineer Selection Bill, which had been passed by the House on July 26 and by the Senate on October 14 (see Institute Page). Called the "Brooks Bill" by some, due to its sponsorship by Representative Jack Brooks (D-Tex.), the law insures that federal agencies can continue to procure professional design services for government projects on the basis of competence and qualifications, at a fair and reasonable negotiated price.

In an interview with William Marshall Jr., FAIA, chairman of the AIA Commission on Government Affairs, reported in the *AIA Memo*, No. 458, November 1, Marshall is quoted as saying: "The new law changes nothing. Its purpose is to clarify and codify existing practices of the federal govern-

ment regarding the selection of design professionals. . . . The new legislation establishes strong precedents as to the proper way of procuring A/E services, both at the federal and state level. . . . If less than a best effort is made in producing the design and specifications, the cost of construction can skyrocket, and the life cycle cost will be totally out of line. We must insure that A/Es are allowed to make their best efforts, in order to protect the taxpayers."

Prior to passage of the bill in the House, Congressman Brooks said, "If one plans to build a building that will cost \$100 million, the A/E fee is going to run 3 or 4 or 5 or 6 percent. If one picks a bad A/E firm . . . the cost of that building would escalate 5, 10, 20 or 50 percent. Anybody who builds buildings picks A/Es with extreme care, and then discusses with them how much to pay them." Similar expressions were heard in the House and Senate during debates.



Certificates of Merit go to designs by Robert B. Gordon (top) and to a team composed of Leland Gilmore, Keith D. Ray and Alan Storm.

Plan to Benefit Architects, Engineers; Reduction of Claims and Costs

Victor O. Schinnerer & Co., which markets professional liability insurance, and its underwriter, the Continental Casualty Company, have instituted additional programs to reduce the frequency and severity of claims against architects and engineers and to lower overall defense costs.

The aim is to inform design professionals about the areas in which legal problems are most likely to occur and to provide lawyers with case precedents and successful legal techniques. The plan has been developed in cooperation with the AIA and the National Society of Professional Engineers.

Gerald W. Farquhar, a Washington, D.C., defense attorney, will be coordinator of the loss prevention program and will be editor of *Guidelines for Improving Practice*, a monthly newsletter for architectural and consulting engineering firms, and of a newsletter for attorneys who represent design professionals. The legal information in the latter will be digested quarterly for architects. He will also head a "brief bank" of unpublished decisions to reduce duplication of efforts of defense teams and time spent in preparation of a case.

There will be seminars to educate architects, engineers and their attorneys about specific problems in the field; a series of study plans for in-house loss prevention programs; and a library service of video tapes and audio-visual cassettes of loss prevention material for use by local AIA, NSPE and Professional Engineers in Private Practice chapters and other interested groups.

"The design professionals have an economic stake in the success of the program, as well as the insurer," states Thomas F. Tucker, vice president of Continental Casualty. "The architects and engineers are pooling their premiums for the first \$100,000 coverage, with a reserve premium fund. If the loss fund operates on a profitable basis, the reserve fund will be returned with inter-

continued on page 44

Electric Heat Recovery System In New Headquarters Office Building Chosen for Economy, Versatility



The National Association of Broadcasters Building in Washington, D.C. features an elliptical front facade and a spacious plaza.

PROJECT: National Association of Broadcasters Building, Washington, D.C. **ARCHITECTS:** Mills, Petticord and Mills, Washington, D.C. **CONSULTING ENGINEERS:** Kendrick and Redinger, Arlington, Virginia.

DESIGN CHARGE: To design, on a small corner lot, a distinctive, dignified headquarters building for a major trade association with a lobby, reception area, private and general offices, library, conference rooms, board room, and employee lounges.

DESIGN RESPONSE: NAB's new headquarters is a handsome seven-story structure constructed primarily of travertine marble, bronzed aluminum, and glass curtain wall. Architect Loren C. Sage of Mills, Petticord and Mills, took full advantage of a corner lot running tangent to a diagonal avenue to provide an elliptical front facade and a spacious landscaped plaza with a large fountain. Two underground levels of the building running the entire length of the plaza are used for indoor parking.

The space conditioning system selected for the building is based on heat recovery principles and

makes economical use of the fact that the interior zones require cooling almost year around. Air distribution is by means of a double-duct high-velocity system. Air drawn through the fluorescent lighting fixtures into plenums above the interior zones supply most of the heat requirements of the hot deck, which is equipped with duct heaters for supplementary heating. Two 110-ton air-cooled reciprocating chillers furnish chilled water to cooling coils in the cold deck. Mixing boxes under the control of independent wall-mounted thermostats regulate the temperature of the air entering the individual zones and any zone may be on heating or cooling at any time regardless of conditions in other portions of the building. Consulting Engineer Lee Kendrick says that the electric system was selected after a feasibility study indicated that owning and operating costs over a 20-year period would be lower than those of an equivalent system using a gas-fired boiler for heating. "The electric system is working beautifully," Mr. Kendrick reports, "and is living up to all expectations."

1 CATEGORY OF STRUCTURE:

Commercial—Office Building

2 GENERAL DESCRIPTION:

Area: 94,600 sq ft
 Volume: 1,121,600 cu ft
 Number of floors: seven plus two basement levels
 Number of occupants: 200
 Types of rooms: private and general offices, conference rooms, lunchroom, lobby, employee lounges, storage, indoor parking

3 CONSTRUCTION DETAILS:

Glass: double solar bronze in south wall, single clear in north wall
 Exterior walls: glass curtain walls on north and south sides; two remaining walls: 1¼" travertine on 2½" precast backup, 1" expanded polystyrene insul. (R-4) ½" gypsum board; U-factor: 0.2 (avg.)
 Roof and ceilings: built-up roof on 2" rigid insul. (R-6), 6" concrete deck, acoustical plaster or tile; U-factor: 0.1 (avg.)
 Floors: concrete slab
 Gross exposed wall area: 33,400 sq ft
 Glass area: 9800 sq ft

4 ENVIRONMENTAL DESIGN CONDITIONS:

Heating:
 Heat loss Btuh: 1,500,000
 Normal degree days: 4333
 Ventilation requirements: 11,000 cfm
 Design conditions: 0°F outdoors; 70F indoors

Cooling:
 Heat gain Btuh: 2,700,000
 Ventilation requirements: 11,000 cfm
 Design conditions: 95F dbt, 78F wbt outdoors; 75F, 50% rh indoors

5 LIGHTING:

Levels in footcandles: 50-100
 Levels in watts/sq ft: 2-4
 Type: fluorescent

6 HEATING AND COOLING SYSTEM:

Two air handling units supply warm and cool air to thermostatically controlled mixing boxes in each zone of the building by means of a double-duct high-velocity system. The hot deck is equipped with 728 kw of electric duct heaters. Two 110-ton air-cooled reciprocating chillers provide water for the cooling coils in the cold deck. A separate 30-ton direct-expansion air conditioning unit cools make-up air as it enters the building.

7 ELECTRICAL SERVICE:

Type: underground
 Voltage: 265/460v, 3-phase, 4-wire, wye
 Metering: secondary

8 CONNECTED LOADS:

Heating & Cooling (250 tons)	852 kw
Lighting	260 kw
Cooking	26 kw
Water Heating	30 kw
Other	360 kw
TOTAL	1528 kw

9 INSTALLED COST *

General Work	\$1,800,000	\$19.00/sq ft
Elec., Mech., Etc.	700,000	7.40/sq ft
TOTALS	\$2,500,000	\$26.40/sq ft

*Building was completed 2/69

10 HOURS AND METHODS OF OPERATION:

8 a.m. to 6 p.m., five days a week.

11 OPERATING COST:

Period: June 1971 through May 1972
 Actual degree days: 3801
 Actual kwh: 3,141,000*
 Actual cost: \$62,000.04*
 Avg. cost per kwh: 1.974 cents*
 *For total electrical usage

Month	Degree Days	Demand	kwh	Amount
6/71		632	256,000	\$ 5,795.32
7/71		668	314,000	6,677.02
8/71		639	290,000	6,365.35
9/71	12	652	285,000	6,267.94
10/71	61	617	249,000	5,656.26
11/71	518	619	255,000	4,489.43
12/71	597	583	218,000	4,141.82
1/72	815	581	257,000	4,602.80
2/72	817	595	261,000	4,625.86
3/72	599	624	292,000	4,870.44
4/72	326	538	240,000	4,479.31
5/72	56	538	224,000	4,178.48
TOTALS	3801		3,141,000	\$62,000.04

12 FEATURES:

The ducted system is designed so that the warm air exhausted from the interior zones during the heating season is used to supply part or all of the heat losses in the perimeter areas.

13 REASONS FOR INSTALLING ELECTRIC HEAT:

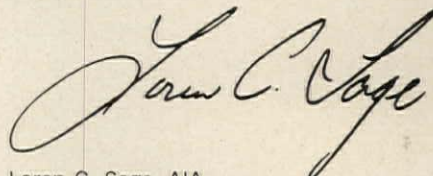
A feasibility study indicated that the owning and operating costs of the electric system projected over a 20-year period would be less than those for an equivalent system using a gas-fired boiler for heating.

14 PERSONNEL:

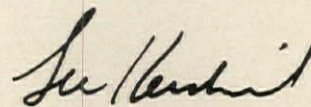
Owner: National Association of Broadcasters
 Architects: Mills, Petticord and Mills
 Consulting Engineers: Kendrick and Redinger
 General Contractor: Chas. H. Tompkins Co.
 Electrical Contractor: E. C. Ernst Co.
 Mechanical Contractor: Alliance Plumbing & Heating
 Utility: Potomac Electric Power Company

15 PREPARED BY:

C. E. O'Daniel, Technical Services Department,
 Potomac Electric Power Company.

16 VERIFIED BY:


Loren C. Sage, AIA



Lee Kendrick, 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.

ELECTRIC ENERGY ASSOCIATION, INC. 90 Park Avenue, New York, N.Y. 10016

Name and Profession:
 Firm, University or other affiliation:
 Address:
 Zip Code:

Gentlemen:
 As they become available, please send me the complete series of EEA Case Histories at this address:

BOARD OF DIRECTORS

Officers

President

S. SCOTT FEREBEE JR., FAIA

First Vice President

ARCHIBALD C. ROGERS, FAIA

Vice Presidents

VAN B. BRUNER JR., AIA

LOUIS DE MOLL, FAIA

DAVID A. PUGH, FAIA

Secretary

HILLIARD T. SMITH JR., FAIA

Treasurer

ELMER E. BOTSAL, AIA

Executive Vice President

WILLIAM L. SLAYTON, HON. AIA

Directors

(Year indicates expiration of term)

California

ARTHUR FROELICH, FAIA ('73)

FRANK L. HOPE JR., FAIA ('74)

EUGENE CRAWFORD, FAIA ('75)

Central States

FLOYD O. WOLFENBARGER, FAIA ('73)

HERBERT E. DUNCAN, AIA ('75)

East Central States

CARL L. BRADLEY, AIA ('73)

Florida

H. LESLIE WALKER JR., AIA ('75)

Gulf States

MATT L. VIRDEN III, AIA ('74)

Illinois

JOHN F. HARTRAY JR., AIA ('75)

Michigan

CLARENCE H. ROSA, FAIA ('74)

Middle Atlantic

ALEXANDER S. COCHRAN, FAIA ('74)

WILLIAM L. ENSIGN, FAIA ('75)

New England

HUGH MCK. JONES JR., FAIA ('73)

ROBERT A. BURLEY, AIA ('74)

New Jersey

ARTHUR E. RIGOLO, FAIA ('74)

New York

DARREL D. RIPPETEAU, FAIA ('73)

FREDERICK G. FROST JR., FAIA ('74)

HERBERT EPSTEIN, AIA ('75)

North Central States

LOUIS R. LUNDGREN, FAIA ('73)

Northwest

ROBERT E. FEHLBERG, AIA ('74)

VLADIMIR OSSIPPOFF, FAIA ('75)

Ohio

JAMES J. FOLEY, AIA ('73)

Pennsylvania

EHRMAN B. MITCHELL JR., FAIA ('75)

South Atlantic

WILLIAM A. CARLISLE, AIA ('74)

Texas

DANIEL BOONE, FAIA ('73)

THOMAS A. BULLOCK, FAIA ('75)

Western Mountain

MAX FLATOW, FAIA ('73)

Student Adviser

FAY DEAVIGNON, ex officio

President, ASC/AIA

HEADQUARTERS

Executive Vice President

WILLIAM L. SLAYTON, HON. AIA

Deputy Executive Vice President

JAMES A. SCHEELER, AIA

Administrator, Community Services

E. DONALD VAN PURNELL

Administrator, Education & Research

JAMES E. ELLISON

Administrator, Environment & Design

MICHAEL B. BARKER

Administrator, Government Affairs

JAMES C. DONALD

Administrator, Institute Affairs

J. WINFIELD RANKIN, HON. AIA

Administrator, Professional Services

ARTHUR T. KORNBLUT, AIA

Administrator, Public Relations

MURIEL CAMPAGLIA

Controllor

WILLIAM G. WOLVERTON

the institute

An Overview: The Federal A/E Selection Law

by JAMES C. DONALD

Administrator

Department of Government Affairs

Very close to a six-year effort by the design professions has culminated in the passage of Public Law 92-582 which clarifies and codifies the traditional manner in which most agencies have selected private architects and engineers to perform professional services for the federal government. The law requires architects and engineers to be selected competitively on the basis of their competence and qualifications at a negotiated fee which is fair and reasonable.

The Committee on Federal Procurement of A/E Services which coordinated this joint effort deserves a great deal of thanks for its sustained work over the years, as well as its member societies: the AIA, the American Institute of Consulting Engineers, the Engineering Division of the American Road Builders Association, the American Society of Civil Engineers, the Consulting Engineers Council of the US and the National Society of Professional Engineers. It is an outstanding example of the way in which the design professions can work together in a common cause for the good of the public and the professions.

The new law answers some questions originally raised by Comptroller General Elmer B. Staats in a report submitted to Congress in April 1967. This report contended that A/E services were subject to price competition procedures but recognized that, in view of past practices for the procurement of such services, "it is important that the Congress clarify its intent as to whether the competitive negotiations requirements of the law are to apply to such procurements."

This was the second attempt of both the House and Senate Government Operations Committees to clarify the law. The first effort, led by Congressman Jack Brooks (D-Tex.) and Senator John L. McClellan (D-Ark.) cleared the House in 1970. After approval by the Senate Government Operations Committee, the bill unfortunately was lost in the legislative logjam which confronted the Senate in the closing days of the 91st Congress and was never called up for a vote.

Early in 1972 Congressman Brooks introduced HR 12807, a bill similar to the 1970 legislation which was modified only to reflect recent development. At about the same time Senators McClellan and Charles H. Percy (R-Ill.) introduced S 3156.

After public hearings and approval by the House Government Operations Commit-

tee, HR 12807 was granted a rule and passed the House on July 26 by a voice vote. The Senate Government Operations Committee adopted and approved HR 12807 on September 20. In the closing hours of the 92nd Congress on October 14, the Senate by voice vote gave approval to HR 12807. The legislation was sent to President Nixon for his signature on October 16, and he signed the A/E selection bill into law on October 28.

In addition to the procedure for selecting architects and engineers, the new law "declares it to be the policy of the federal government to publicly announce all requirements for architectural and engineering services." House Report 92-1188 explains that the purpose of the announcement language is to "assure the broadest publicity concerning prospective government procurements, thereby obtaining a high level of competition in the award of A/E procurement contracts." A similar concern was expressed in Senate Report 92-1219.

The new law also requires that all persons performing services for the government must be properly licensed under appropriate state registration laws and defines A/E services as including "those professional services of an architectural or engineering nature as well as incidental services that members of these professions and those in their employ may logically or justifiably perform."

Public Law 92-582 will have far-reaching effects on the procurement policies of state and local governments as well as the private client. It expressly declares this selection procedure to be "federal policy" for all A/E procurement. Better than two-thirds of the construction in this country has some form of federal assistance involved. Without such a policy, and with continued pressure from the General Accounting Office, it would not have taken very long for the existing similar state selection procedures to have been under attack from many uninformed sources.

The design professions, however, must constantly be watchful to insure that architects and engineers are allowed to make their best efforts and that their fiduciary relationship with their clients is protected. Only in this way can the public interest be served. If less than a best effort is allowed in the development of good design and contract documents, the cost of construction will skyrocket, quality will not be controlled and clients will waste both time and money. □

Is there an easier way

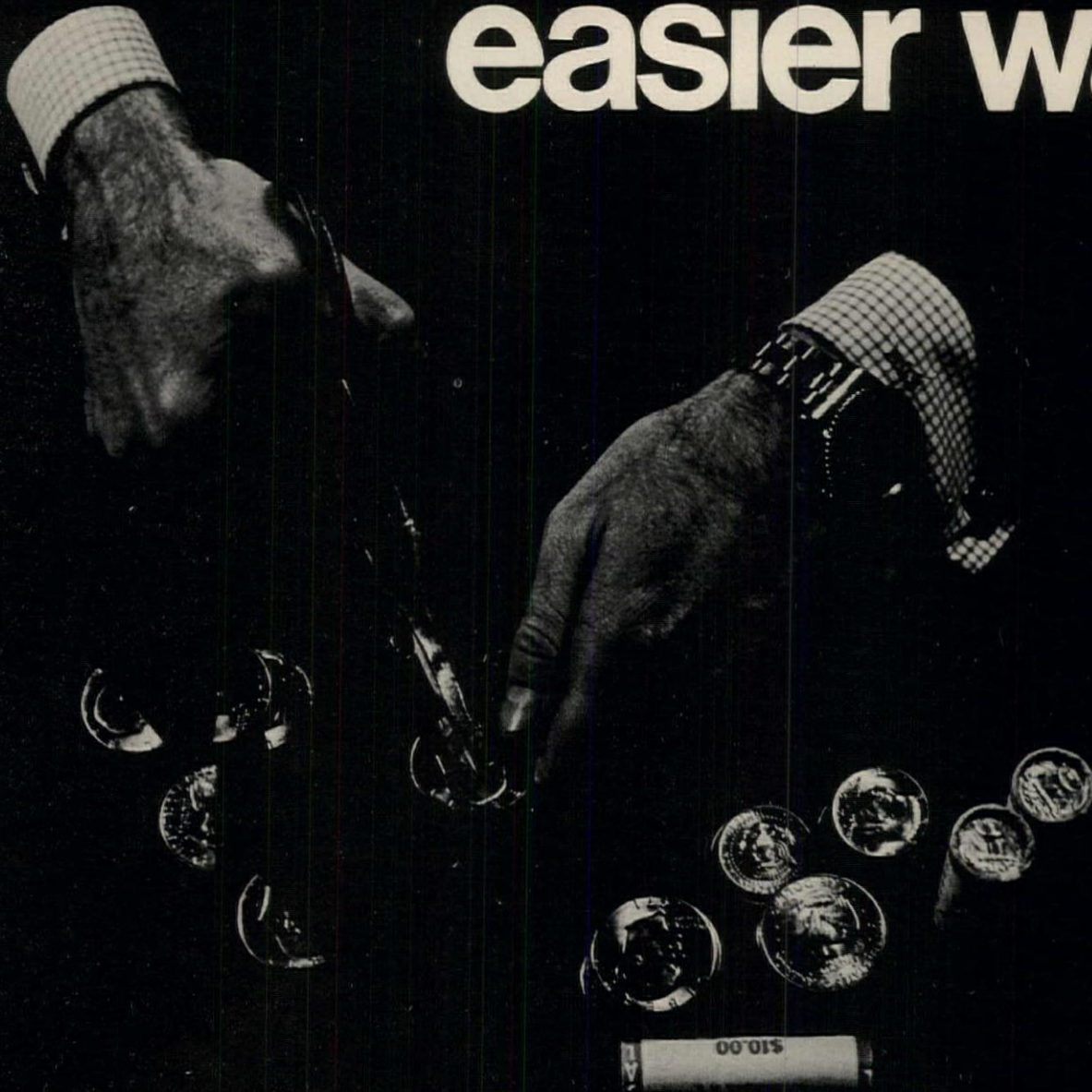


PHOTO: ROY LOGGEE

to cut costs?

Some people just snip at costs. When they could really trim them.

They try to cut a nickel here, a dime there instead of going after the dollars. And the dollars can often be found in costly designs.

How do you spot a costly design?

One way is to have an *independent quantitative*

estimate prepared at concepts through contract drawings.

These analyses show cost overruns. And the *independent estimator* can help you with cheaper and more effective alternatives.

If you have potential cost problems call or write. Robert Scharf.

EDWARD G. SCHARF & SONS

Construction Cost Consultants

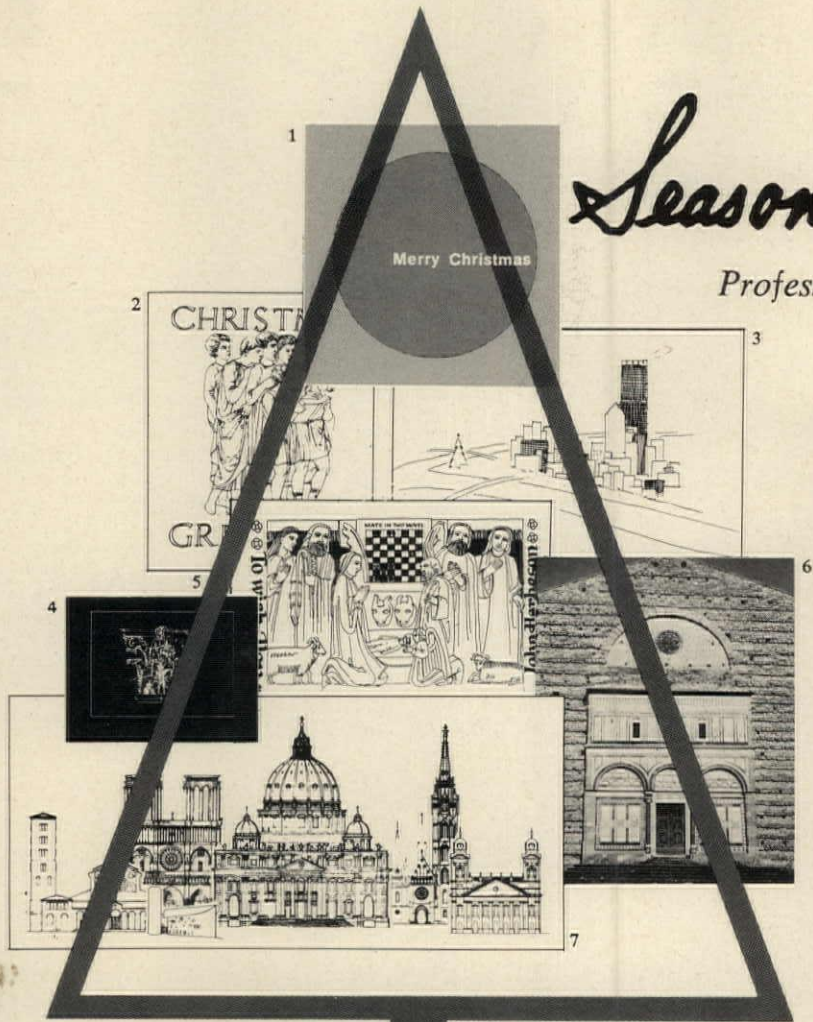
8555 Connecticut Ave. N.W.
Washington, D.C. 20015
(301) 652-2622
Cable: SHARFEST

members

American Association
of Cost Engineers
National Association of

Construction Cost Consultants since 1920



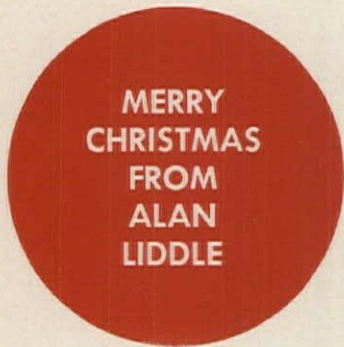


Season's Greetings

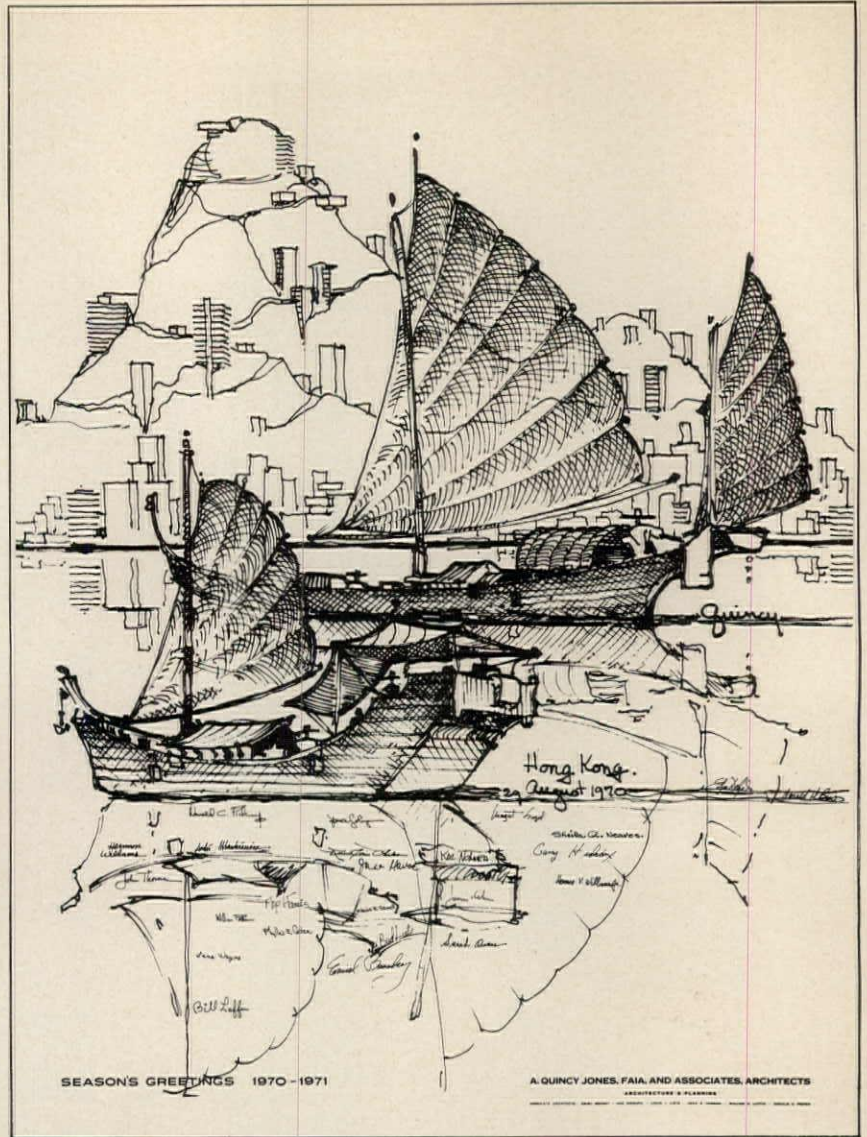
Professionally Speaking

- 1 Ryan Associated Architects
Louisville
- 2 Rowland Snyder, FAIA
Washington, D.C.
- 3 Louis F. Valentour
Pittsburgh
- 4 National Trust for
Historic Preservation
Washington, D.C.
- 5 John Harbeson, FAIA
Philadelphia
- 6 Marcel Breuer, FAIA
New York City
- 7 István Botond, AIA
Washington, D.C.

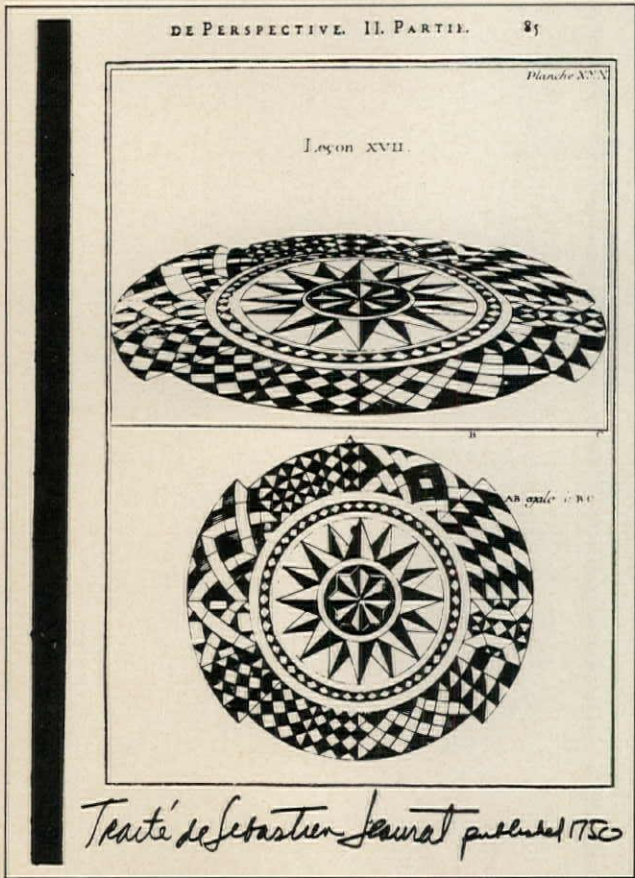
In December bright and beautiful cards travel to carry the greetings of the season. The architect's card, like those of other professionals, is destined to project his image, whether it is purchased or individually conceived, whether it is personal or extends the salutations of his firm. This sampling shows a variety of approaches—commercial, photographic, reproduction of an existing drawing or specially designed. Some are elaborate, some simple; some have religious themes, some avoid them. The designed card serves as a vehicle for the architect's imagination freed from those 3 C's: clients, contractors, codes. Marcel Breuer reproduces a photograph he took of the Badia Fiesolana near Florence, Italy. With his rendering of the Warden's House, John Desmond invites friends to the firm's annual



Alan Liddle, FAIA
Tacoma



A. Quincy Jones & Associates
Los Angeles



Daniel Schwartzman, FAIA
New York City



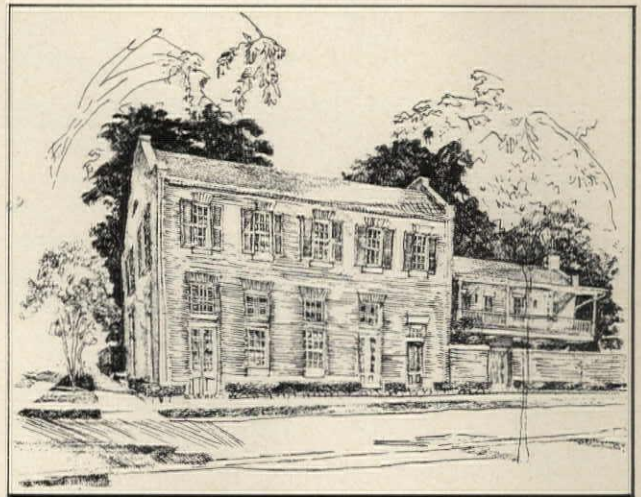
Texas Society of Architects
Austin

Christmas party at its office in that historic building. The inside spread of Rowland Snyder's card shows through sketches of his travels during the year. István Botond reissues his line drawing of contrasting churches in different colors annually.

Chess is the hobby of John Harbeson, who has for years presented a puzzling checkmate with his greetings. The firm of A. Quincy Jones sends a blownup freehand drawing, the signatures of the staff across the bottom. A yearly selection of an illustrated page from a rare book carries Daniel Schwartzman's message. And so in a variety of ways, good wishes are extended. □



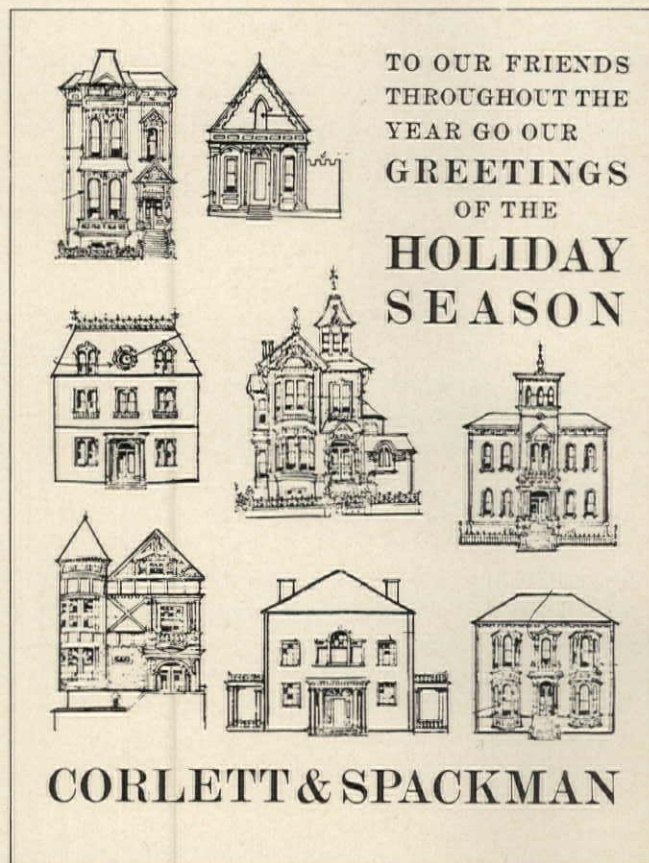
The Kling Partnership
Philadelphia



Desmond-Miremont-Burks
Baton Rouge



Lev Zetlin Associates, Inc.
New York City



Corlett & Spackman
San Francisco



Profile of the President

When he receives his medal of office this month from AIA President Max O. Urbahn, FAIA, S. Scott Ferebee Jr., FAIA, will be only the second Southerner to head the Institute during its 115-year history. By coincidence, the first—Arthur Gould Odell Jr., FAIA—is, like Ferebee, a resident of Charlotte, North Carolina, and is a former employer and mentor of Ferebee's.

The new president of The American Institute of Architects is quiet, direct and unpretentious. S. Scott Ferebee Jr., FAIA, did not actively seek the office. Several of his fellow directors, who had observed his unobtrusive persuasiveness at board meetings and admired his talent for getting to the heart of an issue, asked him to run for the office of first vice president in 1971.

With characteristic modesty, Ferebee refused at first, on the grounds that there were other qualified candidates available. When his backers approached him a second time, he personally contacted those others and made sure that they did not plan to run; then he went back to Charlotte to think it over. A couple of weeks later he contacted the directors who had asked him to take on the job and told them that he was willing.

It was not an easy decision. Besides managing the firm of Ferebee, Walters & Associates, Ferebee has to juggle a lot of other demands upon his time. He is extremely active in his church, serves as a director of Charlotte's Republic Bank & Trust Company and—perhaps most demanding—is a major general in the US Army Reserve. He is commanding general of the 108th Division (Training). Ferebee estimates that his time is currently split up among the AIA (75 percent), his architectural practice (15 percent) and the Army Reserve, which claims the remaining 10 percent. In 1973 the AIA will get even more.

Politically, he describes himself as a middle-of-the-roader. He finds local Democratic politics uncomfortably conservative and national Democratic politics a touch too liberal.

In the management of his firm, however, Ferebee definitely considers himself a progressive. He believes in innovation and in making use of emerging techniques and tools which show promise of making his practice more efficient. He volunteered his office as a testing ground for the Institute's computer-based financial management system while it was still in its infancy. He found it excellent. The computerized system gives him precise information of the progress, costs and time spent on all active projects, in addition to providing the normal accounting reports and records required by an architect's office.

"If we generated conventionally all the information that the system provides, it would take the time of six to eight employees," Ferebee says. "But using it, we need only a bookkeeper and occasional time from an administrator and a secretary."

Ferebee, Walters & Associates had earlier been one of the first users of MASTERSPEC, the Institute's master specification system.

Ferebee has always had strong ties to the AIA's professional practice programs. As chairman of the Commission on Professional Practice, he was often called on to speak on various aspects of office organization and management. "Our office has always been progressive," he asserts. "We have instituted some office management techniques and personnel practices that, for the size of our office, were really ahead of their time."

Ferebee says that he comes from a long line of innovators. His father, a farmer in North Carolina's coastal plains area, owned the first tractor in Currituck County.

The Depression was still going on when the time came for young Scott to start college. Like a lot of others, he worked his way, spending 40 hours a week reading proof for a newspaper at night. He studied chemical engineering at North Carolina State University for three and a half years, but he didn't like it very much. "It was the hot thing at the time," he recalls, "but the lab work was too much like washing dishes."

Then World War II intervened between the reluctant chemical engineer and his work/study routine. After paratroop training, he was sent to Europe in time to take part in the Normandy invasion. Asked whether he remembers his emotions, he says reasonably, "If you know you're going to be making a night jump into a combat zone, I guess nobody is terribly happy about it. But I was younger then and single, and the war was something everybody was involved in. Our ideas about it were different from the way people feel now."

Three days into the invasion, Ferebee was wounded by gunfire and evacuated to a hospital in England where he was to spend the next several months. One night while there, three nurses ("three angels," he calls them now) walked through the ward. Quickly summoning his own nurse, Ferebee whispered, "Who's the girl on the end? I want to meet her." She was Elizabeth Cooper from Asbury, New Jersey, and he not only met her but married her in July of 1945.

That momentous decision was not the only one that Ferebee made during his active duty Army service. He decided to be an architect. He had never been very good at freehand sketching, he admits, and feared that this shortcoming might keep him out of an architectural program. But it didn't, and in 1948 he was graduated from North Carolina State with a degree in architectural engineering.

Ferebee went to work in the office of Arthur Gould Odell Jr., who, Ferebee believed, was doing some of the best work in the state. He stayed for five years, leaving to form his own firm.

S. Scott Ferebee. 2.

Ferebee's practice has always been rooted in the small office. Ferebee, Walters & Associates has only recently jumped to its present strength of 38 employees; for years it had less than 15. "I believe there is a future for the smaller office," he says firmly. "I don't believe the small firm is dying, even though that has been intimated by a lot of people." Does he believe that a small office inevitably has to get bigger to survive? "Generally, I think a firm is healthier if it's growing rather than remaining static. But I know of exceptions—situations in which the principals simply refuse to take on so much work that they have to devote full time to administration at the expense of involvement in design. They accept only those jobs they can handle on that basis, and handle them extremely well."

For the past 10 years Ferebee, Walters & Associates has been able to increase its earnings annually at the rate of 25 percent over the previous year. The firm's practice is general in nature. Until about two years ago, some 60 percent of its income came from educational facilities. Then a reduced demand for schools led to a shift toward housing, shopping facilities and planning projects, along with some office buildings and churches.

Despite the amount of time Ferebee has to spend away from home (he recently returned from a six-week trip that included England, Bulgaria and Russia), he manages to keep current on the status of projects in his office. But it isn't easy. Neither is being separated from his family. The Ferebees have three children—two sons in college and a daughter who is 14 years old. "We've always been very close," Ferebee comments. "The thing that bothers me most about the coming year is the limited amount of time I'll have to spend with my family."

The trip to the Soviet Union posed another kind of problem. Ferebee does not drink. The Soviets do, enthusiastically and heroically, especially in the Soviet Republic of Georgia where, Ferebee says, "They invented wine, women and song, no matter what they claim in Vienna."

Not wanting to offend his hosts at the many official functions which the delegation attended, Ferebee asked the interpreter to explain that he simply does not drink as a matter of principle. The interpreter tried, but without much success. So Ferebee took to arriving at the table in time to fill the glasses lined up at his place for wine, vodka and cognac from the various carafes of tinted mineral water on the table.

As president of the AIA, Ferebee's principal goal will be "to develop programs which will make the architect a strong, forceful and more competent leader in today's climate of environmental concern." For years, he says, there has been a strong tendency for the profession to take the blame for many environmental failures. "At several recent AIA conventions, we flailed

away at ourselves, but we didn't take a positive attitude toward the problems. We have to change that situation. The public is looking for leadership in this area, and we can provide it."

Ferebee sees this leadership as coming to the fore primarily in three areas: nationally, at the community level and within the construction industry. He views the report of the National Policy Task Force as a first major step taken by the AIA toward national leadership. "I would hope that during the coming year we could continue to develop it, publicize it, and promote specific projects that demonstrate it," he states. "To be effective, these examples must speak to the problems of people and to the improvements of their lifestyles."

At the same time, Ferebee wants to see the AIA develop an even more active role in influencing legislation affecting architects and the policies of federal agencies who use their services. The majority of the AIA membership will not be able to make a direct contribution at the national level, he realizes. But he is convinced that members can and should be more outspoken in their local communities. The Institute's role in this area, he declares, is "to provide the tools to assist architects in speaking to the needs for better housing, an improved environment, regional planning, better community design and the need for a national policy of growth."

And in the third aspect of leadership, Ferebee believes that the architect must reassert his role within the construction industry as the leader of the building team. This position is constantly eroding, he thinks, and must be bulwarked by positive actions and programs that demonstrate the architect's leadership rather than only claiming it.

Ferebee is concerned about the lack of confidence within the profession in the nation's schools of architecture and the lack of rapport between practitioners and faculties. "We need programs that will pull the profession and educators together," he declares, "and that will allay the suspicions of the Institute which permeate young professional instructors, most of whom are not members of the AIA. We need a better understanding of each other's role."

He also sees a major need for design research which would permit architects to substitute facts for the opinions and intuitions on which many design decisions must now be based. "We all know about excellent housing projects—warmer, better lighted, better landscaped—that have nevertheless become slums within a few years," he says. "On the other hand, there are projects that are disasters by architectural standards, and yet police report that crime and related problems have been reduced in the community since their establishment. We need to *know*, not guess, why these things happen." □

If You Want to Save Energy

...the hardware, the technology, the expertise that it takes are here now. And here's a list of suggestions for a combined effort to reduce consumption, put forth simply and without intricate samples. How significant such an effort will be depends on you, on me, on us; on every person, every discipline.

by FRED S. DUBIN

Let us set an immediate national goal of a 33 percent reduction in yearly energy requirements for buildings through energy-conscious design. For many individual buildings this goal could be more than 50 percent. We can achieve this without losing any needed services and few, if any, amenities, but that is not to say that changes will not be required in both software and the choices and applications of hardware.

Several conservation measures exist that can reduce the total building cost, and there are many others that at least do not increase the initial costs. All these could find ready acceptance but few financial incentives are made available to designers, who must bear the higher costs of undertaking the tasks which require a great degree of technical competence: first, to make the engineering, economic and energy analyses of alternative systems; second, to use the added time to incorporate the energy conservation features into the building design.

It is even more difficult to find acceptance for systems which save energy but which cost more initially. This goes even for systems which can be amortized quickly enough to make them attractive financial investments.

Unfortunately, to date there has been no

study made which thoroughly analyzes the national aggregate flow of energy in each type of building constructed or the correlation of the energy flow with the type of system, system performance, building construction, design features and building location so that a control model could be derived which would serve as a standard for measuring the energy reduction effectiveness of each of the proposed conservation measures. The potential rewards are tremendous.

So far, neither government, industry, universities nor utilities have been persuaded to fund the approximately \$250,000-study to provide this much-needed information which could rapidly and effectively lead to savings of at least 14 billion barrels of oil in 10 years and the elimination of about 8 million tons of pollutants annually.

Many of the doables are being implemented in buildings under construction or in design, and, of course, many of our existing buildings include one or more energy conservation systems. By combining many more of the following measures, additional resources can be saved, burdens on power plants eased, and air and water pollution reduced. This requires a multifaceted effort in each of the following major categories:

Environmental Requirements and Program

These are ultimately the owner's decisions, but the architect and engineer must make him aware of the alternatives and the beneficial results, including lower operating and life cycle costs.

The design levels of illumination and the degree of heating, ventilation and airconditioning for corridors, lobbies, passageways, storage areas, unoccupied and other less used areas should be lower than in those fully occupied. Classrooms and offices could do with less light outside the task zones. The effect of selective illumination will actually enhance the esthetic quality of the spaces.

Higher relative humidities in the winter will reduce ventilation needs and lower the dry bulb temperature requirements for the same degree of comfort, with a net gain in fuel reduction. To maintain humidities of 45 percent or more requires double and triple glazing. The better U factors which result will also lower heating and cooling loads. The savings in capital costs of the smaller HVAC system will more than compensate for the extra cost of the glazing.

Reducing the area of glazing saves both initial and operating costs (and energy). The loss in natural light will require increased artificial illumination but is more than offset by the gain in energy conservation through reduced heating and cooling loads.

In areas where codes, esthetic or design considerations establish sizable amounts of glazing, the luminaires at the perimeter should be on a separate switch or photo cell so they are turned on only when there's insufficient natural light. In multistory office buildings or schools, about 25 percent of the energy normally used for lighting can be saved in this manner.

Since about 50 to 60 percent of the electrical energy consumed in office buildings goes to lighting, the overall average levels should and could be lowered by 50 percent. Better quality of illumination rather than higher intensities should be the goal. Since the largest reductions in illumination levels are possible in the lesser-occupied areas, the levels in the task areas would not be lowered beyond the visual acuity required for specific tasks. Many recent experiments confirm that lighting levels between 10 and 40 footcandles are sufficient

for visual acuity and physiological needs, where levels of 60 to 150 footcandles are now being provided.

Do we really need 5, 10 or 15 cfm per person of outdoor air for ventilation? The power for fans and the energy it takes to heat and cool vast amounts of outdoor air, often of questionable quality, is wasteful. For most buildings the amount of outdoor air intake can be reduced to 3 or 4 cfm per person; high-ceiling buildings require even less. Odor-absorbing devices and better filtration can maintain the air quality with significant savings in energy and operating costs. The savings in initial costs of fans, heating and cooling equipment and ductwork would offset the added costs of better filters or odor absorption equipment.

The usual practice is to design heating and cooling systems based on the outdoor conditions which are not exceeded more than 2½ percent of the time. Excluding facilities for the elderly, industrial process or health care areas, systems can be designed for the 5 percent condition. The few hours a year when spaces are warmer or cooler (less than 30 hours a year) than our present "standards" seem a small price to pay for a more economical system.

Do we need so much decorative, advertising and display lighting, wall washers and other promotional uses of electricity? New York City is consuming about 7.5 million kwh per year for such purposes.

Building Site, Design and Structure

Where two or more sites for a proposed building are equally favorable in all but energy conservation considerations, it should be remembered that existing trees and/or buildings can provide effective solar control and reduce heat gain; or they can shield the building from high winds, reducing heat losses.

In moderate climates, outdoor air can be used for substantial periods of the year instead of mechanical refrigeration for cooling. Even in climatic zones with severely cold winters or hot summers, outdoor air can provide comfortable conditions more than 500 hours a year.

Heating and airconditioning design starts

with the building design. A building's shape affects its energy consumption. A round building has less surface, hence less heat gain or loss than any other shape for an equal number of square feet or floor area. A square building has less surface than a rectangular one of an equal number of square feet. A rectangular building with the long axis oriented to face north and south suffers less solar heat gain in the summer, and with a 1 to 2½ side ratio will use 29 percent less energy for cooling if the short axis faces north and south rather than east and west.

The cost of insulation to reduce wall and ceiling thermal U factors can be amortized in short time and usually reduces the initial costs for the heating and cooling plant enough to offset the cost of the insulation. Thicker walls and roofs also reduce energy consumption, and noise as well. When panel construction spurted after World War II, insulation in walls seems to have become a casualty.

The effects of the all-glass wall can be overcome only, if at all, by the brute application of more airconditioning and more heating—certainly the wrong direction given today's new energy design criteria. Where glazing is used, external solar devices such as fins, eyebrows, reveals, awnings or special blinds enclosed in double sash should be used.

Light-colored finishes in interior spaces increase the illumination efficiency—more light with less power unit.

Buildings with greater densities—highrises, megastructures, party walls—require less energy for heating and cooling than an equal amount of building space dispersed in many separate buildings.

Equipment, Mechanical and Electrical Systems

Computers should be used for load calculations and to determine the energy load profile of the building since oversized equipment stemming from excessive load calculations is costly and inefficient, especially at part-load conditions. Computers should also be used to determine the optimum orientation and the relative energy conservation benefits of alternative systems and construction materials. Excessive safety factors should not be used.

Lights, people and storage factors should be recognized.

There are a large number of energy conservation systems which are equally effective regardless of fuel type used. However, since all-electric systems for heating and airconditioning basically consume more primary energy fuels for a given task than on-site oil or gas systems, the potential savings in energy by using heat-conservation methods is much greater when used with electrical systems.

For every project which requires more than 2,000 cfm of fresh air, consideration should be given to devices which will transfer energy from the building exhaust air to incoming fresh air.

Wherever illumination footcandle levels exceed 75, consideration should be given to heat-of-light systems, which transfer energy from interior zones to the perimeter as needed. This system reduces the amount of sensible heat entering the space, as well as the amount of air which must circulate in the air-conditioning system, consequently reducing fan horsepower and energy consumption. The wet troffer heat-of-light system saves even a greater amount of energy and also some capital costs of the airconditioning system, since it results in a smaller refrigeration plant and in smaller air handling units and ducts. Both systems, of course, reduce the quantity of sheet metal for ducts.

Rejected heat from refrigeration units can be used in many wide applications for terminal reheat systems, for preheating domestic hot water, for industrial processes and for space heating. A number of years ago we designed a heat recovery system for a chain of supermarkets, using the heat rejected from the commercial refrigeration units as the sole source of space heating. About 33 percent of the total energy required to operate the store was saved this way.

Except where the energy is "free," terminal reheat systems should be avoided since they require energy to lower air temperatures to the dewpoint, even for areas not requiring cooling, and then more energy to reheat the air supplied to those areas to desired room conditions. Variable volume systems con-

sume much less energy than terminal reheat systems and can provide equal functional performance.

Large high pressure, high horsepower, central fan systems should be avoided where possible. In place of these, chilled and hot water can be pumped to decentralized, smaller, low pressure air handling units, each to serve a specific area in the building. Space must be provided for the air handling units, but the piping systems occupy less space than large duct systems; in some cases the elimination of large ducts lowers ceiling heights and provides considerable savings in building volume, hence less energy consumption for the same usable space and less material in the building which requires energy to produce it.

Whenever the use of electric heat is contemplated, heat pumps should be considered instead of resistance heating, since in most parts of the country they consume from two or three times less energy per given unit of work when on the heating cycle. Small air-cooled heat pumps do not conserve energy compared to water-cooled units on the cooling cycle, but large heat pumps enjoy a high efficiency for both heating and cooling.

Heat pumps driven by gas engines use even less primary energy than electrically driven heat pumps and, when combined with waste-heat cycles for supplementary heating and cooling, probably offer the greatest energy benefit/cost relationship of any refrigeration system.

In general, radiant heating systems are not efficient energy systems. Their inherent temperature lag causes unnecessary consumption of energy to right the swings. In fact, the use of more sensitive thermostats, perhaps the type that sense physiological as well as simple dry-bulb changes, will enhance energy conservation by eliminating large temperature variations from the control temperature that is desired.

The building program should be examined closely to eliminate unnecessary exhaust hoods in laboratories, hospitals and manufacturing plants. Often these are operated all day without performing a continuous function—functions which could be consolidated in a smaller number of hoods. Direct air supply to exhaust hoods should be used in order to eliminate the heating and cooling of large amounts of fresh make-up air which is then exhausted outdoors. The savings in heating and cooling equipment generally more than compensate for the additional cost of the di-

rect supply hood and the extra air supply system.

Large space heat gain of both sensible and latent heat can be reduced by shielding equipment and exhausting the heat and moisture emitted directly to the outdoors. In a research project for the Veterans Administration, the author's firm demonstrated that this approach for hospital kitchens and laundries reduced the airconditioning load by more than 25 percent, resulting in savings in both initial costs and energy costs far in excess of the costs of the measures necessary to accomplish these results.

A great deal of energy is lost when domestic hot water is allowed to drain from the building after single use. Heat exchangers to recover the energy in the hot drain water and to transfer it to preheat the makeup hot water costs more initially for the system, but the installation can be amortized in comparatively short time, saving energy throughout the life of the system.

Less energy is required with cooling towers which operate without fans, depending on the induction effect of the water sprays for movement of air. The air intake to cooling towers should be filtered to reduce water treatment and water makeup. Water saved is energy saved.

For saving water, recycling water within buildings might also be considered, using "gray" water for flushing purposes. Large-scale effects of a major water conservation program is reflected in reduced energy requirements for both sewage and water treatment plants, as well as through smaller distribution systems.

Air-cooled condensers reduce water pollution at the site but use more power than cooling towers. A study should be made for each building to determine the power consumption, and water and air pollution with air-cooled versus water-cooled condensers.

Electric demand limiters with load-shedding devices, high-voltage interior and exterior electrical distribution systems, and power factor correcting condensers can all result in energy conservation. Their effectiveness must be established through an engineering analysis for each project.

Over-sized heating and cooling facilities are wasteful energy users. Systems should be designed on a modular basis so that smaller pieces of equipment, including boilers, oil and gas burners, cooling towers, pumps and fans, are operating continuously at their peak

Mr. Dubin, PE, is president of the consulting engineering firms of Dubin-Mindell-Bloome Associates, P.C., and Fred S. Dubin Associates, International, with offices in New York City, Hartford, Rome, and Johannesburg, South Africa.

capacity for the best power consumption performance.

Sufficient temperature control zones should be provided so that large areas outside the control zones do not become overheated or overcooled due to their load variations compared to the control zones.

High-frequency lighting should be more widely used to improve lamp performance, extend lamp life and, by removing the ballasts, reduce the sensible heat gain loads on the airconditioning system.

Large central heating and airconditioning systems generally use 10 to 15 percent less energy than smaller decentralized packaged systems. However, proper controls must be installed so that the same flexibility of operation can be obtained with the central system as with individual systems. The large systems permit the incorporation of energy conservation devices to a greater extent than is possible with many smaller remote systems.

Through-the-wall, window and packaged airconditioners should be specified on a kw per Btu basis, since there is a wide variation—as much as 80 percent—in the power consumption of one commercial unit as compared to another. The maximum watts per unit of work should be specified for laundry, kitchen and laboratory equipment, elevators, water heaters, etc.

Greater use of solar water heaters and space heating for airconditioning should be made in areas with a high incidence of sunlight.

Electric ignition should be used in place of gas pilots for gas burners. It is estimated that gas pilots consume more than 223 billion cubic feet of gas per year in the 30 million gas-heated homes in the United States. Pilots on water heaters, gas dryers, refrigerators and other appliances waste additional gas.

Wider consideration should be given to total energy systems, both with central and decentralized utility plants. Total energy systems and energy storage systems always result in a smaller amount of primary energy fuel consumption for a given set of tasks. For total energy systems to be most effective there must be a use nearby from the waste heat recovered from the generating process. For major utility systems this means large-scale development of industrial plants and other structures in the vicinity of the power generating plant. New communities should be developed in this manner.

Where utility companies are using gas

turbines for peaking loads, the turbines often become the base load in practice. The waste heat in the exhaust gases should be recovered and used for heating, airconditioning, service hot water and process. Where waste heat cannot be used at the generating site, utility companies must give consideration to establishing decentralized total energy plants at large construction developments which need both electric power and heat energy rather than installing the turbines at the central utility plant.

Continuing with a systems approach, utility plants should consider more use of solid waste (garbage) as supplementary fuel for power generation, thereby helping solve a number of problems with one combined system: solid waste disposal, water and air pollution abatement, conservation of natural resources and power generation capacity. Since the thermal loss from central utility power plants and electrical transmission and distribution is about 70 percent of the primary energy input, the greatest immediate energy return can be accomplished in reducing these losses.

Energy loss can be reduced in piping systems by using pipe linings to minimize fluid friction.

Low resistance air filters and the proper selection of duct materials and sizes, and grilles and coils with low air resistance can materially reduce the air horsepower and conserve energy.

Building Materials, Maintenance

It requires approximately six times as much electric energy to produce a ton of aluminum as compared with a ton of steel. In his analysis of a highrise building (AIA JOURNAL, June), Richard G. Stein, FAIA, indicated that its skin would require 5.75 pounds of stainless steel, which takes .77 million kwh to produce, compared to only 4 million pounds of aluminum but which takes 2.1 million kwh to produce. Similar analyses should be made for other materials.

Improved maintenance practices can reduce energy consumption of buildings by more than 15 percent without increasing maintenance labor costs. To improve maintenance practices, design should include

proper data control centers, instrumentation and filtration devices. Operation manuals and a preventive maintenance program should also be made available.

Combined Facilities

Multiuse buildings, such as schools/apartments, apartments / commercial, offices / schools, educational / community facilities, etc., provide utility and energy diversity and result in lower energy burdens than the sum of the separate facilities. Other secondary but by no means unimportant benefits of multiuse buildings are more efficient land use, consolidation of transportation facilities and revival of entire areas, especially at night.

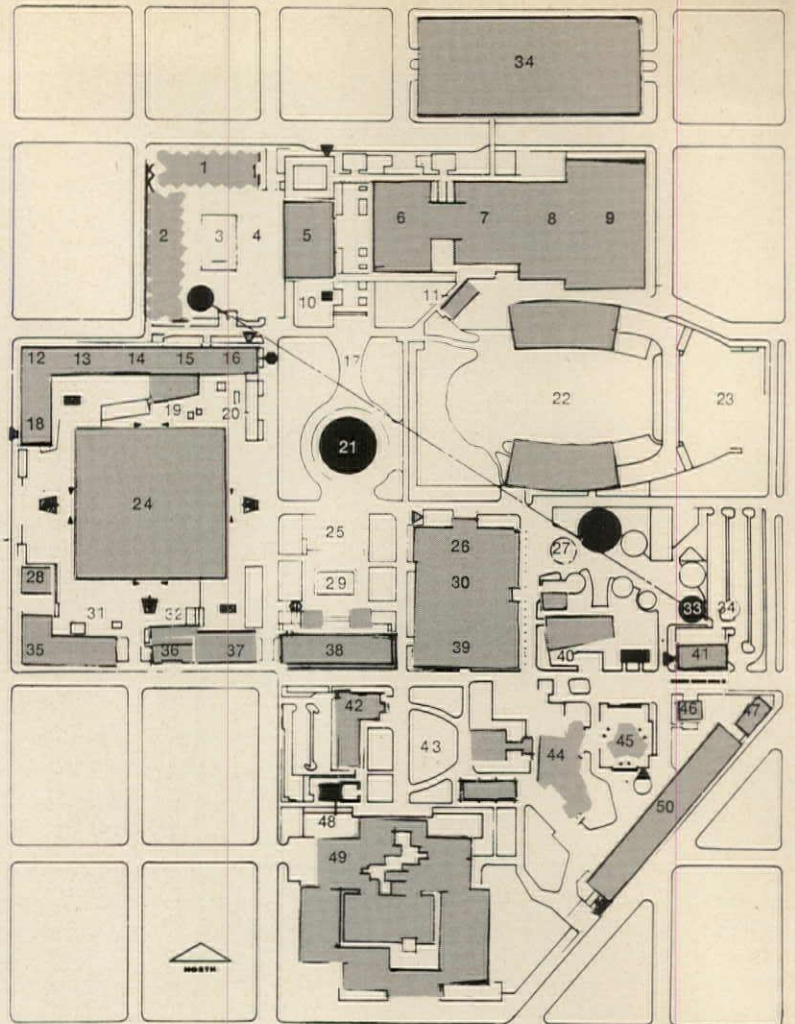
There are great opportunities to save energy by combining urban systems. For instance, methane gas which is generated at sewage disposal plants can serve as a supplementary fuel for high-temperature incinerators or pyrolysis units for solid waste reduction; the heat produced from this process can be used to aid sludge digestion in the sewage treatment plant; the sludge can then be disposed of in the adjacent pyrolysis plant. Or, an industrial park can be merged with an environmental park, and all solid wastes can be transported to the latter. There, metals, glass, aluminum, paper and other recoverable and useful materials can be separated and salvaged and delivered directly to the industrial park portion of the complex where the waste materials are recycled. The residue of solid wastes which are not recycled are reduced in one or more facilities, such as high-temperature incinerators or pyrolysis units, where waste heat is recovered and distributed to manufacturing facilities in the adjacent industrial park. Such a park would provide new employment opportunities in the community. New York State, San Francisco, Connecticut and other regions are now considering the implementation of environmental/industrial parks.

The measures outlined above are by no means all inclusive. A detailed study would reveal many more energy conservation measures which would require no new technology, simply wiser application. Incentives, a new energy ethic and education, however, are necessary to implement a major energy conservation program in buildings. □

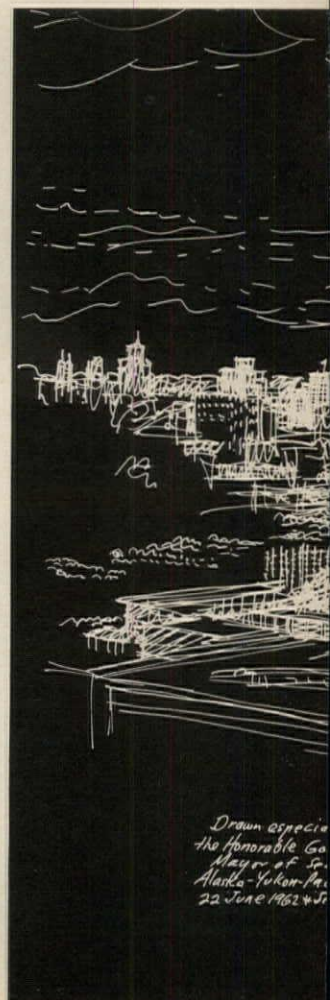
EXISTING SEATTLE CENTER

- | | |
|----------------------------------|---------------------------------|
| 1. Building 1 | 26. Security Guard Office |
| 2. Building 2 | 27. Fun Forest |
| 3. Bandstand | 28. Washington State Building |
| 4. Northwest Square | 29. Plaza Restaurant |
| 5. Playhouse | 30. International Bazaar |
| 6. Exhibition Hall | 31. Coliseum South Court |
| 7. Opera House | 32. Storage Building |
| 8. Display Hall | 33. Sky Ride |
| 9. Arena | 34. Garage |
| 10. Kobe Bell | 35. Storage Building |
| 11. Veterans' Building | 36. Administration Building |
| 12. Olympic Room | 37. Seattle Art Museum Pavilion |
| 13. San Juan Room | 38. Flag Plaza Pavilion |
| 14. Nisqually Room | 39. Food Circus |
| 15. Snoqualmie Room | 40. Monorail |
| 16. Tivoli Garden | 41. Fire Alarm Center |
| 17. International Fountain Mall | 42. Nile Temple |
| 18. Rainier Room | 43. Horiuchi Amphitheater |
| 19. Coliseum North Court | 44. The Lagoon |
| 20. Northwest Craft Center | 45. Space Needle |
| 21. International Fountain | 46. Piccoli Theater |
| 22. Memorial High School Stadium | 47. Cascade Gallery |
| 23. Memorial Plaza | 48. Information Center |
| 24. Coliseum | 49. Pacific Science Center |
| 25. Plaza of States | 50. Fun Circus Building |

Design credits for major projects: 1, 2—Walker & McGough; 5—Kirk, Wallace, McKinley & Associates/Priteca; 6—Kirk, Wallace, McKinley & Associates (exterior remodeling of former Civic Auditorium) and Priteca & Chiarelli (interior remodeling); 9—Kirk, Wallace, McKinley & Associates (remodeling); 20—Paul Thiry; 21—Kazuyuki Matsushita & Hideki Shimizu; 22—Stoddard & Hugard; 24—Paul Thiry (also perimeter exhibit buildings); 26—Schack & Young (former Armory); 27—Roland Terry; 29—Robert Billsbrough Price; 30—Durham, Anderson & Freed (interior remodeling); 33—Tucker & Shields; 34—N. G. Jacobson & Associates/Kirk, Wallace, McKinley & Associates; 37—Paul Thiry; 39—Durham, Anderson & Freed (interior remodeling); 40—Adrian Wilson & Associates (station for Alweg Rapid Transit Systems of Washington State, Inc.); 44—Lawrence Halprin & Associates; 45—John Graham & Co.; 49—Minoru Yamasaki & Associates/Naramore, Bain, Brady & Johanson; 50—Waldron & Dietz.



Sculptural forms and other pieces of art, more than 50 major ones at the present time, have been integrated into the site and the buildings themselves, making the center a virtual living museum.



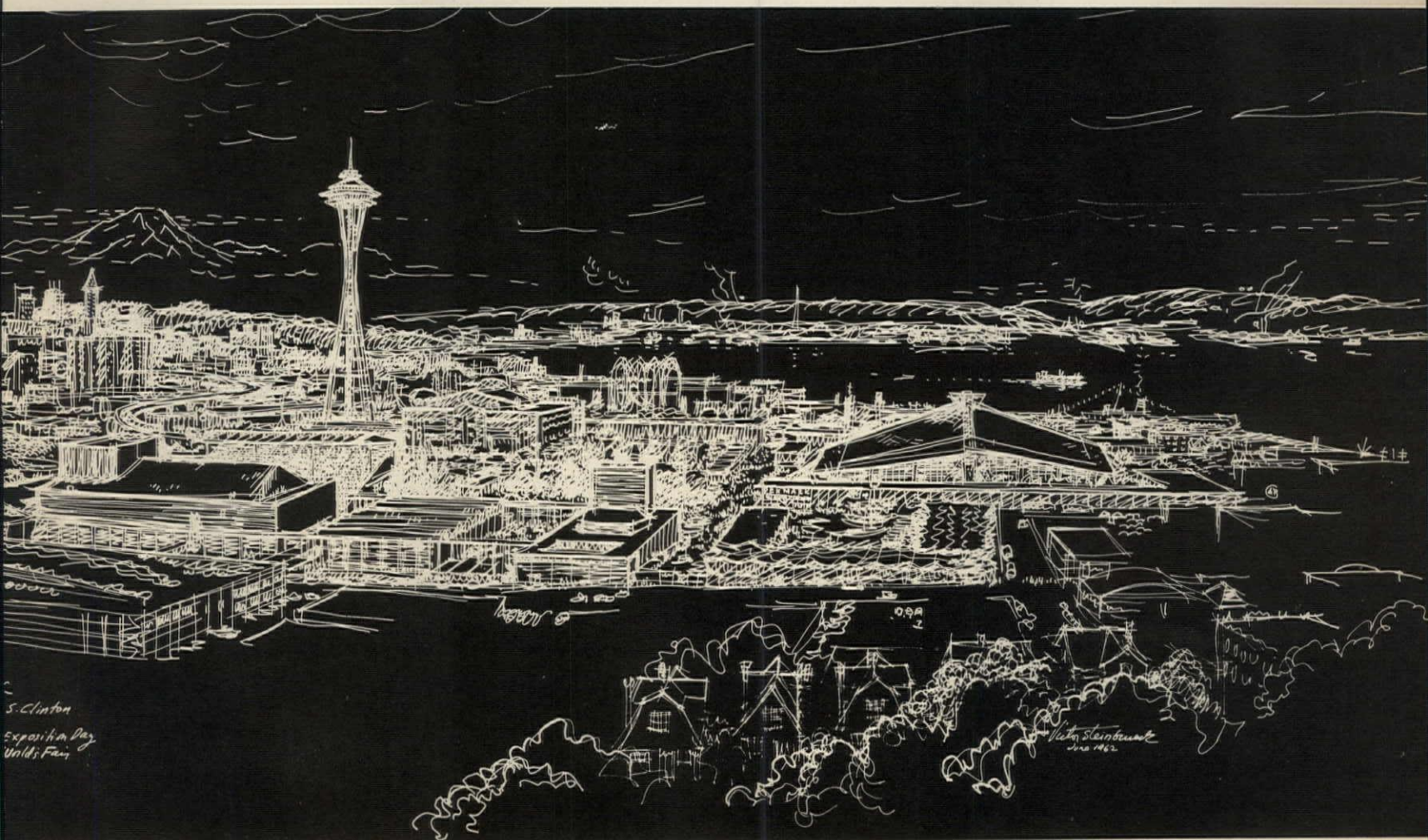
Drawn especially for the Honorable Gov. Mayor of Seattle, Alaska-Yukon-1962
22 June 1962

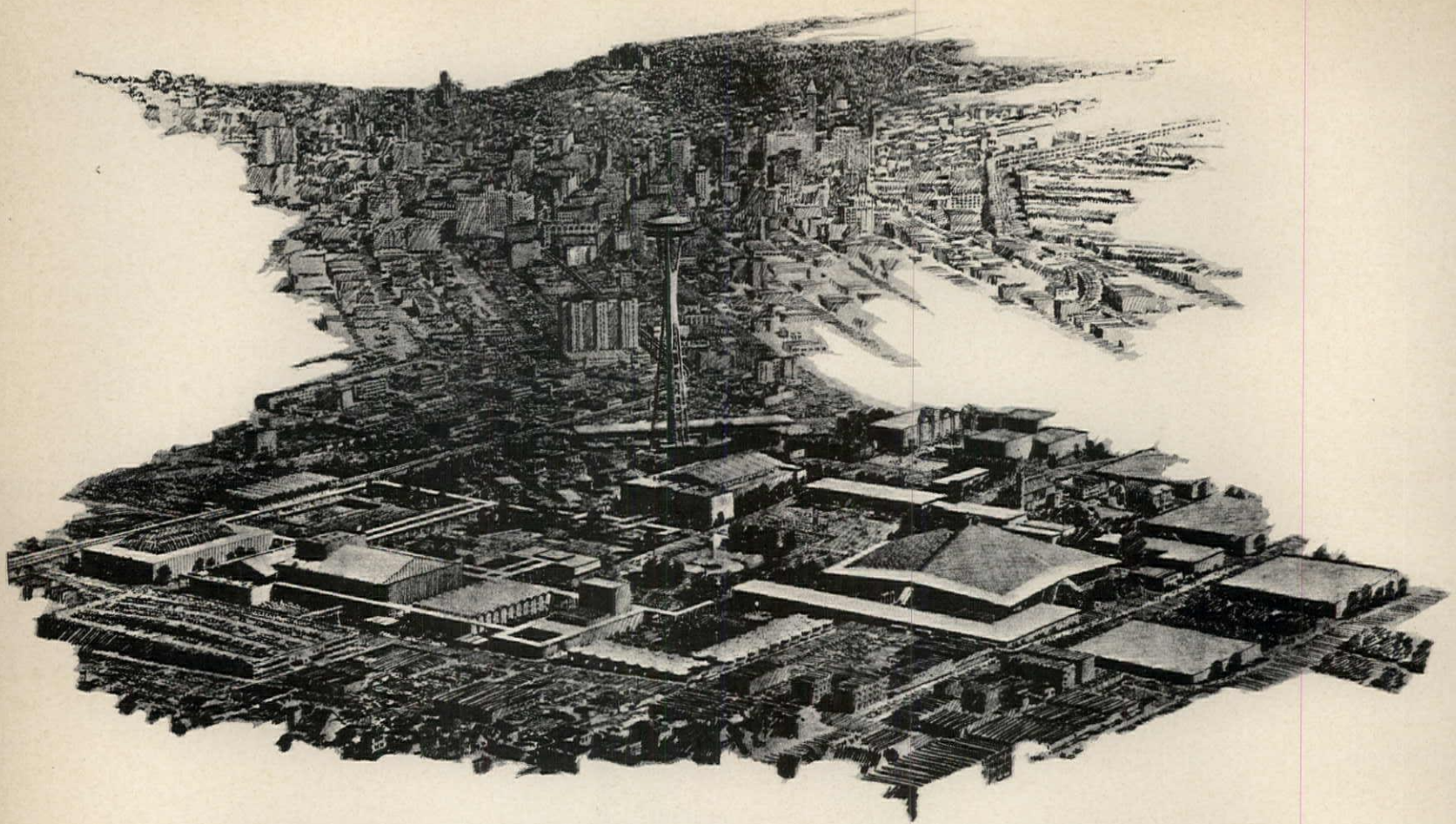
After the Fair Is Over

Termed "The People Place," the Seattle Center is the city's legacy from the 1962 Century 21 Exposition. Unique among facilities of its kind in America, it offers something for everyone, all year long, just a stone's throw from downtown.

The monorail still does its 1.2-mile run from the heart of the Queen City's urban core to the site of Century 21 Exposition, which later was to be known as the Seattle World's Fair. Only today the transit system, perched on T-shaped pylons, carries the passengers to the Seattle Center, a permanent complex that is undoubtedly unexcelled by any other in the United States.

A total of 8.6 million persons visited the center in the last 12-month period; 11.5 million attended the fair from April 21 to October 21 a decade ago. And the numbers keep growing, for the activities range from opera to basketball to amusement rides to trade shows. More important, many of the attractions are free to the public. A case in point is the annual summer festival during which a weekend is given over to events and ex-





The guide to future development, as envisioned by Paul Thiry at the end of the World's Fair, indicates that certain buildings will be added while others will be demolished.

As the monorail bends its way from downtown to the center site in the upper left hand corner, it overlooks the amusement area, one of five "worlds" which were originally conceived for Century 21 Exposition.



hibits of interest to every taste, covering the entire center grounds now lush with landscaping and plenty of open space to boot.

Before the exposition opened, it was pooh-poohed by some critics because of its size—74 acres. Small, indeed, as world fairs go. But maximum utilization had been made of the site, which was divided into five "worlds": Century 21 (theme building); science; commerce and industry; art; and entertainment, all connected by a network of walkways, streets and plazas. Beyond that, the fair provided for 400,000 square feet of exhibit space in permanent buildings as part of the long-range plan.

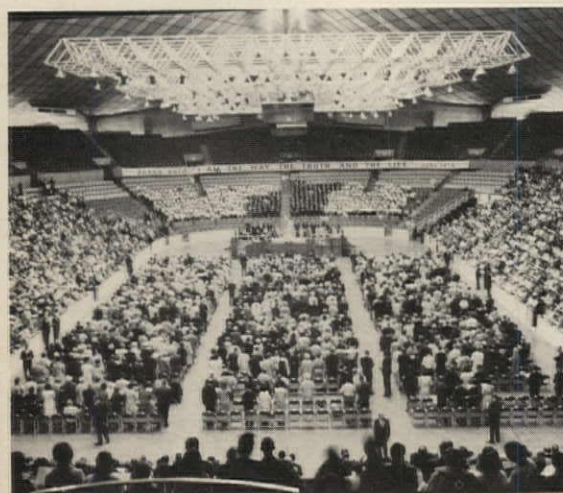
In 1956 the citizens of Seattle voted a bond issue to finance the acquisition of land, the construction of a convention/concert hall and playhouse and the general development of a

civic center at its present site. With this as a beginning, the planners of Century 21 Exposition, headed by Paul Thiry, FAIA, as primary architect and his consultants (James B. Notkin, mechanical engineer; Beverly A. Travis, electrical engineer; O. E. Ohmdahl, landscape architect) got to work, following guidelines that had been established by the Civic Center Advisory Committee.

Finally, in the closing days of the fair, the City Council adopted recommendations encompassed in the Seattle Center "total plan," concerning itself with the purposes of the buildings, both temporary and permanent; open space use; parking and traffic logistics; and construction needs. As a result of the combined efforts of the government at all levels—city, county, state and federal—at the close of the exposition, Seattle possessed buildings and grounds which exceeded expectations.



The space use theory is to reveal the interiors of the site as a series of experiences, with controlled vistas in many directions. Thus the element of surprise and intimacy is possible as well as grandness and massive scales.



The Coliseum (far left), with a seating capacity of 15,000, can be converted to a three-acre show, providing 129,000 square feet of space under one roof. The Opera House, holding up to 3,075 persons, can accommodate all of the performing arts.

Meanwhile, criteria set forth in the total plan were, and still are (under direction of the architectural firm of The Richardson Associates), being executed to express the goals and aspirations of the citizenry. Among the objectives:

- The planning and development of the Seattle Center must take into consideration the surrounding area and its relationship to the downtown business district.
- The design should continue the sensitive use of the topography by providing differences in levels, sunken plazas, concealed parking areas, raised terraces and covered walks.
- A specific amusement park for children should be promoted in a landscaped setting, similar to some of the European parks.
- The center should be planned in such a way that the new stages of development will become an integral part of the total plan being recommended.

As far back as 1966 The American Institute of Architects recognized the successful creation of the civic center for cultural, sports and recreational activities by awarding the city a Citation for Excellence in Community Architecture. The jury which made the selection called the Seattle Center "more than 'just a fair,' the total design and rebuilding of a significant segment of the city—a well-executed concept, conserved and adapted into a permanent asset."

Writing in the April 1962 issue of *Architecture/West*, Thiry made these predictions:

"World fairs, stimuli for new ideas and for probing the future, are places of education, wonderment, excitement and amusement. They invariably indicate the trends of the time. The fairs of Chicago, New York and San Francisco are things of the past. It is sad to read in the daily press: 'Atomium last signs of Brussels Fair.' This last vast exploitation of effort has vanished with no more than a memory and a remnant to recall its existence.

"From this we may conclude that ideas once accomplished are no longer new," the primary architect continued. "But by the same token, we can wonder whether accomplishments need disappear entirely. In contrast, Century 21 Exposition is designed not only for the excitement of the moment, but also many of its structures and facilities are planned as a permanent adjunct to a projected Seattle Center of lasting significance. The termination of Century 21 Exposition will mark a beginning. The Seattle World's Fair is a phoenix among fairs, for from it will emerge a new phenomenon of plazas and buildings destined to provide pleasure not only for present but also for future generations."

His words have indeed come true. ROBERT E. KOEHLER

When Computers Assume Building Operations

by JOHN L. KMETZO

Over the past 10 years or so building automation—or centralized control of a building from a single operator's console—has gained wide acceptance. During the same period computer technology has advanced through several generations to the point where a minicomputer is just another component to be incorporated into a technological product. What the interaction between these two trends means to building design and operation today and in a future of limited energy sources is described here.

Adjustment of a room's wall thermostat is internal environmental control in its simplest and most common form. The thermostat establishes and maintains new conditions by acting through an individual control subsystem associated with the particular air-conditioning unit serving the user and the surrounding spaces.

Although the occupant has this limited control over the end product delivered to him, efficient operation of all these systems depends upon many other variables such as the percent of outdoor air mixed with recycled air, the temperature and amount of chilled water used to cool and dehumidify the air, and the use of heating mediums such as steam, hot water and electric energy. These other variables associated with each system must be monitored and adjusted by a building's operations personnel.

Central control consoles, with sensing and actuating elements attached to the individual remote control systems, enable one operator constantly to supervise operation of the many scattered systems and equipment packages in the building. The operator can:

- start and stop equipment
- read and automatically record temperature, humidity and flow conditions
- reset the devices controlling these conditions
- receive and acknowledge alarms
- communicate with maintenance personnel at the equipment locations.

The chief requirement for the incorporation of a centralized control system is several hundred square feet of comfort-conditioned space for the operator's office containing the central console and computer. Conduit and remote equipment requirements are negligible compared to provisions that must be made for other mechanical and electrical equipment.

The techniques mentioned can be applied without the use of computers. Even basic noncomputerized installations offer advantages; these have been demonstrated in systems which have proved themselves in practice in buildings 10 to 20 years old.

The most apparent operational improvement is a substantial savings in manpower, mainly through the elimination of daily tours for the startup and shutdown of mechanical systems and the elimination of manual logging tours. Centralization of these two activities at the console, where one operator has a concise

picture of the entire operation and can control all necessary functions, typically reduces manpower requirements for these tasks by approximately three to four men per million square feet in a large office building.

Another operational improvement, though not as easily measured as the manpower savings, can be equally important. At a central control console, the operator has at his fingertips all the operational data that he needs for just about any building adjustment that can improve performance and conserve energy. In a nonautomated system, there would seldom be the manpower available to take series of readings throughout the building, analyze them and, based on the results, make manual adjustments in the system before the dynamic response of the building had invalidated the results. Consequently, nonautomated buildings are often uneconomical in terms of energy consumption. Without the data described, various random adjustments are made for individual occupants' comfort, which eventually results in the entire system being thrown out of balance.

There has been an upsurge of interest recently in applying the centralization concept to security functions which protect buildings, their contents and the occupants. The same technology can be used for both environmental and security applications, where the final sensors are designed to detect and control:

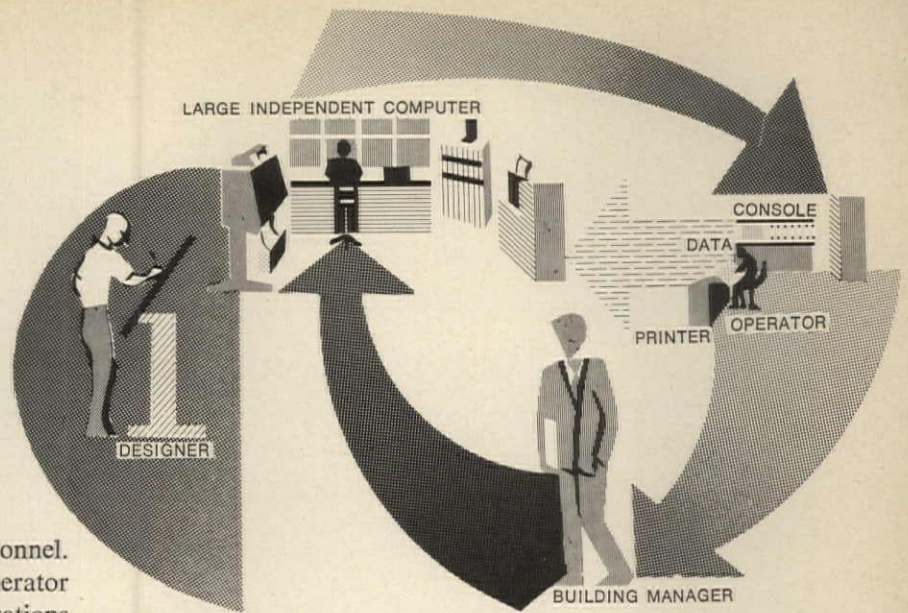
- door ingress and egress
- guard tour scheduling and reporting
- fire detection, reporting and evacuation
- perimeter and area intrusion protection
- security for selected objects.

One reason for the incorporation of computers into centralized building systems was that they offered a simpler and more economic solution to certain design problems of the basic systems. As the cost of computers came down, it was found that it was more economical to use them in large installations to replace a number of individual components that would otherwise have been required. The system's functional performance remained the same.

Regardless of how the basic system functions were implemented, it was also found that, even as peripheral adjunct, the computer could enhance basic operating objectives. The arithmetic computation abilities of the computers were used, for example, to perform calculations of flow and energy transfer data. Since central calculation eliminated the need for computational devices at each metering point, saving the cost of 10 to 20 of these devices was in itself often enough to justify the added cost of a computer.

The computer is also playing an important role in simplify-

Mr. Kmetzo, PE, heads a group concerned with automation at the consulting engineering firm of Syska & Hennessy in New York City.



Optimization programming procedure. The building computer is initially programmed on the basis of the best knowledge available. This programming should be simple, with the bulk of the control being monitored and performed by the operator. This guards against faults which may cause major disruptions of the systems and allows the operators to familiarize themselves thoroughly with system operations. Information is received from the systems monitored by means of console indicators, the printed log and a punched tape. This information, combined with the operator's observations and suggestions and known optimization techniques, forms the basis for more extensive programming of the computer. It takes about two years to reach a state of advanced optimization, when programming efforts can be reduced or eliminated.

efficiency. This, finally, reduces the load on fuel and public utility energy sources.

2. Improved maintenance procedures, including automatic recording and equalization of running time on individual units, calculation of input/output efficiencies to detect poorly operating units, and automatic modification of operations during after-hours cleanup periods. A computer's ability to print out instructions is especially useful in these applications.

3. Improved administrative procedures, such as automatic recording and billing of building utilities plant output information for tenants and automatic recording of conditions requiring corrective action.

Successful implementation of optimization procedures can occur only if the required programming has been properly and thoroughly specified. Definition of these programming requirements should be based upon detailed analysis of building subsystem design characteristics, energy cost structure and prevalent climatological conditions.

Computers are already in architects' and consulting engineers' offices to assist in the design of buildings. Even if a small firm cannot maintain a computer and develop programming on its own, such services are available. Our firm has a subsidiary, S & H Information Systems, Inc., whose computer we have used to apply the "experimentation before commitment" concept described by Peter D. Nairn in "Architects: The Rip Van Winkles of the Electronic Age?" (AIA JOURNAL, Feb. '71).

Thus a preliminary simulation and study of programs that will eventually be incorporated into a building's computer is performed on the designer's computer. This study must include the following steps:

1. Determination of the building owner's anticipated operating procedures in areas such as staffing, equipment maintenance and after-hours operation.

2. Definition of all programming tasks that initially appear to

ing console operation for inexperienced or less skilled personnel. Its superior ability to acquire, sort and clearly arrange operator information greatly reduces erroneous operator interpretations and responses. Furthermore, data on any changes in building design or operation can be logically incorporated with previous information.

Two of the most recent developments in centralized control illustrate the growing impact that computer technology will have on all future installations. The first is a product line that, as previously discussed for larger systems, incorporates a specially designed computer as an integral part of even small building installations. In addition to the advantages described elsewhere, one newly conceived function performed by the computer is worth noting. Besides supervision and control of the building's mechanical, electrical and security functions, the monitoring system supervises itself to self-diagnose trouble at remote locations, bypass the defective location and continue uninterrupted operation for the remaining active locations.

The other development is not a new idea but one whose time has come because it can now be implemented using computer-based technology. It is a subscriber service that operates over telephone lines from a location remote from the subscribers' buildings. It offers extensive monitoring and control of mechanical and electrical equipment in addition to the limited fire and burglary alarms connected in the past. With this approach, many small subscribers will be able to share the cost of a relatively large computer at a central station.

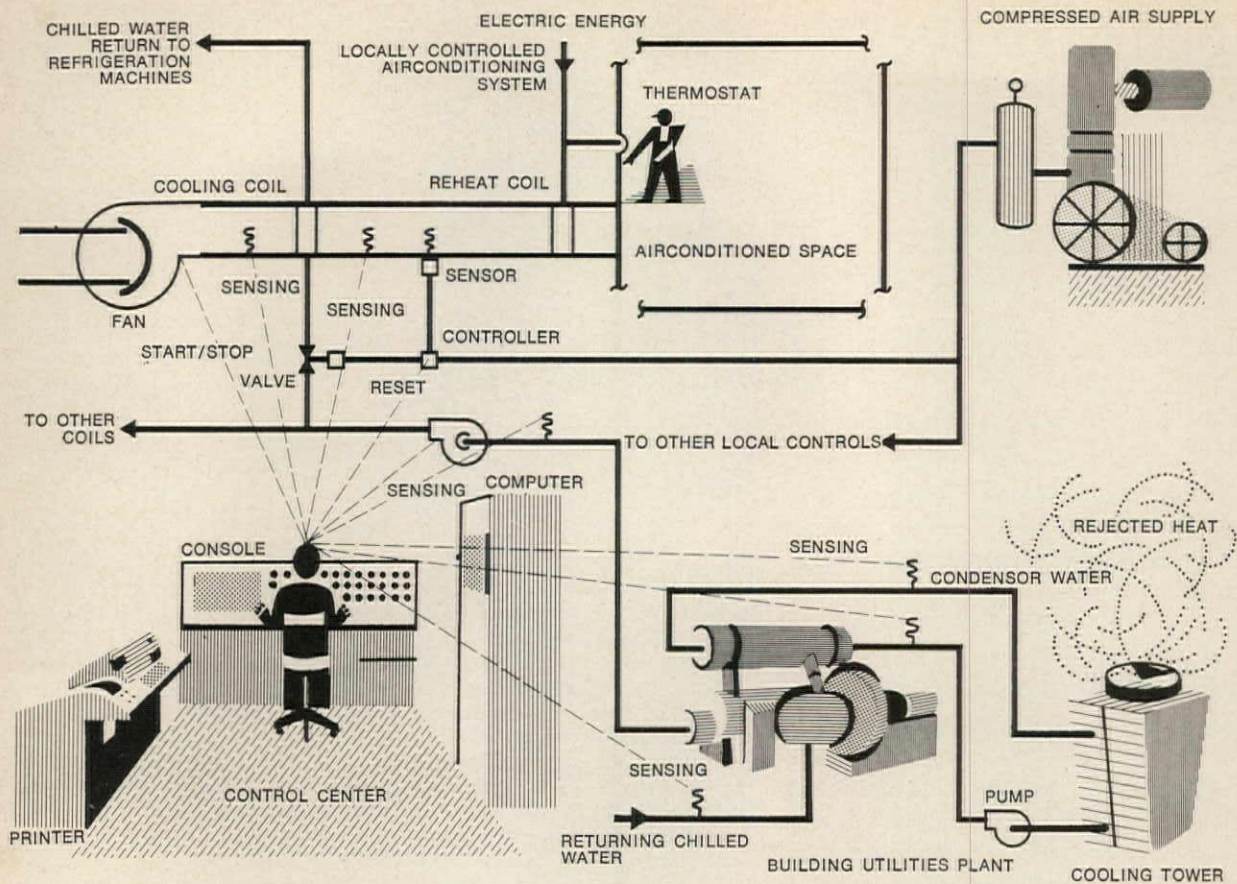
The computer has other unique capabilities. It can be programmed so that the building operating systems are automatically optimized, thus conserving energy and improving maintenance and administrative procedures.

Automatic optimization is an extension of the previously mentioned operating improvements that an experienced operator is able to initiate. In a large building complex even the most efficient operator cannot perform on a continuous and systematic basis all of the tasks necessary for optimum building operation.

Generally speaking, the optimization tasks now being assumed by computers include:

1. Conservation of energy by optimum selection, loading and start/stop time determination of individual subsystems. This is based in part on direct calculation of thermal loads by the computer, using flow and temperature information gathered by sensors located both in the building utilities plant and in the locally controlled systems served by it.

Energy conservation is a three-tiered process that eventually lessens environmental pollution. First, and most important, the demands of the individual building subsystems upon the building utilities plant are reduced. Then, given these reduced demands, the operation of the building plant can be tuned up for maximum



Simplified view of the major components for local control, centralized monitoring and control, and energy exchange in a typical airconditioned building. Cooling and dehumidification of the air is accomplished by passing air over a coil containing chilled water. The valve which regulates the water flow, and hence the discharge air temperature, is controlled by local components which derive their operating energy from a common compressed air supply. Using a thermostat, the occupant adds heat to the air to satisfy conditions for his particular space. Chilled water is supplied from a building utilities plant which may use electrical, steam or gas energy to extract heat and maintain the temperature of the water supplied to the coils. Both the heat added to the air and the energy producing the chilled water must, in turn, be derived from public utility or stored fuel sources. As shown by the dashed lines, a control center can start and stop equipment, sense operating variables and reset controller set points. Actual controlling, however, is done within local systems.

have potential for energy conservation and improvement of operating procedures.

3. Simulation of building operation under control of each proposed program. The simulation should include:

- Building response to various weather conditions at other than peak loads. This information is obtained as a byproduct of programs used to design the building subsystems.
- Reduction of a year's detailed local weather data to determine the extent of occurrence of conditions under which the proposed programs could operate.

4. Determination of the overall characteristics of the major building utility plant equipment.

5. Determination of the energy cost structure.

6. Calculation of the operating savings associated with each proposed program, selection of the most effective programs, and rejection of proposed programs that are ineffective.

After installation, the programming must be updated during the first few seasons of operation to incorporate observed characteristics of building behavior and refinements in operating, maintenance and administrative procedures. The building operator's role is particularly important at this stage since he becomes, in effect, a designer/programmer in helping to acquire the data.

The above has concentrated on applications to mechanical and electrical equipment. It should be noted that, because more human judgment must be applied on a case-by-case basis, applications of programming to security functions have generally been limited to alarm instructions and watch-tour scheduling.

Several future applications of computers in buildings can be foreseen. One affects equipment design and is an extension of the practice of eliminating local recording and indicating devices, which will eventually eliminate local pneumatically operated controllers and sensors. This is known as Direct Digital Control (DDC) since sensing and control information is exchanged directly with the control center's computer. It will eliminate a large number of local control devices and provide substantial savings in capital investment, but its adoption has been delayed by the realization that all the control eggs would then be in one basket and that the continuing reliability of centralized control must first be conclusively demonstrated.

Another development is pending whereby existing methods are applied to newly identified problems concerned with fire protection. Not only can alarm from smoke and heat detection devices be incorporated, but responses requiring the operation of selected fans and dampers for smoke purging and heat ventilating purposes can also be implemented. While limited response can be obtained through direct local interlocking of detectors with fans and dampers, much greater flexibility can be achieved through central programming of varied responses specific to particular situations. Development of this concept awaits changes in the thinking behind local fire codes and regulations.

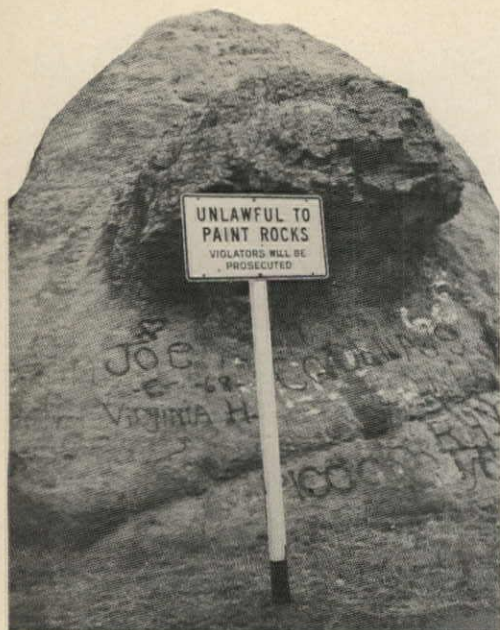
Finally, knowledge of building operation and behavior gained by the building computer in refining its programs will find its way back into the design office's computer. Better and more efficient initial building design will be the ultimate result. □

PEOPLES ART

by ROBERT SOMMER



Black pride murals on Boston's South Side illustrate themes denied expression in neighborhood architecture; the artwork personalizes space.



Even when users are consulted beforehand, the design of a structure or neighborhood may not allow for user inputs afterward. While this may be appropriate for a monument, it is unsuitable for designs which are supposed to fit people's needs and to support their activities. Inevitably, people will attempt to have some control over their environments. Like grass growing through cement, marks of individuals or groups will break through. Officials in several cities have permitted people to express their identities and have endorsed street art and people's parks.

People's art is a generic term which refers to the beautification or improvement of public spaces without the official sanction of the space owner or manager. It brings into focus important issues in environmental decision making, such as professionalism, neighborhood control, property rights and the nature of art and architecture. Examples of people's art include vacant lots converted into playgrounds by neighborhood residents; fences around construction sites which have become graffiti galleries; people's gardens and people's trees; junk sculpture along the roadway; and driftwood sculptures along the shoreline. Its scale ranges from the couplet on a toilet wall to the six-story murals found on Boston's South Side.

The hallmarks of people's art are anonymity, fluidity and neighborhood identification. Most often the identity of the artist is unknown and has become a matter of local folklore. Those who created such art have left the driftwood sculpture of the Emeryville mud flats unlabeled and unsigned. They differ from those who paint rocks along public roads and seem interested mainly in letting the world know who they are, where they come from and to which team or gang they belong. The anonymity of the driftwood sculpture indicates respect for the setting and the materials—the stillness and ugliness of the eastern shoreline of San Francisco Bay—raped by industry and freeways alike.

These productions have a fluid quality lacking in formally designed elements. The people's parks that have sprung up in various cities are constantly changing. When I visited People's Park in Minneapolis, built by residents of Dinkytown as a protest against a drive-in restaurant which would have changed the character of their neighborhood, it contained a large cross in memory of the students killed at Kent State University. The decentralized and heterogeneous layout of people's parks invites a user to add his own flower patch or bench or sculpture. When someone writes a poem and it is published in a magazine, the matter ends there. But when someone writes a poem on a construction fence, he expects others to add to it.

Direct user inputs usually incorporate existing features of the landscape and employ local materials. The People's Park Annex in Berkeley, California, located on the several lots owned by the Bay Area Rapid Transit and developed with their grudging permission, uses several car seats for benches, a discarded box spring as a trampoline and old tires as swing seats. User-gener-

ated designs also tend to express neighborhood values denied expression through established channels and media. C. M. Deasy, FAIA, reported in the article "When Architects Consult People" in the March 1970 issue of *Psychology Today* that the most striking feature of the main walk at California State College at Los Angeles was the gaily painted construction barricade around the new library site. Every inch was covered with fraternity promotions, political philosophies, student wit, avant-garde art and personal pronouncements of timeless love. When he drew up development plans for the college, Deasy recommended that this opportunity for self-expression be preserved.

Formal art, generally a product of an artist's studio, tends



If the writer wants to leave a territorial marker rather than making a setting more attractive, it's vandalism (top left and above). More indicative of user-generated design is the anonymous graffiti displayed on a construction fence at the University of Calgary (bottom).



The creator of the unsigned driftwood sculpture on the Emeryville, California, mud flats has a respect both for materials and the site.



Chicano murals at Casa de la Raza High School in Berkeley, California, provide a means of self-expression, making a drab fence colorful.

to ignore features of the landscape. The large mural in the Sacramento State College cafeteria, for example, has an Aztec theme. The painting ignores the thermostat hanging on the wall; it simply remains suspended between two natives. A people's artist would probably have made the thermostat into a lady's breast or into a piece of fruit. The most creative graffiti embody and emphasize the existing features of the landscape. The cat faces along the cement embankment of the Los Angeles River use the hinges of the storm drain outlet covers as the cats' ears.

Since it embodies features of the natural landscape, people's art is ever-changing and ephemeral. There is always something new to see. On the sewer covers along the Los Angeles River, new cat faces appear as old cats fade away.

Although the nude pink lady painted over the tunnel entrance in Malibu, California, and the Berkeley People's Park became divisive local issues, innumerable incidents of neighborhood residents taking over undeveloped land for ballfields, footpaths or gardens occur without visible repercussions. User-directed environmental changes raise the question of whether it is possible to distinguish between people's art and vandalism. The issue is raised by authorities who consider such changes as steps toward anarchy and invitations to environmental degradation. Is it possible to distinguish between a person decorating a dead tree stump neighborhood and a person carving "C.K. loves Z.B." on a tree in a state park? Both acts represent the utilization of public space for private self-expression and communication with others, but the intent of the two persons is different. Hopefully the tree painter desired to brighten the cityscape and to counteract the drabness and ugliness of his surroundings. The tree carver did not express the anonymity of the true people's artist; his message, although accessible to any finder, was probably directed specifically to his girl friend. The artist's intention to beautify the landscape is what primarily differentiates people's art from vandalism and environmental desecration. Although subjective, the artist's intention is probably the best criterion for testing people's art. The boy who sprays a peace sign on the school wall or who chucks the name of his gang on a building is trying to communicate something to others and to express something within himself, but he is not specifically intent on beautifying or improving the environment.

Because these take-overs of public spaces are illegal, they

are usually performed at odd hours by an underground group or by an individual. The tenants of a housing project in Gladsaxe, Denmark, put together a playground in separate parts over a period of several days before they assembled it at 3 o'clock one morning. They guarded it the following day so it would not be destroyed by the authorities. The playground's popularity finally forced the Gladsaxe bureaucracy to accept it. At Cornell University the Plant Science Building was "attacked" by the Guerrilla Graphics Group which painted brightly colored designs in hallways and corridors. The secrecy involved in such activities necessarily means imperfect democratic decision making. There is no possibility of polling all the occupants of a housing project or of a university about the sort of playground or murals they want because of the risk that authorities would quash the venture before it begins. It is much easier to defend a playground or neighborhood park once it is completed than during the beginning stages. People's gardens and murals cannot be considered the pinnacle of democratic decision making; rather, they demonstrate the failure of the decision-making processes in the larger society to take into account the interests of some user groups.

The need for creative expression found in people's art will emerge sooner or later. Recognizing this, the authorities may attempt to co-opt and channel it. It is already possible to buy fibertip marking pens in order to say, according to the manufacturer's advertisement, "All the things you have always wanted to say"; graffiti wallpaper for the bathroom; and postcards and posters printed complete with cute graffiti comments. At Expo '70 in Osaka, Japan, a wall corner was set apart for scribblers and graffiti fans; anthologies of graffiti are published periodically; and a syndicated newspaper column of one-line graffiti is used as a space filler by many newspapers.

Commercial operators look upon these direct user-generated forms as indications of a potential market for new products. These efforts at legitimization show a dynamic quality in American society to co-opt and incorporate new social forms and thereby channel them. Providing artists with a legitimate chance for self-expression within the larger system, yet benefiting commercial operators at the same time, increases the diversity of options within the society and also permits the self-expression, personalization and urge for beauty which are involved in people's art. Public officials in several cities have taken the cue and have tried

to obtain civic support for street decorations and public gardens. David Bromberg, a young urban planner in New York City, persuaded landlords to let artists paint murals on building facades at nine different locations. It cost about \$4,000 to paint each wall, the money having been secured from the Kaplan Foundation and from the New York City Department of Public Affairs. The Museum of Modern Art conducted an exhibit of color slides of those murals. The private developer of the Cedar-Riverside district of Minneapolis gave permission to a young dental student to paint murals and supergraphics on various buildings and wall surfaces in order to brighten a drab and rather faceless commercial/residential district.

The authorities may also want to channel the direct expression of users in order to keep down maintenance problems. The librarian of the Widener Library at Harvard University placed pads of blank newsprint paper in the elevator, hoping thus to protect the walls from graffiti. Unfortunately, the artists would not accept the pads; they threw them down the elevator shaft. Giovanni's Pizza Parlor in Berkeley, California, provides a blackboard and chalk in the men's room. Construction firms have designated some of their barricades as legitimate graffiti galleries. A number of colleges regularly tack "graffiti boards" in dormitory corridors and student union buildings.

Perhaps it is the invitational character of people's art that makes it seem so threatening to public order. If not controlled or channeled, it would create a society of people changing the environment around them instead of tuning out. Even lampposts, trash receptacles and litter-laden streets would become alive with possibilities, full of potential for beauty and personal expression. The passerby might be moved to repaint the trash can, hang a mobile from the lamppost and create junk sculpture from the litter for esthetic reasons.

User-generated design flourishes in times of social upheaval. During the tortured spring of 1970, the Architecture Building of the University of California, Berkeley, became virtually a graffiti gallery—posters, slogans and sign-up sheets everywhere; the students at the University of Connecticut occupied the ROTC building and decorated it with green, blue, yellow, orange and pink psychedelic designs; and Yale University students, protesting the trial of the Black Panthers, occupied the first three floors of the burned-out Arts and Architecture Building and decorated the central space with guerrilla graphics. While the authorities may view these manifestations of direct user involvement in environmental change as threats to the status quo, one can also see them as the emergence of new social and architectural forms. Guerrilla theater, with its emphasis on participation and spontaneity, attempts to break down the distinction between actor and onlooker



Landscape architectural students create an illegal mural to adorn a monotonous wall in Wurster Hall, University of California, Berkeley.

by bringing plays into the streets, where the neighborhood becomes the stage and the local people the actors.

People's art raises important issues concerning the amount of user participation that is necessary for an acceptable quality of life. Living in an apartment, a child (or adult) will never have the opportunity to plant a tree, to see it grow taller than himself and to stand under its branches and realize that he played a part in its growth. City dwellers not only need parks in which to walk, to picnic and to sit under trees, they also need places where they can actually create parks and plant trees.

Man must be more than a consumer, even a tasteful one, of other people's products. According to psychiatrist Matt DuMont, "The extent to which a person can influence his environment will determine his ability to perceive himself as a separate human being." An account of the Berkeley People's Park stated that the park's importance to the young street people was not simply its status as a park or its location but the fact that it was an outgrowth of their own labor and decision making. The park was something they had created and something in which they had a voice, not something that was created for them. To be fully human means to create as well as to choose, to make things beautiful as well as to admire beauty.

Some architects will go so far as to select a client's dishes, silverware and ashtrays, and some interior designers will prescribe desk sizes, chair styles and the model desk calendars to be used in an office. A passive client may try to live up to the designer's expectations and to shape himself to fit the building; the probable result, however, will be individual and corporate subversion of the designer's plans after occupancy. A vice president may requisition a chair that suits his frame more than the décor, calendars and charts will go up over the glass partitions to



California authorities complain that the sculptures on the Emeryville mud flats are a constant distraction to drivers on the nearby freeway.



This street mural along Telegraph Avenue in Berkeley, California, ingeniously integrates a telephone lead-in into the head of a vulture.

give the occupants a sense of privacy and pictures of children and wives will appear on the desks, despite company regulations to the contrary.

The solution is not to eliminate planning but to plan for freedom. However creative and comprehensive, a master plan should give the opportunity to individual consumers to exercise options in creating environments that suit their unique needs. A man has to win a battle somewhere. If his office location, desk size and draperies are selected for him, he should at least be able to choose his own chair. This may not seem important to the designer, but it is important to the occupant and is necessary for effective use of space. Designs should not be so tight and confining that they preclude acts of spontaneous individual creation. Not only individual needs but also rapid technological changes indicate the value of a *loose fit* between form and function—the designer's concept of what a person's world should be and how it is designed. There must be elbowroom and footroom in designs to give people a place to be creative forces in their environment rather than components of a design scheme. Good planning allows for this freedom and, in fact, encourages it. Personalization does not detract from a good overall plan but enhances it. One sees not only a beautiful office layout or neighborhood plan but also creative and active people who feel an organic connection with an environment which permits them to create as well as to coexist and to adapt.

These user-generated designs can be seen as a reaction against unresponsive and unmoving institutions. The people who built People's Park in Berkeley had attempted to get official approval to convert the littered and vacant area into a park. When they were stymied by delays and denials, they took direct action. Many of the illegal murals and guerrilla graphics on college

campuses were created only after a long frustrating bout with officialdom. This sort of direct action in the face of unresponsive institutions has the tempting quality of moving quickly to the heart of the issue. Unfortunately, shortcut politics has its own problems—frequently making the threat to public order the number one issue—but it does have its appeal, particularly to young people. To paraphrase John Locke, when conditions are intolerable, you take things into your own hands, and if God is on your side, then you win. To officials, the expression *power to the people* produces the image of a faceless and thoughtless mob following the leader with the catchiest slogan or the loudest bull-horn. The actual meaning of the slogan, however, depends upon the sort of power one is discussing and how it is to be exercised. The statement that people should have a share in making decisions that affect them does not have the same threatening connotations.

In order to find a solution to people's parks and graffiti, one must go beyond seeing the artwork itself as the problem. These direct user inputs are a visible manifestation of needs for creative activity, self-expression, the desire to personalize space and the expression of certain esthetic or social values. When there is a *problem*, it usually involves the reaction of other people to the artwork. They may be offended by what has been written or painted. In spite of scatological and infantile comments on some toilet walls, offense to the sensibilities of the observer does not seem a major issue. The nude human form has always been a favorite subject among artists, and people's artists are no exception. Although some persons believe that paintings or sculptures of nudes belong in museums, others argue that some of the best tavern art and garden sculptures involve the sympathetic portrayal of the nude female form. For the most part, it is not the content of the people's art that offends but the feeling that public space has been wrongfully used for this purpose.

Western culture has frequently viewed the expression of creative impulses as a threat to the established social order. The ideal society should involve an inevitable and necessary state of



The murals on Boston's South Side are prime examples of people's art, beautifying the neighborhood and giving expression to group identity.



The hallway in the math building at the University of California, Berkeley, may be less drab, but a \$400 cleaning bill was sent to the professor who helped students paint it.

dynamic tension between free expression on the one hand and social order on the other. If one person's actions infringe upon the rights of his neighbors, these actions must be questioned. When such discussion (and tension) is absent, it means that the social order is stagnant, or that people are so turned off to one another that they don't care what goes on around them. Berkeley authorities tolerated an empty litter-strewn field for several years; yet as soon as local residents planted trees and flowers and converted it into a park, police were called in. Clearly, the issue was the threat to public order. Our democratic society can and must be constructed in such a way that it permits the expression of the impulses seen in people's art. Users of the environment must be more than consumers; they must be creators and participants in decisions that affect them.

The questions concerning the extent of this participation, when it will occur, who will be involved and how the decisions will be enforced, can be resolved only on a local level. Students in a dormitory could be given the authority to decorate their hallways, stairwells, lounges and the cafeteria. The décor of the classrooms and academic buildings might be the responsibility of the art department and an appropriate committee of building users. A different procedure might be developed for a neighborhood in the central city. A group of local residents might be elected to establish control over all aspects of the visual environment. Sign ordinances, the color and style of light fixtures, hydrants and bill-

Dr. Sommer, author of several books including *Personal Spaces*, is chairman of the Department of Psychology, University of California at Davis. The present article is adapted from his book *Design Awareness*, published this year by Rinehart Press, Corte Madera, California, and used with its permission.

boards would be under their auspices. Why should all light fixtures be dark green or gray, particularly if the neighborhood residents prefer warm colors?

Describing the vest-pocket parks built with the assistance of community residents, former New York City Park Commissioner Thomas Hoving admitted that, by middle class standards, they were neither spotless nor elegant. However, the neighborhood residents generally liked them, vandalism was negligible and they were a vast improvement over the filth and rubble which had been there before. Whereas the present system encourages visual anarchy, community control might bring some order on the basis of neighborhood values. The sides of buildings would be public property just as the air space along freeways can be kept unobstructed by state or local laws. A neighborhood might decree that no advertising could be painted on the sides of buildings or it might encourage murals or mosaics expressing local values.

One can imagine a local council publicizing the proposal for a mural, advertising it in the local paper and leaving a scale model or drawings of it on the site with ample space left for people's comments. If the mural turns out to be an acknowledged failure, the solution would be to get another group to paint a better one. One can foresee neighborhood corporations or community councils with jurisdiction over environmental issues. There are playgrounds in Scandinavia where the children elect their own mayor and councilmen from among those using the playground. Special committees are charged with maintenance, sports, animal care and parties. The original adventure playground at Emdrup, near Copenhagen, received a number of obsolete telephones, and the children installed them in their self-made playhouses. When funds and materials for the playground were in short supply, the children collected and sold old newspapers and scrap materials and staged theater performances to raise money. It was their playground and they worked to keep it. The goal of neighborhood involvement in such issues is a more humane and fitting environment. As the designer shifts his role to working with community groups rather than doing things for them, he will find that he learns almost as much from his clients as he is able to teach them.

I would like to add a final note of caution concerning the dangers in romanticizing people's art. It is neither better nor worse art than that created through legitimate channels. The People's Parks in Berkeley and Minneapolis had an interesting variegated quality that is lacking in most official parks, but I would not describe them as beautiful or stately. Some poems on toilet walls are highly creative, but most of them range from mediocre to terrible. I heard an excellent talk by scientist David Lowenthal on "The Environmental Crusade: Ideals and Realities," in which he expressed some harsh thoughts about people who expect instant solutions to complex problems. As he put it, "Oversimplification leads to extinction both in nature and in human society." I must confess to some misgivings about the heated rhetoric that surrounded the people's parks. This should not obscure, however, the important issues in user-generated and user-maintained designs. Most American cities could benefit from the experience of Amsterdam with its people's gardens along the railroad tracks and canal banks. These neat flower-rimmed plots are a far cry from the litter-strewn open sewers along the railroad tracks into New York City. If people were allowed to use the land, it could be no worse but no doubt better. □

"It may be that there are still some architects able to make a living from building follies for rich men, but for most designers contemporary building is a question of satisfying urgent social and operational requirements within severe economic constraints," comments the Royal Institution of Chartered Surveyors in one of its publications.

Although American architects have the technical means of achieving architectural ends, one must look in other directions, it is stated, to explain the difficulties which attend the execution of social building in the United States. The RICS identifies two significant areas: the definition of social needs and the system of economic control of investment. It is conceded that US architects are well informed on the first of these topics and that improvement in this area may turn on political rather than professional issues. But, declare our British friends, much less attention is paid here to the concomitant development of systems for financial control of fixed investment.

The role of the British quantity surveyor emphasizes construction cost control. As an independent professional, the quantity surveyor helps a client set a realistic budget for what his building requirements should cost. The cost information is indirectly obtained through the detailed tendering documents the quantity surveyor produces, the most notable being the bill of quantities. As the RICS explains, "The quantity surveyor, therefore, requires to have an influence on the tendering procedure and the contractual arrangements so that he can relate design requirements to the most economical method of production." In brief, he is able to let the client make his decisions about a building in the light of independent knowledge about contractors' costs. There is economic control of investment.

After the budget is accepted, the money must be spent in a balanced manner to avoid excessive expenditure on one element of the project while the quality of another is sacrificed. All the functional elements (walls, floors, heating, elevators, etc.) have cost allocations so that standards of performance can be clearly identified and compared.

Cost control begins before any decision is made regarding the design of the building, and it operates from sketch plan through working drawings. Cost checks are made from the time the contract is let so that any variations anticipated by the architect are kept within the original budget.

The bills of quantities prepared by the quantity surveyor are a schedule of measured quantities for all items of work required under the contract. They are made available to all contractors wishing to bid together with the contract drawings and specifications. Thus the contractor can give attention to constructional methods and pricing and has a basis for network analysis and construction programs as well as a means of valuing change orders and preparing interim valuations.

The system also helps the designer. By the use of analytic techniques, he is given information about what the building ought to cost and reliable advice on alternative design solutions. Further, the RICS Building Cost Information Service provides a data facility for cost information on nearly all building types. It can give predictive cost models for new projects so that the architect can decide in advance where he wants the money distributed throughout a project. He no longer works in "an economic vacuum." Through the cost planning techniques, he designs to cost rather than adjusting costs to design. This budgetary control, claims the RICS, has produced enviable results in Great Britain. For example, the RICS points out that a rigorous budgetary policy enabled the cost of hospital building to be held unchanged from 1963 to 1970 despite a 37 percent rise in building prices.

Founded in 1868 with an original membership of 200, the RICS now has over 300,000 qualified members who specialize in all branches of surveying. Some 8,700 of them are chartered quantity surveyors. Through its Quantity Surveyors Division, the RICS is represented on all of the major national bodies in Britain that are associated with the construction industry and on many ad hoc committees of importance. Also, a chartered quantity surveyor and the divisional secretary from the RICS sit on the National Consultative Council of the Minister for Housing and Construction. A member is on the National Economic Development Committee for Building. The RICS examines and comments on all parliamentary bills and proposed legislation affecting the valuation, management and development of urban and rural property, town and country planning and land use.

THE EDITORS

A Scotsman Surveys Our Cost Control

by BRIAN DRAKE

At the invitation of the AIA, a mission from the London-based Royal Institution of Chartered Surveyors on a short tour of this country explained the function and purpose of the quantity surveying profession in the United Kingdom and its possible relevance for conditions here. The team included Tony Brett-Jones, a partner in a firm of chartered quantity surveyors; Alastair Fisher, then vice president of the RICS; Christopher Meyer, a senior

Mr. Drake, with an experience of private and government practice and a leader in the RICS, is chief quantity surveyor, Scottish Development Department, Edinburgh, Scotland.

partner in a firm of chartered quantity surveyors; Alex Trimmer, divisional secretary of the RICS; and Brian Drake, who is chief quantity surveyor of the Scottish Development Department in Edinburgh. Drake has recorded some personal impressions of the visit as he replies to questions from a mythical friend back in Scotland.

Well, what did the Americans think of you?

A trifle odd, I think. Not quaint exactly but certainly something of a curiosity. This was partly a matter of terminology. The only sort of surveyor the Americans recognize is a chap who spends the day peering through a transit or a level. It's also partly because they could not at first understand how our tendering system worked, or why we had come to the United States.

Do you really think that they are ready for all our palaver of standard methods of measurement, lengthy bills of quantities and God knows what?

Not a hope, I should say. Our approach would have to be simplified and streamlined to suit American tastes and conditions. But I think we knew this before we went, and therefore we concentrated on the constructive aspects of quantity surveying, such as cost control during the design stages and proper control over interim valuations and final account.

How did they take that? Haven't they got their own procedures for cost control?

I think we all felt that this was the major deficiency in their current practices and an area in which we really had a great deal to offer. There is a certain amount of design-stage estimating undertaken, but the concept of establishing a framework of costs allocated to design elements and costed stage by stage seemed entirely novel. Almost all our audiences received the notion very well and surprisingly little skepticism was expressed. One had something of the impression of having cast a lifebelt. So far as stage payments and final accounts are concerned, there is not much doubt that the client really gets taken to the cleaners. One engineer remarked that the BOAC Kennedy freight terminal was the best controlled job he had known from the financial point of view. He attributed this to the British firm of chartered quantity surveyors who handled contract cost control.

That must have been encouraging?

Yes, and so were the views of many of those we met who readily admitted a need for creative cost planning and control.

Well, why have they not developed their own system then?

Largely because their system lacks the essential characteristic of feedback. I was reminded of Frederick Catherwood's address to the Operational Research Society last year when he said something to the effect that "life is full of uncertainties, and feedback is an essential part of any sound system of decision making. The more feedback can be fed into the system, the more the model can allow for its self correction, the better the eventual outcome is likely to be." Their problem in America, of course, is that just about the only feedback they get is the total cost of the project and the amount which the contractor proposes to charge them for change orders. We, however, can readily obtain a detailed analysis of tender and final account costs broken down into design elements of almost any degree of refinement we require.

That's all rather highfalutin' to me. Do you think they were any more impressed?

I suppose it depends on the size of your problems. If your bids are going wrong in a big enough way, you will be willing to listen to anything, however pretentious it may sound. I think that this was particularly clear in the case of those persons responsible for programs of work with acute budgeting problems because of their inability to make sufficiently accurate forecasts of capital expenditure. These seemed to be among the most interested members of our audiences, although both architects and engineers also seemed to find some ideas of value in what we were saying. I suppose the biggest skeptics were contractors, but once they had mastered their initial difficulties in understanding the use of the bill of quantities, they seemed to find a good deal to interest them. It was amusing to notice the way in which each party attributed the absence of the bill of quantities system to one of the others. Thus architects would say that they were all in favor, but the contractors would never buy it; and the contractors would say that it seemed like a good idea, but they couldn't believe that the client would ever pay for it; and the clients thought it seemed like a good buy, but they couldn't see the architects and contractors standing for it.

Perhaps they were just trying to let you down gently?

Yes, we sometimes felt this was the case. On the other hand, we were encouraged by their reaction on fees. Generally they seemed to think that a fee of 1/2 percent for cost control would be money well spent and, perhaps slightly to our surprise, they did not altogether balk at paying 2 1/2 percent for a complete cost control and bill of quantities service.

Did they want to know what liability you accepted in return for the fee?

This was a popular question to which we generally replied that our responsibility was of the same order as any other professional's: to do a properly considered and competent job within the accepted range of professional standards. This on the whole seemed to satisfy them, though they were also reassured to hear that quantity surveyors carry proper indemnity insurance. It seems as though there is a good deal of shotgun work going on at the moment on the part of American lawyers which is causing some concern among other professions who find themselves associated with mishaps for which their responsibility is of the most tenuous character. One architect we spoke to had ideas of reversing the gun barrel by taking proceedings against lawyers who uttered inadequately researched charges, which ought to be good fun if it comes off.

I have often thought that some of our lawyers could do with a charge of buckshot; at least we have to earn our money the hard way. Incidentally, were they interested in how quantity surveyors are appointed and paid?

Yes, they were. We explained that our appointment was either directly by the client or by him on the recommendation of the project architect and that our fee was payable by the client at defined stages of the work. They were also interested in the letter we took with us from Alex Gordon, president of the Royal Institute of British Architects, which enabled them to appreciate that the status of the profession in Britain is broadly comparable to that of architecture and engineering. There were also a number of questions on training and education, and the Americans were reassured to hear that this was at a university or equivalent level.

So this enabled you to introduce the idea of the quantity surveyor as something of a building economist?

This is right. It was by discussing the profession's involvement in, for example, the production of output price indices and other forms of predictive models that we were able to demonstrate how we attempted to handle the problems of inflation and other market factors. In particular, it seemed clear that the position of the unions in the US would need to be studied very carefully. We were told that a good many of the existing cost estimating services tended to produce a form of normalized costing and not infrequently washed their hands of any attempt to apply costings to particular areas, saying that the complexity of local market factors made this impossible.

Not an altogether satisfactory service?

That is what we thought, but perhaps one ought to get a closer knowledge of the problem before attempting too many critical pronouncements on their practices.

You said earlier that they took some while to understand the bill of quantities system. What was their difficulty?

The trouble seemed to center on two or three points. They had not realized that the bill of quantities simply measures work fixed in place and leaves the responsibility for estimating the time and cost of such work to the bidding contractors. Also they had not understood that the quantities were guaranteed to the contractor, and when they did understand this they immediately began to worry about errors in measurement which might be made by the quantity surveyor. Although we reassured them that in practice this very seldom occurred, I am not sure they completely believed us. They also wanted to know to what extent savings which resulted from improved operational techniques on the part of the contractor would be passed to the client. Depending upon their allegiance, they were alternately reassured or cast down by our reply that such savings normally belonged to the contractor. We also found it necessary to explain that the totals of the extended unit rates in the bills of quantities constituted the bid and served as the basis for stage payments and valuation of change orders.

You also referred to public sector programs. Do they have cost limit systems as we do in Britain?

Not in anything like as developed a form as ours, although there are some cost limits promulgated in housing. We described the techniques used for controlling the cost of public sector programs in the United Kingdom, and this seemed to generate a fair amount of interest. At one meeting in the Middle West, however, one member of the audience passed a note to another saying, "This is all very socialistic and bureaucratic." Well, perhaps it does sound a little that way, but we were rather taken aback to find that the techniques used by one very large city authority to control the costs of its public sector housing was to decree that one window type and one type only was allowed. I am sure such draconian measures would find little favor among Scottish design teams.

I suppose that I have done my fair share of moaning about government cost limits, but I must admit that the general approach of a floor of minimum standards and a ceiling of maximum cost announced at the inception of a project has always given me a reasonable degree of freedom in developing a design, and I really don't think that I want to swap that for a standard window type. Do you think there is any sign of the Americans adopting our approach?

There is perhaps some sign that the very wide differences in standards obtaining between various states is beginning to become a matter of some embarrassment. It is after all something of a contradiction to have one nation and a multitude of standards. My impression was that they were being forced, perhaps slightly against their will, in the general direction of a more uniform quality of social provision and that this was likely in time to reflect itself in a more uniform approach to investment standards. In this case, I fancy that the techniques we were talking about might well be adopted after modifications to suit their conditions.

Does all this mean that we are going to get any work?

Yes, I think this is quite on the cards. Perhaps a trial program in the public sector together with a project or two with a university might well be where we shall begin, and we are currently planning the followup to the mission to try to bring this about. Of course, any such venture is going to be an expensive business and might require a consortium of some of the larger firms to provide the necessary finances to get the project off the ground. Clearly, we also are going to have to send some of our best men. It is not going to be an easy task.

Do you think such people will be willing to go?

Oh, I am sure they will. It is a fascinating opportunity, and we have a great deal to learn from studying American practice. In particular, I think we ought to pay attention to the way in which they minimize post-tender variations and provide adequate information to the contractor on time, both of which are important reasons for the high level of productivity in the US.

Well, that is what they thought of you. What did you think of them? Did you like the place?

We all found a very friendly and hospitable people, and we enjoyed the trip enormously. For my part, I was extremely impressed by what one might describe as the tactical ability of the Americans. Whatever they set their hand to do, it is done with vigor, speed and skill. I must confess, however, that I was less impressed by their strategic ability. In particular, I found their lack of effective planning legislation depressing. It is true, for example, that they build their roads and their suburban shopping centers at a great rate, but they seem never to ask themselves whether the rape of a state as beautiful as Virginia is justified in the name of such projects. I do not know if it is altogether fanciful to apply a similar argument to other facets of life in the US. Tactical skill and strategic bankruptcy make a handy aphorism, but visiting firemen ought to be careful about such easy judgments of a large continent on the basis of a fortnight's acquaintance. I hope that I can go again. □

Computer-Based Financial Management

by G. NEIL HARPER

A new computer-based financial management system for architectural and engineering firms is now available through the AIA. The operational computer system places a full range of management controls in the hands of principals, auditors and controllers, thus making possible improved administrative and financial performance. The implementation of the system in firms where it can be of significant assistance is encouraged.

The computer-based financial management system of The American Institute of Architects can be viewed as the latest in a sequence of Institute-supported activities to provide the practicing professional with assistance in the business related aspects of operating an office. In the late '60s Case & Company, management consultants, developed a series of reports on the economics of architectural practice, profit planning and fee negotiation: *The Economics of Architectural Practice* (1968); *Profit Planning in Architectural Practice* (1968) and *Methods of Compensation for Architectural Services* (1969). These reports basically document the declining profit ratios in the profession and outline suggested techniques for reversing that trend by better planning and fee negotiation.

A fourth report, *Financial Management for Architectural Firms: A Manual of Accounting Procedures* (1970), prepared by Arthur Andersen & Company, went a step further to lay out the fundamental procedures for good accounting practice and for administration of a budgeting system to improve financial control. The newly developed computer-based system is an implementation of the accounting procedures and management reports as developed in this fourth report. Accordingly, it stands in a natural sequence of historical development which began with documenting the need and concluded with an operational management system for installation in individual offices.

Although there are several firms which have invested significant amounts of money to develop customized accounting systems, and an even larger number which have used modified versions of existing job cost and payroll systems, by far the largest majority of firms have not automated any portion of their financial system; and practically no firm has automated as systematic and integrated a set of controls as those offered in the AIA system, regardless of firm size or money expended. From my personal knowledge of the systems used in many of the largest architectural and engineering offices, it is clear that the Institute is now offering the profession a major new development in integrated cost control and financial management.

To the extent that firms use computer systems at all, the most frequent usage is either for payrolls or for job labor cost, or both, as shown in Figure 1. Usually this service is provided by a local bank or service bureau, using an existing payroll or job cost system developed for a general class of clients, without particular regard to the requirements of professional practice. A few firms have placed certain of their direct costs on the computer, and an even smaller number have included a general ledger, accounts receivable, manpower utilization, etc. Figure 1 shows graphically where capabilities of most existing systems stand in relation to the features being offered by the new AIA system of computer-based financial management.

The main features of the new system are best described by

reference to several figures which depict the highlights of the system's organization, input and selected output reports. A complete description of the system, including detailed input requirements and mockups of all output reports, is contained in the book, *Financial Management for Architectural Firms: A Manual for Computer Users* (1971) which is available from the AIA (\$8 AIA members; \$10 nonmembers).

Figure 2 identifies the familiar input data that constitutes normal operating data. Virtually all offices employ some form of time sheets and a record of cash disbursements and receipts through an office checking account. Journal entries are far smaller in volume and are typically made by the bookkeeper or auditor on some periodic basis for various adjustments to the books. Invoices, or statements to clients for services rendered, are an essential input data element for a full-scale implementation of the system. A few firms will add project managers' percent complete reporting and cash flow input data to the system, although this data is not essential to system operation. In general, all input data is used to modify the permanent files and to produce project related management and accounting reports.

Figure 3 shows an overview of the complete system, beginning with the initial input data at the left and progressing through the various accounting logs and project related reports on the right. The principal reports, as indicated, are designed to provide the following information:

- Payroll journal: listing of each employee, rate, hours worked, gross pay, deductions and net pay.
- Payroll checks: an optional feature for printing payroll checks and current year-to-date totals on stubs.
- 941 and W-2 tax forms: basic information for quarterly payroll tax form and end-of-year earnings on W-2 forms.
- Time analysis: a form of manpower utilization report showing chargeable overhead and overtime hours for each employee, as well as overall chargeable ratios.
- Project detail report: listing of hours and payroll costs of each employee working in each phase of a project in a given payroll period. Intended for billing backup.
- Project progress report: comparison to budget for labor and direct costs for each project. Intended for project managers.

Figure 1

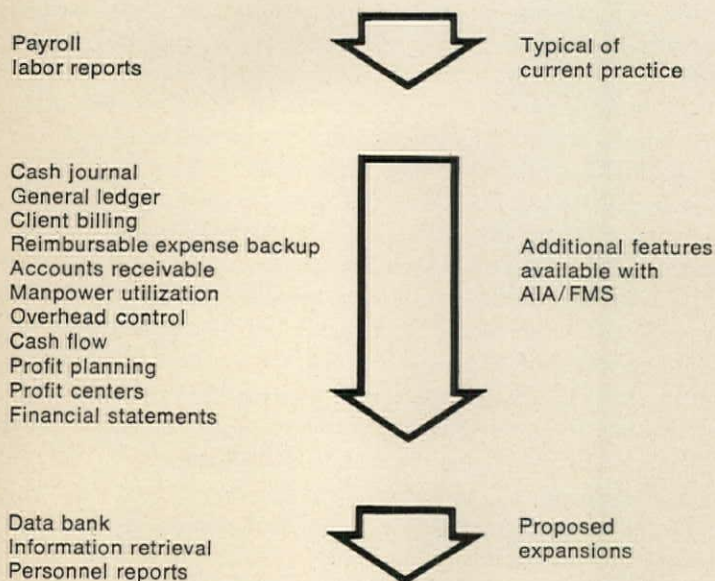
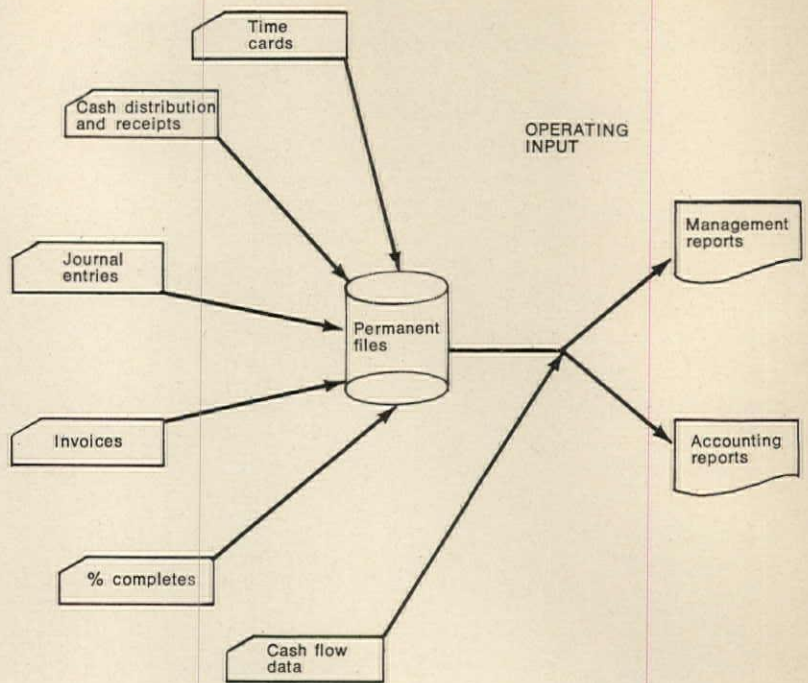


Figure 2



- Project summary report: one-line summary for each project comparing budget and actual performance. For principals.
- Balance sheet: listing of assets, liabilities and net worth (capital) accounts, as contained in the general ledger.
- Income/expense: listing of income, indirect expense, direct expense and reimbursable expenses for current period and year-to-date.
- Office earnings report: summary of financial highlights of each project in concise one line per project format. A form of project profitability report.
- Aged accounts receivable: list of outstanding balances owed by individual clients, with aging.
- Expense analysis: comparison of overhead expenses to annual plan for such expenses.
- General ledger: summary of postings to each account in the general ledger.
- Projected cash flow: tally of periodic cash needs based on detailed input projections.
- Cash journal: list of all cash receipts, disbursements; and how each was charged to jobs and to the general ledger.
- Summary of direct expenses: the cash journal, sorted by project number; used primarily for detailed backup on billing of reimbursable expenses.
- Journal entry log: list of each journal entry entered into the system, showing its debit and credit charges.
- Invoice log: list of each invoice sent to clients, showing project, amount billed and general ledger credit.

From a technical point of view, the single most important characteristic of this series of reports is that they are integrated into a single system. This makes accurate comparison of figures and reconciliations a natural byproduct, rather than a time consuming and uncertain task. Many firms will have parts of the information described above; some will be operational on com-

Dr. Harper, computer consultant to the AIA, is president of CLM/Systems, Inc., of Cambridge, Massachusetts, the computer systems firm which developed the AIA Financial Management System.

puters; but very few, if any, will have the benefits of completeness and certainty of reconciliations provided by the integrated AIA system.

In Figures 4 and 5, two reports have been selected to illustrate in somewhat more detail the nature of the reports produced by the system. Figure 4 is a mockup of the office earnings report which shows the profit or loss on each project in the office, both on a project-to-date basis and year-to-date basis. Note that billings, receipts and accounts receivable are shown on each project, as well as the work in process (unbilled services). The figures in the "spent" column include all labor, direct and reimbursable costs and an allocation of actual office overhead. Thus the expenses reflect the full costs required to execute the job, and the resulting profits are an accurate measure of the contribution of each job to the overall office profits. The office earnings report is reconciled to the periodic financial statements of the firm automatically through the normal trial balance in the general ledger.

Figure 5 represents a typical project progress report, which would normally be reviewed by the project manager. The essential feature of this report is a comparison of actual costs with a prorated ("earned") portion of the budgeted cost for each phase and direct cost item. The total budget for each phase is multiplied by the fractional percent complete provided by the project manager to produce the figures in the "earned budget" column. Thus, if the phase is within its prorated budget, it should have used \$6,402 in preliminary design. It has actually used \$6,693—somewhat over budget.

The system as described has been operating for over a year in several data centers around the country, including Boston; Chicago; the Washington, D.C., area; Charlotte, North Carolina; Albany; and Philadelphia. New centers are in the planning stages or are contemplated for early operation in Newark, New York City, Seattle, Nashville, Knoxville, Denver, San Francisco, Los Angeles, Houston and several other cities.

In general, use of the system has provided a far more comprehensive and systematic set of information to principals than has ever been available before. Much better knowledge of the full cost of job production, made possible by the system, is contributing to more knowledgeable fee negotiation and is clearly

separating those portions of the work which may be billable as extras. In some cases increased billings of this sort can more than justify the cost of the system in a relatively short period of time.

The importance of monthly profit and loss statements, along with billing and accounts receivable reports, cannot be overemphasized. Installation of the full system provides these reports as a natural end product of relatively simple, common input data. Regular production of these fundamental reports has been a new addition to several offices' procedures, yet it has been done without any increase in staff. In general, staffing requirements after installation of the system have not changed significantly. System installation, in fact, has forestalled projected staff increases and has made possible more and better reporting with the same number of people. Considerable clerical time for postings has been eliminated in favor of more significant data analysis, budgeting and planning for the future.

One particularly noteworthy result of early operation of the system has been the development of a series of additional features by firms which have installed the system. Such features as additional work order subtotals, special overhead allocation for field personnel, profit planning monitor and divisional profit center reporting have been important new additions and are offered to the profession by the originating firms on a shared cost basis through the AIA.

The new financial management system belongs essentially to the profession through the AIA. Access to the system is provided by means of a licensing agreement between a firm and the Institute. To contribute toward a return of the original development cost and to provide for system maintenance, a one-time access fee and a quarterly maintenance and usage fee are payable to the AIA, the amounts dependent upon the level of system selected for installation. An introductory information kit is available without charge from the Institute, containing an announcement fact sheet; a reprint of the article "AIA Launches Program to Boost Fees for Architect's Extra Services" from the March 1972 *Building Design & Construction*; a list of additional features; and a budget worksheet for system installation.

Three levels of the system have been developed to meet the needs of differing sizes and complexities of firms. A basic level,

Figure 3

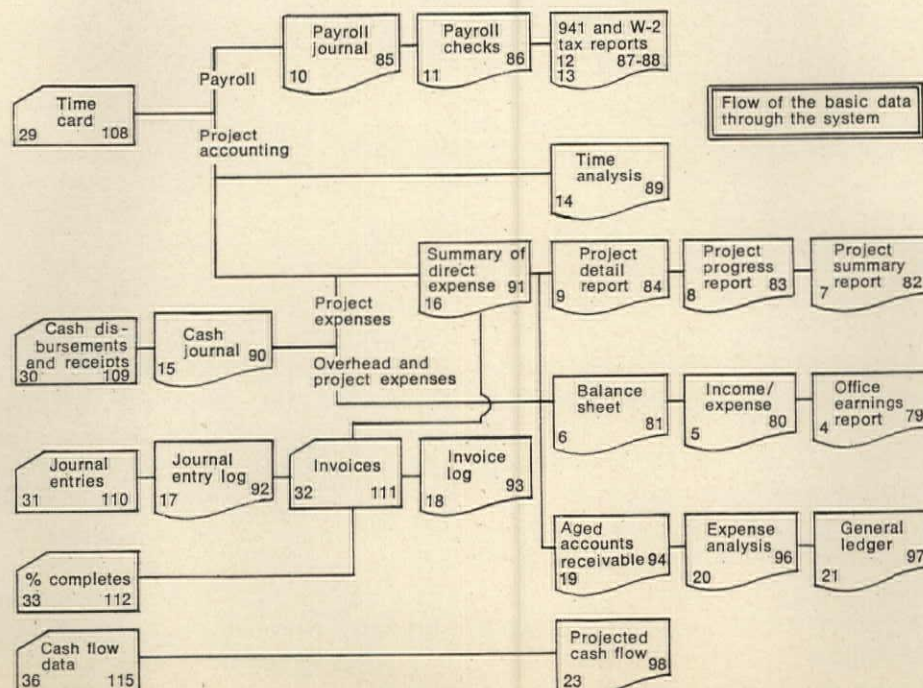


Figure 4

ANDERSON, BABCOCK & CROWLEY
ARCHITECTS
OFFICE EARNING REPORT
FOR THE PERIOD 3/1/71 - 3/31/71

PROJECT NUMBER NAME	PROJECT TO DATE							YEAR TO DATE					
	FEE	PCT COMP	T	EARNED INCOME	BILLED	UNBILLED SERVICES	RECEIVED	A/R	SPENT	PROFIT (LOSS)	EARNED	SPENT	PROFIT (LOSS)
95.00 MISC JOBS			3										
98.00 PERSONAL SERVICES			4	1420	1420		1433	13-	1009	410	1420	1009	410
1000.00 COMPLETED JOBS	483932		3	483932	483732	200	481732	2000	462578	21353		1346	1346-
1005.00 CITY HALL	80000	92	4	84820	84820		88396	16423	76901	7919	9820	10930	1109-
1019.00 BALBOA	38569	94	3	38569	73485	34916-	28053	45432	79333	40764-		4692	4692-
1023.00 ABC PLAZA	7500	58	4	5540	5540		5540		4770	769	791	552	238
1025.00 J L SMITH HOME	5000	21	2	1471		1471			1303	168	184-		184-
1027.00 CITY HALL LOBBY	10000	32	4	3020	3020		3020		1495	1525			
1028.00 CITY HALL AC	16000	79	4	22901	22901		10391	12509	34843	11942-	10040	13673	3633-
1030.00 AJAX FACTORY	28800	69	3	24000	28800	4800-	25000	3800	30429	6429-	4007	11733	7726-
1031.00 PROJECT Y	10300	99	3	10300	10300		10300		16520	6220-		1962	1962-
1033.00 DANCE CENTER	28000	21	4	6772	6772		5017	1755	7937	1164-	702	1232	529-
1034.00 GOVERNMENT CENTER	55000	64	4	52800	52800		41800	11000	43752	9047	16600	12250	4349
1035.00 WGH ELEMENTARY SCHOOL	53200	53	4	54569	54569		37489	17080	35912	18656	25152	9345	15806
1036.00 111 BEACON STREET	68000	48	4	48960	48960		42160	6800	35998	12961	13689	11328	2360
1037.00 FOREST HILLS	20000	53	4	13500	13500		12000	1500	14117	617-	2519	3763	1244-
1038.00 KLH OFFICE	16000	84	4	14761	14761			14761	13448	1313	792	665	127
1039.00 UN WISC LIBRARY	100000	98	4	132862	132862		72991	59871	116934	15928	34917	25537	9380
1040.00 GNH MUSIC HALL	100000	47	4	56855	56855		31865	24989	37758	19096	10115	11194	1079-
1041.00 LANDOWER MEMORIAL	20000	99	4	34793	34793		19332	15461	26152	8641	14793	13230	1563
1042.00 BRUNSWICK PLANT	18000	58	4	22872	22872		13425	9446	16997	5874	12143	8965	3177
1043.00 MOBIL WAREHOUSE	79075	7	4	32718	32718		22909	9808	31450	1267	20858	18803	2054
1044.97 MOLINE BUS DEPOT			0										
1046.00 VA HOSPITAL	7000	4		2795	2795			2795	1428	1366	2795	1428	1366
1047.00 CENTER PLAZA	112000	4		32480	32480			32480	25349	7130	32480	25349	7130
1048.00 SOUTH HIGH SCHOOL	10000	4							309	309-		309	309-
TOTALS	1366376			1182714	1220759	38045-	932857	287902	1116731	65983	213452	189304	24148

Figure 5

ANDERSON, BABCOCK & CROWLEY
ARCHITECTS

DESCRIPTION	PROJECT NUMBER	CITY HALL 1005.00		PROJECT PROGRESS REPORT FOR THE PERIOD 3/1/71 - 3/31/71			PRINCIPAL PROJ MGR		SMITH JONES	
		SPENT THIS PERIOD HOURS	DOLLARS	SPENT TO DATE HOURS	DOLLARS	PCT COMPLETE	EARNED HOURS	BUDGET DOLLARS	TOTAL HOURS	BUDGET DOLLARS
PRELIMINARY DESIGN		8	52.00	917	6693.52	97	882	6402.00	910	6600.00
SCHEMATIC DESIGN		18	68.36	847	5869.66	97	640	4656.00	660	4800.00
DESIGN DEVELOPMENT		31	123.66	867	5356.58	97	615	4462.00	635	4600.00
TOTAL/LABOR		57	244.02	2631	17919.76	96	2137	15520.00	2205	16000.00
DIRECT COSTS										
TELEPHONE			22.60		28.10					
MATERIALS OFFICE					79.21-					
REPRODUCTION EXP			137.42		612.52					
CS-IDC TIME			1000.00		4245.49					
MEALS HOTELS MIS			2.00		35.80					
OTHERS			125.18		32689.11	97		38800.00		40000.00
TOTAL/DIRECT			1287.20		37531.81	97		38800.00		40000.00
CONTRACT TOTALS		57	1531.22	2631	55451.57	96	2137	54320.00	2205	56000.00
REIMBURSABLES										
TOTAL/REIMBURSABLE										
PROJECT TOTALS		57	1531.22	2631	55451.57	96	2137	54320.00	2205	56000.00
OVERHEAD ALLOCATION					21449.48			21449.48		22112.86
TOTALS WITH OH					76901.05			75769.48		78112.86

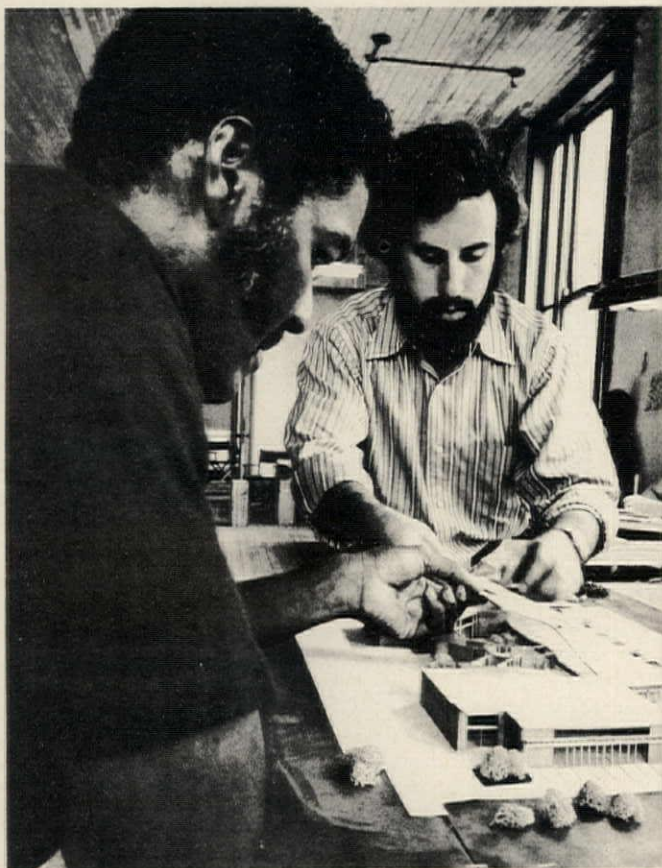
consisting of time card input and labor cost reporting, is designed for smaller firms and those desiring initial entry at minimum cost. An intermediate level adds payroll and direct cost reporting. The full system adds invoicing and regular financial statements.

Experience to date has indicated that installation of the full system typically takes approximately one calendar quarter. System shakedown and staff training for full utilization have required another quarter. Installation of the basic or intermediate levels will take proportionately less time, of course.

Through its computer-based financial management system, the AIA has made a significant contribution to the theory and practice of financial management for professional firms. The ad-

vantages of the Institute's funding a single program to serve the requirements of the profession have become clearly evident as smaller and medium sized firms have been able to install a system to serve their immediate needs, with room for growth to a larger, more complicated system at a small fraction of system development cost. Perhaps equally noteworthy, the profession now owns an operational system which facilitates better data collection and information sharing on such items as fee negotiation, wage rates, overhead ratios, profitability, etc., based on a common set of accounting procedures and reporting techniques. In short, the system is now capable and available to serve the individual office in a practical way, with resulting positive benefits for the common good of the profession. □

You can improve how people live by improving where people live



VISTA Volunteer Zachary Weiss (right) discusses plans for the New Orleans Metro Link with Andy Levy (left) Director of the project.



Peace Corps Architect Wayne Miller (right) checks construction plans for a Colombian school with a co-worker.

In today's world of rapid urbanization, people are only as well off as the city in which they live.

When cities are plagued with slums, inadequate housing and poor planning, it's the people who suffer. So VISTA and Peace Corps architects are trying to ease that suffering by using their training to bring these problems under control.

That requires more than a knowledge of architecture. It requires working with people, facing frustration, sometimes accomplishing a lot, and sometimes accomplishing a little.

In Baltimore, VISTA volunteers working with the American Institute of Architects have helped to generate projects ranging from neighborhood parks to housing and

health facilities. In Tunisia, Peace Corps volunteers are helping Tunisians to train their own architects. In Albuquerque, New Mexico, VISTA volunteers are working on housing rehabilitation. And in Iran, Peace Corps workers are helping meet a housing shortage.

None of them are building beautiful homes or designing revolutionary office buildings. But all of them are making the cities meet the needs of its people. If you're an architect and that sounds like the kind of work you'd like to be doing, write ACTION.

For information call (toll free) 800 424-8580, or write ACTION, Washington, D.C. 20525.

PEACE CORPS/VISTA

One Part of ACTION

est credits. This potentially involves a return to the group of annual sums in the millions."

During the last 15 years, Continental Casualty has handled approximately 14,000 claims against design professionals.

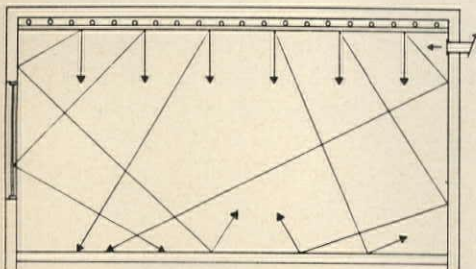
Five Buildings Are Cited by the Jury In 1972 Energy Conservation Program

"In building efficient structures to conserve energy, we can no longer afford the low first-cost syndrome. New approaches as well as wiser use of existing materials and techniques can do much to ease our national energy crisis in the years ahead," said James B. Webel, vice president and general manager of Owens-Corning Fiberglas Corporation's Architectural Products Division, at a dinner in New York City which honored the winners of the first Energy Conservation Awards Program. Sponsored by Owens-Corning, the program was instituted "to encourage an awareness of the urgent need to conserve energy resources and to lessen environmental pollution," as well as to "stimulate new designs and new concepts directed at that goal."

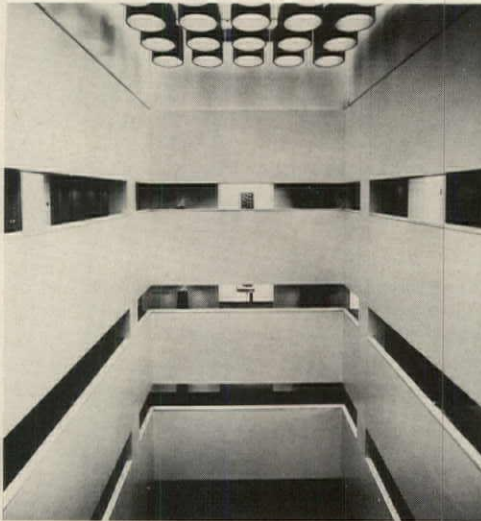
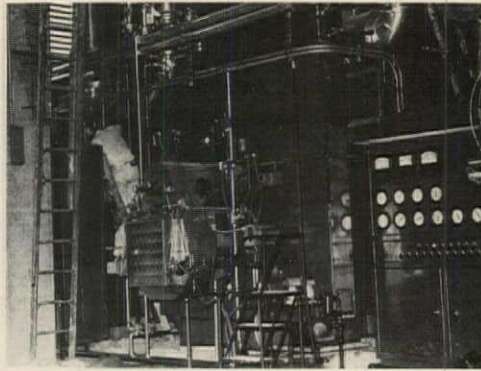
Awards were given in three categories of structures: commercial, institutional and industrial. The firm of Deeter Ritchey Sippel Associates won top honors in the commercial building category for its design of Westinghouse Nuclear Center, Monroeville, Pa. Winner in the institutional building division was Mercy Hospital II, Coon Rapids, Minn., designed by S. C. Smiley & Associates. The Smith Korach Hayet Haynie Partnership received the top award in the industrial category for its design of the Energy Center, Mount Sinai Medical Center, Miami Beach.

Honorable mention was given to the Children's Hospital in Philadelphia, which will be the first major hospital in this country to be heated and cooled by an energy reclaim system that uses heat given off by occupants, lighting and equipment. It is the design of Harbeson Hough Livingston & Larson. Also receiving honorable mention was Drain Properties, Phoenix, Ariz., designed by Walsers-Krause Architects. The structure's engineering features reduce peak energy demand by 51 percent.

Serving on the jury for the competition were MacDonald Becket, AIA, of Welton Becket Associates; Leander Economides, AIA, of Economides & Goldberg; Harold S. Lewis of Jaros, Baum & Bolles; Professor Charles F. Sepsy, Ohio State University; and Herbert H. Swinburne, FAIA, of Nolan-Swinburne Partnership.



One of Mercy Hospital II's features is the radiant ceiling heating and cooling system.



Mount Sinai Hospital Energy Center has high temperature hot water generators (top). Air curtains at Westinghouse Nuclear Center equalize heat gain or loss effect of skylights.

Federally Assisted Housing Discussed; Engineers Urged About Growth Policy

More than 200 architects attended an AIA sponsored two-day conference recently in Washington, D.C., on Department of Housing and Urban Development-assisted housing programs. There were workshops as well as lecture sessions conducted by Frosh, Lane & Edson, a law firm in the nation's capital with extensive practice in federally assisted housing.

One of the principal speakers at the conference was Harold B. Finger, HUD assistant secretary for Research and Technology. He said that physical design improvements can encourage the solutions of social problems by 1) mixing people to break down barriers, 2) bringing people's housing and their major daily activities into close proximity and 3) giving people a reason to stay in an area rather than moving out.

Another speaker, Louis R. Lundgren, FAIA, chairman of the AIA Commission on Environment, linked the architect's participation in low and moderate income housing with the Institute's national growth policy, implying that this can be a means to further the goals of the AIA.

Meanwhile, the Institute has objected to a recent land use report of the National Academy of Sciences and the National Academy of Engineering. The report cites a lack of knowledge and a lack of agreement on national goals as the major obstacles for the establishment of a national urban growth

policy. Under any circumstances, states the report, to establish a national growth policy would not be "wise and proper."

Speaking at the autumn meeting of the National Academy of Engineering, Archibald C. Rogers, FAIA, chairman of the AIA National Policy Task Force, said: "We do not accept that there is a lack of agreement on national goals. All of us, regardless of race or creed or economic standing, want decent housing; high quality education for our children; safety and security within our neighborhoods; and freedom to live within communities that provide the above necessities in locations that satisfy our choice and express in their community design our great variety of lifestyles. We do agree that there is no consensus within the nation on the means of achieving these goals. And this is precisely the reason why it is so important that a national policy be established."

Document on Compensation Is Published, Result of Two Years Study by CCAIA

After nearly two years of exhaustive study, the California Council AIA has published *Comprehensive Architectural Services for Building Projects and Recommended Methods of Compensation* (Document No. 100-72). It is the work of CCAIA's Task Force on Compensation, CCAIA staff and consultants. Members of the task force include architects Walter H. Costa, chairman; Ward W. Deems; Robert W. Stevens; and Frank M. Studer.

CCAIA President Whitson W. Cox, FAIA, states that the publication represents "an innovation of consequence for the architectural community in the establishment of just and justifiable compensation methods." The CCAIA conducted full-day workshops in Los Angeles and in San Francisco to explain the approach contained in the document.

Copyrighted by CCAIA, the document replaces *Recommended Compensation for Architectural Services* (Document No. 100-67-1). The new publication may be purchased for \$5 by non-CCAIA members from the California Council AIA, 1736 Stockton St., San Francisco, Calif. 94133.

Recommended Practices in New Manual Aimed at Good Personnel Procedures

There is a trend in this country toward larger architectural firms and group and interdisciplinary practice. In recognition of changes in professional practice, the AIA has published a new tool for architectural offices. Entitled *Guidelines for a Personnel Practices Manual*, the publication is authored by Arthur T. Kornblut, AIA, administrator of the Institute's Department of Professional Services.

In loose-leaf format, the manual may be tailored to the needs of the individual firm and may be updated as required. The purposes of the manual are "to alert each firm to the necessity of having written administrative procedures; to indicate the scope of items to be covered; to illustrate how the information may be stated in writing; and to provide background information based on existing practices in the profession."

A properly maintained personnel manual gives every employee a clearly written statement of firm policies and practices. Other benefits include the reduction of the need for many interoffice communications, assistance in the recruitment of new staff and retention of promising older staff members by statements regarding incentive programs.

The manual may be ordered from Publication Sales, AIA, 1785 Massachusetts Ave. N.W., Washington, D.C. 20036. The cost to AIA members is \$5; to nonmembers, \$7.

INBEX Attendees Addressed by Nader, Calls for Housing Industry Reforms

Consumer advocate Ralph Nader has warned the building industry that housing is going to be as big a consumer issue in the '70s as automobiles were in the late '60s. Addressing an audience estimated at 3,500 during the third international Industrialized Building Exposition Congress held in Louisville, Ky., Nader pointed out the need for investigation and reform in four major housing areas. He attacked closing costs, building codes, abuses under Federal Housing Administration programs and lack of corporate responsibility.

Nader told the participants that the building code process is pockmarked by vested interests with negligible consumer representation. He noted that the architects have done some good thinking and are beginning to do some pushing. This appeared to be a reference to the AIA's Code and Regulations Center which was established last year at national headquarters to increase the voice of the architectural profession in the codes and standards field.

In a press conference, Nader favored a "federal" (national?) building code concentrating on tiered quality performance standards, with provisions for local problems. He emphasized the need to disclose information on building products so that characteristics of competing products may be compared. As this is one of the goals of the proposed National Institute of Building Science, Nader indicated that he could support such an institute if it had consumer representation.

Lawyer Nader advocated class action suits by homeowners' associations where there are defective houses in a development and suits against government employees who are negligent in administering housing programs. He suggested that the housing industry should establish a formal mechanism for dealing with consumer complaints and a fund to respond to its social responsibility. The industry should also look to reform in closing costs, to be competitive rather than collusive.

Advanced registrations for INBEX/72 were up 12 percent from last year, with a total attendance of 14,000 estimated. Attendees could visit approximately 350 products exhibits covering industrialization.

Daily seminars for the 3½-day meeting were placed on three "tracks": homebuilding, commercial/institutional building and manufacturing. A fourth one on the final day covered planning for human needs and new systems technology. Design professionals were well represented on the panel presentations, bringing their expertise to the diverse disciplines of the industry.

Brazilian Is Honored for Leadership As He Wins UIA Prize in Varna

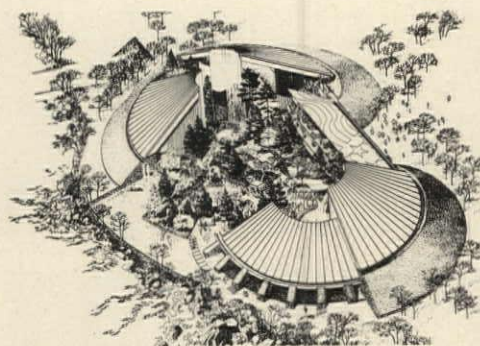
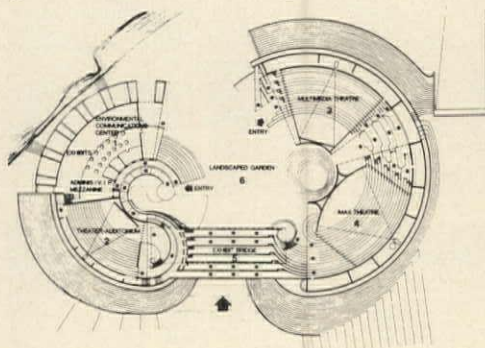
The International Union of Architects awards the Jean Tschumi Prize every three years to an outstanding architect on the world scene. The prize was presented at the September meeting of the 11th World Congress of the



A model of an office for a textile association is the 1969 design of Vilanova Artigas.

UIA held in Varna, Bulgaria, to architect João Batista Vilanova Artigas.

Long active in architectural education, the Brazilian is director of the Department of Projects, Faculty of Architecture and Urbanism, University of São Paulo. He is also a member of the Council of Research and Urban Studies at the university. He helped organize the first reforms in the architectural school. As a member of the firm of Marone & Artigas from 1939 to 1943, he was architect of 54 realized projects in São Paulo. Since 1943, he has worked in his own firm. His buildings include stadiums, a tennis club, hospitals, schools, residences and private and government office buildings.



Within the "horseshoe" of the Federal Pavilion is a sheltered garden for exhibitions.

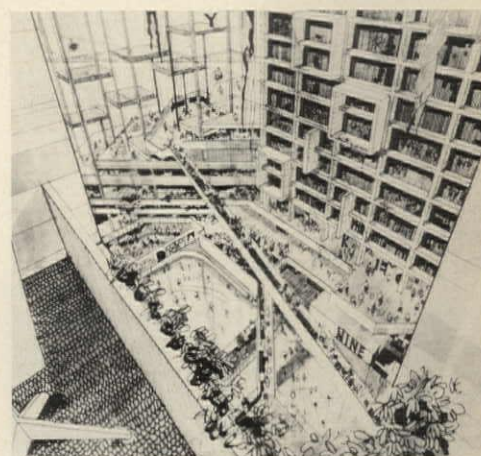
Pavilion in Planning Stage for Expo '74

The works of man and nature will be united in the Federal Pavilion at Expo '74 in Spokane, Washington. In the middle of two cone shaped buildings will be a one-acre garden. A waterfall will pour off the roof of the

upper right structure; all roofs will be covered with flowing water. The proposed \$11.5 million pavilion will be used later as a tourism and environmental education center. The design is the result of a cooperative effort by Skidmore, Owings & Merrill and local architects Trogdon/Smith/Grossman.

Megastructure to Cover Six Acres Is Seen as 'Milestone in Urban Design'

Collectors of odd bits of statistical information may want to know that the world's longest escalator is planned for Atlanta. The 200-foot continuous escalator will rise eight stories from an ice skating rink to the top of a terraced trade pavilion in the \$65 million Omni International. The 14-story mega-



The world's longest escalator will give the riders a splendid view of Omni International.

structure will be built on six acres in the downtown with construction expected to get underway early in 1973.

The new complex, adjacent to The Omni which is Atlanta's recently finished indoor sports and entertainment facility, will encompass 34 million cubic feet of space and will have an interior court of 8 million cubic feet of open space. The architectural firm of Thompson, Ventulett & Stainback, Inc., is designer of both structures.

Called "the city of the future," Omni International will include a hotel, office buildings, banks, stores, a trade pavilion, 10 theaters, restaurants, a regulation size ice skating rink, an indoor/outdoor swimming pool, two tennis courts and a bazaar. Its central "meeting place" will be the giant interior skylighted court.

'Versatility of White Portland Cement,' Seen by Jurors in 1972 Awards Program

Eight regional winners have been named in the 1972 White Cement Architectural Awards Program sponsored by the Portland Cement Association. To be eligible, a building must feature white cement concrete as the principal structural and/or architectural material and must have been completed during the calendar year of the program.

The winners are:

- North Central region: Heavy Shops Building, Western Iowa Technical College, Sioux City. Architects: Architects Associates.
- South Central region: Rare Books Library,

Humanities Research Center, University of Texas at Austin. Architects: Jessen Associates, Inc.

• Midwestern region: Boston Store, Milwaukee. Architects: Baxter, Hodell, Donnelly, Preston.

• Eastern region: Norfolk Convention and Cultural Center, Norfolk, Va. Architects: The William & Tazewell Partnership.

• Great Lakes region: Sentinel Office Building and Assembly Center, Detroit. Architects: John Stevens Associates, Inc.

• Rocky Mountain region: Trades and Industry Building, Greeley, Colo. Architects: CNC/NHPQ.

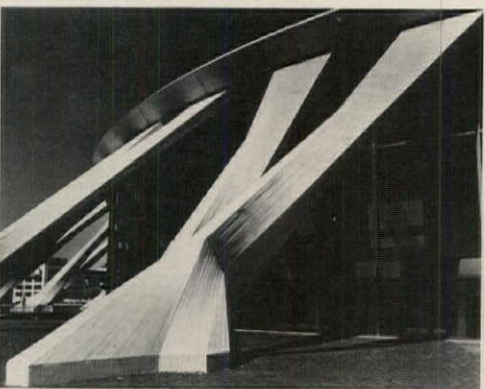
• Pacific Southwest region: Performing Arts Center, University of California, Santa Cruz. Architects: Ralph Rapson & Associates.

• Southeastern region: Burlington Research and Development Center Addition, Greensboro, N.C. Architects: Odell Associates, Inc.

Jurors for the 1972 program were William M. Avery, publisher of *Concrete Construction* magazine; Richard Nash, AIA, McGraw-Hill Information Systems Co.; and D. Coder Taylor, FAIA, Kenilworth, Ill. They reported that the entries showed "the remarkable versatility of architectural white portland cement concrete."



Versatility of use of a material is demonstrated in the winners of the 1972 White Cement Architectural Awards Program: 1) Performing Arts Center, University of California at Santa Cruz; 2) Heavy Shops Building, Western Iowa Technical College; 3) Sentinel Office Building, Detroit; 4) Convention and Cultural Center, Norfolk, Virginia; 5) Boston Store, Milwaukee; 6) Rare Books Library, University of Texas at Austin; 7) Burlington Research and Development Center Addition, Greensboro, North Carolina; 8) Trade and Industry Building, Greeley, Colorado.



Equal Hiring of Women and Minorities Demanded of Harvard Graduate School

The Office of Civil Rights, Department of Health, Education and Welfare, has ordered the Graduate School of Design, Harvard University, to "correct the discrimination against women" and to take positive action which will increase the number of women on the faculty. The following recommendations are to be implemented:

- GSD "will review the résumés of all women who apply to determine those positions, either full or part-time for which they qualify, and must show that these applicants' qualifications were compared with those candidates selected in making all future appointments" to its faculty.

- The school must develop an affirmative action plan to show how it seeks to increase the number of women and minorities on the faculty.

- The plan must include goals and timetables. "The goals . . . submitted in April 1972 . . . are not acceptable."

- Criteria for employment "must be developed and made known to all interested groups."

- GSD must report to the OCR its efforts in filling every position for the next two years.

- The Committee on the Status of Women's Roles and Responsibilities must be "clearly delineated," especially in the recruitment effort.

- The affirmative action plan must be publicized with announcements made in the alumni magazine and other official publications.

- GSD must file quarterly reports with the OCR in which it documents progress made.

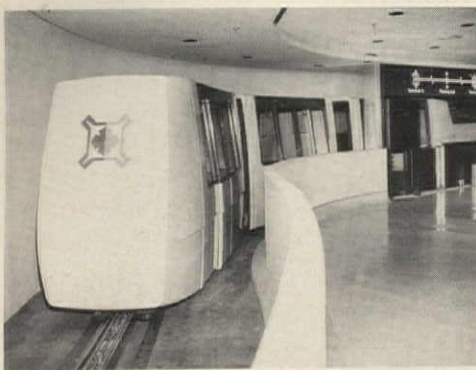
The complaint against GSD was filed in 1971 by Franziska P. Hosken, the third woman graduate of the school.



Houston Airport Has New Train System; Computer Operates for Speed, Routing

Houston's International Airport has a new "monorail" system which carries travelers between two terminal buildings, parking areas and a new hotel. Six trains of three cars each operate continuously on a 6,000 foot loop. Eight stations are provided service at least every three minutes. The trains move along each side of a lighted airconditioned concourse which links the facilities. A barrier separates the route from an adjacent pedestrian walkway.

The vehicles, operated automatically by a computer, are made of molded fiberglass. Amenities include contoured seats and large



Computers stop trains at stations and open and close doors; rubber tires prevent noise.

picture windows of high-strength glass. The system is the design of Rohr Industries, Inc., Chula Vista, Calif., producers of aircraft engine pods and structures and ground transportation systems. The firm has produced rapid transit cars for San Francisco's BART.

The new system replaces a battery-operated one which was installed when the airport opened three years ago. The firms of Golemon & Rolfe and G. Pierce, Goodwin & Flanagan, architects of the airport, have design control over the entire area.

Decentralization, Regional Development Aims of Mexican Program of New Cities

Thirty new cities are being constructed throughout Mexico to encourage regional development and to alleviate urban overcrowding. In addition, seven satellite cities are being built near Guadalajara, Mexico's second largest city. These seven are expected to have a population of about 500,000.

One of the new regional cities, Civac (Cuernavaca Valley Industrial City), has

construction well underway. Ultimately, it will have about 100,000 inhabitants. It is expected that it will draw industry and workers from Mexico City and will relieve some of the congestion in the Valley of Mexico.

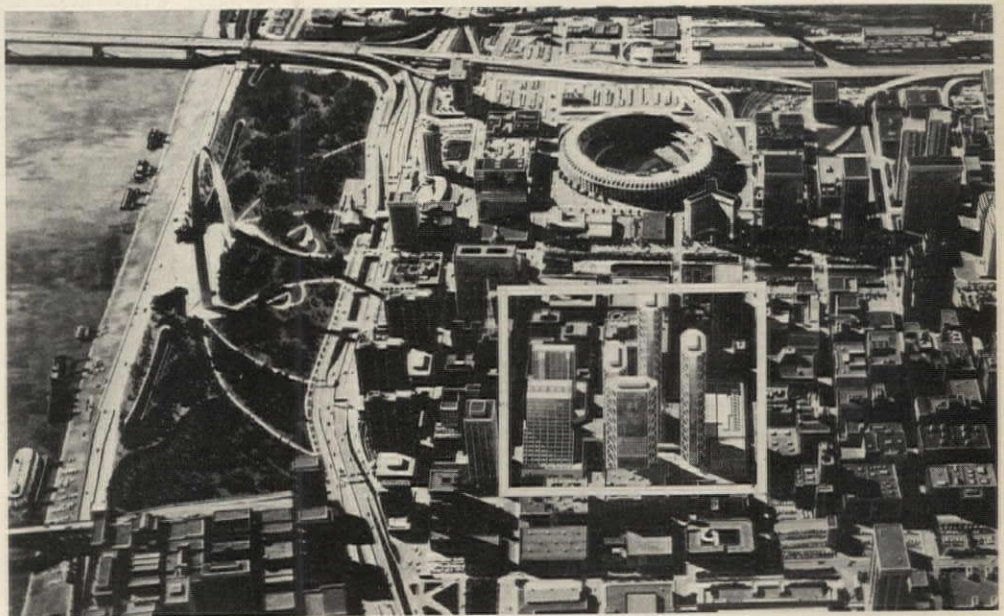
The industrial zone of Civac will cover 35 acres initially and will be separated by wooded areas from the 70-acre residential and commercial zones. Open spaces and parks are considered a vital part of the plan of Civac.

The construction of Civac is being financed by the Mexican Government and private investment groups. Several major companies have already built factories there, and 60 other firms have purchased land for plant construction.

Publication of Interest to Architects Surveys Systems Building in Schools

Produced and distributed by the ERIC Clearinghouse on Educational Management, *Systems Building Techniques* by Alan M. Baas is free while the supply lasts. Besides surveying current literature in the field, the document provides a glossary of terms, a list of major systems building projects, recommended legislative action and a bibliography. A number of references in the bibliography are to articles that have been published in the AIA JOURNAL.

Although the publication is intended primarily for persons in educational administration, its comprehensive scope will make it of interest to architects as well.



An aerial view shows the superimposed Mercantile Center complex in its downtown location. Just above is the Busch Stadium and to the left is the Gateway Arch and the Mississippi River.

Also available without charge until the supply is depleted are four leaflets in the Educational Facilities Review series. The aim of the series is to provide reviews "that are contemporary and sensitive to education's changing information requirements." The publications are "Open Plan Schools," "Environments for the Physically Handicapped," and "Modular Components," all by Alan M. Baas, and "Vocational Education Facilities," by Sharon Counts Johnson.

Requests for any of the publications should

be directed to ERIC at the University of Oregon, Eugene, Ore. 97403.

Multiuse Complex in Downtown St. Louis To Be Developed over 10-Year Period

A \$150 million, six-block, multiuse Mercantile Center is planned for St. Louis. The first phase of the project will be a \$25 million Mercantile Trust Company Tower 35 stories high. It is expected that construction will get underway next spring.

Over a period of about 10 years, the center will add three highrises, a hotel, three commercial towers, retail stores and shops and landscaped open spaces. The four major structures will be interconnected through a system of enclosed malls and bridges, focusing around a garden for flowers, trees, sculpture and fountains.

The proposed development is bounded by Locust Street, Broadway, Washington Avenue and Eighth Street within easy walking distance of Busch Stadium, a major highrise residential area and the proposed new civic convention center. Private financing is being used with no involvement of local, state or federal expenditures. The urban redevelopment process is being used to expedite and assist in the acquisition of some real estate parcels in the area.

The project's master plan and design architects are Thompson, Ventulett & Stainback, Inc. Supervising and coordinating architects and engineers are Sverdrup & Parcel & Associates, Inc.

Ordained Minister and Active Architect, Chaplain of Many Civic Organizations

Herbert Ewing Duncan, AIA, a lifelong resident of Kansas City, Mo., was a craftsman, an architect and a minister. He was ordained in both the Christian and Congregational churches. He was also a devoted parent, who once said of his growing children, "Just love them enough and they'll turn out all right." One of his sons is Herbert E. Duncan Jr., AIA. *continued on page 48*

At the time of his death on September 15 at the age of 67, Duncan was minister of the Westminster Congregational Church. He was eulogized by editorials in three Kansas City newspapers. One called him "a spiritual and civic leader" and one of Kansas City's "really great men."

President of the architectural firm of Herbert E. Duncan Architects, he designed many residences, apartments and office buildings. He was the architect of the first multifamily housing project in Kansas City after World War II. Active in many civic and religious organizations, he was also author of several books. As the *Kansas City Star* wrote of him, "He was a gentleman 'of many parts' with a lifetime of accomplishments."

Washington, D.C., Cathedral Architect, Praised as 'Genius of Gothic Design'

"Since the Middle Ages, there has not been an architect of Gothic to compare with him nor is there ever likely to be another," said the Very Rev. Francis B. Sayre Jr., dean of the Washington Cathedral in the nation's capital, in praise of Philip Hubert Frohman, FAIA. Frohman, who worked for more than 50 years on the Episcopal cathedral, died at the age of 84 on October 30.

Frohman first visited the cathedral in 1914. Under his name in the visitors' register, he wrote a little prayer in code that someday he might be its architect. That prayer was realized in 1921 when the Boston firm in which he was a principal was named to

succeed Henry Vaughan, the first officially appointed architect of the cathedral.

A graduate of the Throop College of Engineering, which is now the California Institute of Technology, Frohman opened his first office in Pasadena, California. After serving in World War I, he became a principal in the Boston firm of Frohman, Robb & Little. After the death of Donald Robb in 1942 and of Henry Little in 1944, Frohman became the sole architect of the Washington Cathedral. Long before the firm became associated with the edifice, Frohman had thought about the work of its original designer George Bodley. He wanted changes in the west facade, taller towers, a loftier nave and a larger west rose window.

In 1924 he moved his home and office to Washington, D.C., and lived within the shadow of the cathedral. From his offices, the central tower could be seen through the skylight. "A rock upon which fear is broken, a spire of gladness against the sky, the sign of Christ o'er a nation's destiny: This will ever be the finest gift of Philip Hubert Frohman to us all," declared Dean Sayre several years ago.

The architect of some 50 Gothic churches throughout the country, Frohman called Gothic architecture "the only modern style that is logical and functional." Throughout his life, he visited and studied all the world's major cathedrals. When his time was not devoted to architecture, he designed electronic organs, holding patents on several such instruments.

Deaths

- HERBERT BAUMER, FAIA
Columbus, Ohio
- HERBERT A. BRAND
Western Springs, Ill.
- ROBERT B. CHURCH III
Knoxville, Tenn.
- H. ERROL COFFIN
Nantucket, Mass.
- WILLIAM W. DRUMMEY
Boston
- HERBERT E. DUNCAN SR.
Kansas City, Mo.
- EDWIN E. FAIRFIELD
New York City
- WOOSTER B. FIELD
Columbus, Ohio
- ALBERT H. HARMON
Lexington, Ky.
- REMI A. LANGELIER
San Antonio, Tex.
- ROBERT M. LUTZ
Perrysburg, Ohio
- WILLIAM L. MAYNE
Arlington, Va.
- WARREN L. RINDGE
Grand Rapids, Mich.
- WALTER F. RITTENHOUSE
Bradenton, Fla.
- GILBERT GONZALEZ SELJO
Hato Rey, Puerto Rico
- M. H. STARKWEATHER, FAIA
Tucson, Ariz.
- ROBERT B. TRIVETT JR.
Millburn, N.J.

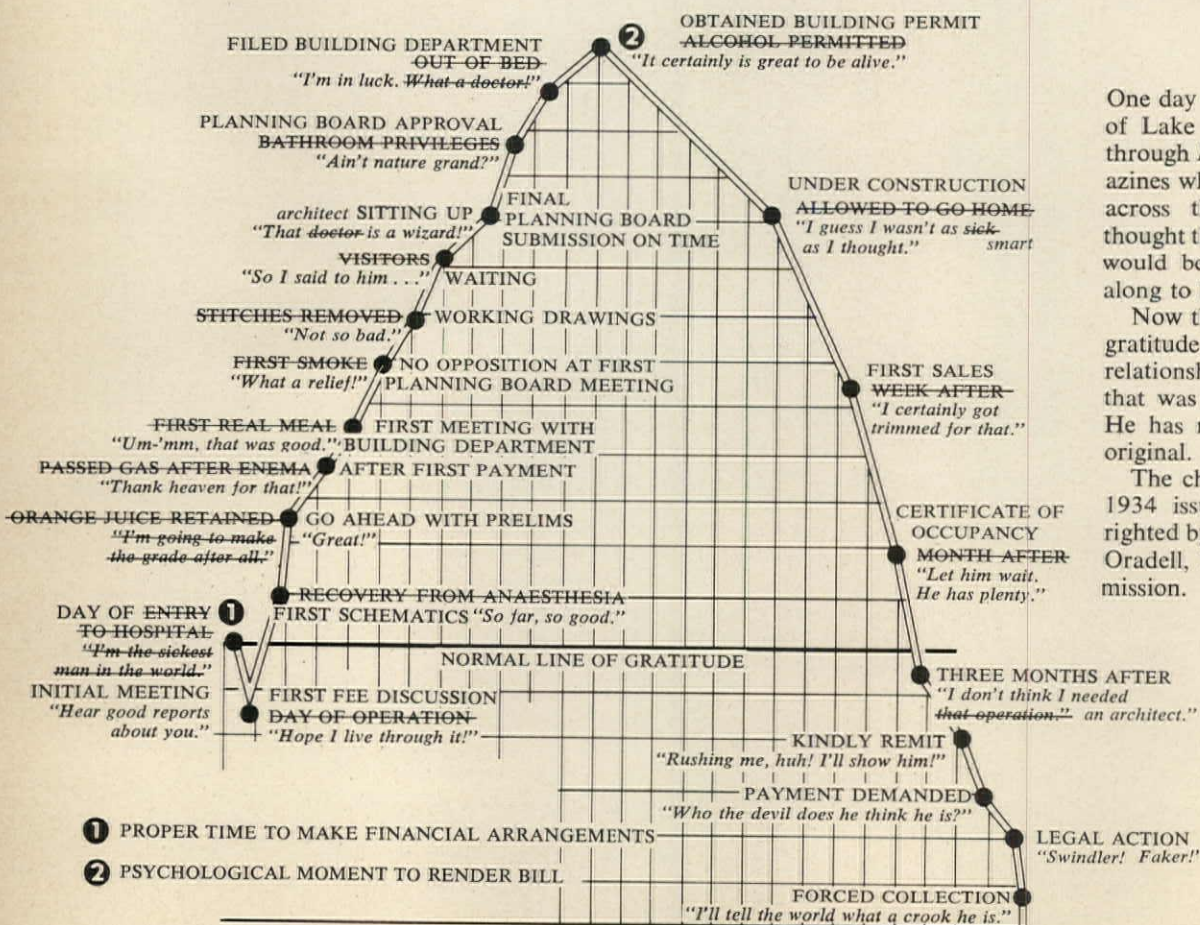
Human Nature Chart

by George S. King, M.D.
I. M. Schnook, R.A.

One day not long ago Seymour Jarmul, AIA, of Lake Success, New York, was flipping through *News of New York*, one of the magazines which his office receives, and he came across the "Human Nature Chart." He thought that his partner Bernard Brizee, AIA, would be amused, so he passed the chart along to him.

Now this outline of human frailty and ingratitude applies only to the doctor/patient relationship, but Brizee saw something in it that was applicable to architecture as well. He has made his own emendations to the original.

The chart was first published in the May 1934 issue of *Medical Economics*. Copyrighted by the Medical Economics Company, Oradell, New Jersey, it is reprinted by permission. □



Newslines

■ **The only major area in the country to lose population** since the 1970 census is the District of Columbia, losing about 1 percent. In the '60s West Virginia, North Dakota and South Dakota were losers, but now each is gaining at about twice the national growth rate. The fastest growing state in 1972 is Florida, although California is the nation's most populous, edging out New York in 1970 which had been at the top since 1800.

■ **The ancient Romans were the first to use condominiums**, meaning individual ownership with group management. The origin of the movement from those days until the present is outlined in a study *Condominiums: Their Development and Management* by Anthony D. Grezzo. Included are model forms for such things as bylaws, regulatory agreements, etc. A free copy may be obtained from the Information Services Branch, Office of International Affairs, HUD, Washington, D.C. 20410.

■ **Frank J. Matzke, FAIA**, former deputy general manager of the State University Construction Fund of New York, has been named associate commissioner for Project Management of the General Services Administration's Public Buildings Service.

■ **A glossary of industrialized housing terms** is included in the article "Manufactured Housing's Language Maze" by J. A. Reidelbach in the 1972 *Builders Guide to Manufactured Homes*. Other articles consider "Leisure Housing," "Can Factory-Built Really Cut Costs?" and "Putting Today's Communities Together," as well as other topics. A copy of the guide may be purchased for \$2 from the National Association of Building Manufacturers, 1619 Massachusetts Ave. N.W., Washington, D.C. 20036.

■ **Earl P. Fullingim, AIA**, has terminated his private architectural practice to become the first director of architecture for the Anchorage Borough School District.

■ **Land use and growth policies** are outlined in the leaflet "How Shall We Plan for Our Land?" which analyzes Congressional proposals for land use legislation and describes emerging issues. Priced at 60 cents per copy, it is available from the League of Women Voters Education Fund, 1730 M St. N.W., Washington, D.C. 20036.

■ **Engineers involved in lawsuits** relating to product liability will be interested in a booklet prepared by Professional Engineers in Private Practice: "Guidelines for the P.E. as a Forensic Engineer." Its intent is to establish a uniform set of procedures for the engineer to follow when he provides services and testimony for litigations concerning product liability. It may be obtained at \$1 per copy by PEPP members and at \$2 by nonmembers from the National Society of Professional Engineers/PEPP, 2029 K St. N.W., Washington, D.C. 20006.

■ **The Urban Land Institute**, an independent, nonprofit research and educational organization located in Washington, D.C., has announced a major realignment of its council structure to reflect the expanding scope of its activities and responsibilities to meet new problems of land use. Three councils (Central City, Community Builders and Industrial) have been restructured into six new ones: Residential, New Communities, Retirement and Recreational Development, Industrial, Commercial and Office Development, and Redevelopment and Civic Facilities.

■ **An English language section** is now a feature of *Art and Architecture: International Review* published in Iran. Translations and summaries are by AIA members E. Nader Khalili and Moira Moser-Khalili. The handsomely illustrated magazine is published quarterly at an annual subscription rate of \$11 or \$5.50 for architectural students. Articles cover both contemporary Iran and ancient Persia. Inquiries may be addressed to the magazine, Shah Reza Ave. 256, Tehran, Iran.

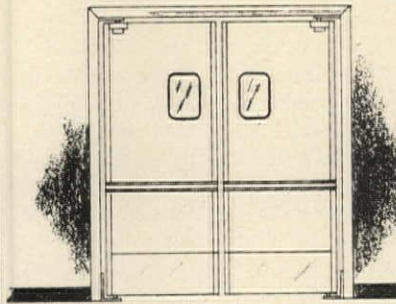
■ **Safety and health regulations** as they apply to industrial lighting are keynoted in *A Planning Guide to Meet OSHA Industrial Lighting Standards*. Copies are available without charge from Commercial/Industrial Lighting Division, Thomas Industries Inc., 207 E. Broadway, Louisville, Ky. 40202. □

BUY OR SPECIFY

Patented NO SPRING

ELIASON Easy Swing® DOORS

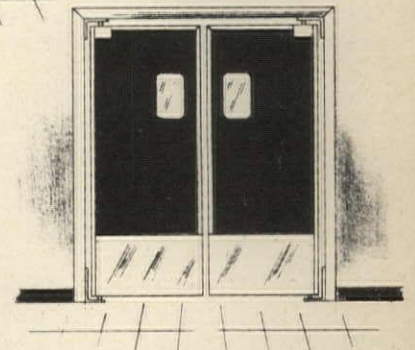
Self-closing • Double Action
FOR SERVICE, TRAFFIC OR CONVENIENCE



in

- STORES
- SUPERMARKETS
- RESTAURANTS
- FOOD SERVICE
- DEPARTMENT
- VARIETY
- DRUG

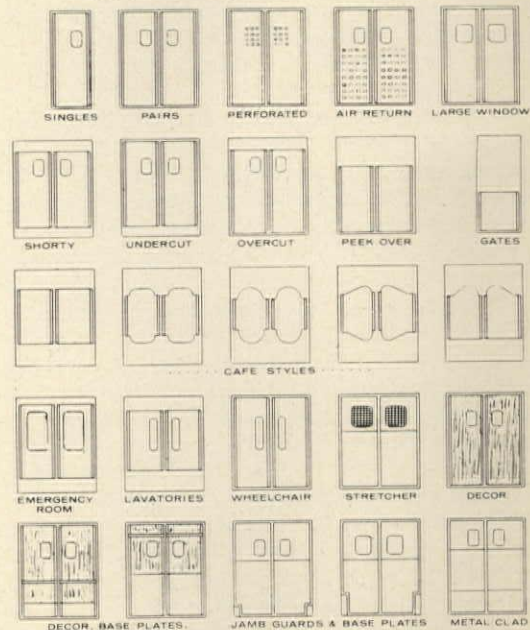
- HOSPITALS
- INSTITUTIONS
- INDUSTRY
- WAREHOUSE
- COOLERS



ALL Easy Swing DOORS open to finger touch or light nudge of stock truck. Safe, gentle, time-delay closing protects elbows, stops sidebinding or heel catching and eliminates high resistance and high maintenance.

.. IDEA CENTER ..

There is a RIGHT Easy Swing DOOR for your Safe Passage



Easy Swing DOORS NATIONALLY EXHIBITED
SUPERMARKET, RESTAURANT, HOTEL-MOTEL
AIA, NARGUS, NEHA & AM. HOSPITAL SHOWS

WRITE OR CALL FACTORY FOR SPECS & PRICES
LISTED IN SWEETS CATALOG FILES

ELIASON Easy Swing® DOOR Division
CORPORATION TEL: 616/327-7003
P. O. Box 2128 Kalamazoo, Michigan 49003 U.S.A.

History of Art. Newly revised and enlarged edition. H. W. Janson with Dora Jane Janson. New York: Abrams, 1969. 616 pp. \$16.50 members, \$19.50 nonmembers.

This book is a beautifully illustrated survey of painting, sculpture and architecture from the earliest known cave paintings right up to Habitat, Montreal. It is the revised edition of a work published in 1962; among additions are the end maps and the synoptic tables. In a work of art history, these maps and chronologies are not only important but vitally interesting.

Janson opens his book with a query: "Why are the strange, disquieting works we are likely to find nowadays in museums or art exhibits supposed to be art?" He continues from this point to show the reader that today's art is the direct descendant of all that has gone before it. The reader will gain understanding by the study of the history of art so that he will "know what he likes."

We begin with the ancient world of the Stone Age (15,000 BC) and its cave paintings, rock engravings and carvings. We learn something of the Neolithic Age when men settled into communities in the Near East about 8,000 BC. Neolithic Jericho (7,000-6,000 BC) was a fortified town of stone houses with plastered floors. We continue through a discussion of the primitive art of the modern day survivors of the Stone Age and the Neolithic pockets of primitive man found in the world explorations of the 18th and 19th centuries.

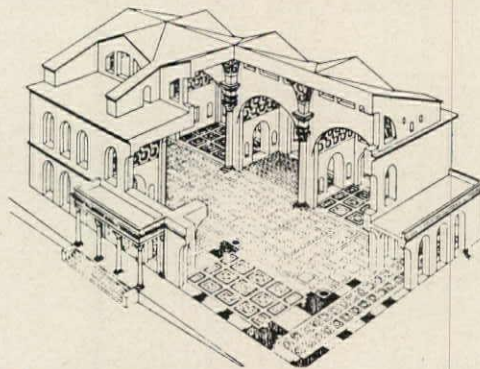
In the chapter on Egyptian art, we are told that man's progress into a more complex society was accelerated by the challenge of human forces. Civilization was built up as a defense against aggression by enemy forces. The architectural achievements of ancient Egypt, vast public works, palaces and cities, the indestructible tombs and the portrait statues, relief carvings and tomb paintings are the ancestors of Greek and Roman art and architecture.

We find in the study of the ancient Near East a civilization as old as Egypt's but one not as well preserved since it was built of mud brick and wood. The ziggurats, rivaling Egyptian pyramids, were the center of Sumerian city life. They were temples of worship combined with workshops, storehouses and scribes' quarters and towered above the flat countryside. The rise of the Assyrians was recorded by their narrated art, inscribed on stone, which was possible in northern Mesopotamia. The art of Persia, culminating in the palace at Persepolis begun by Darius I in 518 BC, refines and advances the art of carved relief, so splendidly displayed on what has come down to us from that long ago empire.

We follow the wake of an ancient ship from the Middle East out into the Mediterranean to search out Greece, making stops at

Crete and the islands of the Cyclades. There is only brief mention of the little known inhabitants of the Cyclades, but the accompanying illustration of one of their idols brings the reader abruptly into the present. This female nude might have been carved by Picasso. In Crete the Minoan art seems to have advanced in separate leaps and to have been destroyed by separate giant disasters. Perhaps Atlantis was settling into the Mediterranean with great quakings.

The beginnings of Greece occurred with the settling of nomadic tribes along the southeastern mainland. These Mycenaeans, at about 1600 BC, were burying their dead in conical shaped tombs which contained gold masks, cups, jewelry and weapons of great artistry and believed to be of Cretan influence. But, unlike Crete which was ap-



The reconstruction drawing of Constantine's Basilica shows a hall used for civic events.

parently unfortified, this area was built with hilltop fortresses in a style borrowed from ancient Near East. The Greeks of a later time concluded that these huge edifices had been built by the Cyclopes, Janson tells us.

In the chapter on Greek art, we follow its progress from 800 BC through the rise of its great civilization with its art and architecture. Here we find Ionic and Doric temple remains. We study the gradual but important advances in sculpture and vase painting and the hints at what the glory of Greece must have been when everything was in glorious technicolor including temples, statues, walls and ceilings.

We enter Italy with the mysterious Etruscans and study what is left of their history through their tombs, the foundations of their temples and the only remaining evidence of their mastery in building, Porta Augusta in Perugia. The Etruscans integrated the arch into architecture, as described in the text, and from this beginning the Romans developed it.

The Romans and the Empire, its vast architectural accomplishments, its painting, sculpture and influence into all parts of the known Western world are given an informative chapter, made necessarily brief for such a large subject. The study of the ancient

world is completed with the early Christians and Byzantine art, and we see the advances made by these people toward the age of faith, the Middle Ages.

The author discusses the gradual climb toward the Renaissance. Man's glorification of his God inspired great church architecture, culminating in the Gothic cathedrals. The painter, sculptor and artisan of this period, sponsored by the church, produced a vast quantity of work. At the end of the Middle Ages, Giotto burst upon the scene with his explosive impact which transformed the art of painting and carried us to the Renaissance.

The Renaissance is a huge, diverse and complicated period which the author discusses in a scholarly, informative and interesting way, bringing us from late Gothic architecture, painting and sculpture through the Italian Renaissance with all its great masters and into Mannerism and the baroque.

We enter the modern world of art with a discussion of Neoclassicism and Romanticism. The architecture of this period, with its Palladian and then Greek Revival influences, was followed by Gothic and finished up with neorenaissance and neobaroque. The painters of this period became involved in social issues on their canvasses, a new hangup for artists.

It is at this point in this large and informative volume that Janson lets us down with a thump. After pouring out such a wealth of information, his treatment of Realism, Impressionism, Postimpressionism and 20th century painting and sculpture leaves us with tremendous gaps in knowledge. The painters and sculptors from Courbet up to Victor Vasarely are cavalierly confined to the briefest study. Monet is lightly dismissed with a few lines, and no mention is made of his life-long search for light and its effect on painting. Renoir is allowed exactly three lines. Degas is summed up summarily. There is no mention here, where it is valid, of the influences of Japanese art on these Impressionist artists in the mid-19th century.

Cezanne fares a little better than his predecessors, the Impressionists. He is discussed in several paragraphs, and we understand some, but by no means a very large part, of what his Postimpressionistic style did for the advancement of painting. Picasso's work is described, albeit briefly for a still living genius. But poor Braque is a mere adjunct to Picasso in Cubism. Thus we proceed through the vast maze of modern art by the briefest of description and gain very little knowledge of what's up. We may know something of modern art, but from this book we learn a great deal more of art from the Stone Age before the Realists and Impressionists arrived on this earth. Next revision time, Mr. Janson, do justice to modern art. It's our life.

ELIZABETH H. CLASS
Washington, D.C.

Roma Barocca: The History of an Architectonic Culture. Paolo Portoghesi. Cambridge: MIT Press, 1970. 569 pp. \$50.

For centuries Italian architects have demonstrated a continuing and scholarly concern for the form and structure of cities. Given the complexity of urban fact even in the

medieval period, such involvement has brought Italian architects well into the circle of philosophic and historic concern. Paolo Portoghesi is a leading contemporary in this rich tradition. As well as being an architect, a historian and a sociocultural analyst, he is dean of the Faculty of Architecture at Milan's Politecnico; and he is a widely respected authority on the work of Borromini. He has made contributions as well to our understanding of the architectural problems and innovations of Michelangelo and Vittone among others.

His latest work under review here is a massive presentation of the history of civic architecture in the city of Rome and environs in the baroque era. It involves critical evaluations of the works of all the major Roman baroque architects as well as some of those not so well known.

Probably the most prominent feature of this unusual and complicated study is the collection of original photographs taken for the most part by the author himself. His acute insight into the power, the contradictions, the innovative techniques and the dramatic "unity through diversity" of Roman baroque forms is brought into sharp and rich focus through his mastery of photographic technique. His careful selectivity of details necessary to gain a good grasp of the whole of baroque Rome makes of this volume a basic one in the growing number of works on this relatively neglected subject. Even a scant perusal of the plates leads one to wonder just what brand of sky hooks Portoghesi had available to achieve the perspective his photographs present.

His narrative historical studies of general concepts as well as of numerous particular accomplishments in the work of Bernini, Borromini, Pietro da Cortona and others are effective accompaniments to a deeper understanding of what his camera shows. In addition, he has scattered carefully throughout reproductions of early prints and drawings so that original conceptions are clarified greatly in terms of "what Rome was" when its baroque architects and planners undertook to bring their solutions to what they saw as its problems in growth.

Apart from the work of the great baroque masters, their patrons and their classicist opposition, Portoghesi has brought to his study a critical analysis of various documents which reveal the strong influence of an active artisan tradition throughout the baroque era. He even seeks to identify regressions and renaissances within it. The interplay of the great baroque and rococo masters with these little known craftsmen of brick and stucco and water furnished, according to the author, one of the strongest currents of the baroque vitality: the unity of the practical and the theoretical. He qualifies this thesis with the positive and negative influences he finds in both Roman and foreign patronage as he reaches for the outlines of a social history of Roman baroque building and urban design.

Of particular interest in this section are his brief but pointed analyses of the planning philosophies of various popes. He suggests that Gregory XIII, for example, through his bull *Quae publice utilia* (1574) laid out

much of the building code for baroque Rome. This code encouraged the emergence of an urban fabric in which building blocks and apartment houses became the constant rule, abandoning the fragmentation of individual one-family dwellings. New major streets were opened, natural scenery was reduced, the concept of building nuclei was launched and the basis for a distinctly urban tissue was prepared. The ensuing plan of Sixtus V (1585-1590) both broadened and enlarged the tendencies already launched by Gregory's actions.

"To Sixtus V is surely due the merit of having instituted, on the basis of preceding experiments, an urban structure capable of resolving the fundamental urbanistic problems of Rome, i.e., the co-presence of the gigantic scale of the ancient imperial city, with its great distances, large spaces and the monumental dimensions of its continuously outcropping remains, with that of the miniscule medieval city . . .

"If the new urban planning policy, based on the connecting poles of religious and ceremonial interest—and indifferent, or almost so, to the poles of civic life—impeded the formation of a functional street structure related to the practical exigencies of the community, and if it made impossible that process of organic clarification characteristic of many European capitals, it did, nevertheless, give rise to the particular fascination of the baroque city of Rome with its very characteristic urbanistic values that were destined to exercise a great influence on European culture. In this way were established the premises that made Rome an experimental city, capable of producing urban nodal points of exceptional formal quality, without, however, succeeding in acquiring the physiognomy of a true urban organism in which the needs of the governing class and the interests of the community were in some way equilibrated."

Apart from his highly suggestive remarks as to the nature and character of Roman baroque architectonics and his sortings of both archival and architectural documentation, Portoghesi's tome is physically unwieldy—something over nine pounds!—rather expensive and a bit heavy on architectonic jargon, much of which cannot even be well clarified by a good bilingual dictionary. Possibly Barbara Luigia La Penta, the translator, might have done a cleaner job, but one suspects that the author's rather tightly wound assumptions have spun off terminology which is bound to make his points—at least for him. He takes on far too many problems and thus becomes embroiled in a simplistic historical methodology plus a certain tendentiousness in defense of the baroque as opposed to the classical.

There have been numerous attempts of late to "rehabilitate" baroque art and architecture from the esthetic limbo to which some 18th and 19th century critics assigned it. Just as Ruskin saw the Gothic as the norm of "true art," so does Portoghesi incline toward a "credo of the baroque" instead of to a careful and systematic examination of the milieu in which it came to be.

The reader in pursuit of a more measured understanding of this phenomenon in the his-

NEW FIFTH EDITION 1972

Order Your IES LIGHTING HANDBOOK

Recognized by planners, designers, specifiers, installers, maintainers as the standard lighting guide. The IES Lighting Handbook, from theory through practice, contains over 700 pages of text, tables, illustrations, calculation procedures, and more, in 26 sections. The most complete and authoritative compilation of essential lighting information in a single source.

\$37⁵⁰

U.S.
POSTPAID
\$1.00
EXTRA
OVERSEAS

\$32⁵⁰

FOR
ORDERS
ACCOM-
PANIED
BY CHECK



FOR NYC RESIDENTS ADD 7% SALES TAX; OTHER NYS RESIDENTS ADD APPLICABLE SALES TAX



**ILLUMINATING
ENGINEERING SOCIETY**
345 EAST 47 STREET,
NEW YORK, N.Y. 10017

TO DEPT. EC

PLEASE SEND COPY (COPIES)
OF THE IES LIGHTING HANDBOOK
— 5th EDITION TO:

NAME

ADDRESS

CITY STATE ZIP

- CHECK ENCLOSED, INCLUDES TAX
 PLEASE BILL

tory of cultural expression would do well to precede his reading of Portoghesi with a consultation at least of the prefatory chapters of Germain Bazin's *The Baroque* (New York Graphic Society, 1968). Bazin's handling of the history of the term "baroque" in its historical and cultural perspective is masterful in its clarity and good sense.

Also Carl J. Friedrich's *Age of the Baroque*, a work of some 20 years ago but still in paperback, remains one of the best general treatments of the broader historical context of what we incline to call these days a significant historical period. Francis Haskell's *Patrons and Painters* (Knopf, 1963) is still unsurpassed in its treatment of baroque patronage, though its scope is somewhat broader than the Roman scene. Haskell avoids the polemics of Portoghesi and sees that the "rise and fall" of the baroque culture is perhaps a bit more complicated to explain than through references to oppositions of worker versus aristocratic patronage, or of classicist versus urbanistic expressionist.

Portoghesi's opus has a place in the development of one's understanding of what he terms "baroque culture," but his "big bang" theories are, in the final analysis, uncomfortably reminiscent of those rather careless and opinionated classicists whose windmills he seeks to overthrow.

MARCUS W. ORR
Professor of History

Memphis State University, Memphis

Jacksonville Form and Appearance: One. Jacksonville, Fla.: Jacksonville Area Planning Board, 1971. 197 pp. No price given.

Assisted by federal 701 planning funds, the Jacksonville Area Planning Board prepared this work as an introduction to the study of the form and appearance of that city. The huge report is a fairly useful collection of urban design theory applied to the Jacksonville area—the kind that a fourth-year architectural student might assemble in completing his planning studio course.

To activists in urban design matters, the report is disappointing in that it makes no solid recommendations for the improvement of the visual form of Jacksonville. For those interested in a brief semiapplied course in urban design theory, it makes fine introductory reading.

The report is too long, too academic and too void of specifics to be of much help to public or private decision makers. This has been a characteristic of most of the reports produced under the federal 701 comprehensive planning assistance program. But alas, it is hard to be critical of such faltering underfunded urban design efforts when the country last year spent more public funds to develop a prototype torpedo, which doesn't work, than it has on the entire 701 program since its inception.

MICHAEL B. BARKER
Administrator

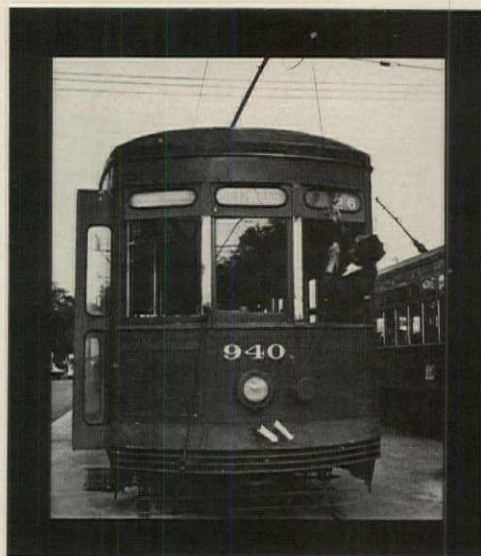
AIA Department of Environment and Design

The Last Line: A Streetcar Named St. Charles. New Orleans: August Perez & Associates (distributed by Claitor's Publishing Division, P.O. Box 239, Baton Rouge, La. 70821), 1972. 88 pp. No price given.

"Venice has its gondolas, Hong Kong its rickshas, San Francisco its cable cars, New

York City its subways. . . . In New Orleans, it is the trolley cars that have given the city much of its character," states August Perez III, AIA, principal in the New Orleans architectural firm of August Perez & Associates. The firm has published this photo essay because it believes that "New Orleans must not lose sight of its heritage and traditions as it experiences accelerated growth."

Nearly everyone, thanks to playwright Tennessee Williams, has heard of the streetcar named Desire, which is now retired to the French Market where it is eagerly viewed by thousands of tourists every year. But the St. Charles trolley, which travels on the only streetcar line left in the old city, may be less well known to outsiders. The St. Charles Line, now 135 years of age, is the oldest street railway line still in operation in the world. The St. Charles trolley "is a reminder



of a time that is no more—a simpler, slower age when the rumble and hiss of a streetcar symbolized the ultimate in transportation."

The handsome photographs which make up the major portion of the volume depict both the old and the new city. There are views of trolleys, the Mardi Gras, the cemeteries, the people, skyscrapers, homes and parks. Interspersed are essays on what makes New Orleans unique, its mass transportation system, a ride on the last line and the importance of symbols.

As the book concludes, "Anyone who has seen the excitement of a wide-eyed four-year-old as he waits impatiently for his first ride on the 'Charley Car' can understand why these reminders of the past should be allowed to roll forever."

LOCATE: The Translation of User Preferences into the Allocation of Space. Stuart W. Rose. Washington, D.C.: The Robert/James Associates, 1972. 53 pp. \$4.25.

Where a situation is relatively simple and there is a possibility of easy communication with occupants and for later adjustment, space may be allocated with reasonable success by means of simple procedures. For more complex problems, says Dr. Rose, special techniques are necessary for the successful allocation of space.

He makes a systematic review of methods developed in the past 8 to 10 years for

the planning of space. Included are both manual and computer-assisted techniques, game simulation and other sophisticated concepts in space planning procedures. The methods are compared and evaluated, with the advantages and disadvantages of each identified.

LOCATE, a computer-based system, takes the best features of the various approaches and integrates them into a flexible and comprehensive method of planning space. User need preferences are emphasized, giving the client a means of direct expression concerning the use of space. The concept can be employed without a computer; the process is the same whether planning a tremendous area for efficient land use or the arrangement of furniture in a living room.

There are three appendices: One applies the LOCATE system to community space planning; the second is an application to architectural space planning; and the third contains notes about the computerized characteristics of LOCATE.

The method will assist anyone directly involved in space planning activity: architects, urban planners, landscape architects, interior designers and managers of space for educational, commercial and industrial facilities.

The author, who has studied the problems of space planning, occupant response to visual qualities of space and space simulation techniques, is an architect and director of Continuing Education Programs, AIA.

The Little Red Schoolhouse. Eric Sloane. Garden City, N.Y.: Doubleday, 1972. Unpagged. \$4.95.

Dead and gone are the days of the early American one-room schoolhouse, as the author of this book reminds us. But even so, there is still a fascination for the simple structures that remain and a nostalgia for what seems to have been uncomplicated lifestyles.

This informally written and chatty book gives an insight into that time when a teacher's annual salary might have been "20 pounds of sugar, 16 yards of satin, three pecks of apples, three-quarters of a lamb, three yards of red cotton, a fat cow, 30 pounds of butter and 2,000 nails," as was true in a Massachusetts community in the 1700s. Even in the early days the term "moonlighting" was used to describe the activities of a schoolmaster who taught by day and earned a living by moonlight.

Sloane tells us how beautiful penmanship was taught, how school desks and benches were constructed, how chastisement was a part of life and education and many other things about America's past. There are sketches of the little schools and of equipment used by the schoolchildren, such as tinware lunch boxes and foot stoves.

The Environment Film Review: A Critical Guide to Ecology Films. New York: Environment Information Center, Inc., 1972. 155 pp. \$20.

This new annual reference guide indexes and critiques environmental films. The 627 films included—selected from several thousand—are arranged in 21 categories. Subject

areas include such topics as air pollution, energy, land use and misuse, solid waste and transportation.

Each review gives information about the film's content and quality; length; whether color or black and white; purchase, rental price or free loan designation; release date; sponsor; producer; name and address of distributor; and intended audience. A star rating system identifies exceptional films. There are also indexes by title, keyword, subject, industry and sponsor.

Colossus: A Novel About Goya and a World Gone Mad. Stephen Marlowe. New York: Macmillan, 1972. 563 pp. \$8.95.

This is a portrait of the "first painter" to the kings of Spain with an insight into the life of that country in the late 18th and early 19th centuries.

Kings Maelum. Henry Irven Gaines, AIA. New York: Vantage Press, 1972. 97 pp. \$4.50.

In 1925 Henry Irven Gaines was 25. He had been graduated from Clemson College and had finally persuaded a young lady named Betty to marry him. With her in tow, he came to Asheville, North Carolina, to practice architecture. He's been there ever since. This book contains his reminiscences, told in a narrative fashion that will hold your attention.

In case you are wondering about the title, it's the name of a cure-all apple juice. During the Depression, Gaines sold it. As he says,

"In the broad sense it has no actual relationship to architecture, but to narrow it down to my personal experience, it has a very real and vital relationship to my practice of architecture." It helped him hang on "until the revival of architecture." To your health, Mr. Gaines! And to the health of architecture.

Valid Architecture. Harold H. Smith. Sydney, Australia: Wentworth Books (US Agent: Richard Abel & Co., P.O. Box 4347, Portland, Oregon), 1971. 201 pp. \$10.

From his first sentence, "Architecture today lacks direction and purpose," to the end of the book, the author makes a valiant attempt to establish a viable philosophy for architecture and architectural education. Many readers will not agree at all with his findings. And others may find themselves turned off by his style, which is anything but lively, and his habit of cataloging those clichés that appeal to him. In spite of this, the book should prove to be stimulating and provocative to architects and educators who are concerned about the future of architecture and its teaching.

The New York Times Book of Antiques. Marvin D. Schwartz and Betsy Wade. New York: Quadrangle Books, 1972. 344 pp. \$25.

The story is told of the little old lady who kept a box on which she had placed a label which read: "String too short to save." Human beings naturally have a "squirrel" instinct; nearly everybody collects something. Whatever you collect in the way of antiques,

from Chippendale furniture to Depression glass, this book will help you. It's for both the amateur and the experienced collector.

There are tips on how to choose the best dealer, how to identify a marking, how to clean furniture, what to beware of at an auction, etc. The main divisions of the copiously and handsomely illustrated volume concern furniture, textiles, ceramics, pictures, metals and glass. And there's a special chapter on "Collecting Bargains," as well as a bibliography of materials that are apt to be found in even a small library.

One broad guide is given to all collectors: "Decide whether quality or fashion is more important to you, if you cannot afford both." As the authors say, "Becoming an expert in any field of antiques takes only the development and education of the five senses, care and time." The book is fun to leaf through and to read even if you don't collect anything more than dust.

Book of Successful Fireplaces: How to Build, Decorate and Use Them. 19th ed. R. J. Lytle and Marie-Jeanne Lytle. Farmington, Mich.: Structures Publishing Company, 1971. 104 pp. No price given.

The fact that this book is now in its 19th edition evidently testifies to the universal appeal of fireplaces. Written primarily for the homeowner, it will help the architect as well in planning either traditional or modern fireplaces. He will even get hints on how to tend an open fire. For example, don't burn one log at a time, nor even two. Three is the practi-

HOUSING & DEVELOPMENT BOARD, SINGAPORE

requires

ARCHITECTS

Salary: S \$950 rising to S \$1,850 p.m. The commencing salary will depend on qualification and experience.

Eligibility: Applications are invited from citizens or permanent residents of Singapore/Malaysia with an Architectural degree from a recognized university. Final Year Architectural Students may also apply.

Benefits: In addition, a non-pensionable annual allowance equivalent to a month's salary or proportionate thereof is payable at the end of the financial year and C.P.F. contributions will also be made. The Board provides medical benefits, car and housing loans and travelling allowance on official duty. The Board will reimburse appointee recruited from overseas one-way economy class air passage for himself and his wife subject to a service bond. Accommodation at reasonable rentals will be provided for those who are not qualified for public housing.

General: Promotion is based on merit and can be rapid depending on the ability of individual officers.

APPLY to the Embassy of the Republic of Singapore, 1824 R Street, N.W., Washington, D.C. 20009 for Application Forms.

Closing Date for application: *December 22, 1972.*

Maybe we can help get your P.U.D.* plans off the boards.

For the past few years we've worked with architects, builders and planners around the country in the development and promotion of many kinds of innovative housing.

Along with most people in the housing industry, we believe that these new solutions are badly needed. But we've found, as you may have, that they aren't easy to come by.

So perhaps some of the things we've learned will add to what you already know and can help get your project off the boards and into the ground.

If you'd like to know more about our organization and activities, just write **American Wood Council**, 1619 Massachusetts Avenue, N.W., Washington, D.C. 20036.

*planned unit development

cal minimum. Anyone who already possesses a fireplace will benefit from the chapter on the prevention, diagnosis and treatment of fireplace difficulties. There's even information on the kind of fireplace that is required if one lives in an area subject to earthquakes. The book is well illustrated with photographs, drawings and diagrams.

The Great Land Hustle. Morton C. Paulson. Chicago: Regnery, 1972. 240 pp. \$7.95.

It's only human nature to be intrigued by promises of a free plane trip with expenses paid to see a plot of land which has been lavishly described in a four-color brochure. The unsuspecting customer who falls for the ploy may then be high-pressured by fast talking salesmen with offers of low interest rates and long-term mortgages.

Although there are ethical and fair operations, many people are defrauded by unprincipled hustlers. Paulson, who is business and financial editor of the *National Observer*, is after the huge land-boom companies who make tremendous sums of money by gypping the "little people." He tells all the tricks of the trade about the "boom in the boon-docks." What's more, he names names. He also suggests ways to alert the consumer, to force protective legislation and to help prevent wastefully exploited land resources.

Practical Legal Advice for Builders and Contractors. Edward E. Colby. Englewood Cliffs, N.J.: Prentice-Hall, 1972. 238 pp. \$16.

A disappointing book filled with questionable advice and misinformation. Even taking into consideration that the author is writing for the novice builder, the value of his efforts is minimal. The best advice given is to secure the services of a good attorney.

Some of the things that the author apparently does not understand include: The architect is not a party to the construction contract; he does not "supervise and superintend" the construction; he is not an agent of the builder (contractor); the contractor is not an agent of the owner; the subcontractor is bound to submit his work to the decision of the architect. Nor does he seem to comprehend the difference between turnkey and lump sum projects, and he doesn't appear to know about liquidated damages and that a joint venture is a partnership.

STEVEN H. ROSENFELD
Director

AIA Professional Practice Programs

Mobile Home Parks, Part 2: An Analysis of Communities. Max S. Wehrly. Washington, D.C.: Urban Land Institute, 1972. 136 pp. \$10.

The technological, financial, economic and legal aspects of mobile homes were considered in part 1 of this analysis of mobile home parks and subdivisions (see Dec. '71, p. 42). That work, by Robinson Newcomb, was informative, as is this second publication which focuses on land planning and use.

Wehrly, planning consultant and former executive director of the Urban Land Institute, bases his work upon a questionnaire survey of 220 mobile home park managers in the US and Canada and on personal visits to some of the mobile home communities.

The mobile home unit itself, Wehrly comments, was frequently found to be the least innovative element in the park. We are dealing with a new form of shelter—one that is more stable than its name implies. He thinks that something better will emerge and old images will disappear in the process. "The principles of good site planning and architectural design which apply to conventional residential development can be, and have been to some extent, adopted by mobile home community builders."

Wehrly discusses in detail such matters as the age, size, density and occupancy of mobile home communities and physical characteristics such as streets and roadways, spaces between units and recreation and service facilities. He gives attention to police and fire protection and to management and operation. Finally, he makes some valid conclusions about mobile home communities. They can become not only an acceptable but also a desirable form of residential land use.

Construction Management and Contracting. Alonzo Wass. Englewood Cliffs, N.J.: Prentice-Hall, 1972. 298 pp. \$14.75.

Construction management as discussed in this book is not the same subject that was considered in *Professional Construction Management and Project Administration* by William B. Foxhall (see Jan., p. 52).

This is a primer for students (not architectural) or low level personnel in a contracting firm. The book attempts to cover the operation of typical contracting firms in both the US and Canada. It makes for dull reading. It is, in brief, an overview of existing procedures, which limits its value or interest to architects.

Thesaurus of Building Science and Technology. Preliminary edition. Montreal, Canada: University of Montreal, Industrialization Forum, 1972. Various pages. \$19.

This is described as a "working document" which will be brought up to date by addenda sheets to be issued for a year. It contains the essential terminology of building science and technology and relevant parts of the sciences of the environment. There are about 5,000 terms presented in an alphabetical permuted and systematic hierarchical display. An introduction explains the structure and gives suggestions for its use. Developed by the Industrialization Forum team, the School of Architecture, University of Montreal, the aim of the thesaurus is to provide "a better tool of indexing and retrieving information in the field of building industry."

Concrete Thin Shells. Detroit: American Concrete Institute, 1971. 424 pp. \$15.75.

This publication contains the proceedings of a symposium held in 1970 which was organized by the ACI Committee on Concrete Shell Design and Construction.

The preface states that "concrete thin shells require the highest level of competence and interdisciplinary collaboration of the architect, engineer and contractor if a truly outstanding project is to emerge." This book will assist the team members in the realization of that aim.

The first section of the book concerns con-

ceptual design and construction. It is concluded by five papers on outstanding examples of completed concrete shell structures in this country and Mexico. The second part of the book is devoted to the problems of analysis and design, and there are comprehensive papers on shell types such as hyperbolic paraboloids, cable-supported concrete shells, cylindrical shells and folded plates, shells of revolution and shells of general shape.

Construction of Prestressed Concrete Structures. Ben C. Gerwick Jr. New York: Wiley-Interscience, 1971. 411 pp. \$13.50.

The author, whose work engages him in engineering construction and prestressed concrete manufacture, has written a practical guide intended primarily for the contractor and construction engineer. He sets forth the general principles and specific techniques for the manufacture utilization of prestressed concrete, suggesting appropriate materials, techniques, equipment and methods. He indicates means for ensuring quality, economy, durability and desired performance for a wide range of applications.

Manual of Precast Concrete Construction. Vol. 2: Industrial Shed-type and Low-rise Buildings, Special Structures. Tihamér Koncz. Wiesbaden, Germany: Bauverlag GmbH, 1971. 427 pp. DM 110.

The author's detailed treatment of prefabricated construction with large precast reinforced concrete and prestressed concrete units has required a subdivision into three volumes. The first was concerned with principles and fundamentals and with roof, floor and wall components. The present second volume is given over to the construction of single story, shed-type industrial buildings and similar structures. A third volume will consider multistory buildings.

The five main chapters in Volume 2 are devoted to shed-type and low rise buildings with solid web structural frames; the analysis, design and detailing of precast concrete lattice structures; prefabricated arches and similar structures; plate and shell-type components as main structural features; and special purpose prefabricated structures, such as grandstands, silos, cooling towers, etc.

Building Construction Specifications. Ivan T. Rathbun. New York: McGraw-Hill, 1972. 384 pp. \$7.95.

Rathbun calls this a "text/workbook." Directed to the student, its intent is to teach specifications reading and writing. There are forms and specifications written and used for existing buildings and corresponding worksheets that may be used for tests. Questions are given at the end of each chapter as well as "thought problems" that may be used for class discussion, work assignments or test questions.

The Weathering and Performance of Building Materials. Edited by John W. Simpson and Peter J. Horrobin. New York: Wiley-Interscience, 1970. 286 pp. \$10.

Weathering and the durability of building materials is a subject which has been given short shrift, conclude the editors of this book, with whatever attention is paid the matter

usually relegated to a subsection in standard texts on building materials. Consequently, they enlisted experts to write about the principal materials used on the exterior of buildings. Five chapters on concrete, clay products, timber, metals and plastics are supplemented by an introductory section on the most important factors which contribute to weathering and performance. The book has considerable information for the US architect.

Energy Conservation References

Several months ago the National Bureau of Standards and the General Services Administration co-sponsored the Roundtable on Energy Conservation. At the time NBS's Center for Building Technology had a number of relevant publications on display. A list follows with information about where the references may be obtained. They are all inexpensive, and in many cases they are free. Requests should be placed with the sources indicated.

Analysis for the Determination of an Air Conditioning Criteria. T. Kusuda, J. Hill, S. Liu, W. Gewehr and F. J. Powell. NBS Report 10815. 1971. Free.¹

Analysis of Electric Energy Usage in Air Force Houses Equipped with Air-to-Air Heat Pumps. P. R. Achenbach, J. C. Davis and W. T. Smith. NBS Monograph 51. 1962. Free.¹

Durability of Insulating Glass. H. E. Robinson. Proceedings of a Seminar, BSS 20.

1970. 75 cents. (SD Cat. No. C13.29/2:20).²

Dynamic Thermal Performance of an Experimental Masonry Building. B. A. Peavy, F. J. Powell and D. M. Burch. NBS Report 10664. 1971. Free.¹

The Effect of Moisture on the Heat Transfer Performance of Insulated Flat-Roof Constructions. F. J. Powell and H. E. Robinson. BSS 37. 1972. 75 cents. (SD Cat. No. C13.29/2:37)²

11 Ways to Reduce Energy Consumption and Increase Comfort in Household Cooling. 1971. 30 cents. (SD Cat. No. C13.2:EN2).²

The First Symposium on the Use of Computers for Environmental Engineering Related to Buildings. NBS 1970 Program and Abstracts. (Proceedings are BSS 39 containing full text of about 60 papers, weight about 5 pounds, size about 3 inches thick). \$7.75. (SD Cat. No. C13.29/2:39).²

Heat Transfer Analysis of Underground Heat Distribution Systems. T. Kusuda and F. J. Powell. NBS Report 10194. 1970. Free.¹

Least Squares Analysis of Annual Earth Temperature Cycles for Selected Stations in the Contiguous United States. T. Kusuda. NBS Report 9493. 1968. Free.¹

Procedure for Determining Heating and Cooling Loads for Computerized Energy Calculations. ASHRAE, 1971. \$4 ASHRAE members, \$8 nonmembers.³

Proposed Procedures for Simulating the Performance of Components and Systems for

Energy Calculations. ASHRAE, 1971. \$2 ASHRAE members, \$4 nonmembers.³

Report of the Ad Hoc Committee on Urban Environment to the R & T Committee. ASHRAE, 1970. Free.¹

Research Needs in Thermal Insulation. F. J. Powell. ASHRAE Symposium Bulletin. 1969. Free.¹

7 Ways to Reduce Fuel Consumption in Household Heating Through Energy Conservation. 1971. Free.¹

Some Observations on the Use of Underground Reservoirs as Heat Sinks. B. A. Peavy and R. S. Dill. NBS Report 4795. 2d edition. 1972. Free.¹

Thermal Resistance of Airspaces and Fibrous Insulations Bounded by Reflective Surfaces. H. E. Robinson, L. A. Cosgrove and F. J. Powell. BMS 151. 1957. Free.¹

Trends in Heating, Ventilating and Air Conditioning. F. J. Powell. CIB 5th Congress, Versailles. 1971. (Research into Practice: The Challenge of Application). Free.¹

Use of Modern Computer Programs to Evaluate Dynamic Heat Transfer and Energy Use Processes in Buildings. T. Kusuda and F. J. Powell. NBS Spec. Publication 361. 1972. Free.¹ □

¹ J. L. Haecker, AIA, Center for Building Technology, National Bureau of Standards, US Department of Commerce, Washington, D.C. 20234.

² Superintendent of Documents, US Government Printing Office, Washington, D.C. 20402. (Include catalog number).

³ American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc., 345 E. 47th St., New York, N.Y. 10017.

Questions About Your Subscription

To insure fast service on inquiries concerning your *AIA JOURNAL* subscription, please include the address label from the most recent issue received.

Change of Address

Four weeks' notice required for change of address. Include address label from most recent issue and new address information in space provided below.

NEW SUBSCRIPTION

Please check here if you wish subscription rate information.

Name _____

Address _____

City _____

State _____ Zip _____

MAIL TO:

AIA JOURNAL
Circulation Dept.
1785 Massachusetts Ave., N.W.
Washington, D. C. 20036



To the author (or organization) in search of a publisher

YOU ARE INVITED to send for a free, illustrated brochure which explains how your book (or your organization's) can be published, promoted and marketed.

Whether your subject is fiction, non-fiction or poetry, scientific, scholarly, specialized (even controversial) this handsome 52-page brochure will show you how to arrange for prompt publication.

Unpublished authors, especially, will find this booklet valuable and informative. For your free copy, or more information, fill in and mail the coupon.



Mail Coupon for your Free Copy

Vantage Press, Inc.—Dept. DO-1
516 W. 34th St., New York, N.Y. 10001

Please send me a complimentary copy of **To the Author in Search of a Publisher.**

Name _____

Address _____

City _____ State _____ Zip _____

Offices in Washington, D.C. and Hollywood, Calif.

letters

Illumination on Lighting

W.M.C. Lam's letter in the November issue contains a number of accusations against the Illuminating Engineering Society and the lighting industry that are untrue and need to be answered. Criticism and controversy are healthy for any discipline, and illuminating engineering is no exception. But people who would seriously equip our commercial and industrial capacity with the output of a good gas mantle — about 17 footcandles — are out of touch with the real world. Let's separate fact from fiction.

Lam knows about the way in which IES arrives at its recommended practices and how for almost 30 years they have been based upon a research program conducted by independent researchers at independent universities throughout the world. The research results having to do with the relationship between lighting and visual performance are examined exhaustively, in some cases for years, by technical committees composed of representatives from all segments of the field, *half of whom have no direct stake in lighting levels*. The end product of this approach is a common body of lighting knowledge which simply cannot be dismissed because it doesn't work to Lam's advantage.

If anyone takes exception to the common body of knowledge about illumination developed by the Illuminating Engineering Research Institute and the IES, he must be prepared to offer something more original than "it's no good." Lam, along with Richard Stein, Leslie Larson, the American Gas Association and others variously motivated, continually raise questions about IES and IERI. So far, however, they have failed to submit a semblance of original research for objective scientific appraisal. They seek to raise serious doubts about a whole body of engineering knowledge by taking an isolated piece of research, with which the IES has no argument, twisting it to suit their own purposes, and then attempt to present it as if it were conclusive evidence that the research and technology upon which IES recommendations are based are invalid.

What kind of nonsense is this? IES has labored in the field of illumination research and technology since 1906. It has fairly established by fact, not rhetoric, its reputation as the authoritative spokesman for all matters having to do with illumination. It is recognized as such by its affiliations with the National Academy of Sciences, the American Association for the Advancement of Science, the American National Standards Institute and, on an international level, the Commission Internationale de l'Éclairage. It has led the world in developing good lighting practice, and it isn't going to roll over and play dead because of the personal motivations and unsubstantiated doubts of a few people.

It is important for industry, government and the public to distinguish between those who feed upon the uncertainty of a national resource problem and who have a partial knowledge of an enormously complex engineering discipline, and the documented work of research scientists and engineers who have devoted literally hundreds of thousands of man-hours to their subject. It is important to know that the standards recommended by the IES are the result of literally years of research, review, discussion and debate. The standards are open in all stages of development to questions and challenge by any qualified individual or institution that is prepared to offer an opposing or modifying view at a recognized level of scientific and engineering competence.

Apparently, Lam believes that lighting people shouldn't be allowed to have anything to say about lighting. Obviously, people from the lighting industry who have a legitimate and competent interest in matters having to do with their professional activity are represented within the IES committee structure and the IES as a whole. Questioning their participation in the IES makes about as much sense as questioning the membership of architects in the AIA. Where does Lam think the largest body of expertise within any field resides? If lighting people are unfit to be involved in the development of lighting practices, then by Lam's logic, architects who work for architectural firms are unfit to have anything to say about the practice of architecture. Similar analogies are endless.

Another curious opinion of Lam's is that there is something wrong about IES deriving a substantial portion of its income from industrial companies, associate memberships and advertising in its magazine. According to our current statement of income, that total figure is actually considerably less than half the total income. But more importantly, so what? If Lam knows of some windfall other than membership dues and assessments, advertising and other hitherto unsuspect areas of income counted upon by literally every professional organization to support its operations, I am sure that the AIA and everyone else will be interested.

Lam also slyly left out half of the paragraph from the IES 1970-71 annual report in which I called for greater support from the lighting industry. This is an interesting ploy in which he cites a half sentence wherein I publicly implored greater support from the industry which he claims dominates IES. Does anyone besides Lam seriously believe that the 4/1,000 of 1 percent of the total lighting market that IES derives from industry firms constitutes dominance? The truth of the matter is that I cited the need for more funds in general to support programs of research, education, publication, etc., about lighting. In this regard, I applaud the

AIA's assessment of architectural firms; the income will help the Institute accomplish the things that the profession would like to have done.

Lam has inconsistent points of view about cold fluorescence, green mercury, etc. If America wanted that kind of nostalgia, she would be paying billions of dollars more to retain the incandescent lamp. To get back to those "good old days," we would be using as much energy for lighting as we do today for all purposes. Incidentally, the mercury lamp now has excellent color properties, lasts more than five years and produces 50 lumens per watt, more than twice the incandescent. If the lamp and utility industries were as blinded by profitability as Lam makes them out to be, they would be clinging like the devil to the pre-1938 profits of the incandescent lamp. Those designers who do cling to the incandescent lamp see no conflict between what they preach publicly about energy consumption and what they practice privately.

The only really important issue that Lam raises concerns our encroachment upon the design responsibilities of architects. The truth is that the great body of technology developed, particularly in the last five years, *does* give the architect, the designer and the engineer powerful new tools to do a more flexible and sensitive design job than ever before. Our data shows the relative difficulty of various tasks, the differences among people, the angles of frequency distribution at which tasks are viewed.

Our computer technology enables the architect to calculate the illumination at any point so that he can employ the principle of nonuniform illumination as he wishes. As contrasted with the old scissors curve, our new VCP technology enables him to determine for himself the trade-offs between the quality of a lighting design and cost and energy consumption. If Lam, Stein, et al., were really conversant with these developments instead of being obsessed with the narrow subject of footcandles, IES membership qualifications, etc., they would recognize, enhance and promote rather than demean the enormous contributions that IES research and technology have made to the operating room, the highway, offices, factories, schools and scores of other areas of human performance. They would do their utmost to bring IES tools to the attention of the design professional. PAUL C. RINGGOLD

*Executive Vice President
Illuminating Engineering Society
New York City*

Hands Across the Sea

As a result of the publication in the August issue of my letter in which I asked for data regarding artificial stone and pioneers in the field, I have had a gratifying response. For example, one of the members of the AIA who has more or less retired has volunteered to help me in collecting information, etc., in his part of the world. I am most grateful. Thank you for the opportunity to publish my appeal.

PETER ROBB
*The Fairway, Keyworth
Nottingham NG12.5 Du England*

Joseph Watterson Eulogy

The final tribute to Joseph Watterson, FAIA, former editor of the AIA JOURNAL, and the eulogy of him in Comment and Opinion in the July issue are, in my opinion, fine pieces of writing. A job well done.

ALFRED H. ZARSE, AIA
Milwaukee

Regionalism Issue Still Praised

If there are reprints of your articles on regionalism from the October 1971 issue, I should greatly appreciate having them for the use of my students this fall quarter in our city and regional planning curriculum. It is an excellent selection of work.

BENJAMIN POLK, AIA
Associate Professor
School of Architecture and
Environmental Design
California State Polytechnic College
San Luis Obispo

ED. NOTE: With the fulfillment of this request, we have exhausted our supply of reprints.

Addresses of Publishers

For the benefit of those like myself who live and work in the wide open spaces, the boondocks, the hinterlands and what have you of these United States of America — and there are quite a few of us — please give the address of the publishing company with the book reviews published in the AIA JOURNAL. It would assist a person who wants to order the book.

ROBERT L. BROWN, AIA
Huntington, W. Va.

ED. NOTE: For reasons of space, we do not give publishers' addresses with the book reviews and annotations. Even in the boondocks, there is usually a public or school library which will give the inquirer this information. If the architect lives in a town with a bookstore, that is also a source. We are always glad to know of interest stimulated by book reviews, and we'll supply addresses to any of our readers if they wish to write us directly.

Architects in Elective Offices

I read with considerable interest Comment and Opinion in the August issue, and I herewith respond to the request for knowledge of architects serving in elected political offices.

I am presently serving my second two-year term as mayor of San Luis Obispo, California, having initially defeated an incumbent mayor in April 1969 and having been re-elected in 1971.

Like Mayor Gordon Johnston, AIA, of Tacoma, Washington, I also cut my civic participation teeth serving on the city planning commission. This I did for two terms (eight years), serving as commission chairman for five years. I heartily concur that more architects should become involved on advisory bodies—especially planning commissions—and should try their hands at elective offices.

From the perspective of my experience, I must sadly conclude that architects are just not making nor effectively influencing the making of the really big decisions about our physical environment. Occasionally, we produce a fine structure or complex of buildings,

but this is simply not enough. To be more effective, if we truly wish to be, architects are going to have to come down out of their proverbial ivory towers and learn to stand toe to toe and slug it out in the political arena with land owners; realtors; developers; money lenders; slick deal artists of all assorted sizes, shapes and persuasions; government officials and politicians, as well as the butcher, the baker and the candlestick maker. We must do battle constantly and not just intermittently as we are presently prone to do.

My strong feelings should not be interpreted to mean that all is right with San Luis Obispo. Not so. But a few things are beginning to head in different directions, and I'm encouraged though constantly frustrated.

Frustration may well be the name of the game for any architect who accepts the challenge of serving as an elected public official in today's arena which sees on one hand the advocates of uncontrolled growth and on the other, exponents of complete environmental protection. One's sense of values is sorely tested, but it is a testing to which more architects will subscribe, I hope.

I, too, will be interested in learning of other architects who are serving in elective offices.

KENNETH E. SCHWARTZ, AIA
Mayor
San Luis Obispo, Calif.

A Question . . .

Reference is made in the August issue in the article "The Adaptable Hospital," by Rex Whitaker Allen, FAIA, to construction cost tabulation for hospitals using the interstitial concept. He indicates a range of square foot costs (I assume gross square feet) from \$35.20 to \$50.10 per square foot. It is not clear whether the total gross square feet include the interstitial floors or a percentage of them in the calculations. Nor is there an indication whether the costs are all inclusive, i.e., site development, building, mechanical systems, etc.

It would be helpful to have answers to these questions since our firm does considerable hospital work, and we are constantly combatting clients' ideas of square foot and per bed costs.

KENNETH E. WISCHMEYER, FAIA
St. Louis

. . . and an Answer

The gross square footage does not include any square footage for the interstitial space and, therefore, makes the figures comparable to a building with furred space only. It is our experience that in a building where mechanical services approximate 50 percent of the total cost, no premium is paid for interstitial space if the contractor recognizes the time savings which can be realized.

It is essential, however, that the design be modular so that there is minimum variation in structural elements to permit economical off-site fabrication of trusses. The savings occur in the mechanical systems because of easy access and the opportunity to overlap the work of various trades; mechanical contractors and finishing contractors can be working simultaneously.

The costs are the usual all inclusive construction costs, including site development, building, all mechanical systems and group I equipment. REX WHITAKER ALLEN, FAIA
San Francisco

Tennis, Anyone?

I read with interest "The American Endless Weekend" in the September issue. Although there is a photograph of the Hazel Hotchkiss Whiteman Tennis Center in Weston, Mass., this is about the only reference to tennis. The 12 million golfers are mentioned, but nothing is stated about the 13.5 million tennis players.

Note is made of the fact that since the poor are not mobile, recreational opportunities are minimal at best. Tennis is a sport that can be very close at hand, frequently within walking distance. The equipment costs little to buy, and the fee for playing on a public facility is generally nil.

As chairman of the Tennis Facilities Committee of United States Lawn Tennis Association, I have found that for some reason most architects are not familiar with the way tennis facilities should be built. Unfortunately, too often they create projects that are far poorer than they should be.

ALFRED S. ALSCHULER JR., FAIA
Chicago

'Red Face' Day

In case anyone should claim that he "honestly identified every one of the symbols" from "Substitutes for Words" in the August issue, I think it only fair to point out that the identifications on page 48 of the October issue have an error. Symbols 11 and 14 are reversed. Symbol 11 designates ionizing rays or dangerous radiation; symbol 14 is the familiar sign shown on many buildings, including the AIA Headquarters, to designate shelter for protection from fallout gamma radiation following nuclear attack.

ROBERT BERNE, AIA
Chief Architect,
Defense Civil Preparedness Agency
Washington, D.C.

'A Brickbat and an Onion'

After reading the item in the April issue (p. 56) about Rob Cuscaden's "melange of bouquets and brickbats, orchids and onions" for the architectural professional, I really wonder if this profession will ever get its rear end off the fence. Evidently you recognized Cuscaden's remarks to be of some consequence, but you awarded yourself a brickbat and an onion when you let the "ethics of the profession" eliminate announcement of the "worsts." The architectural profession, similar to the medical profession, has abortions. The difference between the two is that ours are more apparent.

I hope that the AIA JOURNAL isn't so naive as to believe that we, as a profession, create only good architecture. If the losers can't be faced, we've got no business talking about the winners.

BRIAN A. SPENCER
Wauwatosa, Wis.

ED. NOTE: Readers who want to know about the "worsts" may consult the December 26 Chicago Sun-Times.

events

AIA State and Region

- 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.
Feb. 8-10: North Carolina Chapter Winter Convention, Downtowner East Motel, Charlotte, N.C.
Mar. 22-23: Virginia Chapter Winter Meeting, Sheraton-Fredericksburg Motor Inn, Fredericksburg, Va.
Mar. 28-30: Michigan Society of Architects Annual Convention, Olds Plaza Hotel, Lansing, Mich.
Apr. 24-26: Wisconsin Chapter Convention, Playboy Club Hotel, Lake Geneva, Wis.

National

- Jan. 7-11:** National Association of Home Builders Annual Convention, Astrodome, Houston
Mar. 30-Apr. 1: '73 Poolside Living and Garden Expo, Anaheim Convention Center, Anaheim, Calif.
Apr. 1-6: Environmental Needs as Part of the Quality System in Construction Conference, Asilomar Conference Grounds, Pacific Grove, Calif.
May 7-10: AIA National Convention and Exposition, Brooks Hall, San Francisco

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.
Jan. 31: Entries due, Plywood Design Awards Program. Contact: American Plywood Association, 1973 Plywood Design Awards, 1119 A St., Tacoma, Wash. 98401.
Feb. 2: Entries due, Homes for Better Living Awards Program. Contact: Mrs. Denise Martenis, *House & Home*, McGraw-Hill Building, 1221 Avenue of the Americas, New York, N.Y. 10020.
Feb. 7: Entries due, Reynolds Aluminum Prize for Architectural Students. Contact: Mrs. Maria Murray, AIA Headquarters, 1785 Massachusetts Ave. N.W., Washington, D.C. 20036.

Fellowships

- Dec. 31:** Application and submission of work due, Rome Prize Fellowships. Contact: Executive Secretary, American Academy in Rome, 101 Park Ave., New York, N.Y. 10017. □

AIA JOURNAL

1785 Massachusetts Ave. N.W., Washington, D.C. 20036. (202) 265-3113

Robert E. Kochler, HON. AIA, Acting Publisher
 Richard J. Satola, Sales Manager
 George L. Dant, Production Manager

ADVERTISING SALES OFFICES

Atlanta (404) 233-6729

Morgan Pirnie
 Harold Brown
 Charles I. Reynolds
 G. Spencer Prankard
 3108 Piedmont Road N.E.
 Atlanta, Ga. 30305
 (Alabama, Georgia, Mississippi,
 North Carolina, South Carolina,
 Tennessee, Virginia)

Chicago (815) 459-8020

Robert E. Davis
 Ray Davis
 Robert J. Malone
 P.O. Box 595
 Crystal Lake, Ill. 60014
 (Illinois, Indiana, Iowa, Kansas,
 western Michigan, Minnesota, Mis-
 souri, Nebraska, Wisconsin)

Dallas (214) 369-8621

Stanley T. Poag
 6617 Snider Plaza
 Dallas, Tex. 75205
 (Arkansas, Louisiana, Oklahoma,
 Texas)

Denver (303) 825-3325

Robert H. Heidersbach
 846 Lincoln St.
 Denver, Colo. 80203
 (Colorado, New Mexico, Utah,
 Wyoming)

Los Angeles (213) 483-1304

M. Jeffrey Kaufman
 1313 W. Eighth St.
 Los Angeles, Calif. 90017
 (Arizona, southern California)

Miami (305) 891-2414

John J. Kelly
 1005 N.E. 125th St.
 North Miami, Fla. 33161
 (Florida)

New York (212) 685-9620

Robert L. Bassinette
 Harold D. Mack Jr.
 271 Madison Ave.
 New York, N.Y. 10016
 (Connecticut, Delaware, Maine, Maryland,
 Massachusetts, New Hampshire, New
 Jersey, New York, eastern Pennsylvania,
 Rhode Island, Vermont, metropolitan
 Washington, D.C.)

Portland (503) 292-8521

Frank M. Eaton
 P.O. Box 25150
 Portland, Ore. 97225
 (Idaho, Montana, Oregon, Washington)

San Francisco (415) 397-5377

Morton McDonald
 Tom X. Carter
 625 Market St.
 San Francisco, Calif. 94105
 (northern California, Nevada)

Washington, D.C. (202) 265-3113

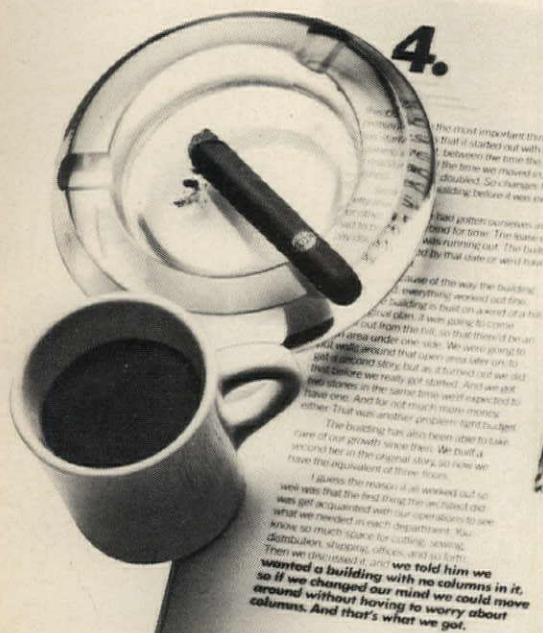
Richard J. Satola
 1785 Massachusetts Ave., N.W.
 Washington, D.C. 20036
 (Kentucky, Ohio, eastern Michigan, western
 Pennsylvania, West Virginia)

ADVERTISERS

Azrock Floor Products Div.	Cov. 4	Libbey-Owens-Ford Company	2-3
American Wood Council	53	Mutual Benefit Life	7
Circulation Dept. (AIA)	55	National Electrical Contractors	
Continuing Education Program (AIA) ..	4	Assoc. (NECA)	1
Electric Energy Association	9-10	Peace Corps/Vista	43
Eliason, Easy Swing Door Div.	49	Potlatch Forests	Cov. 2
Embassy of Singapore	53	Scharf, Edward G. & Sons	12
Haws Drinking Faucet Co.	Cov. 3	Vantage Press	55
Illuminating Engineering Society	51		

Take stock in America.
 Join the Payroll Savings Plan.

Before you start building, read this booklet.



"Our architect suggested a way of mounting our crane system that saved us \$60,000..."

"He helped me develop a whole new way of merchandising..."

"His way of doing the building saved us \$1 million..."

These intriguing quotations are right out of a new collection of short stories for businessmen.

It's strictly non-fiction.

And if you are involved in your company's decisions as to what to build and how to build it, you ought to have a copy.

(Especially if you think of architects as impractical dreamers who draw cupids and curlicues on buildings.)

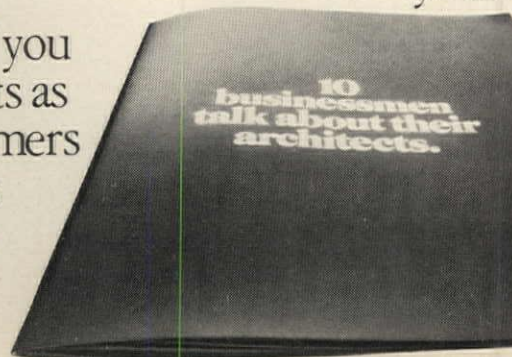
Title of booklet: 10 BUSINESSMEN TALK ABOUT THEIR ARCHITECTS.

Authors: 10 men with jobs like yours: General Managers, Executive Vice Presidents, Directors of Facilities, Presidents.

(Worth repeating: Architects did not write these stories about architects. Businessmen did.)

Reading time: 15 minutes. You can skip parts without losing the plot.

Price: Nothing. It's free. Just ask your secretary to mail us this coupon.



American Institute of Architects
1785 Massachusetts Avenue, N.W., Washington, D.C. 20036

Gentlemen: Please send me a copy of your free booklet.
"10 businessmen talk about their architects."

Name _____

Firm _____

Address _____

City _____ State _____ Zip _____

AIA JOURNAL

INDEX

Volumes 57-58
January-December 1972

A

Aalto, Alvar. Jan 4
ABC and Why of Development Building.
[Griffin] Apr 33
*Acquisition, Conservation, Creation and
Design of Open Space for People.* Mar
47
Adaptable Hospital. [Allen] Aug 43
Advertising. Nov 14
A/E Selection Law. Dec 8, 11
A/E services. Jan 50; Apr 13; May 54;
Dec 8, 11
AFL/CIO. Jun 12
After the Fair Is Over. [Koehler] Dec 22
After the Planners. [bk rev] Aug 56
Aging. Jan 4
Agnew, Spiro T. Mar 10
Air rights. Aug 51
Akron, Ohio. Jul 55
Alexander, Christopher J. Jun 52; Aug 12
Allen, Rex Whitaker: *The Adaptable
Hospital.* Aug 43
Alley Theatre. May 32
Allwork, Ronald. May 6
American Association of University Wo-
men. Aug 52
American City Corp. Sep 8
*American Courthouse: Planning and De-
sign for the Judicial Process.* Oct 15
American Endless Weekend. [Ensign] Sep
17
American Institute of Steel Construction.
Jan 50; Feb 42
American Management Association. Feb
11
American Plywood Association. May 52
American Revolution Bicentennial Com-
mission. Apr 13
American Society of Landscape Archi-
tects. Oct 55
American Wood Council. Oct 56
Anderson, Zane: *Keeping a Ferryboat
Afloat.* Oct 51
Ann Arbor, Mich. Aug 52
Answer Lies Not in the Unions. [Bowen]
Aug 27
Antitrust proceedings. Jun 11; Jul 39
Apartments. Aug 51
Appalachian Trail Conference. Sep 6
*Application of Modular Production Sys-
tems to Ambulatory Care Facilities.* [bk
rev] Oct 59
Archaeology. Jun 49
*Architect and Archaeologist as Collabo-
rators.* [Rippeteau] Jun 49
Architect as developer. Jan 8; Apr 33, 38
Architect of the Capitol. Jan 8
Architect-Researcher's Conference. Jan 8
Architects and New York City. [Rosen-
feld] Sep 40
Architects in government. Sep 20
Architects in politics. Aug 8; Dec 57
Architects' offices. Mar 51
Architectural concrete. Nov 17
Architectural Credo. [Urbahn] Jan 10
Architectural education. Jan 37; May 41;
Jul 47; Oct 41
Architectural Firm Award. Jan 6

Architectural Graphics Manual. Aug 34
Architectural License Seminars. Nov 10
Architectural research. Jan 42, 43; May
41; Jul 47; Aug 12
Architectural Research Medal, AIA. Aug
12
Architectural Secretaries Association. Apr
14; Oct 56
Architectural services. Jun 27; Sep 27, 45;
Nov 27, 43; Dec 39, 44
Architectural tours. Mar 55
Architecture and Color. [bk rev] Aug 56
*Architecture by Team: A New Concept
for the Practice of Architecture.* [bk
rev] Apr 60
*Architecture for Human Behavior: Col-
lected Papers from a Mini-Conference.*
[bk rev] Oct 59
*Architecture for Labor in Postindustrial
America.* [Osman] Oct 29
*Architecture in a Crowded World: Vision
and Reality in Planning.* [bk rev] Oct
62
Architecture in Houston. [Papademetriou]
Apr 19
Architecture in Wood. [bk rev] Aug 57
'Architecture 1980.' [Maurer] Jan 40
Arizona State University. May 45
Art. Dec 29, 50
Assessments, AIA. Sep 10
Association of Collegiate Schools of Ar-
chitecture. Jan 42; Oct 44
Association of Student Chapters/AIA.
Jan 40
At Your Service. [Slayton] Jul 13
Atlanta. Aug 38; Dec 45
*'Attainment and Restraint' of Pietro Bel-
luschi.* [Ross] Jul 17
Automation. Dec 26
Awards. AIA May 13; AISC Jan 50;
ASLA Oct 55; Bartlett May 31; Corps
of Engineers Feb 48; energy conserva-
tion Dec 44; Honor May 13, 31; library
Apr 41; Louis Sullivan Oct 56; non-
profit housing Nov 38; offices Sep 10;
PCI Nov 8; plywood May 52; Rey-
nolds May 24; Southern Baptist Jul 12;
spacecraft design Jul 28; store interiors
Jun 51; 25-Year Jul 26; UIA Dec 45;
white cement Feb 48, Dec 45

B

Bailey, Anne Howard: *Refracted Images.*
May 27
Balchen, Bess: *A Firm That Gained
Strength Through Transition.* Nov 27;
For More Concrete Relations. Jan 13;
*A New Client: The For-Profit Hospital
Corporation.* Mar 29; *Planning For Ed-
ucation.* Feb 15; *With the City Fore-
most in Mind.* Sep 27
Baldwin Hills Village. Jul 26
Baltimore Chapter AIA. Aug 53
Baltimore City Public Schools. Feb 19
Barker, Michael B.: *Emphasis: Environ-
ment and Design.* Sep 14; [bk rev] Jun
56; [bk rev] Aug 57; [bk rev] Dec 52
Barnes, Edward Larrabee. May 38

Barr, Vilma: *Team Approach for a Uni-
fied Result.* Apr 46
Bartlett Awards. May 31
Basic Real Estate Financing. [Farrell]
Apr 38
Becket, Welton & Associates. Jul 58
Behavioral research. Feb 25; Aug 15;
Sep 35; Oct 37
Belluschi, Pietro: *The Unchanged in a
Time of Change.* Jul 25; Feb 6; Jul 17
Bernardo, Jose. [bk rev] Jul 59; Oct 55
Berne, Robert. [bk rev] Sep 60
Bicentennial parks. Apr 13
Bidding. Jun 11
Birren, Faber: *Color and Man-Made En-
vironments.* Aug 15; Sep 35; Oct 37
Blanton, John. [bk rev] Sep 56
Bond, Michael A.: *Science Fiction Be-
comes Fact.* Jul 28
Bose, Vilmar K.: *Highrise Living: How
Safe?* Jan 32
Boston. Jul 9; Nov 51
Boston Society of Architects. Oct 32
Botond, István and Patricia. Dec 5
Bowen, David M.: *The Answer Lies Not
in the Unions.* Aug 27
Bowman, Peggy Cochrane: *In Praise of
Mexico.* Apr 30
Braden, David R. Feb 4
Breakthrough. see Operation Break-
through
Breuer, Marcel & Herbert Beckhard. May
39
Bridges, Leon: *'Fill the Void.'* Oct 10
Brizee, Bernard. Dec 48
Brochures. Apr 56
Bronx Zoo. Aug 53
Brooks Bill: see A/E Selection Law
Brooks, Kenneth W. [bk rev] Sep 56
Brooks, Robert A.: *In Addition to Fund-
ing.* Feb 19; [bk rev] Feb 52
Brower, Martin A.: *How to Dedicate a
Building.* Jan 27
Bryant & Bryant. Sep 27
*Building a New Town: Finland's New
Garden City, Tapiola* [bk rev] May 58
Building in the USSR, 1917-1932. [bk
rev] Oct 58
Building Research Advisory Board. May
10
Building systems. Jan 48; Feb 42
Building Team Conference. Apr 14; Nov
8
Built-Up Roofing Systems Institute. Jun
51
Burriss Laboratory School. Jun 40
Bylaws, AIA. Jun 11; Jul 44

C

California Council AIA. Jul 28; Dec 44
Campaglia, Muriel: *Demolishing Some
Myths.* Nov 14
Can Systems Building Be Better? [Luck-
man] May 17
Capitol, US. see US Capitol
Caracas. Sep 12
*Case Study and an Assessment of Strate-
gies.* [Clarke] Jan 42
Cassette programs. Feb 4
Caudill Rowlett Scott. Jan 6; Feb 19; Apr
60
Caudill, William W. [bk rev] Feb 52
Census reports. Mar 54
Chicago. Aug 52
Chicago Sun-Times. Apr 56
Chief of Engineers Architectural Design
Awards. Feb 48
Christmas cards. Aug 8; Dec 13
Cintas Fellowships. Oct 55
Citation for Excellence in Community
Architecture, AIA. Jun 12; Jul 55; Nov
51
City Signs and Lights. [bk rev] Jan 52
Clark, Lord Kenneth McKenzie. Nov 7
Clarke, David: *A Case Study and an As-*

assessment of Strategies. Jan 42; [bk rev] Aug 57; [bk rev] Oct 62
 Class, Elizabeth H. [bk rev] Dec 50
 Class, Robert Allan: *Industrialization and the Architect*. Jan 48; *Today's Answer to Data Filing*. Nov 43; [bk rev] Apr 62
 Classrooms. May 45
 CLM/Systems, Inc. Mar 11
 Codes. Feb 42; Nov 10
 College buildings. Feb 27
 Collins, Edward C. II. Oct 32
 Color. Aug 15; Sep 35, 56; Oct 37
Color and Man-Made Environments. [Birren] Aug 15; Sep 35; Oct 37
 Comment & Opinion. aging Jan 4; AIA JOURNAL Jun 8; convention Apr 6; earthquakes Nov 4; Expo '74 Dec 6; highways Sep 6; humor Feb 4; interprofessionalism May 6; Joseph Watterson Jul 6; membership profile Mar 6; national parks Oct 4; politics Aug 8
 Commissions, AIA. Community Services Mar 8; Government Affairs Mar 8
 Committee on Federal Procurement of A/E Services. Dec 11
 Committees, AIA. Architecture for the Arts and Recreation Sep 17, Nov 7; Automated Practice Technology Dec 39; Federal Procurement Dec 11; Housing Mar 6, Nov 7; Personnel Practices Aug 27; Professional Consultants Jan 8; Resolutions Jul 45; Scholarships Oct 10
 Compensation. see Fees
 Competitions. Bonn, Germany Feb 6; Ghent, Belgium Apr 55; inaugural reviewing stand Dec 8; Jacksonville, Fla. May 10; mobile homes Mar 8; New York City Convention Center Jun 51; Perugia, Italy Jan 8; Tanganyika Jul 56
Computer-Based Financial Management. [Harper] Dec 39
 Computer systems. Mar 11; Dec 26, 39
Concert Approach to Problem Solving. [Taylor and Peterson] May 45
 Concrete. Nov 17
 Conference on HUD-Assisted Housing Programs. Dec 44
 Conference on Religious Architecture Feb 49
 Consent decree. Jun 11; Jul 39
 Conservation Foundation. Oct 4
 Construction Industry Affairs Committee Aug 53
 Construction industry manual. Jul 12
 Construction management. Jan 52
 Construction Specifications Institute. May 52
 Continuing Education Programs, AIA. Feb 4; Jun 14
 Controlled Environment Corp. Sep 12
 Convention, AIA. Apr 6, 8, 16; Jun 11; Jul 6, 34, 62
 Convention centers. Jun 51
 Conway, Don: *Knowledge and Intuition in Combination*. Aug 12; *With Research in the Curriculum*. Jul 47; [bk rev] Sep 58; [bk rev] Oct 59
 Corps of Engineers. Feb 48
 Correctional architecture. Jun 46
 Corwin, E. F.: *Nature at Play*. Jan 30
 Cost control. Dec 35
 Costello, Anthony J.: *Let's Have Inside-Out Schools!* Jun 40
 Council of American Building Officials. Nov 10
 Council of Landscape Architectural Registration Boards. May 6
 Courthouses. May 10; Oct 15

D

Dallas. Apr 28
 Data filing. Sep 8; Nov 43, 51

Deasy, C. M.: *The Two-Wheeled Solution*. Sep 51
 Dedication of buildings. Jan 4, 27
Demolishing Some Myths. [Campaglia] Nov 14
 Department of Community Development May 54
 Department of Community Services, AIA. Sep 10
 Department of Education, AIA. May 41
 Department of Environment and Design, AIA. Sep 10
 Department of Government Affairs, AIA. Sep 10
 Department of Housing and Urban Development. Jul 12; Oct 26; Dec 44
 Department of Justice. Jun 11; Jul 39
Design Awards for Nonprofit-Sponsored Low and Moderate Income Housing. Nov 38
 Design professions. Jan 37, 42
 Design Science Institute. Sep 12
Design Translation of Political Decisions. [Horsbrugh] Sep 52
 Detroit. Jul 12
 Development building. Jan 8; Apr 33
Development Building: The Team Approach. Apr 33
 Discrimination. Dec 46
 Dluhosch, Eric. [bk rev] Oct 58
Doing and Learning. [Quinn] Jul 49
 Donald, James C.: *An Overview: The Federal A/E Selection Law*. Dec 11
 Donham, Brett. Oct 34
 Dormitories. Feb 25
 Dorsey, Robert T.: *An Extension of the Energy Crisis: More Light on Lighting*. Jun 24
 Drake, Brian: *A Scotsman Surveys Our Cost Control*. Dec 35
 Dreyfuss, Henry. Aug 31. [obit] Nov 54
 Dubin, Fred S.: *If You Want to Save Energy*. Dec 18
 Dubos, René: *In Praise of Diversity*. Jul 30
 Dues, AIA. Sep 10
 Duncan, Herbert E. [obit] Dec 47
 Durham, Robert L. [film rev] Sep 59

E

Earthquakes. Nov 4
 Ebenezer Tower. Nov 38
 Education. Jan 37; Feb 15 Mar 43; May 41; Jul 47; Oct 41
 Educational facilities. Feb 15; Oct 29
 Ekstein, Peter A.: *Through Unionization Comes a New Spirit*. Aug 29
 Elderly, Housing. see Housing, Elderly
 Electric heating. Oct 54; see also Heating
 Electricity. Jun 17
 Ellison, James E.: *Looking Ahead in Education and Research*. May 41
Emphasis: Environment and Design. [Barker] Sep 14
 Employer/employee relations. Aug 27; Dec 44
 Employment. Aug 10
 Energy conservation. Jun 17; Jul 55; Sep 8, 64; Oct 54; Nov 59; Dec 18, 26, 44, 55, 56
 Energy Conservation Seminars. Sep 8
 Ensign, William L.: *The American Endless Weekend*. Sep 17
Environmental Design: New Relevance for Special Education. [bk rev] Sep 59
 Environmental Educators' Conference. Jan 42
 ERIC Clearinghouse on Educational Management. Dec 47
 Evans, Daniel J. Aug 8
 Expo '70. May 24
 Expo '74. Aug 10; Dec 6, 45
 Expositions. May 24; Aug 10; Dec 6, 22
Extending Scientific Method in Architecture. [Frank] Jan 43

Extension of the Energy Crisis. [Dorsey] Jun 24

F

Faget, Estelle Clair. [obit] Nov 54
 Fairfax Co., Va. Jun 11
 Fairs. see Expositions
 Farrell, Paul B. Jr.: *Basic Real Estate Financing*. Apr 38
 Faulkner, Waldron. Jun 11; Aug 15
 Federal buildings. Aug 52
 Fees. Dec 44
 Fellows, AIA. May 10, 50
 Ferebee, S. Scott Jr. Jun 8; Dec 16
 Ferendino, Grafton, Spillis, Candela. Mar 55
 Ferryboats. Oct 51
 'Fill the Void.' [Bridges] Oct 10
Financial Management for Architectural Firms. Dec 39
 Fink, Peter: *Reflections on Refractions*. May 29, 26
Firm That Gained Strength Through Transition. [Balchen] Nov 27
 Fleming, William R.: *The Keys to It All Are Personnel Administration and Development*. Aug 30
For More Concrete Relations. [Balchen] Jan 13
 For-profit hospital corporations. Mar 29
 Fountains. Jan 30
 Four-day work week. Sep 45
 Frank, Edward: *Extending Scientific Method in Architecture*. Jan 43
 Frank Lloyd Wright Foundation. Feb 6; Nov 35
 Franzen, Ulrich & Associates. May 32
Frederick Law Olmsted and the American Environmental Tradition. [bk rev] Nov 55
 Friedlander, Gordon D.: *New Horizons in Structural Steel*. Feb 42
 Friendship Village. Nov 39
 Frohman, Philip H. [obit] Dec 48
 Frye, Jason W. Jr.: *How to Give a Hospital a Solid Foundation*. Mar 23; [bk rev] Mar 60
 Fuller, R. Buckminster. Jan 40; Sep 12; Nov 7
 Furniture. Feb 16

G

Gangnes, Arnold G. [bk rev] Sep 59
 General Services Administration. Oct 56
Genius and the Mobocracy. [bk rev] Mar 62
Genuine Response to the Region. [Koehler] Jun 27
Glimpse of Old India. [Larson] Feb 40
 Gold Medalist. Feb 6; Jul 12, 17, 25
 Gould, William A. Mar 6
 Graffiti. Dec 29
 Graham Foundation for Advanced Studies in the Fine Arts. Aug 54
 Graham, Julie. Jun 30
Graphic Shielding Analysis. [bk rev] Sep 60
 Graphics. Aug 31
 Graves, Ben E.: *The Inspired Learning Space*. Feb 16
 Great Lakes. May 6
 Greenfield, Sanford R.: *A Modest Proposal: An AIA National School of Architecture*. Oct 41
 Griffin, C. W. Jr.: *The ABC and Why of Development Building*. Apr 33
 Gropius, Walter. Nov 4
Guidelines for a Personnel Practices Manual. Dec 44
Guidelines for the Planning and Design of Regional and Community Correctional Centers for Adults. Jun 46
 Guild for Religious Architecture. Oct 55
 Gutheim, Frederick. [bk rev] Nov 55

H

Hagopian, Vahan. [obit] Jul 56
 Haines Lundberg & Wachler. Sep 45
 Haines, Richard F.: *Science Fiction Becomes Fact*. Jul 28
 Hale Mahaolu Elderly Housing. Nov 42
 Halse, Albert O. [bk rev] Aug 56
 Harmony House Co-op. Nov 42
 Harper, G. Neil: *Computer-Based Financial Management*. Dec 39
 Hartman-Cox. Oct 56
 Harvard University Graduate School of Design. Dec 46
 Haviland, David S.: *The 'Temporary' Facility Comes into Its Own*. Feb 27
 Headquarters, AIA. Jan 50; Jul 54
 Health services. Mar 17
 Heating. Jun 17; Dec 18; *see also* Electric heating
 Hedrich, Kenneth. [obit] Aug 55
 Heimerich, John J. [obit] Jul 56
 Higgins, H. Cassius. Feb 6
 Highbridge House. Aug 51
Highrise Living: How Safe? [Bose] Jan 32
 Highrises. Jan 32; Jun 21; Sep 23; Oct 6
 Highway Beautification Act of 1965. Sep 6
 Highway Transportation Congress. May 10
 Highway Trust Fund. May 10
History of Art. [bk rev] Dec 50
 Homebuilders. *see* National Association of Home Builders
 Honor Awards. May 13, 31
 Honorary Fellows, AIA. Apr 14
 Honorary Members, AIA. Mar 10; Nov 7
 Hood, Raymond M. Sep 23
 Horsbrugh, Patrick: *Design Translation of Political Decisions*. Sep 52
Hospital Architecture: Integrated Components. [bk rev] Mar 60
Hospital Modernization and Expansion. [bk rev] Mar 58
 Hospitals. Mar 17, 23, 29; Aug 43
 Housing. allowances Oct 26; Baldwin Hills Village Jul 26; Breakthrough May 10; elderly Jan 6, 46, Mar 55, Aug 50; HUD-assisted Dec 44; low income Apr 55, Jul 12, Aug 50, Nov 38; mobile Feb 6, Nov 35; moderate income Nov 38; prefab Feb 6, Mar 11, 55; Soviet Aug 48
 Housing allowances. Oct 26
 Houston. Apr 19, 23, 52
Houston: An Architectural Guide. Apr 19
 Houston Chapter AIA. Apr 6
 Houston International Airport. Dec 47
 Houston Museum of Fine Arts. Apr 8
How Soviets Plan Their Urban Housing. [Roberts] Aug 48
How to Dedicate a Building. [Brower] Jan 27
How to Give a Hospital a Solid Foundation. [Frye] Mar 23
 HUD. *see* Department of Housing and Urban Development
Human Nature Chart. Dec 48
 Hunt, Dudley. Jun 8

I

Ice Houses I and II. May 40
If You Want to Save Energy. [Dubin] Dec 18
 Illinois Center. Aug 52
 Illuminating Engineering Society. Jun 17, 24
In Addition to Funding. [Keyes and Brooks] Feb 19
In Answer to Questions on Correctional Architecture. [Moyer] Jun 46
In Praise of Diversity. [Dubos] Jul 30
In Praise of Mexico. [Bowman] Apr 30
 INBEX. *see* Industrialized Building Exposition and Congress

Indian architecture. Feb 35, 40
 Indiana Dunes National Lakeshore. Oct 4
 Indiana State University. Feb 25
 Industrialization. Jan 48; Mar 33; Dec 45
Industrialization and the Architect. [Class] Jan 48
 Industrialized Building Exposition and Congress. Jan 48; Dec 45
Inspired Learning Space. [Graves] Feb 16
 Institute of Store Planning. Jun 51
 Institute Page. advertising Nov 14; A/E Selection Law Dec 11; AIA services Jul 13; AMA Feb 11; awards May 13; component and member services Mar 14; continuing education Jun 14; Department of Environment and Design Sep 14; National Policy Task Force Apr 16; president's statement Jan 10; research Aug 12; scholarship fund drive Oct 10
Institution for the Design Professions. [Wade] Jan 37
 International Book Year. Oct 4
 International Business Machines Corp. Mar 44
 International Conference on the Planning and Design of Tall Buildings. Oct 6
 International Union of Architects. Jun 12; Sep 17; Nov 7; Dec 45
 Interprofessional Council on Environmental Design. May 6
 Interprofessional Council on Registration. May 6
 Ireland/Associates, Inc. Apr 42
Issue: Personnel Practices. [Bowen, Eckstein and Fleming] Aug 27

J

Jacksonville Form and Appearance: One. [bk rev] Dec 52
 Jamestown Homes. Nov 40
 Jarmul, Seymour. Dec 48
 Johansen, John M. May 34
 Johnson, Eugene I. [bk rev] May 58
 Johnson, Hugh B. Sep 6
 Johnson, Philip C. Apr 45
 Johnston, Gordon. Aug 8
 Joint Committee on Employment Practices. Aug 27
 Joint Industry Conference. Sep 8
Joint Ventures for Architects and Engineers. [bk rev] Oct 59
 Jova, Henri V.: *Underground Atlanta*. Aug 38
 Justice, Department of. *see* Department of Justice

K

Kahn, Louis I. Mar 11
 Kaufman, Max. Oct 6
Keeping a Ferryboat Afloat. [Anderson] Oct 51
 Keyes, Sterling S.: *In Addition to Funding*. Feb 19
Keys to It All Are Personnel Administration and Development. [Fleming] Aug 30
 Kilham, Walter H.: *The Way of an Architect with a Client*. Sep 23
 King, Frederic Rhineland. [obit] May 54
 Kliment, Stephen A. [bk rev] Jul 58
 Kling, Vincent, & Partners. Jun 11
 Kmetzo, John L.: *When Computers Assume Building Operations*. Dec 26
Knowledge and Intuition in Combination. [Conway] Aug 12
 Koehler, Robert E.: *After the Fair is Over*. Dec 22; *A Genuine Response to the Region*. Jun 27; [bk rev] Jun 56; *see also* Comment and Opinion
 Koerfer House. May 39
 Konrad Wachsmann: *Toward Industrialization of Building*. Mar 33

Kornblut, Arthur T.: *The Occupational Safety and Health Act*. Aug 36; Dec 44
 Krathen, Allen M.: *The Problems and Prospects of Indian Architecture*. Feb 34
 Kruger, Kenneth: *Should You or Shouldn't You Go Out on Your Own?* Oct 32

L

Labor unions. Aug 27
 'Landmark Document'. [Urbahn] Apr 16
 Landscape architecture. Aug 20
 Larson, Thomas N.: *A Glimpse of Old India*. Feb 40
Legacy from the Past. [bk rev] Sep 56
 Legislation. Apr 13, 55; May 10; Dec 8, 11
 Leisure. Sep 17
Let's Have Inside-Out Schools! [Rosenman, Costello and Mullins] Jun 40
 Libraries. Apr 41; Oct 6
 Library Buildings Award Program. Apr 41
 Licensing. Jan 54; May 6; Aug 10; Nov 10
 Liddle, Alan. [bk rev] Jan 52
 Light. Aug 15; Sep 35; Oct 37
 Lighting. Mar 54; Jun 17, 24; Nov 59; Dec 18, 56
 Lincoln Memorial. Jul 9
 Little, Sidney W. [obit] Jun 52
 Lockwood-Mathews Mansion. Aug 53
Looking Ahead in Education and Research. [Ellison] May 41
Looking Behind the Iron Curtain. [Russell] Jan 23
 Los Angeles. Jun 12
 Louis Sullivan Award for Architecture. Oct 56
Louisiana's Antebellum Architecture. [bk rev] Jun 56
Low Income Housing with Amenities. Aug 50
 Luckman, James M.: *Can Systems Building Be Better?* May 17
 Lundberg, Robert S.: *Making the Four-Day Work Week Work*. Sep 45
 Lundgren, Louis R.: *Minnesota Sizes Up Its Firms*. Nov 50

M

Maintenance. Dec 26
Making Open Space Work. [Propst] Aug 22
Making the Four-Day Work Week Work. [Lundberg] Sep 45
Management with Computers. [bk rev] Apr 62
 Mann, George J.: *Stress Health, Not Hospitals!* Mar 17; [bk rev] Oct 59
 Manny, Carter H. Aug 54
 Maplewood Terrace. Nov 40
 Markelius, Sven. [obit] Jun 52
Marketing Architectural and Engineering Services. [bk rev] Jun 55
 Martin Luther King Square. Nov 39
 Matzke, Frank J. [bk rev] Apr 60
 Maurer, Neil: *'Architecture 1980'*. Jan 40; *Thoughts on New Towns*. Jan 35
 McCallum, Angus. [obit] Jan 51
 McCormick Place On-The-Lake. May 36
 McFarland, M. Carter: *The Rising Tide of Housing Allowances*. Oct 26; [bk rev] Nov 55; Mar 10
 Medal for Research, AIA. Jun 52
 Medalists, AIA. Feb 6; Mar 10; Apr 8, 46
 Membership Profile Questionnaire. Mar 6
 Mercantile Center. Dec 47
 Mexico. Apr 30; Dec 47
 Michigan Society of Architects AIA. Jul 12
 Miller, Ewing H.: *The Student Quarters That Teamwork Created*. Feb 25
 Ministry of a Project, IBM Mar 44

Minnesota Sizes Up Its Firms. [Lundgren] Nov 50
 Minnesota Society of Architects. Nov 50
 Mobile Home Industry Viewed by an Architect. [Swaback] Nov 35
 Mobile Homes. Feb 6; Mar 8; Nov 35
 Modest Proposal: An AIA National School of Architecture [Greenfield] Oct 41
 More Light on Lighting. [Dorsey] Jun 24
 Morgan, William. May 10
 Mormon Temple. Nov 51
 Motorcycles. Sep 51
 Mount Angel Abbey. Jan 4
 Moyer, Fred D.: *In Answer to Questions on Correctional Architecture*. Jun 46
 Mullins, Craig W.: *Let's Have Inside-Out Schools!* Jun 40
 Mumford, Lewis. Jul 12
 Mummers Theater. May 34
 Munich, Germany. Aug 20
 Murphy & Mackey. Apr 45
 Murphy, C. F., Associates. May 36
 Murray, Maria F.: *Toward Excellence in Design*. May 13
 Museums. Apr 8

N

NAAB. *see* National Architectural Accrediting Board
 NAAB Makes Changes, Elects New Officers. Jul 54
 NAHB. *see* National Association of Home Builders
 Nader, Ralph. Dec 45
 Nash, Robert J. May 52; Jul 46
 Nashville, Tenn. Oct 54
 National Academy of Design. Jun 11
 National Aeronautics and Space Administration. Jul 28
 National Architectural Accrediting Board. Jul 54
 National Association of Home Builders. Mar 6, 10; Aug 51, 53; Nov 7
 National Association of Store Fixture Manufacturers. Jun 51
 National Clearinghouse for Criminal Justice Planning and Architecture. Jun 46
 National Conference for the Building Team. *see* Building Team Conference
 National Council of Architectural Registration Boards. Jan 54; May 6; Aug 8, 10; Nov 10
 National Council of Engineering Examiners. May 6
 National Council on the Arts. Aug 51
 National Endowment for the Arts. Aug 51, 52; Oct 54
 National Homes Corp. Feb 6; Nov 35
 National Park Service. Oct 4
 National Policy Task Force. *see* Task Forces, AIA, National Policy
 National School of Architecture, AIA. Oct 41
 National Society of Interior Designers. Mar 11
 National Swimming Pool Institute. Jun 37
 Nature at Play. [Corwin] Jan 30
 NCARB. *see* National Council of Architectural Registration Boards
 New Client: The For-Profit Hospital Corporation. [Balchen] Mar 29
 New Community Development Conference. Jan 35
 New Horizons in Structural Steel. Friedlander Feb 42
 New Jersey Society of Architects. Nov 10
 New Organization Patterns. [Stinchcomb] Mar 14
 New System for Professional Growth. [Rose] Jun 14
 New towns. Jan 35; Sep 12; Dec 47
 New York Chapter AIA. Sep 42; Oct 54
 New York City. Sep 40
 New York State Bar Center. May 33

New York State Council on Architecture. May 52
 New York State Urban Development Corporation. Oct 54
 Nixon, Richard M. Jan 6
 Noise pollution. Jun 12.
 Nonprofit-sponsored housing. Nov 38

O

'Oasis of Warmth and Relaxation.' May 24
 Occupational Manpower and Training Needs. Aug 10
 Occupational Safety and Health Act. [Kornblut] Aug 36
 Office buildings. Jun 12
 Office of Component and Member Services, AIA. Mar 14
 Office of the Year Awards. Sep 10
 Offices. Sep 10
 Ohio Arts Council. Oct 6
 Olmsted, Frederick Law. Nov 8, 55
 Olmsted in Chicago. [bk rev] Nov 55
 Olympic Games. Aug 20; Dec 6
 Olympics Landscape. Aug 20
 Omni International. Dec 45
 Open Space. Mar 46
 Open Space Schools. [bk rev] Feb 52
 Operation Breakthrough. May 10
 Organization of Architectural Employees. Aug 29
 Orr, Marcus W. [bk rev] Dec 50
 OSHA. *see* Occupational Safety and Health Act
 Osman, Mary E.: *An Architecture for Labor in Postindustrial America*. Oct 29; *Substitutes for Words*. Aug 51; [bk rev] Jun 55
 Overview: The Federal A/E Selection Law. [Donald] Dec 11
 Owens-Corning Fiberglas Corp. Dec 44

P

Pabst Mansion: A Glory of 'Sauerkraut' Boulevard. Mar 51
 Pacheco & Graham. Jun 27
 Palmiter, Russell C. Oct 33
 Panamerican Congress of Architects. Feb 6
 Panepinto, Alfred. Jul 12
 Papademetriou, Peter C.: *Architecture in Houston*. Apr 19
 Parks. Mar 46; Apr 13; May 52; Aug 51; Oct 4; Dec 29
 Pawtucket Model Cities Demonstration Agency. Oct 51
 Peaceful Retreat in the Automobile Age. Jul 26
 People's Art. [Sommer] Dec 29
 Perkins & Will Partnership. Apr 56
 Personnel practices. Aug 27; Dec 44
 Peterson, John R.: *A Concert Approach to Problem Solving*. May 45
 Pfaller, Mark A. Mar 51
 Pfisterer, Henry A. [obit] Jul 56
 Philadelphia Chapter AIA. Oct 59
 Photography. May 26
 Pierson, Paul S. [bk rev] Mar 58
 Planning for Education. [Balchen] Feb 15
 Playgrounds. Jun 30
 Police headquarters. May 10
 Polshek, James Stewart & Associates. May 33
 Poor & Swanke. Dec 8
 Portland Cement Association. Feb 48; Dec 45
 Practical Legal Advice for Builders and Contractors. [bk rev] Dec 54
 Practice Aids. computer-based financial management Dec 39; data filing Nov 43; four-day work week Sep 45
 Practice Profiles. Pacheco & Graham Jun 27; Bryant & Bryant; Sep 27; SMS Architects Nov 27

Predictions. [Wachsmann] Mar 43
 Preservation. Mar 8, 51; Apr 28; Aug 38, 51, 53; Sep 10; Oct 6; Nov 8
 Presidential inaugural reviewing stand. Dec 8
 Presidents, AIA. Jul 12; Dec 16
 Prestressed Concrete Institute. Nov 8
 Prisons. *see* Correctional architecture
 Problems and Prospects of Indian Architecture. [Krathen]: Feb 34
 Product literature. Nov 48
 Professional Construction Management and Project Administration. [bk rev] Jan 52
 Professional liability insurance. Dec 8
 Professional responsibility. Jul 34
 Profile of the President. Dec 16
 Proposals on Housing for the Elderly. Jan 46
 Propst, Robert: *Making Open Space Work*. Aug 22
 Public Affairs Conference. Feb 48; May 54
 Public relations. Jan 27; Apr 56

Q

Quantity surveyors. Dec 35
 Quinn, Patrick J.: *Doing and Learning*. Jul 49

R

"Radiant Structure." May 24
 RAP. *see* Review of Architectural Publications
 Reactions of Body and Eye. [Birren] Sep 35
 Reactions of Mind and Emotion. [Birren] Oct 37
 Real estate. Apr 38
 Recreation. Sep 17
 Reed, John. Sep 64
 Reflections on Refractions. [Fink] May 29
 Reflections on the Rothko Chapel. Apr 52
 Refracted Images. [Bailey] May 27
 Refractions. May 26
 Reiner, Jan. [bk rev] Aug 56
 Rensselaer Polytechnic Institute. Jul 49
 Renwick Gallery, Washington, D.C. Mar 8
 Research. *see* Architectural research; Behavioral research
 Resolutions, AIA. Jun 11; Jul 37, 39, 45; Oct 41
 Restoration. *see* Preservation
 Result of Student Advocacy. [Sheldon] Feb 22
 Reuther, Walter. Oct 29
 Review of Architectural Publications. Feb 4
 Reynolds Awards. May 24
 Reynolds Metals Co. Sep 54
 Rhode Island School of Design. Oct 51
 Richmond, Va. Sep 54
 Rippeteau, Bruce: *Architect and Archaeologist as Collaborators*. Jun 49
 Rising Tide of Housing Allowances. [McFarland] Oct 26
 Robert, William L.: *How Soviets Plan Their Urban Housing*. Aug 48
 Rochester Institute of Technology. Apr 46
 Rogers, Archibald C.: *First Report of the National Policy Task Force*. Jul 36; Aug 51; Dec 44
 Roma Barocca. [bk rev] Dec 50
 Rome, Italy. Mar 55
 Rose, Stuart W.: *A New System for Professional Growth*. Jun 14
 Rosenfeld, Steven H.: *Architects and New York City*. Sep 40; *Talking the Same Language*. Feb 11; [bk rev] Jun 56; [bk rev] Oct 59; [bk rev] Dec 54; Aug 27
 Rosenman, Marvin Eli: *Let's Have Inside-Out Schools!* Jun 40

Ross, Marion D.: *The 'Attainment and Restraint' of Pietro Belluschi.* Jul 17
 Rothko Chapel. Apr 52
 Rothschild, Bernard B. [bk rev] Jan 52
 Rotunda, University of Virginia. Jun 52
 Roundtable on Energy Conservation in Public Buildings. Jul 55
 Royal Gold Medal for Architecture. Mar 11
 Royal Institution of Chartered Surveyors. Dec 35
 RTKL Inc. Apr 44
 Russell, George V.: *Looking Behind the Iron Curtain.* Jan 23
 Russia. see USSR
 Russian architects. Jan 13; Apr 13

S

Saarinen, Aline. [obit] Sep 54
 Safety. Jan 32
 St. Louis. Dec 47
 St. Louis Chapter AIA. Mar 55
 St. Louis Post Office. Aug 51; Nov 8
 Samton, Claude & Associates. May 35
 Sanders, Walter B. [obit] May 54
 San Francisco. Sep 10
 Santamaria, Joseph W.: *Urban Dynamics of Nonzoning.* Apr 23
 Sasaki, Dawson, DeMay Associates, Inc. Apr 43, 45
 Schindler. [bk rev] Sep 56
 Schinnerer & Co., Victor O. Dec 8
 Schmertz, Mildred. Mar 47
 Scholarships. Oct 10
 Scholer, Walter Sr. [obit] Apr 56
 Schools. Feb 16, 19, 52; Jun 12, 40; Aug 22, 51
Science Fiction Becomes Fact. [Haines and Bond] Jul 28
Scotsman Surveys Our Cost Control. [Drake] Dec 35
Season's Greetings—Professionally Speaking. Dec 13
 Seattle. Dec. 22
 Sedco headquarters. Apr 28
 Seminar for Architects in Industry. Nov 51
 Sheldon, George C.: *A Result of Student Advocacy.* Feb 22
Shelter and Subsidies. [bk rev] Nov 55
 Shilstone, James M.: *Ways with Architectural Concrete.* Nov 17
Should You or Shouldn't You Go Out on Your Own? [Kruger] Oct 32
Significance of Light. [Birren] Aug 16
 Skidmore, Owings & Merrill. Apr 44; May 37; Jun 51
 Slayton, William L.: *At Your Service.* Jul 13
 Small offices. Nov 50
 Smith Barker Hanssen. Apr 44
 Smith, C. Ray. Sep 17
 Smith, Hinchman & Grylls. Mar 44
 SMS Architects. Nov 27
So Human an Animal. [bk rev] Jul 59
 Sobel, Walter H.: *When the Bench Puts Its Case Before Architects.* Oct 15
 Solid wastes. Oct 54
 Sommer, Robert: *People's Art.* Dec. 29
 Soviet Union. see USSR
 Spacecraft designs. Jul 28
 Special Assessment Programs, AIA. Sep 10
 Spokane, Wash. Aug 10; Dec 6, 45
Spotlight on the Energy Crisis. [Stein] Jun 18
 Steel. Feb 42
 Stein, Richard G.: *Spotlight on the Energy Crisis: How Architects can Help.* Jun 18
 Stinchcomb, Lawrence S.: *New Organization Patterns.* Mar 14
 STOLports. Sep 10
 Stonorov, Oskar. Oct 29
 Store Interior Design Contest. Jun 51

Stores. Jun 51
Stress Health, Not Hospitals! [Mann] Mar 17
Student Quarters That Teamwork Created. [Miller] Feb 25
 Student union buildings. Feb 22
Substitutes for Words. [Osman] Aug 31
Suburban Land Conversion in the United States. [bk rev] Aug 57
Sunlight and Shadows. [bk rev] Sep 58
 Swaback, Vernon D.: *The Mobile Home Industry Viewed by an Architect.* Nov 35
 Swimming Pools. Jun 35, 55
Swimming Pools: A Guide to Their Planning, Design and Operation. [bk rev] Jun 55
Symbol Sourcebook: An Authoritative Guide to International Graphic Symbols. Aug 32
 Symbols. Feb 6; Aug 31; Oct 48
 Systems building. May 17; Dec 47

T

Tafel, Edgar. [bk rev] Mar 62
Talking the Same Language. [Rosenfeld] Feb 11
 Tall buildings. see Highrises
 Tapiola, Finland. May 58
 Tappé, A. Anthony. Oct 35
 Task Forces, AIA. Aerospace and Hostile Environment Architecture Jul 28; Development Team Apr 33; Employee/Employer Relations Aug 27; National Policy Jan 10, Mar 8, Apr 16, Jun 11, Jul 34, 36, Aug 51, Sep 8, Dec 44; Professional Responsibility to Society Mar 8
 Taylor, Anne P.: *A Concert Approach to Problem Solving.* May 25
 Teachers' Seminar. Jan 42
Team Approach for a Unified Result. [Barr] Apr 46
 Teams, Interdisciplinary. Apr 14, 46, 60; May 45, 52; Nov 8
 Telescopes. Oct 6
'Temporary' Facility Comes Into Its Own. [Haviland] Feb 27
 Testimony, AIA. May 10, 54; Jul 12; Aug 51; Sep 6
 Texas Society of Architects AIA. Apr 6
 Thomas Jefferson Memorial Foundation Scholar in Architecture. Jul 12
Thoughts on New Towns. [Maurer] Jan 35
Through Unionization Comes a New Spirit. [Ekstein] Aug 29
Today's Answer to Data Filing. [Class] Nov 43
Total Design: Architecture of Welton Becket & Associates. [bk rev] Jul 58
Toward Excellence in Design. [Murray] May 13
Toward Industrialization of Building. [Ward] Mar 33
Toward Understanding Modern Churches. [film rev] Sep 59
 Transpo '72. May 10; Jul 9
 Transportation. Jul 9; Dec 47
 25-Year Award, AIA. Jul 26
Two-Wheeled Solution. [Deasy] Sep 51

U

UIA. see International Union of Architects
 UN Conference on the Human Environment. Sep 52
Unchanged in a Time of Change. [Belluschi] Jul 25
Underground Atlanta. [Jova] Aug 38
 Unesco. Oct 4
Uniform Construction Index. Sep 8; Nov 43, 51
 United Automobile Workers. Oct 29

University of Delaware Student Living Center. May 17
 University of Oregon, Erb Memorial Union. Feb 22
 University of Virginia. Jun 52
 Urbahn, Max O.: *An Architectural Credo.* Jan 10; *'A Landmark Document.'* Apr 16; *The President's Message.* Jul 34; Jan 6
 Urban Design Assistance Teams. Jun 11
 Urban Design Council. Sep 40
Urban Dynamics of Nonzoning. [Santamaria] Apr 23
 US Capitol, West Front. Jan 8; May 52
 USSR. Jan 13, 23; Aug 48; Sep 12

V

Victorian Accent in Downtown Dallas. Apr 28
 Vilanova Artigas, João Batista. Dec 45
 Village Park. Nov 41
Visual Survey of Downtown Portland. [bk rev] Jun 56

W

Wachsmann, Konrad: *Predictions.* Mar 43; Mar 33, 34
 Wade, John W.: *An Institution for the Design Professions.* Jan 37
 Wagner, Edward P.: *When Your Client Wants a Swimming Pool.* Jun 35
 Walker Art Center. May 38
 Ward, Robertson Jr.: *Konrad Wachsmann.* Mar 34
 Washington, D.C. Sep 27
 Washington State Dept. of Highways. Jun 12
 Waterfronts. Jul 9
 Watterson, Joseph. [obit] Jul 6, 9
Way of an Architect with a Client. [Kilham] Sep 23
Ways with Architectural Concrete. [Shilstone] Nov 17
 Weekends. Sep 17
 Western Park Apartments. Nov 41
 Weyerhaeuser Headquarters. May 37
What's Your Symbol I.Q.? Oct 48
When Computers Assume Building Operations. [Kmetzo] Dec 26
When the Bench Puts Its Case Before Architects. [Sobel] Oct 15
When Your Client Wants a Swimming Pool. [Wagner] Jun 35
 White Cement Architectural Awards Program. Feb 48; Dec 45
 White House Conference on Aging. Jan 4, 6, 46
 Whitney M. Young Jr. Citation, AIA. May 52; Jul 46
With Research in the Curriculum. [Conway] Jul 47
With the City Foremost in Mind. [Balchen] Sep 27
 Wittenberg, Delony & Davidson, Inc. Apr 45
 Women in architecture. Dec 46
 World Conference on National Parks. Aug 51
 Wright, Frank Lloyd. Mar 62
 Wurster, Bernardi & Emmons, Inc. May 40

X-Y

Yellowstone National Park. May 52
 YM-YWHA Day Camp. May 35
 Youth centers. Oct 51
 Youtz, Philip Newell. [obit] Mar 55

Z

Zoning. Apr 23
 Zoos. Aug 53