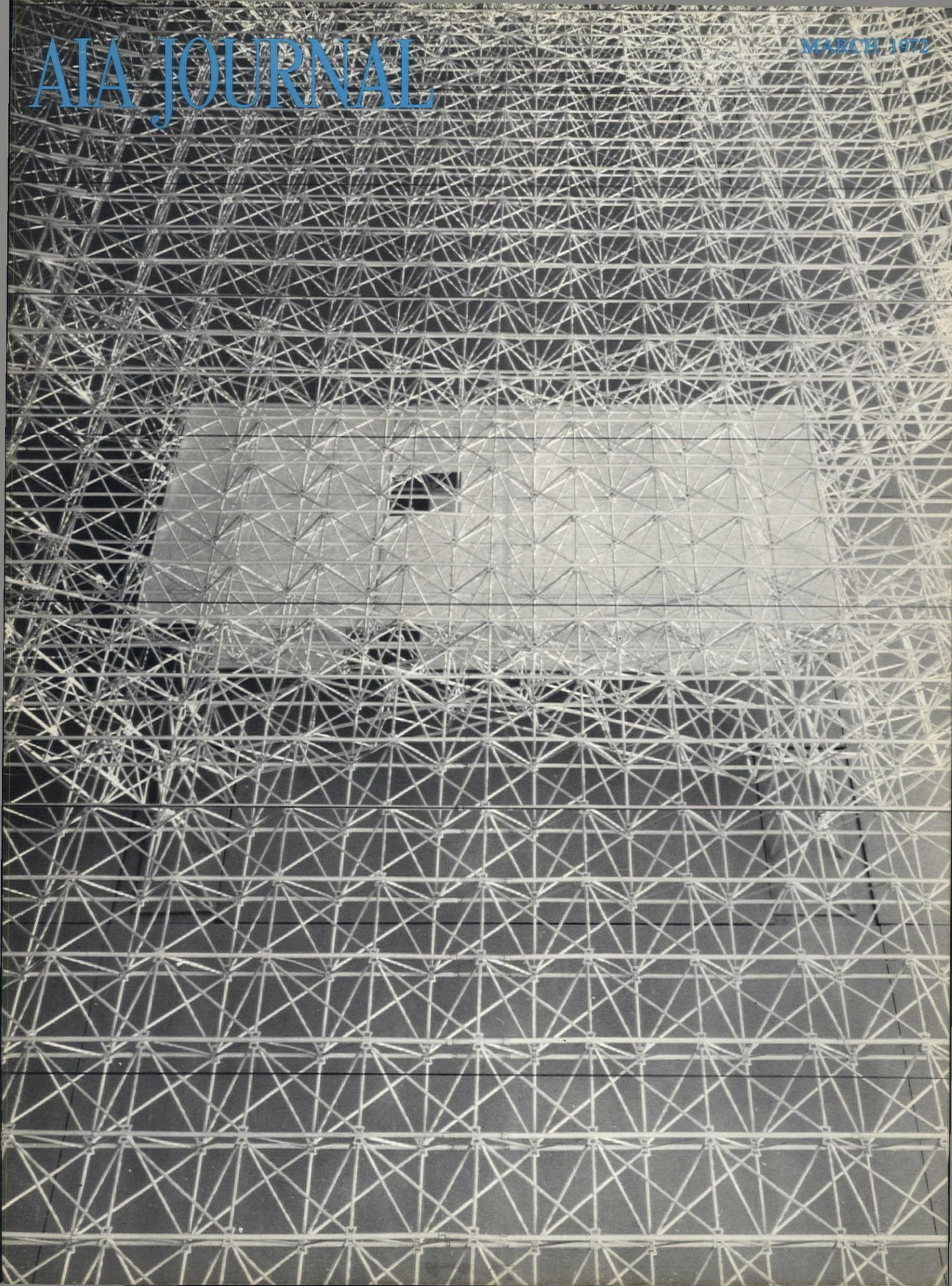
AIA JOURNAL

MARCH 1972



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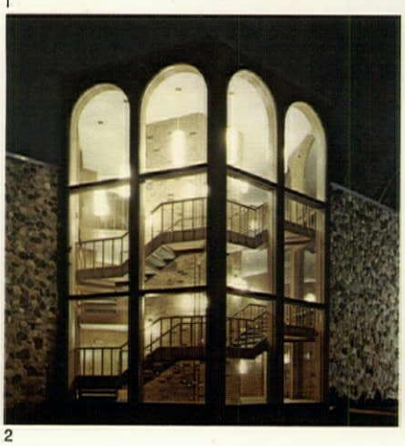

2

5

1. Residential Complex, The Children's Hospital Medical Center, Boston, Mass. Architects: The Architects Collaborative, Cambridge, Mass.
2. Imperial House Apartments, Kenosha, Wisconsin Architect: Sheldon Segel, A.I.A., Milwaukee, Wisconsin
3. Delta Airlines Waiting Rooms, Standiford Field, Louisville, Kentucky Architect: Pierce, Wolf, Yee & Assoc.
4. Ashland Ski Bowl, Ashland, Oregon Designer: Robert L. Bosworth, Medford, Oregon
5. Bismarck Municipal Airport Terminal, Bismarck, North Dakota Architects: Ritterbush Brothers, Bismarck, North Dakota

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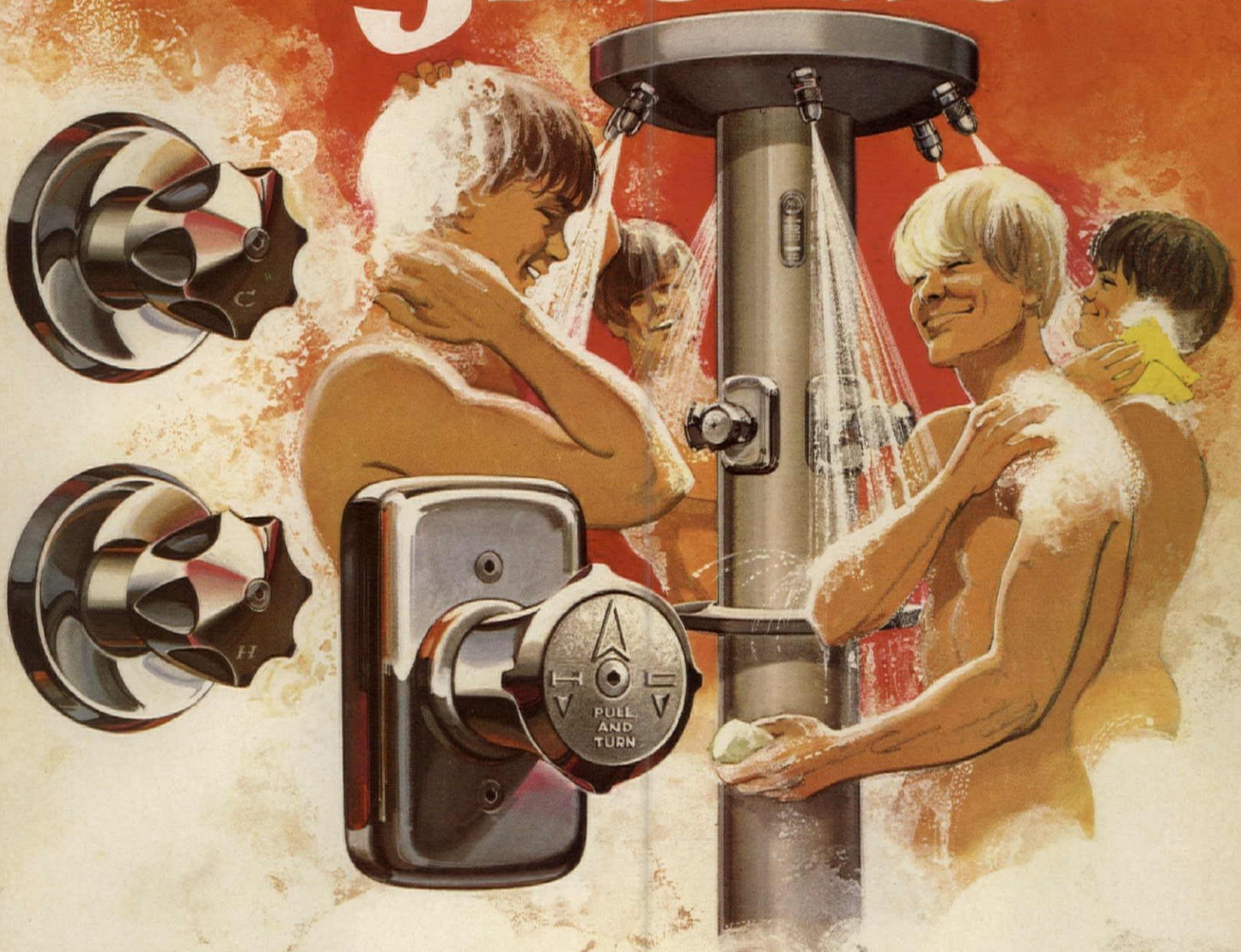

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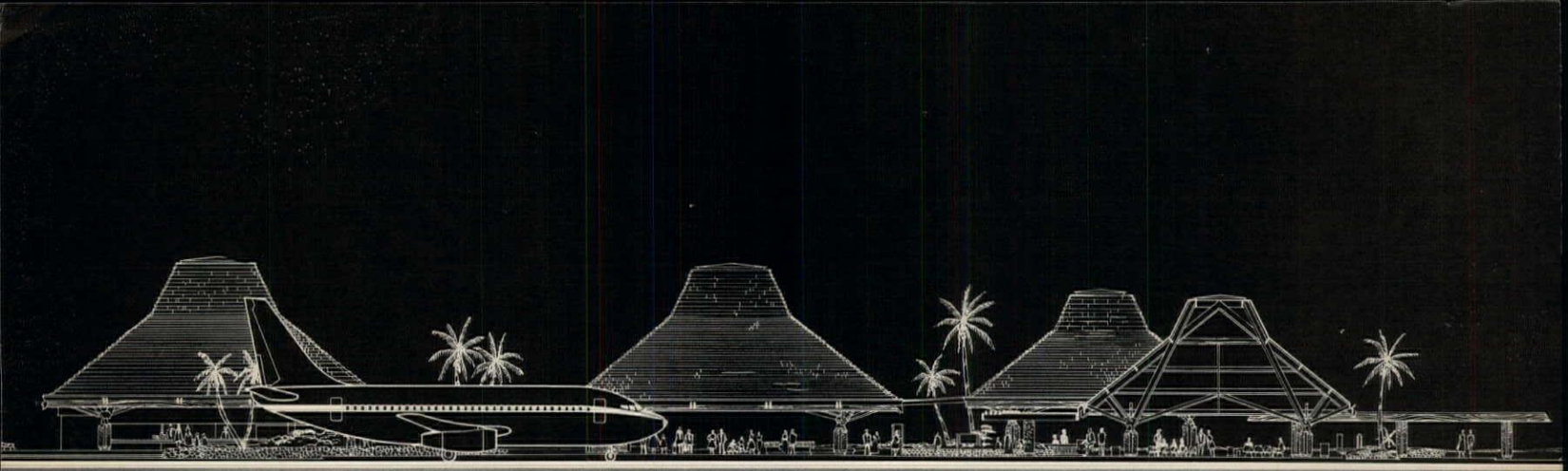

Ke-ahole Airport, Ke-ahole (Kona Coast) Hawaii. Certi-Split Handsplit/Resawn shakes, 24" x ¾" to 1¼". Architects: Actani & Oka, Inc.

Red cedar shakes: striking departure for an airport.

Hawaii's Ke-ahole Airport doesn't look much like an airport, it looks like Hawaii. That's a remarkable achievement considering the functional demands of the facility.

The terminal consists of 15 high beam-ceiling bungalows. A thatched-roof effect is attained by extensive use of red cedar handsplit shakes.

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AIA JOURNAL

MARCH 1972

DEPARTMENTS

COVER: Spaceframe by Konrad Wachsmann, developed in 1951 (*see* p. 33).

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VOL. 57, NO. 3

Environmental Systems Building, St. Louis, Mo.
Owner: Emerson Electric Co.
Architects: Hellmuth, Obata & Kassabaum Inc., St. Louis, Mo.
Glazing Contractor: Hadley-Dean Glass Co., St. Louis, Mo.

How to save electricity without remembering to turn out the lights: Vari-Tran®.

Emerson Electric's new Environmental Systems Building is sheathed in Thermopane® insulating glass with a Vari-Tran 208 coating. Because Vari-Tran was used instead of ¼" bronze plate glass, over $4,000 less electricity will be needed every year for heating and cooling. With the problem of energy supply being critical, that's a meaningful saving in power.

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comment and opinion

WHAT THE PROFESSION REALLY CARES ABOUT: The results of a survey tabbed the Membership Profile Questionnaire and conducted in late 1970 can be considered surprising or not, depending upon one's outlook. Specifically, the then 23,000 members of The American Institute of Architects were given this request: "Please indicate below the subjects which are of most concern to you from the standpoint of interest and personal knowledge," with the stipulation that they were to check no more than three of the 24 topics, which accounts for a total exceeding 100 percent. Undoubtedly, the most astounding figure to emerge was the number of replies—almost 70 percent—which as anyone in the survey business knows is remarkable.

While the subjects are listed here in order of preference and probably speak for themselves, a few comments seem to be in order. First and foremost, almost one-half of the respondents put "design" in the No. 1 spot, indicating that the profession has not lost sight of architecture as an art. But when architects consider the esthetics of buildings today they think in terms of the entire process from decision making through delivery. The design of hospitals, for example, is treated in the section which leads off this issue, just as the five articles in February presented under the title of "Planning for Education" discussed innovative approaches to the handling of these facilities.

Subject	Percentage
1. Design	45
2. Office administration	17
Professional practice	
3. Comprehensive services	13
4. Housing—privately developed	11
5. Education	10
Urban design	
6. Building codes and regulations	9
Construction contract administration	
Specifications	
7. Construction management	6
Public relations	
8. Housing—federally assisted	5
Research	
9. Restoration	4
10. Computerization	3
Ethics	
Finance	
Social programs	
11. Design competitions	2
12. Government contracting	1
Political contracts	
Professional insurance	
Technical writing	

Second, only 6 percent of the members expressed an interest in construction management, even though the utilization of this technique is on the increase, not only on large-scale projects but on medium-size ones as well. Third, an even smaller number—3 percent—indicated concern about social programs.

In any event, the Institute is grateful to all those architects who replied, and the AIA JOURNAL is particularly happy, too, for the results can help to serve as guidelines in publishing future material. As a matter of fact, we editors think the survey shows that we are on the right track right now. To cite just one instance, the acceptance of two of our ongoing series—Practice Aids and Practice Profiles—is reflected in the statistic that "office administration" and "professional practice" shared second place.

One final point: The Membership Profile Questionnaire is not to be confused with another study which dealt with 148 areas of interest in regard to continuing education, the results of which will be used by Institute staffers in developing programs for practitioners who want to keep up to date. ROBERT E. KOEHLER

ACKNOWLEDGEMENTS

8—National Collection of Fine Arts, Smithsonian Institution
18—Balthazar Korab
19—Grayscale Commercial Photography
20—Courtesy Steel Products News Bureau
21—Copy Craft Inc.
30—above, Richard Payne
46—above, Mildred F. Schmertz, AIA
46—center, Theodore Osmundson
46—below left, C. C. Withers
46—below right, Mildred F. Schmertz, AIA
48—left, Ron Green
48—right, Tarek Alam & Nicolas V. Maselli
51—above, *Milwaukee Journal*
51—all interiors, Hugo Gorski

NEXT MONTH

Since the site of the AIA convention May 7-10 will be that bustling, vibrant city of Houston, it is only fitting that we take a look at what makes it tick. The two leadoff articles approach the subject from different points of view. One examines the urban dynamics of nonzoning as seen by a native practitioner, for Houston is the only metropolis in the country which is not controlled by zoning legislation. The second, written by a member of Rice University's faculty, considers the architecture itself in three categories: 1) historical, 2) contemporary and 3) vernacular. It is, in essence, a sneak preview of the guidebook which will be available to convention-goers.

And just for good measure, we cross the US border to Mexico to get a glimpse of the capital city which hosts the second portion of the 1972 sessions.

April also presents the biennial Library Awards and reflections by two of the designers, of the RIT campus, which won the AIA Collaborative Achievement in Architecture Medal.

Rounding out the issue is a synopsis of the Institute-sponsored book on the architect's role in project development which is scheduled for publication in May. C. W. Griffin Jr. is the author.

ASIDES

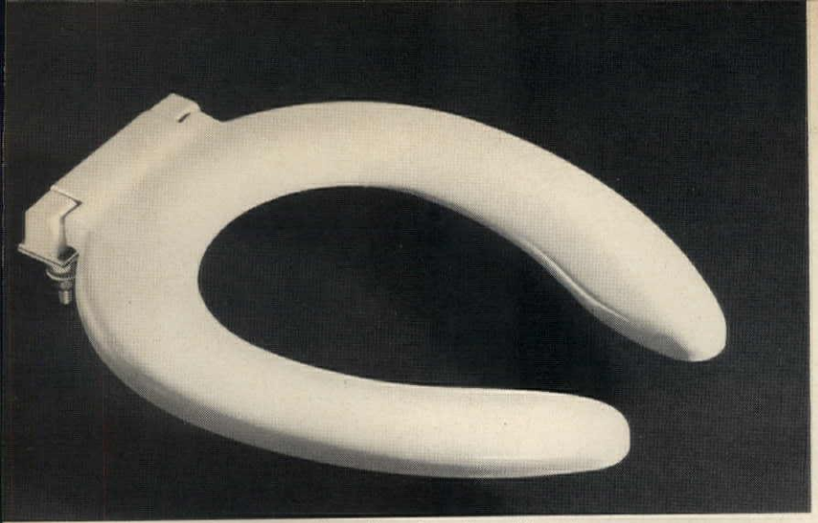
Writing about Houston reminds us of the annual convention-exposition of the National Association of Home Builders which has met there for the past four years and about which we report in this issue. But so much takes place at that mammoth gathering that one can only touch the surface.

The principal of William A. Gould & Associates, for example, appearing on the presentation made by the AIA Housing Committee, referred to an interesting survey of persons involved in two projects designed by his firm in the Cleveland area. Interviewees included residents of the one development; city officials of the sites of the two projects in question; officials whose banks financed them; and representatives of the builder/developers in each case.

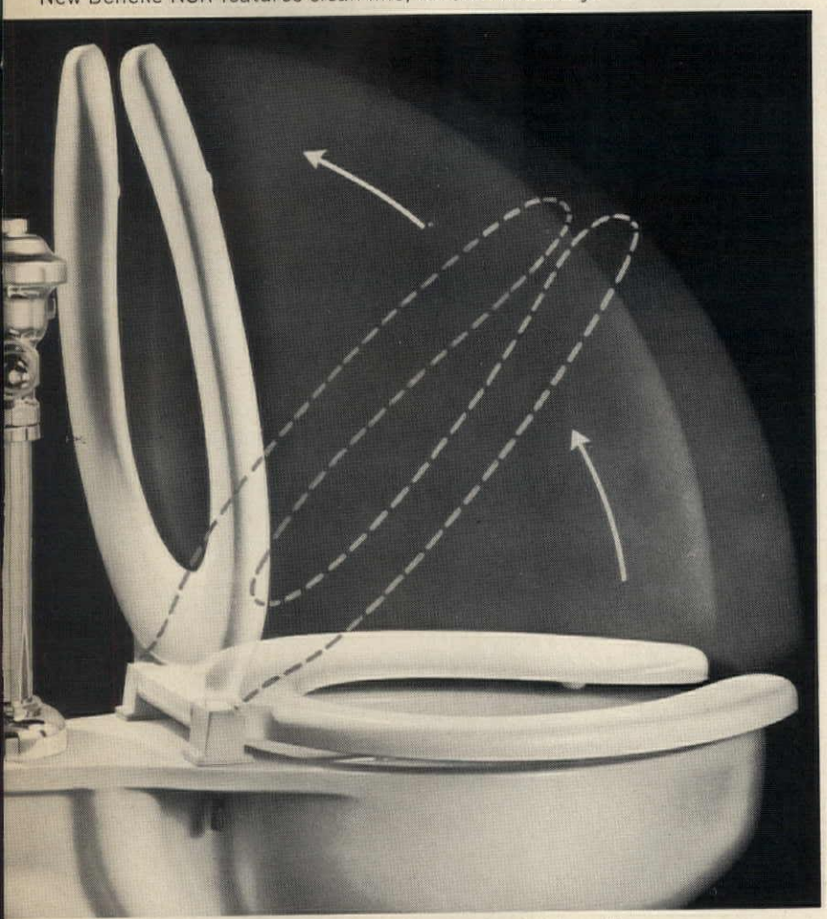
Gould made the survey because, as he told the NAHB audience, "There is a sharp difference between what an architect thinks is good design and what the others think."

Among the questions, some of which were to be answered by all groups, some by just one of the four: What is your definition of good design? What percentage of a project's cost should be allocated to design factors? How do you rate your development as a place to live? What are your main criticisms of your home? Does better design mean better profits to the financing institution in the building of housing developments? Which are the most important in the design process of your project: architecture, landscape architecture or community planning? As a builder/developer, does better design mean better profits to you?

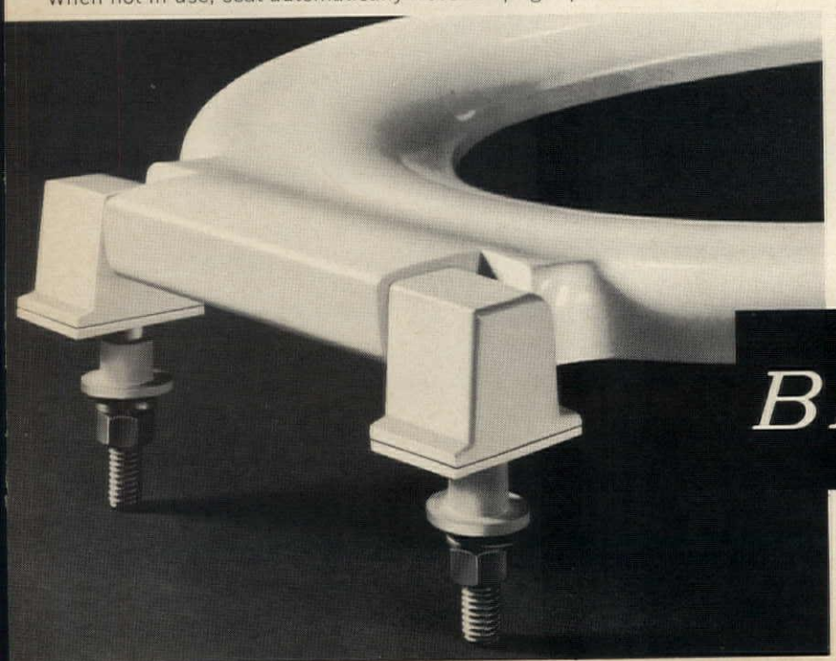
These are the kinds of questions to which design professionals will have to seek answers if they are to make a real contribution to the man-made environment. □



New Beneke NSR features clean line, functional beauty.



When not in use, seat automatically rises to upright position.



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outlook

Sweeping Strategy for a Better America; Board Plans for '72; Two New Commissions

The AIA National Policy Task Force has issued its first report which includes a strategy for building a better America. The task force is headed by Archibald C. Rogers, FAIA, and includes Ioeh Ming Pei, FAIA; Jacquelin Robertson, AIA; William L. Slayton, Hon. AIA; and Paul N. Ylvisaker, first commissioner of community affairs for New Jersey. The report was published in a special issue of the Institute's *Memo* dated January 1972.

At a news conference recently, AIA spokesmen said that the architectural profession will promote the report's recommendations vigorously and will lobby for the necessary legislation. Institute President Max O. Urbahn, FAIA, called the program "a historic step" which, if supported by citizens and political leaders, "will have a major impact on the quality of life in America."

The task force recommends that governmental agencies assemble 1 million acres of land for community development within the cores and on the peripheries of the 58 metropolitan areas with populations of half a million or more. Planning for the development of both publicly and privately owned land should take place using the neighborhood scale "growth unit" to insure "a full range of essential facilities and services, environmental integrity and open occupancy." The urban development and redevelopment process should be aided by creation of a national development corporation to handle federal grants, a series of state development corporations and at the metropolitan level public and public/private corporations subject to regional planning controls.

The task force stresses the need for a disciplined, organized approach to a national growth policy but emphasizes that the differing needs and lifestyles of diverse groups must be accommodated.

At its December meeting, the AIA Board of Directors mapped its program for 1972 and plans were made to direct a major portion of the operating budget to the implementation of the task force recommendations.

Other endorsements by the board include task force studies of constraints to building and of creative economics. The board will give continuing assistance to the development of informed clients for architectural services. The AIA will continue to explore ways in which the community itself can act as client, with focus upon the Community Design Center program.

Chairman Rodgers explains task force report.

Still other programs to be supported in 1972 include continued efforts in the area of practice aids with the establishment of a technical services center and a new computerized technical management system.

Other recent activities of the AIA include the establishment of two new commissions to oversee government relations programs and direct activities in the area of professional responsibility to society. This brings the Institute to a total of seven commissions whose task is to advise the board in major policy areas. The Government Affairs Commission will be chaired by William Marshall Jr. The Community Services Commission, whose chairman is Van B. Bruner Jr., will take over the function of the 1971 Task Force on Professional Responsibility to Society.

Restoration of a James Renwick Building Gives the Nation a Modern Showcase

The nation's newest museum in Washington, D.C., is an old one. Opened to the public on January 28, it is named the Renwick Gallery in honor of its original designer, the 19th century architect James Renwick Jr. who also was the architect of the Smithsonian Institution's original turreted "castle" on the Mall.

Located at 17th and Pennsylvania Avenue N.W., next door to Blair House where dignitaries visiting the President are housed and across from the White House, the structure is of red brick elaborately adorned with carved stone. Meticulously restored to its former grandeur, the building has been refurbished with period furniture of the last part of the 19th century. The museum, administered by the Smithsonian, will be a revolving showcase of American design, decorative arts and crafts.

The building has had a varied career. Commissioned in 1858 by William W. Corcoran to hold his art collection, the incompleted structure was taken over by the Quartermaster Corps during the Civil War as a clothing warehouse. In 1869 Corcoran gave the building to the public, and for 20 years it was an art gallery. When the Corcoran Gallery, as it was called, moved its growing collection to new quarters in 1889, the structure

Renwick spirit prevails despite problems.

was used by the US Court of Claims. Vacated in 1964, it became something of an eyesore, besides being a favorite place for pigeons, and detracted somewhat from the image of America that one would want the next-door visiting VIPs to have.

During the Kennedy era, plans were put forth for its destruction or reuse. Fortunately, some argued for restoration and the building's return to its original use as an art gallery. Architects John Carl Warnecke Associates, who had begun the restoration of Lafayette Square, performed a feasibility study and agreed that the building could be restored. It was so ordered by President Johnson in 1965 who gave the building to the Smithsonian.

The Warnecke staff and personnel from Universal Restoration, Inc., which was commissioned to clean and repair the building, traced old Matthew Brady photographs which helped in the realization of the flamboyant exterior Renwick detailing. Craftsman talent was recruited from Europe to recreate with as much exactitude as possible the former appearance of the building.

Hugh Newell Jacobsen, FAIA, of Washington, D.C., was named interior restoration architect. He says that his work on the gallery's interior was an opportunity "to pay homage to Renwick by bringing back the feel and concept of one of his major structures."

The restoration cost $2.6 million. With 90 percent of the woodwork and nearly all of the detail gone, it was impossible to have exact reproductions. But as Jacobsen says, "the spirit of Renwick" is there.

Imaginative, Creative Housing Concepts Evidenced in Mobile Home Competition

A concept for a structure that blends into the landscape using earth tones has won the top award in the first annual Reynolds Metals Company's Creative Design Award Program for Mobile Homes.

In his winning entry, landscape architect Victor R. Nelhiebel of Lansing, Mich.,

continued on page 10

colonial beige

Beautiful successor to wood shakes.

cedar brown

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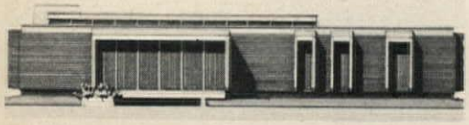
UNITED STATES GYPSUM

BUILDING AMERICA

outlook *from page 8*

changes the boxlike exterior appearance of the traditional mobile home by improving living space both inside and out. His expandable plan contains a living room, two bedrooms and an entry deck, making extensive use of aluminum for the exterior design.

A seven-man jury from the Design Council of Industrialized Housing, which administered the program, picked five award winners and cited 25 other submissions for honorable mention. Second place went to William R. Knauss, Seattle designer; the third to two Missourians: Thomas J. Millerbaugh, an architect of Sunset Hills, and W. Marion Bamman of Kirkwood. The design of the latter two was called the "most unusual." The scheme uses a distinctive pitched ceiling made of aluminum decking and wood beams.



Living area is open, expanding from 13 feet 3 inches to 16 feet 9 inches on site.

Eight Distinguished Citizens Awarded Honorary Membership in the AIA

Honorary membership in the Institute is awarded to persons of "esteemed character who are not eligible for corporate membership . . . but who have rendered a distinguished service to the profession of architecture or to the arts and sciences allied therewith."

Admitted to honorary membership for presentation at the 1972 Convention are: the Hon. Luis Echeverria Alvarez, President of Mexico; Stanley Marcus, president of Nieman-Marcus; Elliot Lee Richardson, Secretary of the Department of Health, Education and Welfare; Laurance S. Rockefeller, president, Rockefeller Brothers Fund, Inc.; Helen T. Schneider, executive director, New Jersey Society of Architects AIA; Beatrix Sebastian, director, School Building Service, American Association of School Administrators; Sydney Steinborn, chief, Engineering Division, Corps of Engineers, Seattle District; Wallace F. Traendly, president of McGraw-Hill Information Systems Co.

Other Honors Set for Houston Convention

In addition to the AIA awards announced in January and February, the following honors will be presented at the 1972 AIA convention in Houston in May:

- Citation of an Organization: The New York State Dormitory Authority.
- Collaborative Achievement in Architecture Medal: Rochester Institute of Technology (five architectural firms—Anderson, Beckwith & Haible; Edward Larrabee Barnes; Kevin Roche, John Dinkeloo & Associates; Hugh Stubbins & Associates; and Harry Weese & Associates—and landscape architect Daniel Urban Kiley).
- The Edward C. Kemper Award: David N. Yerkes, FAIA.

Agnew Sets Optimistic Note in Houston; NAHB Raises Environmental Concerns

"Let it be noted by all the news media present, for replay to the doomsayers on the campaign trail: America's housing industry is healthy and strong and optimistic."

Speaking in Houston's Astrohall, surrounded by more than 500 exhibits, Vice President Spiro T. Agnew addressed the annual convention of the National Association of Home Builders, whose registration of nearly 55,000 was even larger than anticipated.

"We begin the year in the almost certain knowledge that the recently established records will be surpassed and that Americans by the hundreds of thousands will be moving into new and improved housing in 1972," continued Mr. Agnew.

Echoing the Vice President's remarks was George Romney, Secretary of the Department of Housing and Urban Development, who predicted that "housing starts in 1972 could be at the 2.1 million level and could reach 2.3 million this year depending upon the quality and therefore the level of subsidized starts."

But Romney emphasized that "we must not simply play a 'numbers game.' For we in HUD are convinced that the housing industry cannot truly make any meaningful contribution if the standard of the housing we produce—whether conventionally financed, FHA insured or under government-subsidy programs—does not contribute to the quality of American life. Quality housing in direct proportion to the income of a family is second only to food in its role in daily life."

Despite the myriad of speeches, seminars, small roundtables and live demonstrations that dealt with the nitty-gritty of homebuilding during the January 23-27 sessions, the term "quality" and related ones got their just due, thanks in large part to the Institute of Environmental Design. This unit is headed by Abba I. Polangin, an architect/planner who is the only AIA member on the NAHB headquarters staff.

It is interesting to note, for example, that 11 events were specifically devoted to the areas of planning and design and that 27 professionals in those areas appeared on the program, representing 15 percent of the total participants.

Meeting on the Saturday prior to the convention opening, the environmental design group saw a slide kit entitled "Why Not Build for People?" developed by Robert W. Hayes, AIA, of San Francisco.

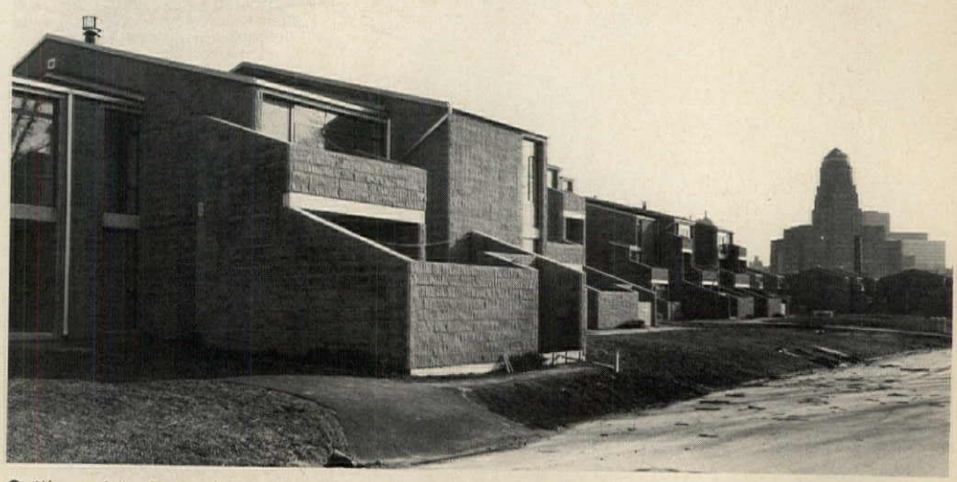
And for the fourth year in a row, the AIA Housing Committee did its own thing, with more than 1,000 persons attending the presentation given twice: at 8:15 on Monday morning and repeated on Tuesday afternoon. Moderated by Jack C. Cohen of Silver Spring, Md., it carried the banner "Better Design, Better Building, Better Profit." Three other AIA members—Jack Craycroft, Dallas; William A. Gould, Cleveland; and Rodney Friedman, San Francisco—discussed the use of architectural services on condominiums, single-family houses and apartment complexes utilizing government programs.

As an added thrust, the environmental design unit told the NAHB board that through developmental controls, federally subsidized housing programs are restricting innovative land use, planning and architectural design. It recommended the evaluation of such programs on the basis of environmental quality in addition to other factors.

The group called for a staff study and report of state and local government environ-

AIA Names Housing Director

M. Carter McFarland, most recently a special assistant to Eugene Gulledge, HUD's Assistant Secretary for Housing Production and Mortgage Credit, has been appointed director of Housing Programs for the AIA. Closely associated for 20 years with the development and implementation of federal housing programs, he is the author of *The Challenge of Urban Renewal* and has been a professor and lecturer at several universities.



Getting a lot of attention at NAHB sessions are low/middle income housing units, as exemplified by the Shoreline Apartments on Buffalo's waterfront. The project now underway is sponsored by the New York State Urban Development Corporation. The 147 units are the design of architect Paul Rudolph, FAIA, and the builder is the Caldwell Development Corporation.

Modular duplex townhouse, shipped to its site by truck in four units, makes debut at NAHB convention. Frank Lloyd Wright Foundation is designer for National Homes.

mental restraints due to legislated costs in the form of hookup fees, permits, taxes, mandatory land dedication and other cost-related contributions from developers.

Stanley Waranch of Norfolk, Va., is the newly elected president of the 59,000-member organization, which will continue to hold its convention-exposition in the Astrodomain complex through 1974, but it is exploring other possible sites. The first vice president is George C. Martin of Louisville, who has served two terms as a trustee of NAHB's environmental design arm.

Institute's '71 Gold Medalist to Receive Similar Honor from British Architects

Louis I. Kahn, FAIA, of Philadelphia has been named recipient of this year's Royal Gold Medal for Architecture. The honor is conferred annually by Her Majesty the Queen for work of high merit or for accomplishments which have directly or indirectly advanced architecture.

Kahn, who was the AIA Gold Medalist in 1971 (*see* AIA JOURNAL, Sept., p. 33), becomes the sixth American in recent years to receive the British award. The others: Eliel Saarinen, 1950; Walter Gropius, 1956; Ludwig Mies van der Rohe, 1959; Lewis Mumford, 1961; and R. Buckminster Fuller, 1968.

The presentation of the British Gold Medal will be made at a special ceremony in London on June 13 by the president of the Royal Institute of British Architects, Alex Gordon. The medal was instituted in 1848.

Computerized Financial Management System Now Available for A/E Firms

A full computer system for project cost accounting is now available. It is described in detail in *Financial Management for Architectural Firms: A Manual for Computer Users* (available from the AIA at $8 for members, $10 for nonmembers; input forms for the system also may be obtained from the AIA).

Briefly, the system offers a low cost comprehensive set of project cost and budget reports, financial statements and accounting journals specifically designed for the architectural/engineering firm. The initial price for the full system is a one-time charge of $2,000 plus a nominal annual maintenance fee. A minimum system of time card reporting, time analysis and labor costing for the project status reports is available at $800. An intermediate system which includes the minimum system plus payroll, cash disbursements, summary of direct expenses, journal entries and overhead expense analysis is $1,500.

Highly modular, the system can be tailored to fit individual firm requirements. G. Neil Harper of CLM/Systems, Inc., is the Institute's computer consultant and principal installer of the new system. CLM is prepared to assist firms in becoming familiar with the system, to install it at a local service bureau or on in-house computer hardware, to custom the system for individual use and to provide assistance during operation.

For additional information, contact Arthur T. Kornblut, AIA, Department of Professional Services, AIA Headquarters, 1785 Massachusetts Ave. N.W., Washington, D.C. 20036.

AIA Officers, Interior Designers Meet, Matters of Mutual Concern Discussed

New ground was broken when national officers of the AIA and the National Society of Interior Designers met in New Orleans in January to discuss examination and admission procedures and architectural qualifica-

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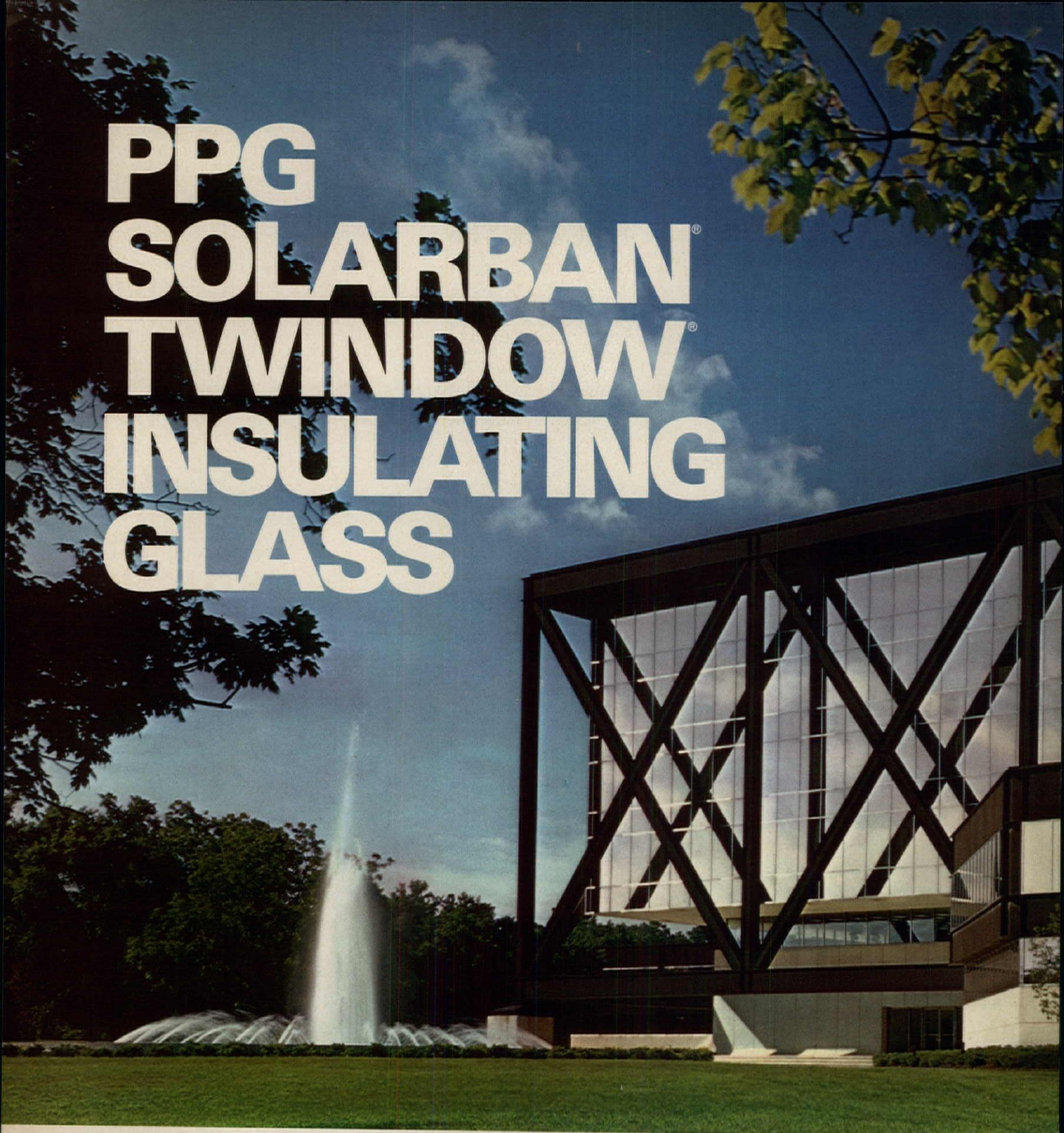

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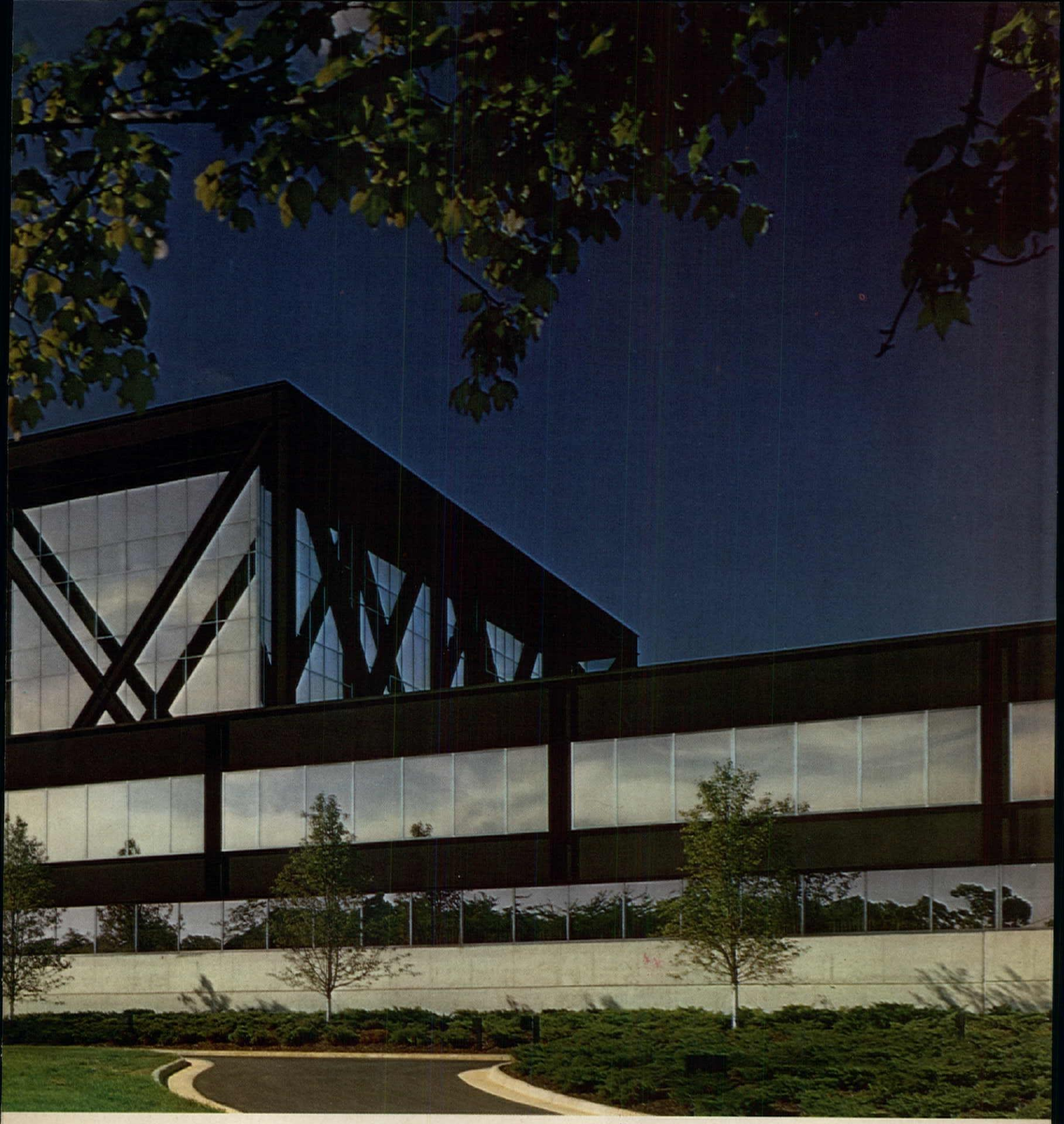

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New Organization Patterns

by LAWRENCE S. STINCHCOMB
*Director, Component and Members Services**

In recent years, the citizens of this country have demonstrated a growing concern about the centralization of political and organizational power. This uneasiness has been expressed by all groups of society with no apparent relation to age, income, race or sex. The young and minority groups have been most vocal and, without question, most forceful. Their cry of "Power to the People" expresses their desire for the decentralization of power. Middle aged and middle class citizens have been constrained to join citizen constituency organizations, such as Common Cause, an organization that acts as a political lobbyist for its members. Organizations are now using such terms as "grassroots" which refers to direct communication between an organization and its constituency.

The problem rests in what people now refer to as "lack of communication" or "credibility gap." It all comes down to the fact that many members of society are not represented in national decision-making.

The apparent centralization of power did not happen overnight as a conspiracy of a few nefarious individuals or groups; it was the will of the vast majority of the people. Years ago, this country developed institutional mechanisms and patterns of organization in addressing the needs, problems and opportunities that came with a rapidly growing and changing nation. These mechanisms proved to be effective for a time.

However, as the country changed with more general affluence and higher density metropolitan areas and with emphasis placed upon the communications media, problems have become more complex. We now have outdated institutional mechanisms attempting to deal with very complex problems, some of which are so deep-seated within society that no institution can solve them.

The question then is how to begin to solve these complex, many-faceted problems.

As a national organization representing some 24,000 architects, the AIA is sensitive to the breakdown of the traditional national institution's approaches to today's problems. It has taken steps to make appropriate changes. Recognizing the necessity for effective communication with its members as well as the need to have active, strong local chapter operations, the Institute reorganized several programs in order to establish the Office of Component and Members Services.

This office brings together the Component Affairs Program, Student Affairs Program and State Government Affairs Program. The charge is to assist the AIA components in strengthening the effectiveness of their operations and in promoting more and better communications between the Institute and the components, between the Institute and its members and among the components.

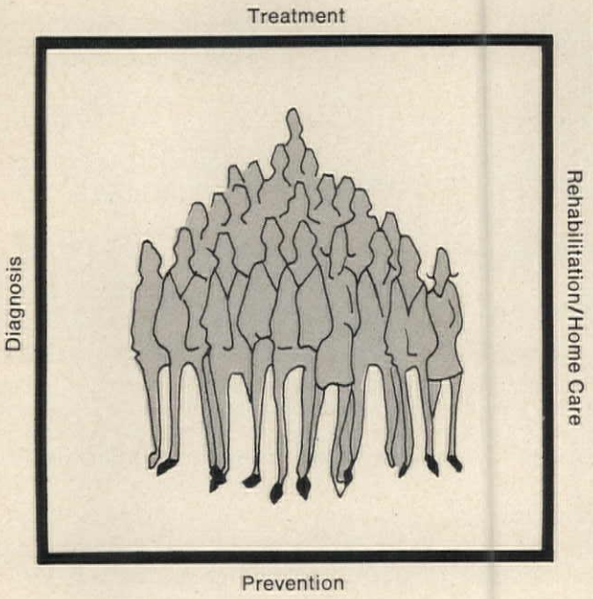
The effectiveness of a national organization is dependent upon a constant input from its members as to the direction of that institution. At the same time, it is necessary that the members of a national organization have a firm understanding of that institution's activities. For these reasons as well as the understanding that a national organization can only ultimately be as strong as the sum of the strengths of its local chapters, the AIA established the new Office of Component and Member Services.

The office has responsibility for the following activities: 1) the annual Grassroots meetings, the purpose being to inform component officials of the services and activities of the AIA and to receive input from the membership as to Institute direction; 2) the *Component Presidents' Letter*, a regular means of informing officials of the activities of other components; 3) regional workshops conducted at about eight locations each year to assist components in the development of more efficient operations; 4) coordination of Institute staff travel to local chapters to achieve as much exposure and communication between staff and membership as possible; 5) direct technical assistance to components to strengthen their general operations or specific programs; 6) a clearinghouse of information pertaining to state government affairs; 7) encouragement of young professionals and students to participate in Institute policy making; 8) subsidization of the Student Forum and Component Executives Meeting to provide additional vehicles of communication.

The Component and Members Services Office is a gateway to the Institute. It is also a general delivery system to membership and components. Its responsibility is to encourage communication and to assist in the strengthening of component operations. It can be only as effective as the membership chooses for it to be. The manner in which the AIA addresses itself to the new and complex problems that confront the architectural profession depends upon the commitment of its members. □

*Since writing this page, Mr. Stinchcomb has accepted the position of staff administrator for the Washington, D.C., Bicentennial Commission.

Estimates.



Stress Health, Not Hospitals!

by GEORGE J. MANN, AIA

Why?

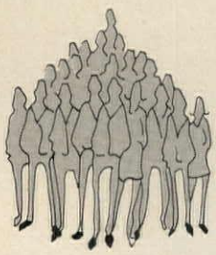
Because we have lost sight of the primary objectives: to keep people healthy and out of the hospital in the first place. In the past we have organized for sickness; in the future we must organize for health. This concept will profoundly affect the architecture of our nation's network of health facilities. In the following, current trends in this area are spelled out and specific recommendations made for architects, how they can contribute toward improving people's health.

In the next 10 years Americans will spend $30 to $40 billion on the construction of health facilities in the United States. And the World Health Organization estimates the need for construction of such facilities in the developing nations alone at a huge $10 billion over the next five years. We must be sure to spend these whopping sums wisely and where it is most needed.

In spite of the dire need for hospital beds in some areas, of a total of 1.6 million beds in US hospitals registered by the American Hospital Association, an average of 318,000 are empty at any given time—just under 20 percent or one in every five hospital beds, reports *US News and World Report* (Sept. 6, '71). Often hospitals are located far from population centers for lack of regional planning. But the reasons for the downward trend, the magazine goes on, are:

- The economic situation, making people more hesitant to seek health care.
- More stringent monitoring of Medicare and Medicaid payments.
- Too many new and existing hospitals.
- Efforts by doctors and private physicians to save money for patients by using ambulatory facilities.

But the more fundamental underlying reasons are that the basic health problems and methods of treatment have changed dramatically in recent years. For example, new concepts of treat-



Prevention

Good housing and a wholesome environment play major roles in prevention of illness and in keeping people happy. This includes dwellings for the elderly. The above shows a 40-unit low rent housing project for senior citizens in Wayne, Michigan. The units are oriented inward to the courtyards to invite sociability between the neighbors. The restricted sizes of the courtyards make gardening easy. William Kessler & Associates.

ing the mentally ill through the use of drugs and emphasis on comprehensive community mental health center programs have reduced the occupancy and use of psychiatric hospitals dramatically in the last decade.

The Problems

Let's take a moment to define the basic major problems related to health care and health facilities today:

Services: skyrocketing costs; fragmentation and duplication; rapid advances in medical knowledge with a consequent changing nature of major health problems; changing relationships of environment and health; poor delivery of health care in both urban and rural areas; changing age characteristics and distribution of population.

Manpower: shortage and poor distribution.

Facilities: rising costs of construction and operation; fragmentation and duplication; poor planning, obsolescence and overcrowding; unreasonable length of time for project delivery; imbalances in utilization rates.

Every time an architect designs a health facility he does himself, the client and the community a disservice unless he takes each of the above points into careful consideration.

The Trends

Several definite and significant trends in health facility design are quite apparent:

Comprehensive health planning: Planning for *total* health needs is being emphasized. In order to achieve this, there must first be an analysis and understanding of precisely what the major health problems and causes of death in the US actually are. (These problems tend to shift drastically with the new medical breakthroughs which occur at an accelerating rate.) This analysis will determine the needs and priorities for health services, manpower and facilities.

Concern for the total environment is an important aspect of comprehensive health planning. In recent years it has been widely recognized that there is a critical link between health and the environment. Serious and often irreversible damage due to environmental health problems is causing direct and indirect physical and emotional problems. They include air and water pollution, noise, urban and rural blight, crowding, traffic, garbage, junkyards, ugly signs and billboards, radiation, food poisoning, drugs and narcotic abuse. Yet our young people show positive signs that they are developing a reverence for our environment, which is most encouraging for the future.

Regional health facilities planning: Due to the limits in individual community planning efforts, more comprehensive and sophisticated regional planning is necessary, the objectives of which are to: achieve better geographical distribution and coordination of health facilities; provide comprehensive health services commensurate with the needs of people; establish needs and priorities among new health programs and services; eliminate duplication; reduce fragmentation; foster more efficient use of health manpower; integrate health needs into other areas of urban and regional planning and development.

The general methodology in regional health facilities planning is to 1) undertake an analysis of the region with respect to social, political, economic and cultural factors, existing health care delivery organization and systems, and existing health indices as a basis for the development of recommendations concerning health needs and priorities; and 2) develop a master plan commensurate with the concepts and recommendations established by the community itself and to be incorporated into a coordinated regional network of health facilities.

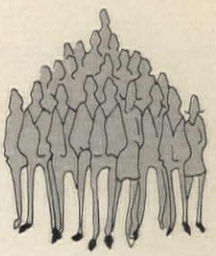
The trend is well apparent that health facilities will share computer, accounting, dietary, laundry, laboratory and other facilities on a regional basis through affiliations and mergers.

Criteria for the actual location of health services, manpower and facilities should be made on a time/availability basis. William G. Anlyan, M.D., vice president of Health Affairs, Duke University, in his address "1985" at the annual meeting of the Association of American Medical Colleges last October had this to say about the time/availability system:

"I propose that we endorse a system advocating medical care within a maximum of one-hour availability for every American. We cannot just stop with that recommendation. We must go on to look at the total picture.

Mr. Mann is director of the Health Facilities Research Program at Texas A&M University's College of Architecture & Environmental Design at College Station, Texas. He is also a member of the AIA Committee on Architecture for Health and a consultant to industry and government. The drawings are by Tarek Alam and Nicolas V. Maselli.

Diagnosis



Public health centers within easy reach of people help keep a community healthy and reduce medical cost by preventive care. After diagnosis, patients are if necessary referred to a health central. El Paso has six such new centers within three to four miles of each other. The J. Harold Tillman Health Building, above, a health central, and the centers are a joint venture between Fouts, Langford & Associates and Middleton & Staten.

"We must be major participants in evolving various types of nonphysician manpower for health care obtainable in less than one hour. More specifically, we must be active in developing educational programs for 'self and buddy care' that can be videotaped nationally and taught in every junior and senior high school. Such self and buddy care programs should take care of dire health emergencies within zero to 15 minutes of need. Health maintenance and drug abuse programs could also be included in the same educational structure and be made mandatory prior to driver licensing.

"Within 15 to 30 minutes' availability, there should be rescue squads of allied health personnel who have been trained in our academic health centers or equivalent teaching hospitals. For nonemergency care we should also encourage the development of nurse practitioner and nurse specialist programs, particularly in areas of preventive care, screening clinics and lesser illnesses. Nurses are one of the most underutilized human resources that we have today in the health care system. It is inconceivable that by 1985 we will have enough physicians or other resources to copy the 'Skoraya' system now being instituted in the major cities of the Union of Soviet Socialist Republics. This system entails a mobile unit headed by a physician to render emergency care within minutes of need.

"Primary medical care within one hour of need would be rendered by a minimum group of eight to ten physicians who are mostly primary medical care specialists. By this term, I do not mean exclusively family practitioners but also general internists and general pediatricians. Presumably, uncomplicated obstetrical care and minor surgical procedures could be rendered by the primary care specialist. Most academic surgeons today believe that surgeons should not be operating in a primary medical care facility without competent backup of the various surgical specialties and anesthesiology as well as pathology. This question is still in need of debate.

"Within two hours of need, there should be the standard secondary specialty care that is available today. Within a maximum of five hours there should be available tertiary subspecialty care in a university hospital or its equivalent.

"[I recommend that we] develop a time/availability system of health care which provides primary medical care within a maximum of one hour of need; secondary specialty care within a maximum of two hours; and tertiary subspecialty care within five hours. For emergencies necessitating care within 15 minutes, the AAMC should play an active role in developing self and buddy care educational programs to be taught in junior and senior high school. Nonphysician personnel should be trained for care needed in less than one hour."

Dr. Anlyan's criteria would have a fundamental effect on regional health facilities planning, particularly with respect to selecting the location and scope of health facilities.

New Emphases for Health Facilities

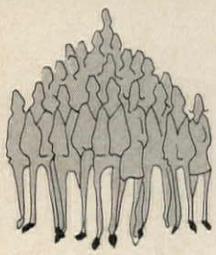
Perhaps the major differences between the comprehensive health care delivery system of 1985 and the hospital today will be the great emphasis on *prevention* of diseases and accidents.

For the pragmatists, prevention of sickness is more economical than disability and disease. If people are healthy, they will produce more. For the more idealistic, a characteristic of a civilized society is how it cares for the ill and the aged. The new Health Maintenance Organizations (HMO's) will create incentives to keep people well rather than only to care for those who are ill. (The Kaiser Foundation Health Plan is a working success of this general concept.) They will be financed by the healthy; those who are ill will not have to pay. In too many cases the present health care delivery system today is geared for the convenience of the doctor rather than for those he treats.

Preventive health programs (including extensive TV health education programs) and health maintenance organizations will result in the following new types of health programs and facilities:

Multiphasic screening facilities: Technicians and automation should be used for preventive health mass screening programs rather than more expensive doctors. The Stanford Research Institute predicts that within the next 10 years the number of Americans going through health screening centers will grow from the 1970 figure of 170,000 to 174 million *(Family Health,* Oct. '71).

Mobile health units: These will carry programs for prevention of illness and health education directly to residential and rural areas. Improved and coordinated emergency services (incorporating constantly cruising police cars/miniambulances, mobile coronary care units, helicopters, and clearly defined points of entry to the health care system); flying doctor service to remote



Extended treatment centers with services including X-ray, laboratory and minor surgery reduce the workload of general hospitals. The training of allied (nonphysician) health professionals is important in this connection. The Veterans Administration plans a nationwide group of such centers, some combining treatment and training. The above steel structure, adjoining a 500-bed VA hospital in Durham, North Carolina, trains 325 students annually. Don Irwin, Titan Environmental Construction Systems; architect of record, Robert W. Lance, AIA.

areas; and hospital ships, will be included among various types of mobile health units and services.

Public health centers: Such facilities, located in store fronts or shopping centers, are already providing health programs directly in and easily accessible to the community.

Health education programs and centers: Raising the general public's knowledge about health is perhaps the most effective long-range weapon in the battle to prevent disease. Health education programs through lectures, TV, video cassettes and movies, will be further emphasized in schools, industry, government and the armed forces, with stress on the importance of proper nutrition. For example, lack of a balanced diet is a major basic cause of health problems throughout the world. Health education programs can provide the knowledge and awareness necessary to improve diet.

Housing: While not belonging under the health facility category, a home is a basic health unit. Raising standards for housing and sanitation is a definite health problem and should be viewed as such by the architect and the health planning agency.

Ambulatory and outpatient facilities: These will reduce the load on inpatient facilities within the general hospitals. They have been given high priority by the US Public Health Service. They will emphasize diagnosis and treatment. Services that will be provided include X-ray, laboratory and minor surgery.

Facilities for rehabilitation, and home care programs: Upon completion of diagnosis and treatment, continuing programs in rehabilitation for single or multiple disabilities will often be required. Often located in or near general hospitals, these rehabilitation facilities will aim at maximizing an individual's potential. People with the following types of problems need rehab services: aphasic, arthritic, asthmatic, cancer, cardiovascular, cerebral palsy, diabetic, epileptic, geriatric, multiple sclerosis, orthopedic, poliomyelitis, psychiatric, respiratory, speech and hearing, as well as amputees, blind persons, mentally retarded persons and those in need of vocational rehabilitation.

Home care programs will be expanded to provide visiting nurse services to those who for various reasons are able to or who have to remain home. (This type of program also reduces demand for expensive hospital inpatient facilities.)

Long term care facilities for the aged: The 20.5 million Americans who are over 65 need improved health services and facilities. This age group is expanding twice as fast as those under 65. In recent years, because of the growing recognition of the problems of the aged, the federal government has undertaken programs in Medicare and Medicaid and has established the Older Americans Act of 1965.

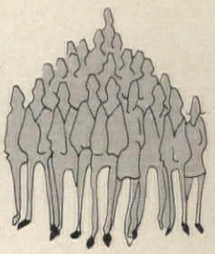
Those over 65 have a great deal to contribute to society. Facilities for them must be located and designed to make maximum use of their potentials and make them an active and vital part of society. Often there are no facilities for the aged between the nursing home and the standard apartment. Facilities for the aged may be near schools or shopping centers to permit more activity and interaction for this age group. Long-term care facilities will also care for the infirm under 65.

Highly specialized facilities: Eye, kidney, semen, skin and blood banks; hyperbaric chambers; narcotics and alcoholism treatment centers will be among the highly specialized facilities needed.

General acute care hospitals: The trend is definitely toward single patient rooms and fewer but larger hospitals.

Use of technology, electronics and communications: The need for improved and more efficient health care, the shortage of qualified health professionals and costs of health personnel will necessitate technology, electronics and communications to be used as a leverage to raise the standards of health care in the US. Among things that will come and may well come, and which will definitely affect the design of health facilities are:

Telephone and TV diagnosis; films for health education and education of allied health professionals (possibly using public television); electronic fire, security and utilities surveillance devices; automated storage and retrieval of medical records; automated history taking; workable artificial hearts; economic kidney machines; kitchenless hospitals (food catered airline style); scanning devices (for observation and reading of body processes); emergency communications with ambulance teams linked with police and fire departments, trauma centers, hospitals and physicians, obtainable by dialing a nationally uniform phone number; central and satellite blood banking facilities.



Long-term care facilities are, in essence, skilled nursing homes handling post-acutely ill and long-term care patients in an intensive manner. Some also provide rehabilitation and therapeutic treatment to reduce recovery time. The above facility, planned as part of the Wayne County Medical complex in Westland, Michigan, will encompass all of these services. The 360-bed structure will not have provisions for surgical or emergency care since these functions are already contained in the adjacent general hospital. Eberle M. Smith Associates, Inc.

Biomedical engineering research programs to develop new tools for health care are already underway in many of our universities. We can therefore look forward to more developments such as improved prostheses, monitoring equipment, heart lung machines and cardiac pacemakers. These new mechanical systems will change use patterns and design of health facilities.

Facilities for education and continuing education of allied health professionals and for research: Dr. Anlyan also recommended in his address that our nation achieve an increase in medical school enrollment from 11,360 in 1970 to 15,000 by 1976, and an entering class of 25,000 by 1985. This growth, coupled with changes in curriculum, would increase the demand for up-to-date medical education facilities. Our medical schools and teaching hospitals are already reaching out to the community through affiliations with local hospitals and even actually staffing neighborhood health centers. It is likely that the entire health care system of the future will have the same functions as our present medical schools and teaching hospitals, i.e., patient care, teaching and research.

Many persons feel that a physician should be recertified every five years. If this comes about, it will create a sharp increase in the demand for continuing education facilities for physicians wherever they are.

Yet, it must be remembered that doctors are only a part of the health team. Programs for physicians' assistants (notably successful in the USSR) are underway in a number of areas in the US. The demand for nurses is far beyond the supply. Years ago nurses were looked down upon. The trend is, and will be, to give them more responsibility and thus more status. Others on the health team include hospital administrators, dietitians and nutritionists, dentists, medical technologists, practical nurses, home health aides, pharmacists, radiologists, social workers and speech pathologists. They will most likely be educated in university health sciences centers.

However, these professionals should be related to the universities' general resources in behavioral sciences, economics, business, engineering, law, etc., which closely relate to improving health. Therefore, schools for the education of health professionals will likely be located on the main university campuses.

Facilities for research will play an important part in the future in combating the major causes of disease and grow in size and importance.

Research and development toward improved health facilities: Information retrieval sources will be developed and made available to architects of complex areas of health facilities such as coronary care units. An information system that exists today is MEDLINE at the National Library of Medicine. It can and should be easily adapted for use by architects.

Priorities based on national need will be established for demonstration research and development programs. To expedite these, The American Institute of Architects' Committee on Architecture for Health is supporting the establishment of a much-needed program in ongoing Health Facilities Research.

Due to the rapid progress that has been made in the battle against disease during the past 75 years, health facilities have become obsolete within very short periods of time. For example, if we design and build a system for health facilities specifically to combat heart disease and cancer (the present two leading causes of death) and breakthroughs occur, then we will be stuck with billions of dollars of capital investment in obsolete facilities. Therefore, R&D efforts must be directed toward developing structures that are responsive to change. Highly specialized hospitals were built at a great expense in the first half of the 20th century. After the introduction of isoniazid and streptomycin in the late 1940s, the TB death rate dropped by 95 percent. Thus hospital uses were dramatically changed in a very short time and as a result we had a number of poorly located structures which could not readily be used for any other purpose.

The Architect's Challenges and Opportunities

Regional health facility planning: Due to the complex interrelationships of a comprehensive health care delivery system, architects will have to view the buildings they design in relation to an overall health care delivery system. They will no doubt be involved in regional health facility planning including program development for comprehensive health services, manpower and facilities.

Systems building development: Due to the demand for medi-

cal requirements that are similar in nature, opportunities will arise for systems building development financed by Health Maintenance Organizations for the purpose of reducing time and costs of health facility construction.

International problems and opportunities: The jet has brought the nations of our world closer together but has thereby increased the possibility for rapid spread of communicable diseases. The US has a great deal to contribute toward solving the health problems and health facility needs on our planet.

Frequently, foreign architects are called to developing nations for consultation. These experts have often recommended expensive facilities without first having properly analyzed the local health problems and needs. Often these problems stem from poor nutrition, leading to mental retardation as well as other disorders. More often it is the water supply that needs to be purified. In other cases, a simple vaccine is necessary and can be administered outdoors without any facility whatsoever. Often a simple basic comprehensive health center with the following services can provide the greatest impact: general medicine; maternity service; pediatrics; surgery; communicable diseases; endemic diseases; TB and mental disorders; outpatient services; preventive medicine; occupational medicine; health education; geriatrics.

Of course the need for hospital beds in developing countries is staggering but still the decision to build a hospital must be carefully deliberated. Basic questions should be asked such as: Is there a need? Will building and equipping a hospital help solve the priority health problems? Will there be adequate health manpower available for staffing? Will there be funds available for maintenance and operation? Could not a rural comprehensive health center having the aforementioned services have a greater impact?

The world population is expected to reach 7 billion by the end of this century. This will demand basic new approaches in undertaking projects; for example, use of systems building. Yet the architect must recognize that the amount spent on construction will still be relatively small in relation to the remainder of the health dollar (in the US, construction represents 4 to 5 percent of the total). The architect can help by understanding existing health problems and trends and by designing health facilities so that the utmost use can be made of the potentials of health professionals. He must be careful not to build a white elephant which does not respond to the actual health problems of a region. On the other hand, the facility must raise standards of health care and not preserve the status quo.

To prepare for the formidable and complex tasks at hand, architectural firms specializing in medical facilities will have to expand their scope of services and develop an interdisciplinary staff. Clients will demand total project delivery and even operation. The capability to begin a project from its conceptual stage through construction will be in great demand.

Recommendations

The following are the author's recommendations on specific actions in areas where architects can help and that will result in improved design of health facilities:

1. Incorporate methods of improving health facilities into pending legislation for National Health Insurance. One possibility is that NHI may encourage architects to aggregate markets for economic development of building systems for health.

2. Establish an easily accessible automated information system for use by architects.

3. Offer basic public health courses in the undergraduate curriculum in architectural schools.

4. Establish graduate interdisciplinary programs in health facilities research (such as at Texas A&M and Columbia Universities).

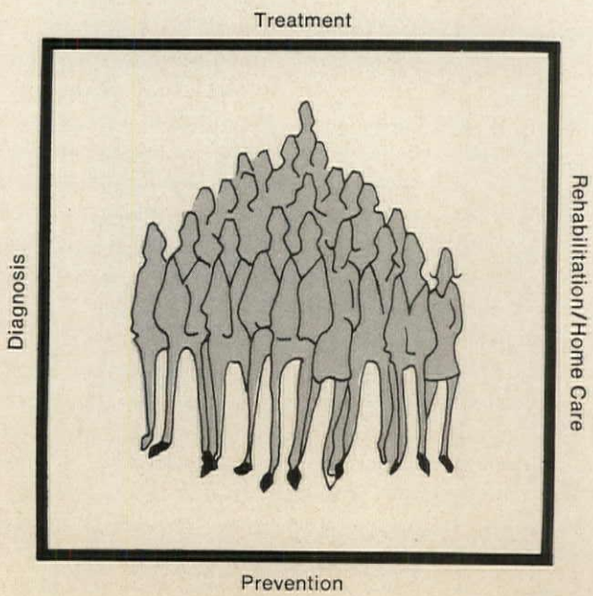
5. Establish an independent health facilities research program funded from private sources and focusing on solving the nation's priority health problems related to design.

6. Encourage the World Bank, World Health Organization and other international groups to provide incentives for developing nations to recognize health services, manpower and health and hospital facilities as priorities.

7. Expand liaison and activities and exchange of personnel and information between The American Institute of Architects and international health groups.

8. Develop a system of national medical record retrieval which would allow transmission of an individual's medical history to any point in the nation, within the legal requirements for privacy. A highly mobile population has caused this to become a necessity if continuity of health care is to be achieved.

The hospital evolved as a reaction to the needs of the ill and the poor. The new and more sensible emphasis on health maintenance will result in new kinds and new networks of health facilities. The opportunities for innovations are tremendous. □



HOW TO GIVE A HOSPITAL A SOLID FOUNDATION

by JASON W. FRYE JR., AIA

No matter what form of economic support it has, a medical facility, the structure itself and the services it houses, must have a sound economic base. A realistic budget is always based on an institution's capability to raise capital for immediate and long-range expenditures. Programmed services and facilities must be evaluated to determine if costs of providing them are reasonable. If the architect is to program effectively, he must reconcile cost to budget through adjustments in scope and quality before design begins, and in addition he should be able to develop the economic data required for a mortgage application.

What is the basis for programming? First, the program is a translation device. It converts requirements stated in technical terms into planning terms. At the same time it eliminates—or should eliminate—the variations of interpretation by converting vague language into specific, easy to understand terms, or preferably to numbers. There are methods for doing this easily, such as the affinity matrix form of indicating interrelationships. To begin the programming our firm uses numbers provided by the client. These indicate production in numbers of procedures or tasks to be performed, the number of people, size and type of equipment, and of supplies required to perform them. Concurrently, we collect data on methods of operation. It is important to understand how the client does his work, how he manages his decisions, and what kind of controls are required. A chart of organization and a functional flow chart are useful in documenting these factors. It is interesting how often these organizational charts will be quite similar to the planning/functional relationship diagrams developed by the planner.

It is not unusual to find that the client has no clear understanding of his operational relationships and therefore cannot convey them meaningfully. When this is the case, the planner must first assist his client in developing operational statements and functional flow diagrams. This adds necessary context to the entire planning effort. The answers that the programmer receives must be evaluated in terms of defined methods of operation.

Programming includes making the decision whether a facility or space is in fact needed; analyzing and documenting the needed spaces and financial limitations; and generating data used to implement a fund-raising campaign or application for federal funds. Programming is too often accomplished when only part of a planning team is available or when the work is done by several different consultants on an uncoordinated basis.

Few project schedules include the tasks of developing the economic data required for a mortgage application, and the preparation and documentation of *all* factors affecting the cost of a facility. It is possible to reduce the time required for these early steps and to increase efficiency, but only if a complete planning team is available and the efforts of all are organized and scheduled. The hospital administration and its consultants need reliable cost data in order to select alternatives rationally in the early program stage. Such data used to be unobtainable until the architect completed his schematic design because hospitals were often unwilling to enter into contracts with the whole planning team before having secured funds to go forward. The tendency has been to limit contractual obligations and therefore restrict the number of consultants involved in the early stages of development. This is no longer the case. With the whole team represented and current procedures of cost analysis and estimating, it is possible to project cost based upon program data. The whole cost can be determined, including long-range economic consequences of providing new services and new facilities, or modifying existing operational patterns and facilities to provide the same services.

Due to the complexity of today's health facilities, the architect, with other consultants or sometimes alone, has become the author of program data, even though historically he depended on his clients to provide much of the program requirements. Often the hospital consultant writes a program of services, based upon the analysis of the hospital and the area it serves. A program of facilities is then prepared by the architect. There are many variations in the authorship, timing and responsibilities for portions of the program, depending somewhat on the size and complexity of the hospital and the number and types of consultants retained by the client. Some large hospitals have their own planning staffs but only a few can afford the cost. A few use consultants on a continuing basis to help in long-range planning.

Some form of continual contact between a hospital and professional planning consultants would permit a better understanding of the changes in the hospital which lead to construction programs and provide more lead time in anticipating needs. Without such relationships consultants currently perform a kind of crisis planning, filling the need only after it has become acute. There is a trend in federal grant programs to require long-range planning as a condition of financial support. This is already generally a requirement on the part of most large sources of borrowed capital, which expect to see short- and long-range plans as a part of the

package of data furnished with an application for funds. From now on, the early documentation of project development may become more future-oriented and comprehensive.

Our own firm has for some time been active in early economic planning, and our programming procedures are geared to the early needs of the decision process. Specific data—all quite different—is required for borrowed capital, for public fund raising, for federal grants or loans and for foundation funds. The problem is to provide only the pertinent data and not waste time and money producing unnecessary information. Furthermore, overdocumentation can cause a problem by limiting the flexibility of solutions and alternatives during succeeding phases of planning. Hardships can result for the hospital if it is committed too early to provide specific facilities and services. (The data necessary for seeking borrowed capital is covered later in this article.)

The term "systems approach" is overused but it adequately describes a valid method of programming and design of hospitals. It provides a basis for reconciling cost and performance. It offers techniques for dealing with a wide range of factors and interrelationships, resulting in innovative solutions for health facilities to meet future needs.

When addressing the Committee on Health Environment of the Houston Chapter of The American Institute of Architects, Donald R. Peet, Product Specialist Systems, Castle Company Division of Sybron Corporation, described the system approach as a seven-step procedure:

1. *Statement of broad objectives.* Decide, in broad terms, what is to be accomplished.

2. *Statement of definitive objectives.* Satisfy specific details of other pertinent factors in order to achieve the broad objectives.

3. *Development of general alternatives.* Determine all possible alternatives that may satisfy the definitive and the broad objectives. *Every* possible solution that may ultimately satisfy the final objectives should be considered. If one alternative is eliminated too early, then the final results may be invalid since at this point in the procedure, sufficient knowledge has not been developed to eliminate any alternatives.

4. *Collection of pertinent data.* Begin with the traditional questions, "what, where, when and how much." At this point it is necessary to start questioning and learning the intricacies of the operation.

5. *Data analysis and evaluation.* With all the data in hand, evaluation is made of each of the alternatives to see how well they satisfy the objectives. The alternatives that do not satisfy the objective are eliminated.

6. *Economic evaluation:* After data analysis and evaluation, several alternatives will remain, each satisfying the objectives. The cost/effect must be considered for each, and a ranking or performance versus cost established. The alternative selected should have the lowest total cost and the highest performance.

7. *Selection and implementation.* This procedure is oriented toward decision making. There is another term, "systems integration," which is the process of designing each component of a building complex with the capability to function in an optimum way when combined with other components. A number of examples of systems integration studies are available through the United States Public Health Service, the Veterans Administration and other agencies.

Program is a simple term originally applied to a list of requirements. Our firm's programming process consists of seven general activities:

1. *Development of a schedule of tasks* leading to an accumulation of the data necessary to go forward with a schematic design, and management of this schedule, including continual updates.

2. *An organized inquiry securing data* which sets forth the client's objectives, and the scope and type of activities to be performed to obtain those objectives.

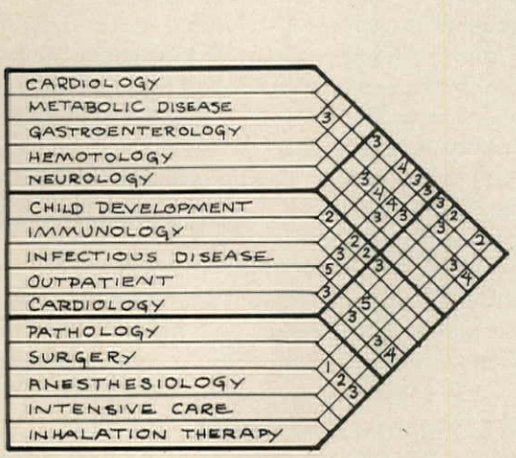
3. *Documentation of a program of spaces,* usually done in two steps, the first being a trial program which is reviewed with the client. Once cost data and other factors have been considered, the second or final space program is prepared, usually including a listing of major items of equipment.

4. *Development of functional relationships,* preparing functional relationship diagrams with the client and his decision making team.

5. *Selection of systems and materials,* including in some cases performance of integrated systems analysis.

6. *Preparation of cost projections,* including definition of system alternatives and their effect on cost projections, and an account-

Mr. Frye is partner and director of Medical Facilities Design in the firm of Golemon & Rolfe, Houston.



INDICATE PROXIMITY

1.	CONNECTING
2.	MUST BE ADJACENT
3.	MAY BE ADJACENT
4.	MAY BE REMOTE
5.	MUST BE REMOTE
(BLANK)	NO RELATIONSHIP

affinity- relationship patterns

ing of costs not directly springing from construction (summary of direct and indirect expenses).

7. *Special studies* such as site optimization, data, flow, transportation, material handling and a continuing list of other studies tailored to the needs of the client.

These seven steps include the basic activities that we now group under the title of programming. The entire effort is one of gathering sufficient data so that the client can reach a decision concerning the quality, quantity and cost of what is to be built. He reaches this decision by comparing the results of the programming with his own previously documented goals and objectives, levels of need, operational considerations as well as economic limitations.

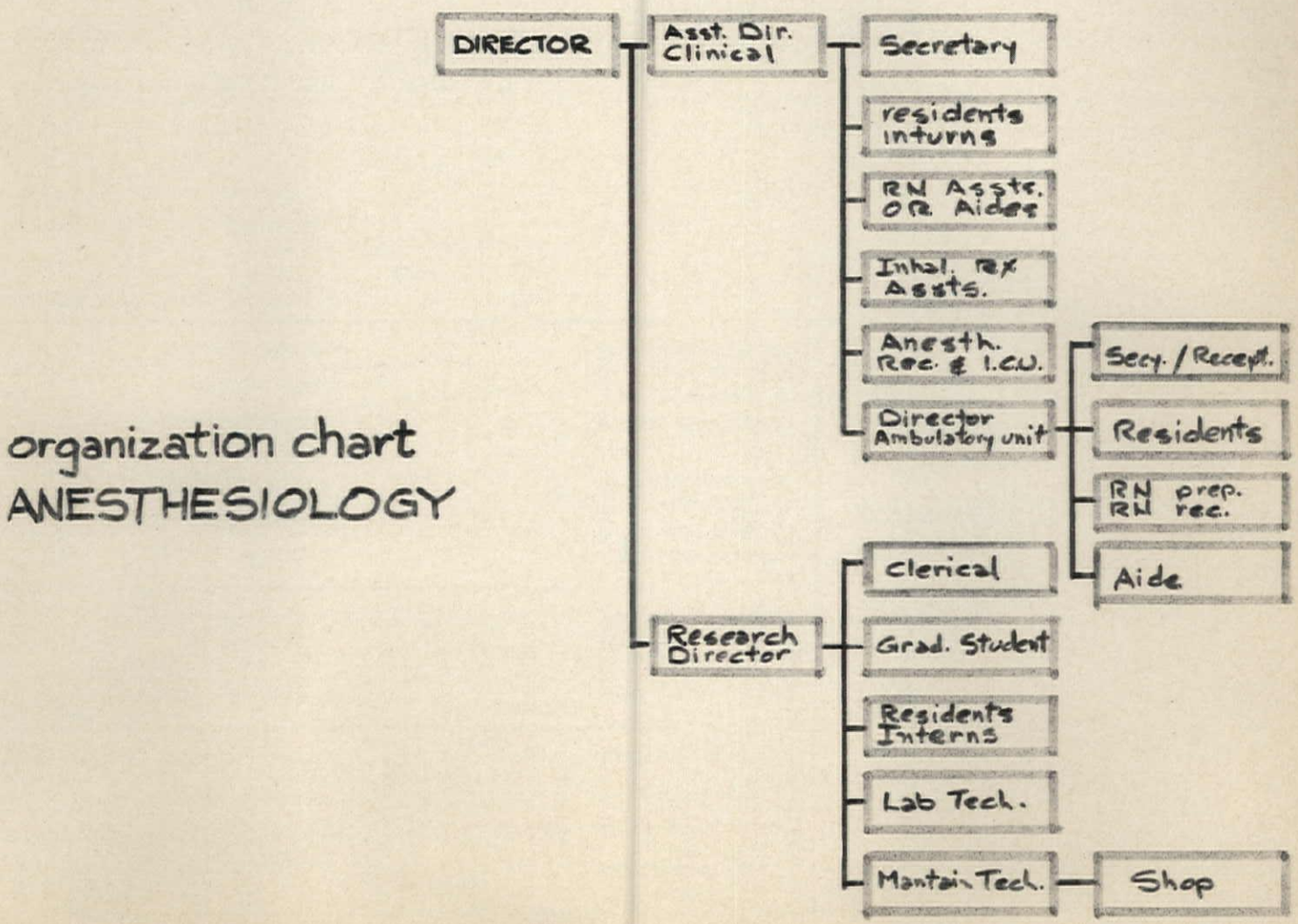
The programming is fact-gathering, translation and group therapy. The basis for a viable program cannot be departmental empire building, which often happens. For evaluation of whether the input received from the client's decision team is overambitious, inadequate or optimal, the architect should rely on the following resources: the hospital administration, consultants, and data on comparable facilities. The last category may to a certain extent be obtained from resource literature. Obviously, architects who have planned other hospitals most often draw from their own experience. In some cases "state of the art trips" or visits to similar facilities are appropriate, provided that the consultants and the client's decision team are able to identify problems within their own project, and solutions demonstrated at the facilities to be visited.

The programming stage is the time to seek answers which will be the basis for the evolving design. To change some of the answers late in the design process can adversely affect the design or slow the design development, causing unnecessary escalation of costs. In this regard, particularly in the high-speed, overlapping design and construction processes, the architect and client both must organize early for decision making, since the speed of the process depends largely on whether the decisions are made in a timely way.

There have been a number of articles written recently on network scheduling, which is an effective tool in organizing for decision making. The client can easily visualize the effect of delaying a decision, and the architect and his associated consultants can more clearly understand what data the client needs in order to make each decision. The time-saving made possible with the overlapping design and construction process originates with the network schedule. The network also sorts out and lists the tasks required during programming.

The cost of health care inevitably goes back to the cost of constructing health facilities and financing them. High initial cost can delay needed future growth and change. Cost control, then, is a major contribution of the design/construct team toward expanding the nation's health services. The cost control base line (budget, quality and quantity) developed during programming provides a means of checking the scope of facilities and quality of the systems selected against budget during design development.

Procedures and techniques are now used by the architect to



simplify cost analysis by categorizing costs according to larger units of construction; combinations of materials and systems; and, in some cases, areas of a building according to use. Some of the costs for combinations of systems have been documented and stored in computers and are kept continually current, providing quick recall of a wide range of component costs. There also exist construction cost analysis companies with reliable cost data available to the architect's estimator/cost analyst. These costs are provided in a form which can be applied directly to the combination of a space program, systems outline and certain basic assumptions concerning general configuration.

The quantity of space documented in the program is a variable and depends upon functional relationship. Therefore, it is important that functional relationships be carried to a point that will permit general conclusions concerning the configuration of the building, using functional relationship diagrams. System alternatives sometimes can be substituted for convenient functional relationships. It is in this area that most of the recent developments in systems of transportation and communications have shown their greatest benefit.

The functional alternatives which affect costs are those which permit joint use of space, rather than having two spaces for basically the same purpose. Some savings can be accomplished during the program stage by defining functional relationships, setting forth joint use or multiple use of programmed space.

System alternatives which affect costs usually have to do with the sophistication of the system and the quality of environment generated by it. For example, there is a direct relationship between cost and the efficiency of control provided by a specific airconditioning system. The major concern is to be sure of uniform quality for the systems which support a specific activity within the hospital; i.e., to function successfully, a room may depend on the quality of lighting, humidity and temperature control, and acoustics. It can be self-defeating to provide good lighting and airconditioning and disregard sound control.

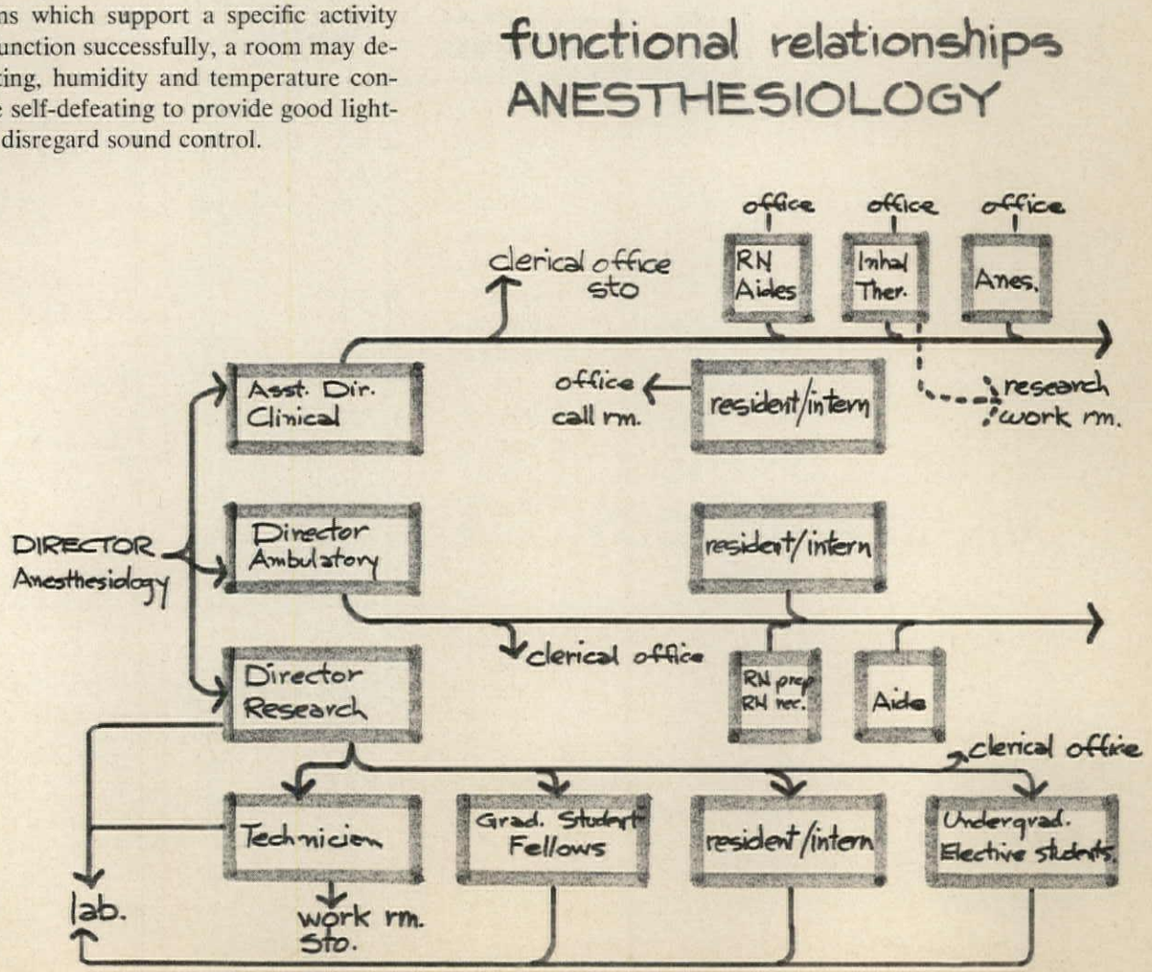
The stages and development of cost data consist generally of the following:

1. *Prior to final program development* a project budget must be presented, based on economic analysis of the proposed project.
2. *Programming* must include the development of quality of construction systems, quantity of space provided and cost base line. Concurrent with the conclusion of the program there will be cost analyses of systems selected and of functional alternatives.
3. *Schematics* include updating of cost projections.
4. *Design development* includes detailed cost estimate.
5. *Construction documents* include periodic updating of detailed cost estimate.

The cost control team consists of the client, the architect, the contractor, if project is negotiated, and consultants. Really, every decision maker who participates in the design process should be on the cost control team. Every member of the decision team will make decisions which will substantially affect cost and therefore should have the responsibility of assisting in controlling costs by continual reference to, and observance of, the quality/quantity formula. When the decision makers work as a team, it is possible to consider trade-offs of systems and quantity of space in order to obtain optimum performance and quality within the client's budget. This is done through cost/effectiveness studies in which the alternative planning solutions and/or systems selected can be graded according to cost and performance.

As part of our firm's initial research and analysis, design considerations affecting program and cost include:

1. *Existing conditions and limitations,* including such things as the site and surroundings; available utilities, traffic and trans-



portation network serving the site; etc., and factors of location such as codes and restrictions.

2. *Functional arrangement and circulation,* or the most desirable pattern of relationships between various elements of function.

3. *Esthetic considerations,* dealing both with the quality of the space within and the exterior character of the building, and how these factors relate to the use of the building and the requirements of the user.

4. *Technical requirements,* or detailed functional considerations, not related to item No. 2 but to the activity needs for each functional area, helping to define support systems.

5. *Considerations for future development* such as expansion and change, usable life, overall master planning and phasing.

Statements concerning these considerations are part of the programming. Each factor has an effect on the program of spaces, the systems outline and the cost projection and must therefore be spelled out in as much detail as possible.

Frequently we are asked to prepare the program for far more than just the first stage of development of a project. Since reliable cost data is available during the programming, it is possible to reach some conclusions concerning the overall cost effect on the time it will take to implement a complete master plan. It is not at all unusual when a program is developed to establish phasing based on available financing. Economic considerations will determine the scope and time involved in implementing each phase of a master plan.

For hospitals, especially, the relationship of master planning to economics is extremely important. It is an indication of whether a facility will be able to keep up with a thriving demand for services and facilities. This is an important factor in determining which portions of a phased master plan will be carried out first. It is possible, by considering cost as a factor in master planning, to determine the extent of flexibility or expandability which will be required, or which the client can afford to build into his facilities.

Sources of financing for hospitals are primarily federal grants, public funds and lending institutions. Capital from such sources as public fund-raising campaigns and foundation gifts is generally declining. Public fund raising is affected by the awareness of the public at large that funds are available from federal sources. The considerable tax burden and the publicity given to federal programs have fostered the attitude that the individual is already paying taxes which are being used to finance health care. Whether this is true or not is not really important, for the effect is certainly real enough. Foundations seek to stretch their funds over more projects and recently have been tending to make more donations but smaller in size.

Mortgage financing is being considered more and more for both private and public facilities. It can work to the benefit of the project if the hospital and its planning team understand the kind of data required to obtain borrowed capital, as well as the time schedule for the process of making the application and receiving funds.

For for-profit hospital corporations (*see* p. 29), borrowed capital is the prime source of financing. The quarterly statement of one such corporation says: "We came into 1970 with 931 beds and have continued to grow to our present size of 2,213 beds. You can see that our present construction or expansion plans will take us to 3,600 beds by the end of 1973." This pace of growth is not unusual among corporations but is possible only through borrowed capital.

The time schedule for financing usually requires 60 to 90 days to "test the market," i.e., to obtain an informal, preliminary reaction from several lenders in response to material and data prepared specifically for financing. The time required to secure borrowed capital once the specifics of program and economics are known for the project varies but can take from six months to a year or more from the presentation of the final mortgage package to the investment broker. It is wise to work through a broker, particularly when the anticipated costs are in the range of $5 million or more. The general data required to seek financing are:

1. *Documentation of the need for the project.* In some states where Certificate of Need legislation exists, certification is required as part of the mortgage application.

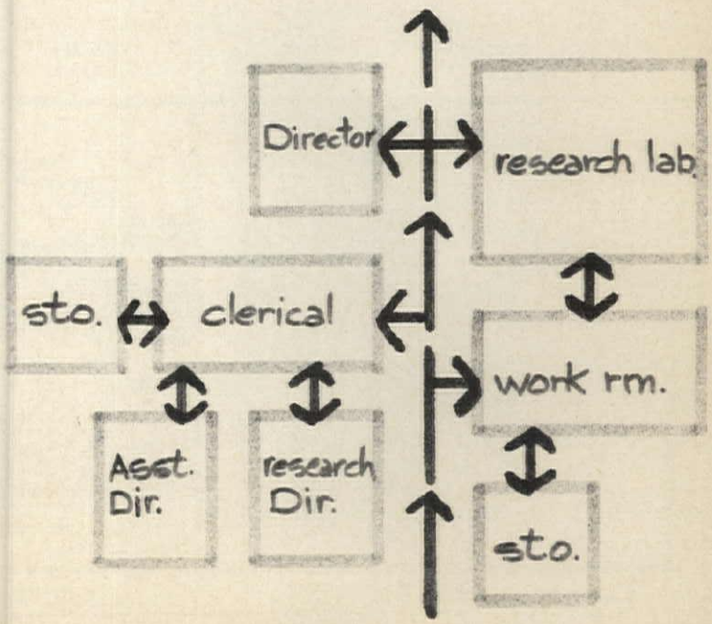
2. *Staffing capability.* The lender must be assured that there is sufficient staff resource to be able to operate the proposed facility.

3. *Pro forma budget of operation.* This consists of analysis and projection of revenue expense data and is perhaps the most important portion of the mortgage package since it demonstrates the ability to return the borrowed capital.

4. *Program of facilities.* This includes systems outline and cost projection and a listing of space requirements.

5. *Diagrammatic or schematic drawings and outline specifications.* These should be prepared in sufficient detail to indicate the scope and quality of the project.

6. *Economic consequences.* This portion of the mortgage pack-



diagrammatic plan
ANESTHESIOLOGY

age begins with the cost projection. To this are added other costs, such as surveys, legal fees, furnishings and equipment, land, etc. The important factor here is that all costs should be accounted for. The cost and the revenue expense projection are analyzed to determine the probable consequences of the ownership and operation of the constructed facility.

Note that the "pretty picture" rendering is not among the requirements.

The effect of financing on master planning was mentioned previously but bears restating here. Basically, the point is that the development of the master plan can proceed only at a pace permitted by financing. In the case of borrowed capital, a hospital is as a rule limited in financial resources and consequently must demonstrate sufficient financial strength for each phase before borrowing for subsequent phases to allow the master plan to go forward. If the operating cost or the financing and construction cost don't turn out as projected, the master plan can be completely destroyed.

In summary, financing new facilities is based upon stability of income and good financial management. Some form of broad health insurance will come about for certain, but the exact form is not predictable. (There are currently more than nine bills before Congress.) Therefore, to a certain extent, revenue expense projections are difficult to formulate since they presume continuation of current relationships with third-party payers and a rate structure which may change. As an example, insurance payments largely determine a demand for single or double patient accommodations as well as inpatient or outpatient modes of care.

A comprehensive and valid program and reliable documented cost are necessary for successful design development. Cost control and design/build processes depend on it for success, and it is the basis for all long-range planning. All buildings are becoming more complex, and programming techniques developed for medical facilities have broad application on other kinds of structures.

No national awards are given for good programs, but if we are going to make dollars work for us in accomplishing good design, then architects must not forget the relationship between functional arrangement, quantity and quality of space, cost control and the resulting usefulness of the emergent design. Architects must program effectively, reconciling cost to budget through adjustments in scope and quality before design begins. □

Recommended Reading List

Application of the Principles of Systems Integration to the Design of the "Nursing Tower" Portion of V.A. Hospital Facilities. Stone, Marraccini & Patterson and Building Systems Development. Washington, D.C.: Office of Construction, Veterans Administration, 1971.

"Can a 54 Year Old Architectural Firm Find Romance and Happiness with an Interactive Computer System?" Clifford D. Stewart and Kaiman Lee. *Progressive Architecture,* July 1971.

"Health Facilities: An 18-page Portfolio of New Buildings and Concepts for Patient Care, Medical Training and Research." *Architectural Forum,* June 1971.

"Hospital Design." Roy Hudenburg. *Hospitals,* April 1, 1969.

"Hospitals: Building Types Study 416." *Architectural Record,* Dec. 1970.

"How Hospitals Finance Construction." Richard W. Foster and Dorothy McNeil. *Hospitals,* July 1, 1971.

"An Ideal Nursing Unit." Sidney R. Garfield. *Hospitals,* June 16, 1971.

"It Seemed Like a Good Idea: But How Well Did It Stand Up?" E. Todd Wheeler, *Modern Hospital,* Mar. 1969.

"Keys to Long-lasting Hospital Design Are Operating Efficiency, Ability to Expand." Herbert McLaughlin. *Modern Hospital,* Mar. 1970.

"The Modern Hospital: Rx for a New Design." Special issue, *Consulting Engineer,* Oct. 1970.

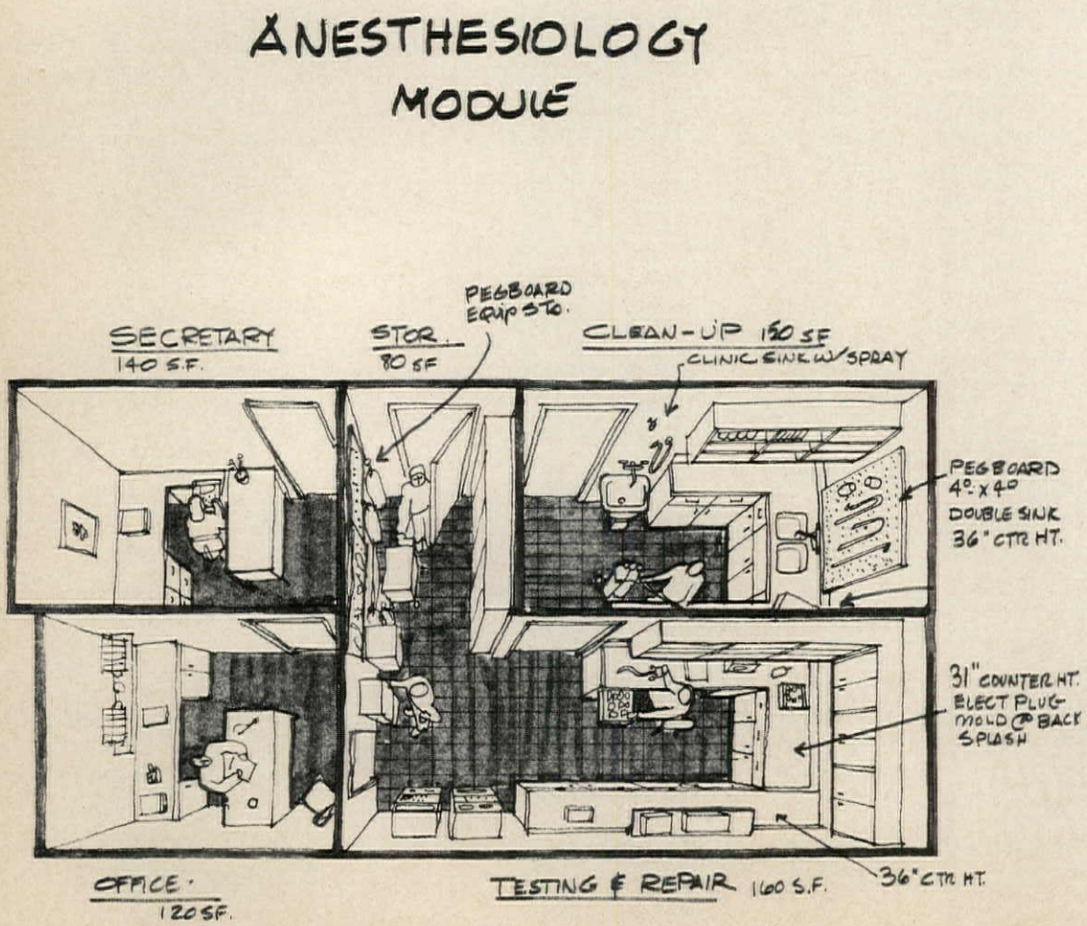
"New Tool for Architects: Computers Will Help Design Hospitals for Tomorrow." Herbert McLaughlin. *Modern Hospital,* Mar. 1968.

Planning for Hospitals: A Systems Approach Using Computer-aided Techniques. James J. Souder, Weldon E. Clark, Jerome I. Elkind and Madison B. Brown. Chicago: American Hospital Association, 1964.

Quantitative Methods for Evaluating Hospital Designs. G. Delon and Harold E. Smalley. (Developed under a research grant from the National Center for Health Services Research and Development), 1969.

"Systems Engineering," Addison C. Bennett, *Hospitals,* April 1, 1969.

"Technology: Multiple Contracts, Fastrack Schedules and Quick-Step Drawings Change Design and Speed Construction." *Architectural Forum,* June 1971.



Programming includes documenting the needed spaces and generating data used to finance the facility. The entire project and the smallest details as well should be subjects of an economic evaluation. The cost/effect must be considered for each and a ranking of performance versus cost established. Here and on the preceding pages are shown planning details of the Child Health Center, University of Texas Medical Branch, Galveston. It starts with an affinitive relationship pattern, using data indicating production in numbers of procedures to be performed, the number of people, etc. Then follows an organization chart and its interpretation into functional relationships. At left is the final result of the diagrams, used as a means of getting planning requirements across to the client. Golemon & Rolfe.

A New Client:
THE FOR-PROFIT HOSPITAL CORPORATION

They have had an astounding growth in a very short period of time but even so, few people are aware of the existence of these new hospital chains. Here is a brief look at what they are and the views as well of a few architects who are involved with them.

Less than a dozen years ago, for-profit hospital corporations didn't exist. Today there are around 90 of them. Of these, about 40 are publicly held. Several chains are listed on the major stock exchanges; one of them has showed a 1,000 percent increase in its stock value in less than three years while another had a 5-to-1 stock split the first year it went public. Only two chains reported deficits in 1969.

Combined, the chains control about 5 percent of the 1.6 million hospital beds nationwide. Within two years they are expected to own 10 percent. The two largest of the chains are American Medicorp, Inc., Bala Cynwyd, Pennsylvania, and Hospital Corporation of America, Nashville, each owning around 5,000 beds. Beverly Enterprises in California, Hospital Affiliates, also of Nashville, and Extendicare, Louisville, Kentucky, are nearly as large, and the five own more than all the other chain corporations together.

The corporations have concentrated on the southern and western parts of the United States, though there are a few examples of corporate ownership in Illinois, Ohio and Pennsylvania. Many states, especially in the northern part of the country, have laws which prevent direct or indirect ownership of hospitals within the state by corporations based outside the state boundaries. However, since most of the small proprietary hospitals are located in the South and West, such laws have really not affected the growth of the corporations which have been buying up these facilities. For example, in Houston, of the 30 or so privately owned for-profit hospitals which were originally owned by groups of physicians, there are now only two which have not been purchased by corporations. Present and planned construction among the chains runs into the hundreds of millions.

For-profit hospitals are nothing new in the US; there are around 1,400 of them. It's the chain concept that has put the picture in a different perspective, as well as the businessmindedness of the chains' managers. This last factor is why the chains are often treated alike, and en masse are accused of catering to the well-to-do, short-term, easily treated patients only, and of eliminating services that are unprofitable. Furthermore, the corporations, some hold, draw away doctors and nurses from nonprofit hospitals already plagued by staff shortages and play no part in staff training or research.

On the other hand, critics concede, some of the chains have built hospitals where beds were sorely needed but where funds from other sources had not been forthcoming; and they pay substantial amounts of taxes both to federal and local governments.

About 95 percent of the chains and chain-operated for-profit hospitals are certified for Medicare. This is about the same percentage as for the nonprofits. Most of the chains belong to the Federation of American Hospitals. Of all the chains registered about 90 percent are members of the American Hospital Association. This compares with approximately 77 percent of other for-profit hospitals and 91 percent of nonprofit hospitals. The chains should therefore adhere to AHA's policies of building, even expanding, only where there is a determined need. The AHA is seeking to get financing agencies to go along with this policy. However, the determined need factor is considered by mortgage money sources anyway, just through sheer business sense. The chains must meet state licensing requirements, which in some cases are not very demanding. Only a few states have "certificate of need" legislation, which requires sufficient evidence of need for services as a condition of licensing.

But corporate obectives are, of course, based upon the ability to compete in a market, and the architect may well be called upon to design a facility which is to be located in an area already serviced by other hospitals, where the priority is low or nonexistent. Some hospital corporations attempt to monopolize the supply of patients by entering into agreements with groups of doctors or offering financial incentives such as stock, or office space, to them, and since population distribution and patient location are not as important to the corporations as the availability of physicians, it is not unusual to find hospitals being built where they are not needed, but where they will cater to a certain type clientele.

This is one of two major problems confronting the architect who becomes involved with a corporate owner of hospitals. "Where several corporations own hospitals in the same area and are competing against each other, all may plan expansion at the same time. The architect has a community responsibility which can become difficult to discharge if he is faced with a commission to design a facility and yet his understanding of his own community tells him that there may be no demand or need for it," says Jason W. Frye, AIA, who is partner and director of medical facilities design, Golemon & Rolfe, a firm which has had experience with several corporations and is presently working with two of the larger ones.

"Most of the corporations make every effort to cooperate," says Paul S. Pierson, AIA, director of AHA's Division of Design and Construction. "But the difficulty for an architect can lie in the fact that he is not called in soon enough to participate in the area-wide planning. On occasion, the for-profit corporations have been known to disregard the recommendations of health authorities and citizens and have gone ahead with construction in spite

Hospital Corporation of America is owner of the Diagnostic Clinic and Hospital in Houston. The original 18,000-square-foot building (at left in photograph), completed in 1958 and designed by Kenneth Franzheim, was owned by nine doctors. By 1966, the facility had an additional 11,000 square feet of area and a 150-bed hospital connected to it, now with 20 doctors. The second phase of the hospital brought bed-count to 300 in 1970. At this time, with a new clinic building under construction (at right in photograph), HCA acquired the center. It has presently 43 doctors in the group. The eight-story clinic structure has three floors left unfinished; a projected third stage of development over the next five to ten years will bring seven additional floors. Golemon & Rolfe.

of loud protests. Consequently, all concerned, including the architect, could come out with a black eye."

But then again, a problem that the corporations frequently come up against is the lack of regional health planning. Florida, for instance, has only one regional planning agency. "In some areas without such planning, Hospital Corporation of America has worked out agreements with other existing hospitals to provide in its hospital some services which the others do not offer rather than duplicating services that could not be fully used in any of them. HCA has in such cases let the other hospitals select which services they would prefer to provide," says Thomas E. Batey, AIA, director of HCA's Architectural Planning & Construction division. "Then we are criticized for not providing 'full service hospitals.' Obviously, a company such as ours that must show a profit from its operations does not want to build unneeded facilities."

However, in some states where a full range of services are required by law, waivers may sometimes be obtained. In at least one state where this occurs, a movement is underfoot to make the licensure laws more rigid. But a risk here could be that too strict laws could bar the use of common sense.

A second problem confronting the architect designing for the corporations can be the client himself who is traditionally a group of doctors who own, or wish to build and operate a hospital for their own use. In the case of a corporation the ownership rests with the corporation, and the relationship between the doctors and the corporation may be much that of a tenant and landlord. This is a role which is unfamiliar to most doctor groups because of prior ownership roles. It is difficult for them to understand that once they sell their hospital, or join a corporately owned hospital, their right of decision over the kind of facilities to be built no longer exists, that all such decisions are made by the corporation. Such a relationship puts the architect squarely between those who feel that they have a clear understanding of the needs (the doctors) and the corporation, which actually finances and constructs the facilities and is looking primarily at the economic returns for anything constructed. This usually means that many specialties and services which inherently lose money are eliminated. The criticism of for-profit hospitals in this regard is in many cases valid though there certainly are exceptions. Whenever there is an economic decision to be made, the experience of some firms has been that if at all possible the corporations, during the planning process, will make it seem as though somehow the architect is at fault for not being able to provide the kind of facilities the doctors want, particularly if the economic limits are extremely tight, which they usually are.

"The architect must be quite certain that the local doctor group, which is composed of members of his own community, clearly understands that many of the decisions on scope and quality of facilities do not rest with them but with the corporation, and that the architect must follow the directions of the corporation on these matters," says Frye. "If the architect does not see to it that this relationship is clearly understood by the doctor group, his reputation can take an unjustified but severe beating when the requests of the doctors are not met."

Groups of doctors, competent in their practice but with no knowledge of how hospitals are put together, are easily sold on the idea of an arrangement with corporations which promise

The 150-bed Montgomery County Community Hospital in Blacksburg, Virginia, is one of four basically identical hospitals erected by Hospital Corporation of America in various locations. Opened in 1970, it replaces a 50-year-old, 30-bed facility and has operating rooms, obstetrics, intensive and coronary care, isolation rooms for the mentally disturbed or alcoholics, as well as other services not provided by the old hospital. Gresham & Smith.

them high profits and better working facilities. Some chains are strictly money machines and have neither the expertise nor the inclination to provide good medical service. In such cases the community could be hurt by a new hospital which appears to provide adequate medical services but which may not.

Some of the chains have their own architectural planning divisions. Through these, they have been attempting to standardize hospital design in order to lower cost. This is a move in the right direction, needless to say, but the question remains

whether individual practitioners might not have been able to contribute more in their specific locales. A mistake that many corporations make is to try to force a prototypical hospital into non-applicable conditions, while each hospital should be an answer to a specific community need or to a reasonably anticipated need.

"Most of our architectural work is handled by outside firms," explains Batey. "My primary duty is to coordinate the planning and construction functions. At the present time we are working with eight different architectural firms in five states. However, most of our work is handled by a young, relatively small firm, Gresham & Smith, located in Nashville.

"At the inception of HCA it was decided that for an in-house staff to do all design work was not practical, especially due to the speed with which our building program was initiated. Since our founding in mid-1968 we have completed construction of 1,468 beds. We have a $100 million building program with 14 projects under construction totaling 2,008 beds and have plans for five additional projects that will add another 461 beds. We are currently operating 40 hospitals with a total of 5,000 beds. Since my own background was primarily related to health care facilities, it was the decision of the company that I act as consultant to outside firms to develop programs and coordinate their work.

"We chose Gresham & Smith to develop prototype designs for various sizes and types of hospitals. Obviously there are many advantages to be gained through the development of these prototype designs that can be repeated and modified as required for various locations. Each repetition of the construction of a prototype facility results in improved planning and construction techniques."

Gresham & Smith are designers of 17 hospitals for HCA, some of them identical. In their work, says Batey M. Gresham Jr., AIA, "We have been able to talk with numerous users of hospitals, HCA's and others, from physicians and surgeons to housekeepers and technicians. HCA has been receptive to their impact, through us, on the planning.

"As for the need of the corporations, my personal feelings are these: There is a crisis in the delivery of health care, observable in its architecture, that is translated into a crying need for all sorts of clean, efficient, safe and beautiful buildings," continues Gresham. "I know that HCA does not make arbitrary judgments and that the needs expressed by the community are given attention and consideration. Analysis of need and 'role studies' are performed regularly by Hospital Planning Consultants, and HCA uses much the same procedures. No hospital can possibly satisfy all the health needs of all the community, and the lines of comparison between them are pretty small and the arguments petty to the point of hypocrisy. I see no pitfalls at all for the architect as long as the product of his skill is worthy of the profession."

Earl S. Swensson, AIA, whose Nashville firm, Earl Swensson Architects, has designed a dozen facilities for Extendicare in the last three years, feels that this corporation has "an excellent attitude toward programming."

Contrary to what they heard about other hospital corporations, says Swensson, "Extendicare's staff does not shove design plans down our throats. On the contrary, staffers work closely with us and with the local physicians in each hospital to establish the particular needs of the staff. We work as a team from beginning to end and consequently we feel that we have a great opportunity to contribute. When it comes to being sure that we are helping to put the right facility in the right place, well, we don't know the answer to that one, because that isn't the design profession's area of expertise. However, we have worked with experts on market studies for medical care facilities and with the state and federal agencies which control such decisions, and we find it hard to believe that our client would deliberately build a facility that is not needed."

The Pasadena Bayshore Hospital near Houston, also owned by the Hospital Corporation of America, has under construction an addition to an existing 275-bed facility, bringing the total of beds to 500. To be completed in 1973, the addition will, with the present hospital, form the nucleus for a large medical center. The second and third floors surround a courtyard located on the first level. Welton Becket & Associates.

Working on several projects for American Medicorp, James M. Hartley, AIA, says that the programming is usually developed as a joint effort between his staff and the staffs of the various hospitals with the review and concurrence of AMI officials. "A space allocation and utilization program is being prepared by AMI for the major expansion of Golden Isles Hospitals in Hallandale, Florida. From this program we will develop our schematic drawings. We find this arrangement no different than working for other public or private clients who have the in-house expertise to develop programs. We feel that AMI officials are flexible in their thinking and receptive to suggestions and constructive criticism," explains Hartley.

"There are distinct advantages for the architect who is work-

ing with a corporation," says Frye. "As a general rule the financing of the project is much less difficult and less time-consuming than the normal community hospital which must raise funds by public subscription or sale of bonds." (For more on this, *see* p. 23.)

"We feel that we have much to offer the architect," says HCA's Batey. "We can provide the financial backing to allow study in new techniques, materials and construction methods. We would like to develop and employ as much modular construction as feasible but find this difficult to accomplish in view of the varying building codes. The repetitive use of prototype designs can afford an architect the unique opportunity of improving on a finished product after seeing it in use. A corporation such as ours affords the architect a continuity of work that allows him to build an effective staff of competent personnel."

So much for what the corporations can do for architects.

Baytown Hospital, Baytown, Texas, is built by Extendicare near a large industrial development complex now under construction for US Steel. The 189-bed, full-service facility, opened in February, was designed and built in 16 months. Golemon & Rolfe.

What can they do for a community? Is there actually a bona fide need for them?

"Yes," emphasizes Swensson. "They are filling a real need and are providing services that are important. We don't feel that hospital corporations ever intended to replace the fine educational/research/medical facilities, or the community nonprofit, or public, hospitals. If one will take the time to analyze the functions of the various types of medical facility ownerships, one will probably come to the same conclusion we have: that there is a place for all such varieties of ownership.

"The corporations have a unique opportunity to make new breakthroughs in management efficiency, construction techniques, equipment design, construction management, planning innovations and lower cost quality delivery service to the patient because of their nationwide involvement both as a purchaser and as a seller of services."

The federal government has recently given recognition to the for-profit facilities, having changed its mortgage insurance program for hospitals. This now permits proprietary or profit-making sponsors to apply for mortgage insurance if they can prove a need for new or better hospital facilities and they can operate the hospital properly. Such insurance has up till now been limited to nonprofit sponsors such as church groups, unions and fraternal organizations.

There is no question that certain for-profit corporations have been able to reduce construction and operating cost. "The for-profit hospital corporation has the potential of delivering to the medical profession and therefore to the public a medical care product at least equal to—and at times superior to—public hospitals, and usually at less cost to the patient," says Gilbert Thweatt, AIA, senior vice president and director of the Houston office of Welton Becket & Associates. His firm has worked with the Pasadena Bayshore Hospital near Houston both as an independent proprietary group and since it joined forces with HCA. "Making money from operating a hospital seems to be considered by some to be wrong per se. I find this hard to understand," Thweatt goes on. "Providing inferior medical service at *whatever* cost is wrong and should not be condoned either by administrators, corporations, or doctors who work in hospitals.

"There are at least three major reasons why the chains can deliver less costly health care. First, corporate hospitals, as is the case of most private versus governmental undertakings, are capable of far more careful scrutiny of overall operation of the facility, including purchasing and the selection, use and retention of personnel. Second, corporate hospitals have a less rigid framework of operation in that while public health rules certainly must be met, many of the additional regulations necessary for satisfying various governmental agencies are not required. Third, corporate hospitals permit the architect significant opportunities for reducing cost of patient care. Specifically, the architect can introduce:

- programming of space requirements and adjacencies using advanced data processing methods
- fast track scheduling and use of negotiated contracts, a cost-and-time-saving feature which most public hospitals do not yet permit
- building systems and components using methods and materials difficult, if not impossible, for public bodies to accept
- low maintenance materials, which sometimes require a higher initial cost.

"An extremely important item for the architect and his client to keep in mind is that the operating cost of a hospital equals the original building cost in approximately three years. This means that considerations given to reducing operating costs—from design concepts to maintenance—will pay for themselves over and over," Thweatt concludes.

Scheduling the work and buying the material for several hospitals at a time is another means for at least the larger chains to save. There are others: more use of automation (the chains have 14 percent fewer employees per patient than voluntary hospitals and 7 percent fewer than government hospitals according to a study undertaken by A. T. Kearny & Co.); use of computers for accounting; catering to outpatient trade, profiting from ownership of pharmacies, laboratories, physical therapy departments, laundry services, etc. Some develop satellite systems where smaller hospitals send more complicated laboratory jobs to a central facility and are also connected by phone to a central electrocardiogram service.

Better ideas may well be spurred by the for-profit chains when it comes to streamlining hospital management and economy. But the architect who may receive a commission from one of them, with its challenges and opportunities, must understand the problems, including the financial requirements and limitations of the corporations. And above all, he must be sensitive not only to the doctors' needs but to the needs of the community as well. Only by helping to make the chain hospitals a viable part of the complete medical system, which they should be, will he be making a true contribution toward solving the nation's health problems. And only when our laws become such that the architect is not faced with this type of situation—while a corporation might erect a facility anyway without the expertise of an architect—will the corporations become a completely wholesome part of our health care system.

BESS BALCHEN

KONRAD WACHSMANN

Toward Industrialization of Building

"When one becomes interested in the problems and prospects of industrialization in the building field, there is one name that stands out as a pioneer and innovator: Konrad Wachsmann," says John P. Eberhard, AIA, dean of the School of Architecture, University of New York at Buffalo. Eberhard states that when he has had occasion to be concerned with the implications for architecture of a shift to industrialized building systems and when he has had the responsibility for a research program in the subject or for the education of future building systems designers and thought that he and his associates had isolated a key problem, he has found that Wachsmann has gone before and has already "recognized the problem and wrestled with it." In some cases, Eberhard contends, Wachsmann has been through it all 30 or 40 years ago.

Eberhard believes that the work Wachsmann has been doing since 1965 at the Building Institute, University of Southern California, "may become as fundamental to future industrial technologies as was the work of his friend Albert Einstein to nuclear physics." This praise is contained in a temporary guide to an exhibition of 50 years of Wachsmann's work toward the industrialization of building which opened last February at the University of Southern California under the sponsorship of the university, the Graham Foundation and the Architectural Guild. The exhibition has gone from Los Angeles for a tour of cities and universities in the United States and Canada. It is being shown at the Octagon in Washington, D.C., in March through April 2.

Back in 1950, Wachsmann was appointed as a professor and director of Advanced Building Research at the Illinois Institute of Technology in Chicago. During this stay there, he carried out part of his research in the form of teamwork with his students, one of whom was Robertson Ward Jr., whose tribute to his teacher follows. Ward gives some of the highlights of Wachsmann's life and contributions to industrialized architecture. He does not mention the fact that Wachsmann was awarded the Gold Medal of the Senate of the Republic of Italy in 1970, being cited for "the high quality of his research in the field of design, in a vision elevating the science of construction, which is the study of the possibilities of the creation of space through structural geometry of absolute originality, toward a poetry of construction itself, within the framework going from practice to education, in perfect harmony with the dynamics of history." (*See* AIA JOURNAL, Jan. '71, p. 8.)

This study of the "possibilities" noted by the Italians marks Wachsmann's career all the way. It is the future that interests him. As Margit Staber writes in an article about him in the *Encyclopedia of Modern Architecture,* "He has anticipated the future time and again with his apparently utopian projects and his stimulated discussion, beyond the limits of architecture, on the problem of the spirit in a technical civilization."

KONRAD WACHSMANN

by ROBERTSON WARD JR., FAIA

Konrad Wachsmann is one of those identities that is by way of being a kind of monument. He has been, and is now, a vital participant of two kinds of worlds. He is like a man standing on a bridge, one of a classic few that for good or bad probably will never happen again. For those of us who dare call ourselves his friends, it is difficult to realize the dimension and the consequence of his existence.

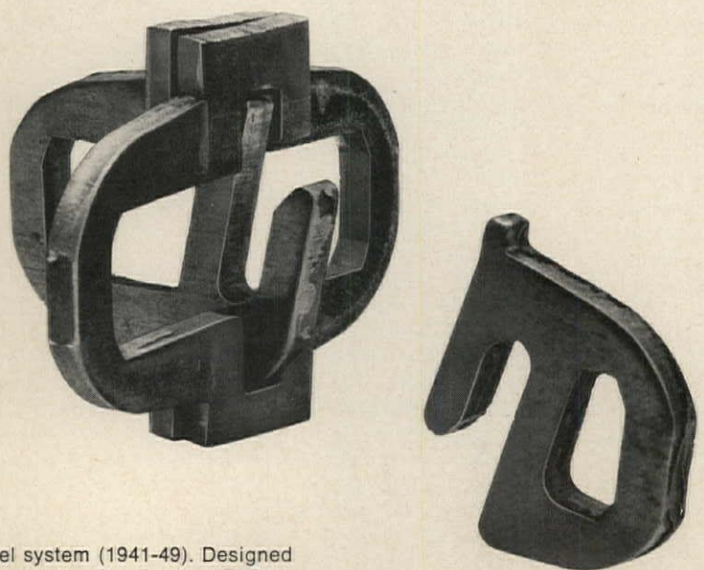
He is a creature of science as it inadvertently approaches poetry. He is an accumulation of a thousand irritations, who unexpectedly transcends the limits of his own existence to suddenly and wonderfully address himself to the central problems and projects of the living conscience.

I introduce him in this strange way because I would not attempt to measure him as a human personality. For this kind of true "original"—for this kind of unique creature, there is no prototype . . .

There is some mysterious genetic composition that has ignited this man. There is a recipe for this kind of reasoning human inhabitant that society would be well advised to find again and nurture, and carefully treasure.

And so, I bring to you this old friend, this aging *Wunderkind*, this concoction, this mixture of a Loki and Apollonius of Tyana—this Konrad Wachsmann.

An introduction by John D. Entenza, director of the Graham Foundation for Advanced Studies in the Fine Arts, before a lecture Wachsmann delivered at the foundation.



The General Panel system (1941-49). Designed by Wachsmann and Walter Gropius for the General Panel Corporation, the stressed-skin plywood panel system of construction has flexibly interchangeable components. Seen here is a connecting device which, regardless of what position or combination, joins standard elements and transfers all resulting stresses. It is used in the General Panel system which is illustrated on the following pages.

I had just finished the Graduate School of Design at Harvard University in 1951. My thesis on a modular, multistory, suspended housing system and my interest in generalized building systems and the potentials of industry led me to Konrad Wachsmann's oasis.

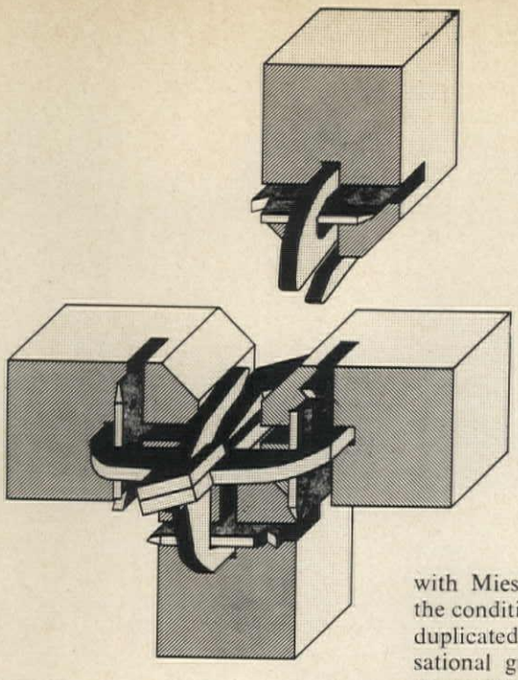
Over the past few years we have been inundated with information on systems, industrialization, the impact of industry and so on. But back in 1951 there was only one small and rare group to be found: Wachsmann's Department of Advanced Building Research, hidden away in the upper stone arches of the Institute of Design in the blowsier section of Chicago's Near North Side. Six to eight graduate students and assistants worked as a team under Wachsmann's demanding eye on contract research projects: information, data and retrieval for building systems; modular coordination studies for the Housing and Home Finance Agency; the design of a tubular space frame building system for aircraft hangars; a stainless steel curtain wall construction system for a steel corporation; and other programs.

These projects involved industry processes, production, assembly, materials, tools, machines and mass production, modules and standardization, joints and connections, information, coordination, team studies and research. These were the new specifics in the structure of understanding whose roots Wachsmann knew grew only from a respect for directness, simplicity and refinement—almost inevitability nurtured in a historical and human continuum.

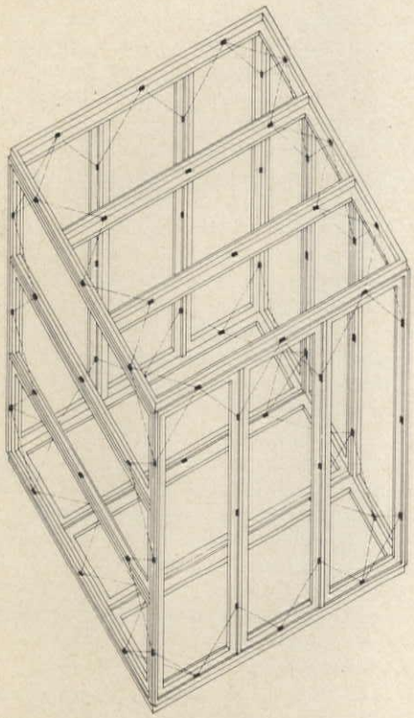
In Wachsmann's work, solutions emerge from the understanding of political, social, scientific and technological processes; one seeks "the imagination of fact." He demanded precise, explicit, specific communication in graphic tools. Simulation test models and full-scale mockups were exact and frequent.

Wachsmann is a transformer to any situation. Our research group of five graduate assistants was required by the Illinois Institute of Technology to take an elective course. Wachsmann transformed this to seminars

Mr. Ward, who is chairman of the AIA's Housing Technology Subcommittee of the Operation Breakthrough Review Committee, heads his own design and research firm in Chicago. He was designer of the major component systems for the California SCSD project.



Each of the four parts of a metal connector (top) is fastened in a corresponding slot in each panel frame. Horizontal and vertical sections (below) are identical, permitting any combination of panels using the same profile and joining device in the XYZ direction.



with Mies van der Rohe at his apartment, the conditions of which I am sure were never duplicated: to be paid full time to be conversational guests of Mies and to receive his comments, criticisms and generous drinks, all at full academic credit! Working with Wachsmann, we produced prototype studies of a 500-foot-square free-span, space-form structure, using the same system as the main Air Force hangar project, similar to Mies' later developed 700-foot free-span convention hall. Mies and Wachsmann were close friends. Mies' "God is in the details" was matched by Wachsmann's "A building's message is the fact," but one must only know how to find it.

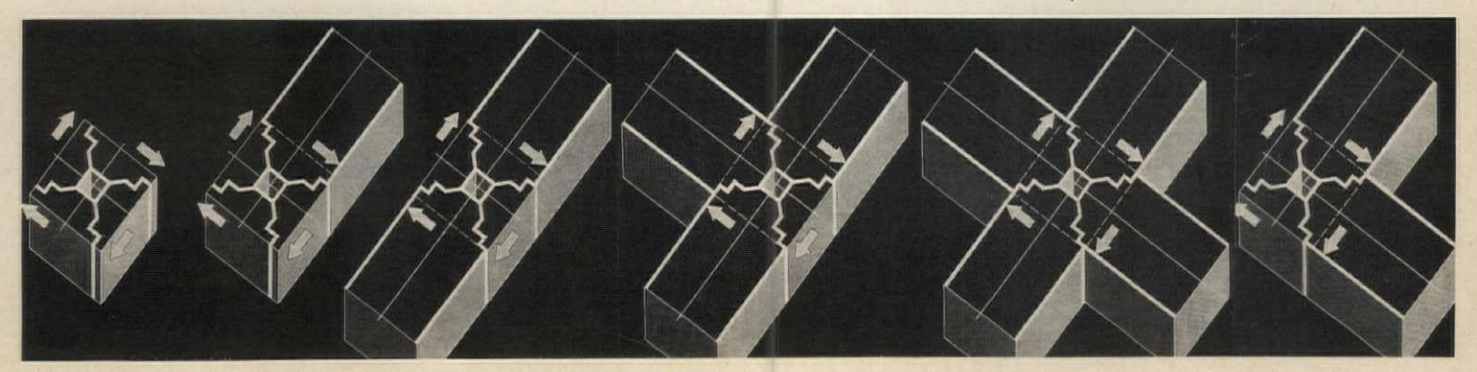
The Department of Advanced Building Research lasted less than six years before Wachsmann went on to other more globally dispersed educational team efforts. Yet students from this Chicago era alone, I know, have become a rare nucleus group which plays an increasingly significant role in the industrialization of the US building industry as heads of research and development for a number of major building manufacturers and developers, as directors of research groups in major architectural and consulting firms, as designers of major components systems and developments, as educators and innovators in new curricular structures. This is typical of the germinating trail Wachsmann has left behind him in his varied catalytic journeys both before and after Chicago in the early part of the '50s.

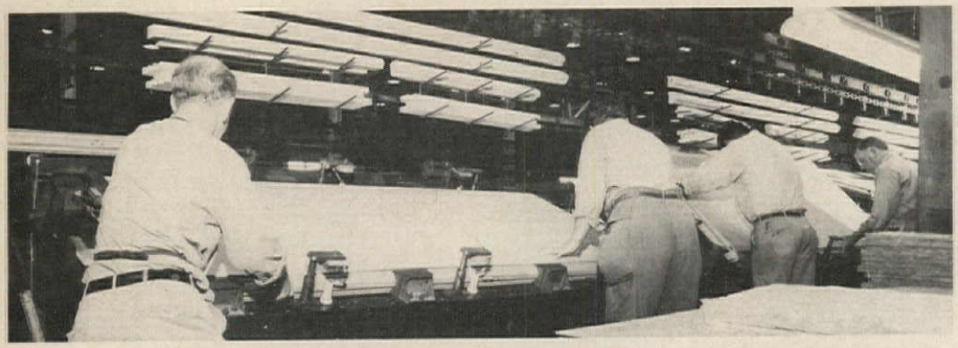
Wachsmann arrived in this country as a classic refugee a few months before the beginning of World War II, his earthly possessions stuffed into a shoebox so small that there was not even space for a toothbrush but still room for a small roll, 1 foot long and about 1 inch in diameter, which contained the essence of two projects: one describing a structural system for prefabricated houses and the other a large-span industrial building, both conceived during the time in which he was detained in various internment camps.

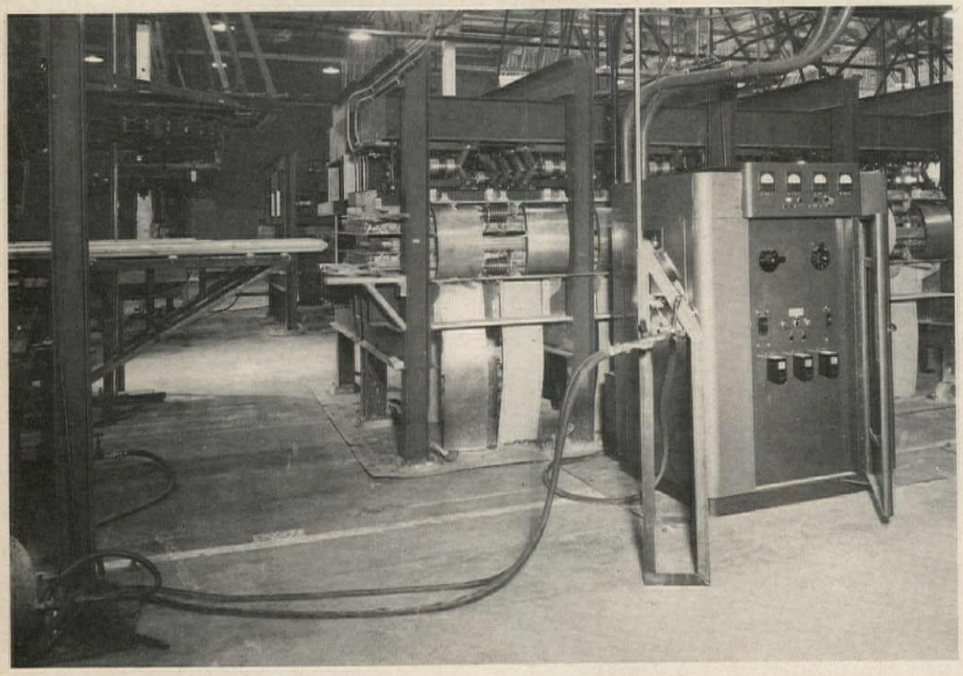
He faced formidable handicaps. Trained in the metric system and in the German language, he had to overcome the problems of communication. But he managed, already one year after his arrival, to found a building enterprise which became the General Panel Corporation and which, with a starting capital of $13,000 in 1942, developed into a firm in which, altogether, approximately $6 million were invested—and lost. Shortly after the beginning of this work, he started another enterprise for the development of steel structural systems which later became Mobilar Structures.

Destiny is always finding Wachsmann in the strangest places and confronted with unexpected situations—some favorable, others not. One incident, for example, occurred around 1944. On the urgent recommendation of Walter Gropius, Edward L. Barnes and others who had the desire to make him "legitimate," Wachsmann made application for membership in The American Institute of Architects' New York Chapter. He had more than 10 years' experience as an architect and had built over $4 million worth of buildings in every type of wood construction as well as

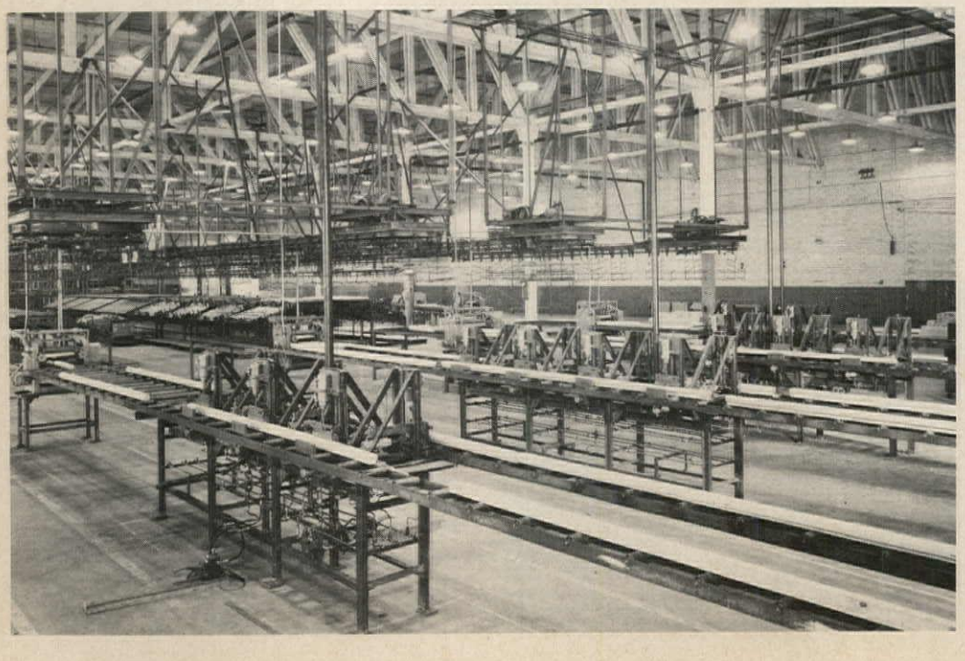
General metal connectors are distributed on the same modular three-dimensional grid system which controls the size of the panels. Each of the four parts of a connector is fastened in a corresponding slot in each panel frame. These parts are connected with each other on the side by three strokes of a hammer at the end of one of the four specimens to be assembled.







The General Panel factory (1946). This was one of the first fully automated straight-line production systems for all building elements. Such a factory layout can produce floor, wall, window, door, ceiling and roof panels, as well as filler strips, trusses, beams, columns, built-in furniture and plumbing boxes to yield 10 million square feet of average size living space per annum for housing, offices, schools, hospitals, etc.



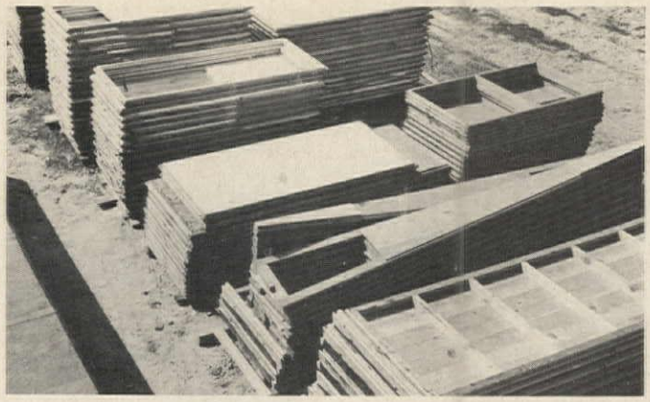
conventional brick and steel structures and later many reinforced concrete buildings, particularly in Rome, Italy.

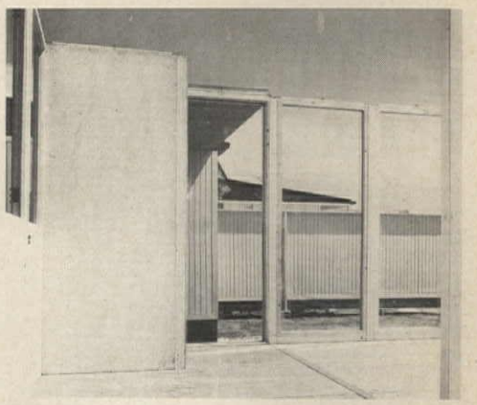
He had written the definitive book *Holzhausbau* in 1930, in which the majority of the buildings were his own designs, and which was considered the standard reference work on wood construction at that time in Europe. He was president of General Panel Corporation and had received enormous recognition in the early '40s. Architectural magazines had featured his work. The General Panel system was a milestone in its implications of flexibly interchangeable components. Six months previously he had mounted an exhibit on the system at the headquarters of the New York Chapter AIA. He had just had a one-man show at the Museum of Modern Art on the "Mobilar Structure," with an introduction by Le Corbusier.

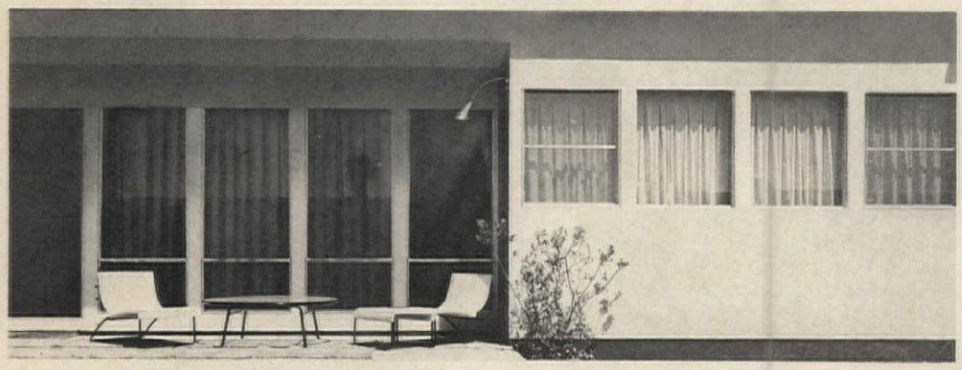
During his interview with the chapter's examination committee, Wachsmann explained that his contribution to the architectural profession was exclusively restricted to the field of industrialization and mechanization and mass production of building components and extended into the field of mechanical integration, and starting from those points of departure expanded into the development of new criteria in the field of designing and planning and into urban and regional planning, reflecting the impact of potentials of an industrialized production.

He was informed with regret that he "failed of election to membership because of lack of proper qualification." He has not since reapplied.

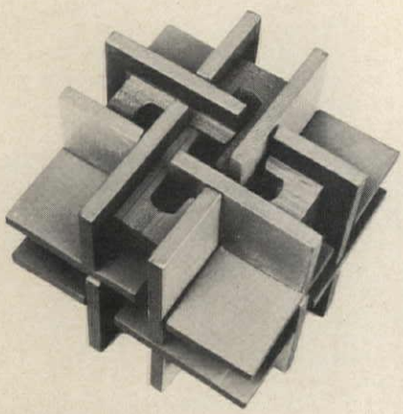
The theme of transformation runs throughout Wachsmann's work at many levels. First, as the basic attitude and process of transforming the possibilities of new circumstances and resources to new solutions, he has great insight into the potentials of industrialized techniques and the process of determining the nature of the solutions. Transformation also could describe his effective educational efforts in reorienting his student groups from the myth of the independent individual creation to a communal search by a working team for a comprehensive decision in the "imagination of fact." Lastly, his own scope of concerns can be seen as a progressive transformation from early primarily industrialized hardware solu-

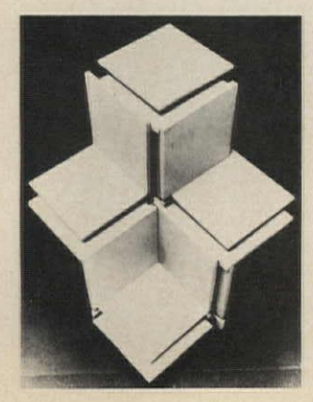


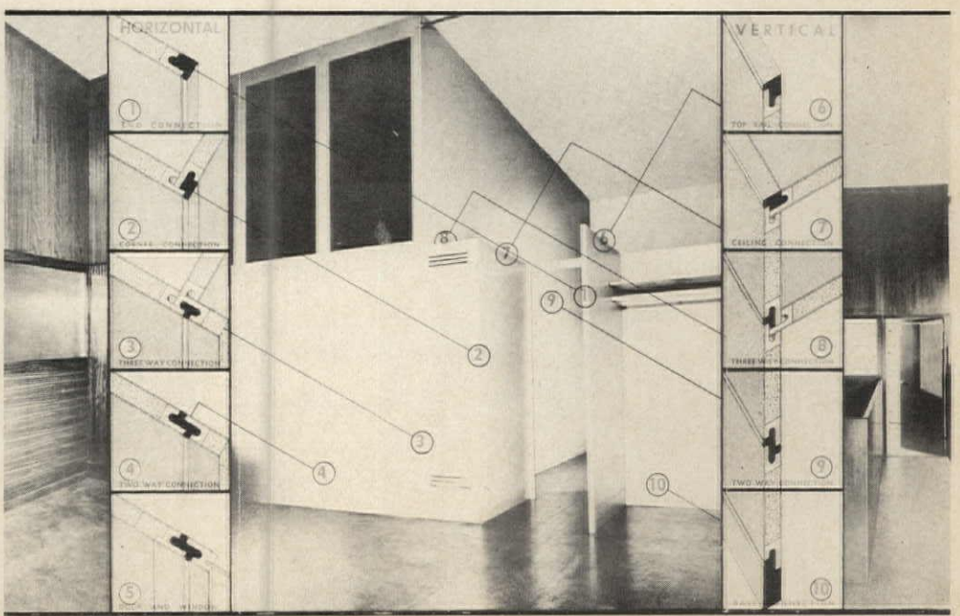




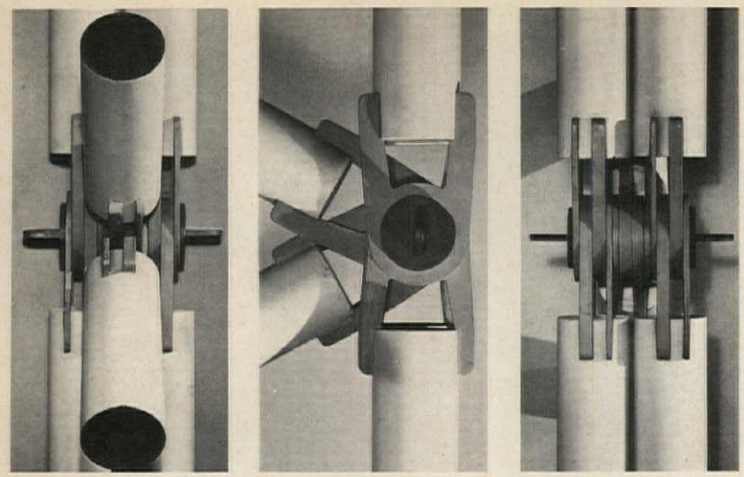
One flat-top trailer can carry all components of a typical General Panel house (above) to the site. Each component is completely finished in the factory; therefore, the building process is only assembly. With no waste materials, the site is always clean. The assembly of a low cost two-bedroom house, including kitchen and bathroom fixtures, electrical installation, plumbing and heating system can be accomplished in eight hours by five unskilled laborers.

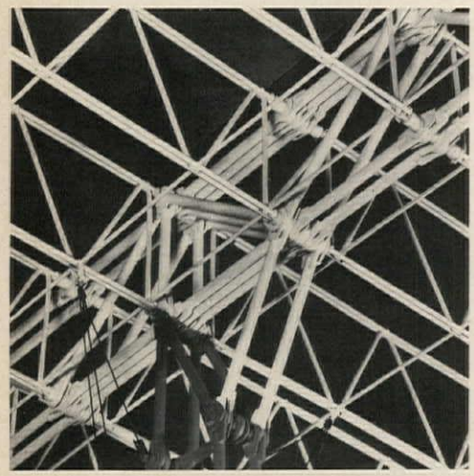






Partition panel system (1942-43). This system (above) is based on a simple friction joint without any connector. It is a three-dimensional system which permits combinations of up to 12 panels, horizontally and vertically, joined around one grid point on an XYZ basis.





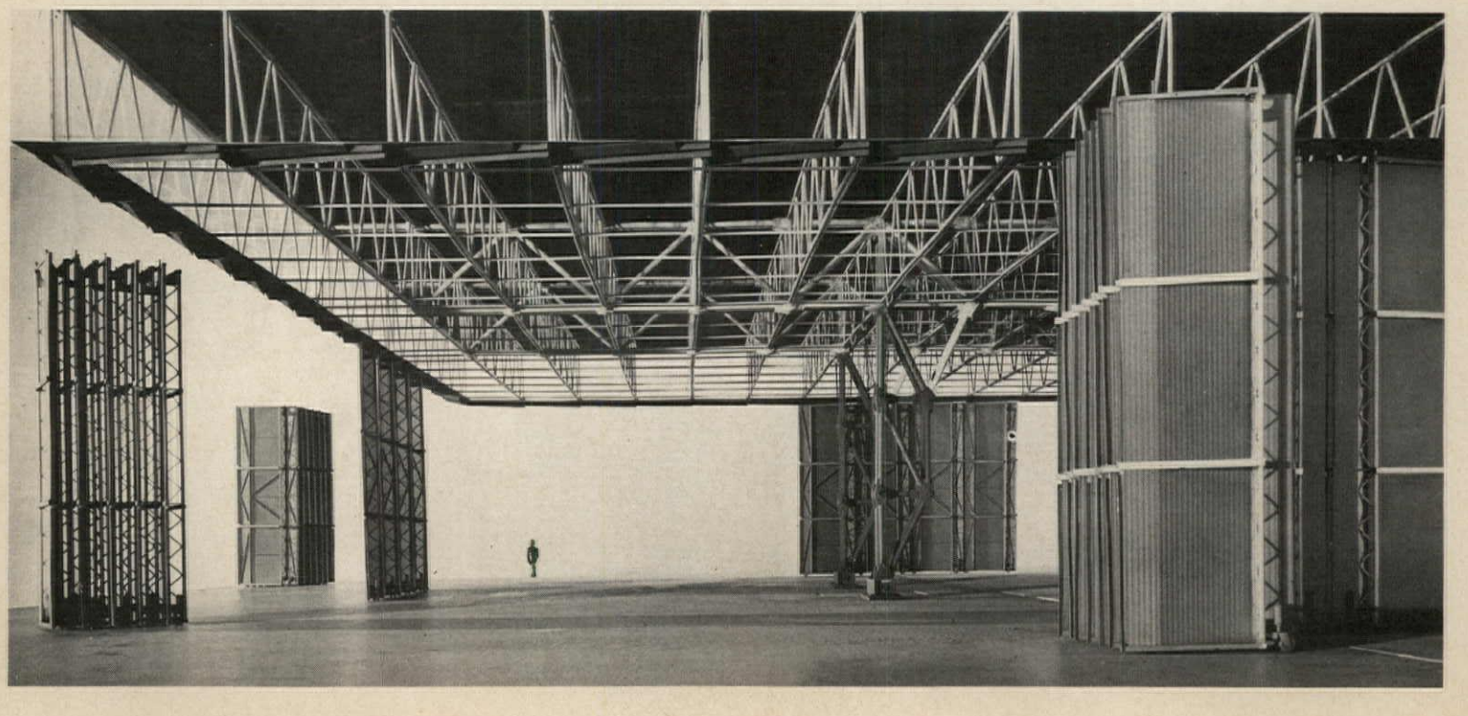
Mobilar Structure (1942). The linear cantilevered roof structure (above) has seamless lightweight steel tubes of one uniform outside diameter. But with varying wall thicknesses and one standard eyeplate joining system (details at top), it can be preassembled to modular trusses in any variety of combinations. The enclosures are self-sustaining wall units (bottom) which can be completely removed from the building, thereby creating free-standing groups of wall elements.

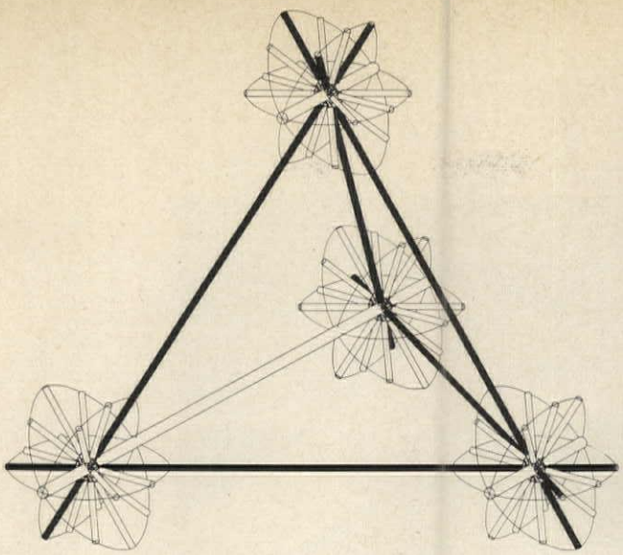
tions into more generalized research studies toward these solutions, a deepening involvement in the problems of information and communication, an increasingly concerned dedication to the educational "transformation" and its techniques, and to a still broader interest in the necessity for interdisciplinary teams for simultaneous general and specialized involvement in all areas of human endeavor.

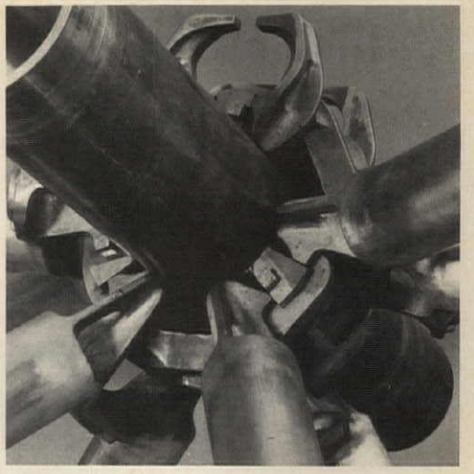
Wachsmann's grasp of the industrialized process as one of transformation of our social and economic resources has always extended quite specifically to the transformation of our available energy media through new machine and management techniques. To harness the expanding potential of our machines and our industrialized technology, Wachsmann has long argued for a greater awareness of all aspects of the process. Unless we know the tools, we cannot possibly control them nor begin to sense the limits and possibilities out of which solutions can emerge. The process is a transformation of fact; we must be ready to recognize this emergence and the inevitability of a solution. It demands a nurturing of order—an ordering of elements, spaces, systems; an ordering of potential change, permutation, choice; and a reordering of the reality of environmental determinance (i.e., the light bulb has had more impact on our environment than any collection of specific buildings). It is more a faith in the process of ordered germination and less in the manipulation of physical results. "To Build Is Everything or Nothing Is Built" was a lecture title of Wachsmann's at Aspen. If the basic approach is not comprehensive, what is built in fact is nothing. Building is in the realm of acts, not words.

Wachsmann speaks of "inherited direction," of where we find ourselves, of what potentials we have. First, we must see them clearly, welcome them and *do* something with them. We must accept the new conditions, learn to control them and then translate and transform them. From his earliest commitment to the potential of the machine, Wachsmann has fought to narrow the gap between architecture and industry. He continues to be amazed at the idea of "monotony" being inherent to industrialization, remembering his horror in 1941 at the monotony in the miles of unindustrialized Brooklyn streets.

Just as Wachsmann sees the true act of creation as this transformation into reality, he also sees the act of teaching as enabling the transformation toward a common language to work for a common goal. To nourish and develop this attitude of exchange, curiosity, order and commonality, one must accept the fact, accept the machine, share knowledge and communicate the knowledge gained. The problems we need to solve are the common ones, and we must work together to solve them. Wachsmann's group work with student teams is well known, and the results remarkably attest the successful



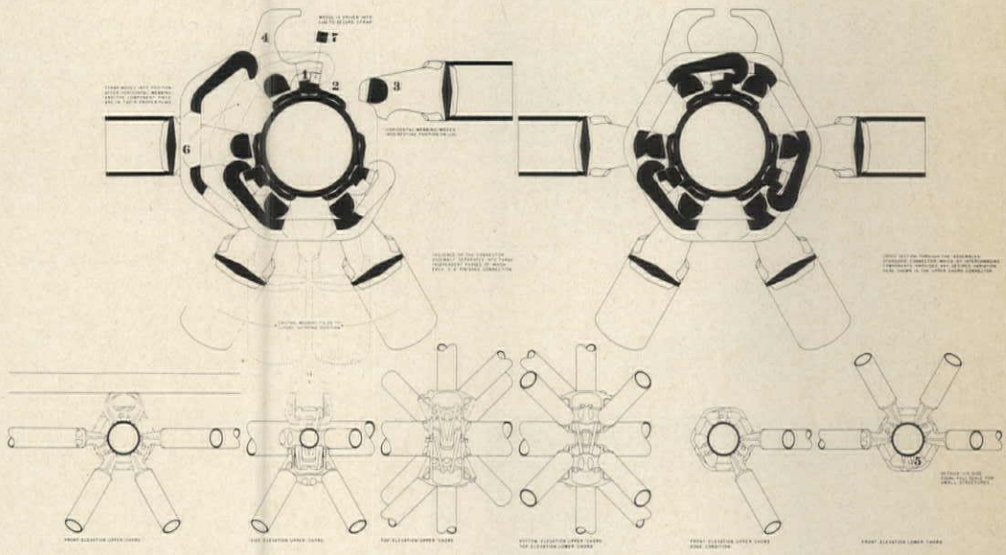




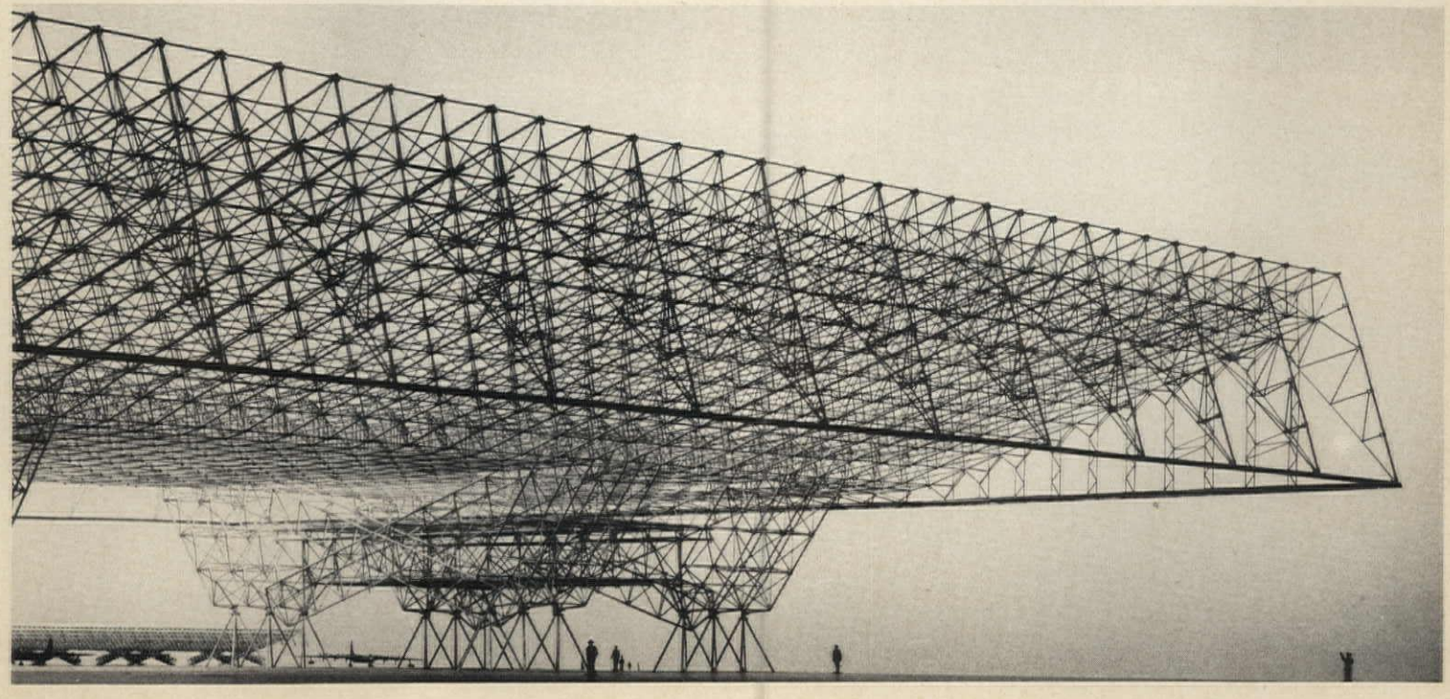
transformation of attitude from the guarded, separated, singular, independent efforts to a whole, complete, coordinated group work.

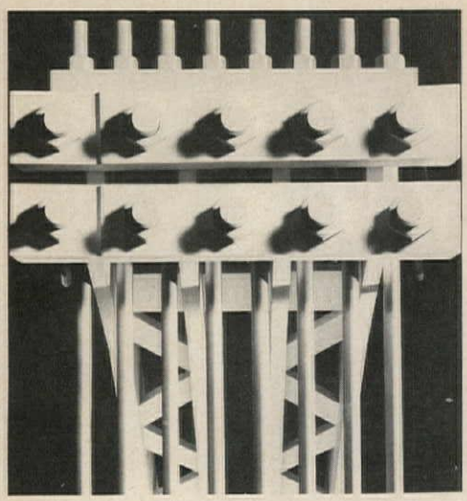
The State Department was well advised to send Wachsmann as a working ambassador to student groups around the world in the late '50s. He went to Japan, India, Israel and throughout Europe. The seeds that he planted in many soils in his teaching travels include a respect for the conjunction of the simplest elements, a respect for the tools that create each part, a respect and an awareness of the choice or order appropriate to a particular problem, an understanding that only a few relationships can create the richest of permutations and, most important, that these insights can be built collectively, unpossessively, by diverse talents in the commitment of group effort.

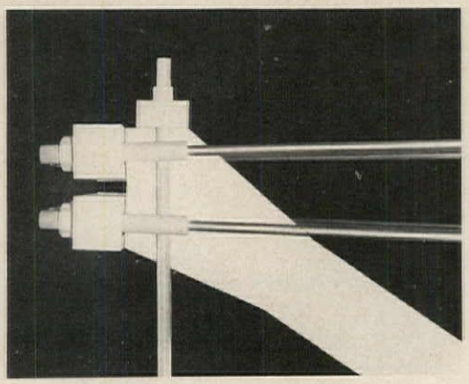
Increasingly, through his research study work with student groups and through the stimulus of interchange from his major exhibits in Europe in the early '60s, Wachsmann's own priority of concerns transformed his primary involvement in the physical syntheses to the broader aspects of the educational and communication issues of the problem. The major joint exhibit of "Corbusier/

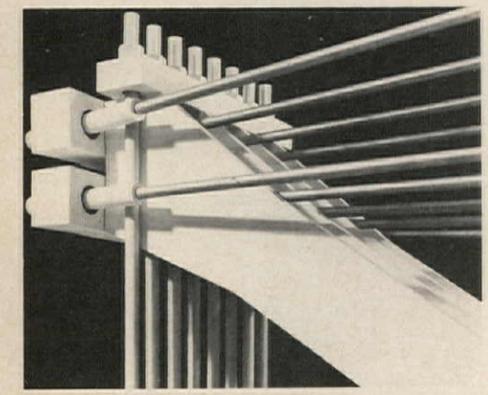


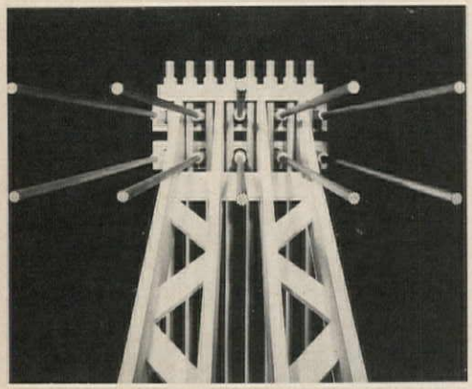
Air Force hangar (1951). A prefabricated tubular space-frame building system for airplane hangars or any kind of wide-span structure, e.g., bridges, towers, etc., was commissioned by the US Air Force at the Institute of Design, Illinois Institute of Technology. One standard joint and two tube sizes, 3½ and 6 inches, are assembled three-dimensionally creating a space-frame construction. Up to 20 structural members can be connected around the centroid of each joint.









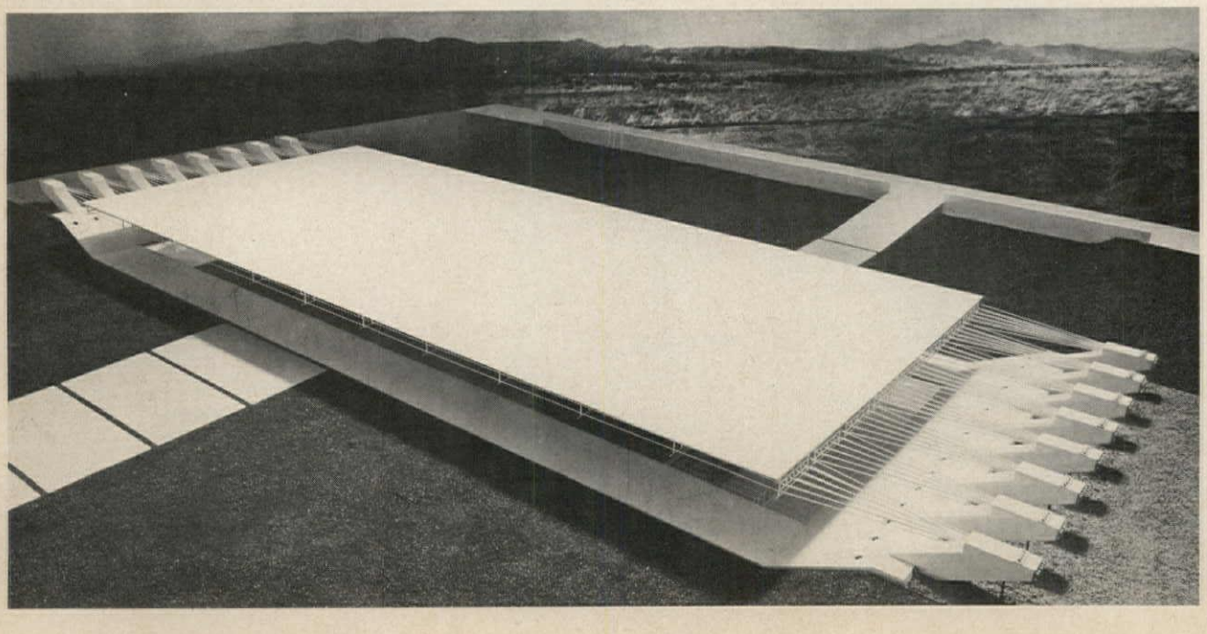


Wachsmann" in Rome in 1959 led to the commission to design the highrise headquarters building for the Italian Steel Industry and, subsequently, to the redesign of the surrounding areas of Genoa and its harbor installations and to support for the hopeful establishment of a broadened research institute in that city, reflecting Wachsmann's expanded interests which are concerned with a continued investigation of the disciplines involved in a much broader context relevant to industrialized resources.

Although aid for the proposed research institute remained elusive, support of more specific planning and building studies kept Wachsmann active on his Genoese studies while continuing to develop a broadened image of such an institute's goals. His earlier conviction of the great value of teaching by research was reinforced by that of establishing a bridging continuity which would lead from the programming of progressive educational methods to teacher training to active research, and only then to graduate studies. This progression would train and create and, in turn, reunite the needed research minds in a comprehensive international collaborative network of information and communication and develop academic order of interdisciplinary study systems.

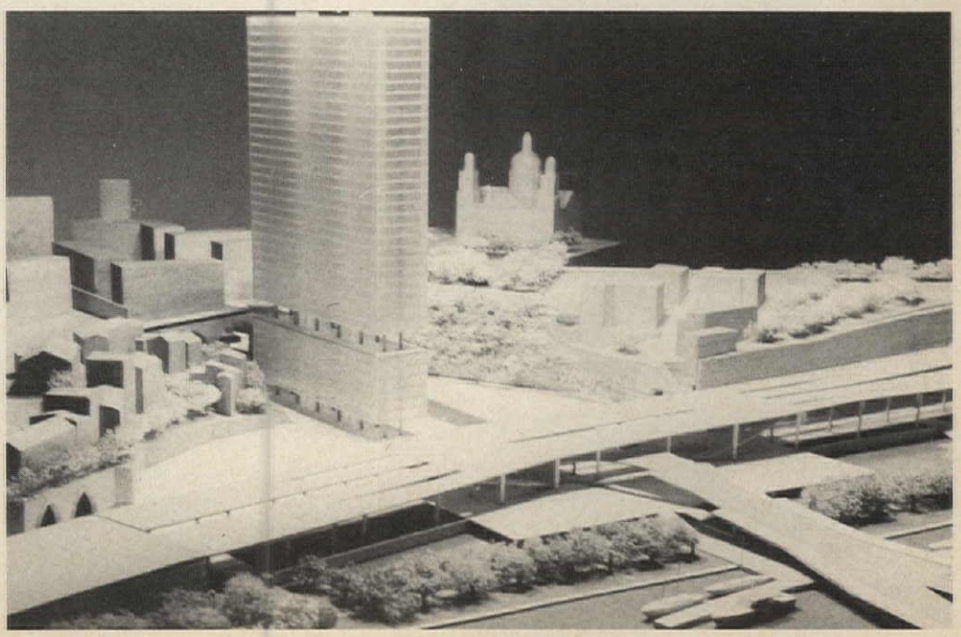
An opportunity came in 1965 to initiate the beginnings of such an institute at the University of Southern California. Six major programs for the Building Institute have emerged: information, educational studies, teacher training, faculty development, research and development, and graduate studies. Significant efforts have been made since the institute's founding. The fabric of an interdisciplinary structure has been set up. Graduate teams have worked together on joint projects and on individual research efforts. As a result, a program for a degree of Doctor of Building Science has been initiated.

Programs have ranged from the fundamental educational restructuring studies, revaluations of the educational process and examination of techniques of study and teaching through the development of generalized tools of exploration to specific involvement on some of Wachsmann's prototype tension structure project studies. Support has been forthcoming from industry, foundations, the university and concerned individuals but not as yet at the magnitude which will permit the development of Wachsmann's image of an interdisciplinary center acting as a catalyst for simultaneous studies throughout the university and bringing together a changing continuity of master teams of generalists and specialists to develop a multilevel team



High-tension cable structure for California City Civic Center (1966-71). A straight-line system of 1¼ outside diameter cables, each tensioned at 94,000 pounds, 2 feet on center horizontally and 18 inches vertically, form the 80-foot wide "floating" roof structure between abutments and vertical tie-downs 192 feet apart. Stressed-skin fiberglass panels 16 feet wide and 80 feet long, connected with an accordion-type neoprene expansion joint, form the surface of the roof.

Genoa, Italy, projects (1961-63). Wachsmann worked on city and harbor developments for Genoa (above) in connection with the design of a highrise steel structure for the headquarters of the Italian National Steel Industry. The building (below), preassembled from standardized prefabricated elements, each three stories high, including all mechanical installations, was transported from a shipyard in Savona by barges directly to the building site. The rigid structure consists of only 12 columns, horizontally connected with beams in the longitudinal direction.



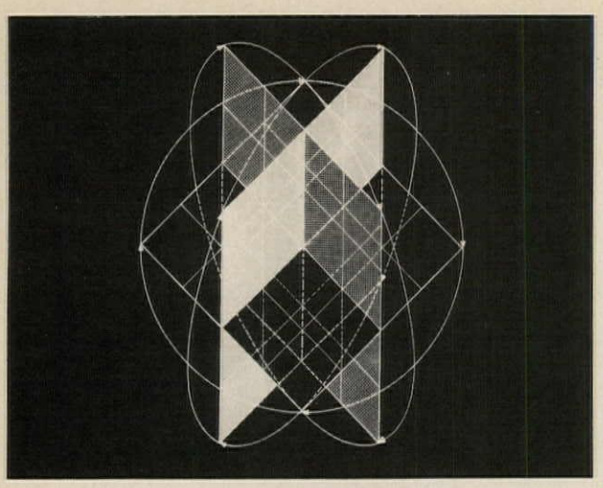
study program. He continues to strive for this goal of a universitywide interdisciplinary network centered around the master teams of translators and transformers with his characteristic energy and indomitable faith in its eventual achievement.

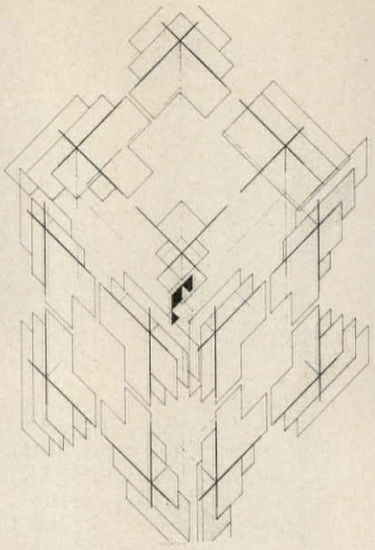
For over 50 years Wachsmann has argued that man facing an ever-increasing technology and complexity should welcome the possibilities, if only he will divest himself of the shackles of unreality, develop clarity to see the simple and existential fact of building, learn in depth the new tools and techniques and work with others in a new collective way to develop a humane and bountiful environment. This faith, germinating at the time he was learning his early skills as a cabinetmaker, has been unshakable. From the time of Wilhelm II through the vigor of the Berlin '20s, buffeted by adversity, to his arrival as a refugee at the American possibility, Wachsmann has held a singular and single course with rigorous persistence. Even in times of stress, his transforming talents have learned to find in the new possibilities a spirit that delights in coincidence and change.

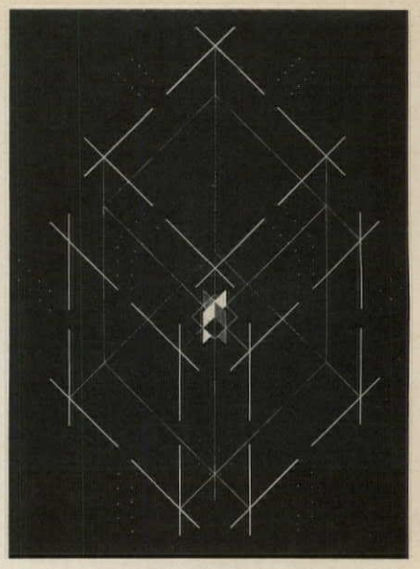
He has been accused of a panaceatic myopia that focuses only on a mythical "universal joint." He has been accused of being lost outside technology and also of being lost inside the details of technology. He is the first to admit his limitations in some areas of technological depth, but as he says, he knows well what a piano can do although he cannot play one. He also has that not inconsiderable talent to know what a real problem is. His friend Horst Rittel defines three kinds of problems: a real problem, a trivial problem and no problem at all. Wachsmann found and continues to address himself to a real problem.

What he most certainly does have is a supreme understanding and comprehension of the implications of the technological and social possibilities of today's resources. What has always emerged in his work has been the mark of this great insight.

At the opening in Los Angeles last year of Wachsmann's retrospective show, Bucky Fuller described this particular quality by saying that what he, Wachsmann, Gropius and a few others had in common was love. Love and comprehension. And all that Wachsmann had to say on that eventful night was, "The past is the past, the present is only in passing but the future is everything." □

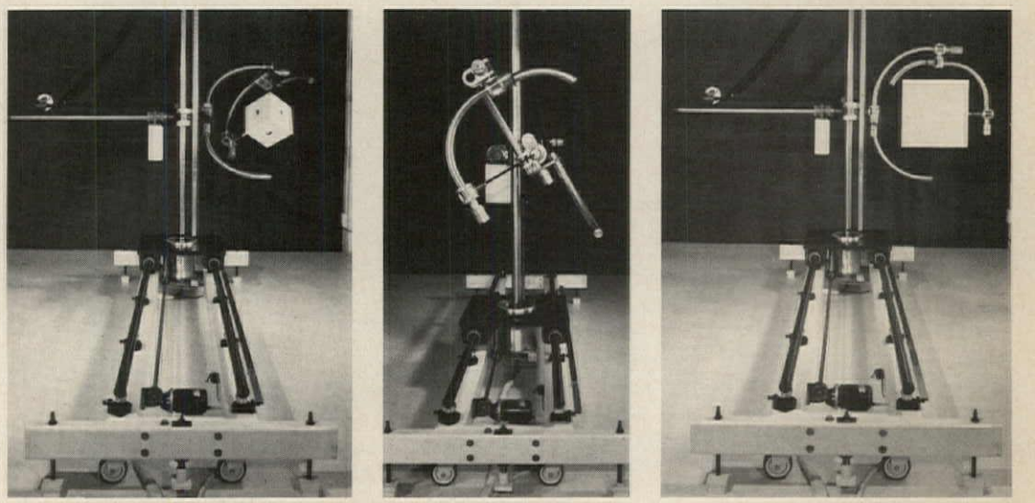




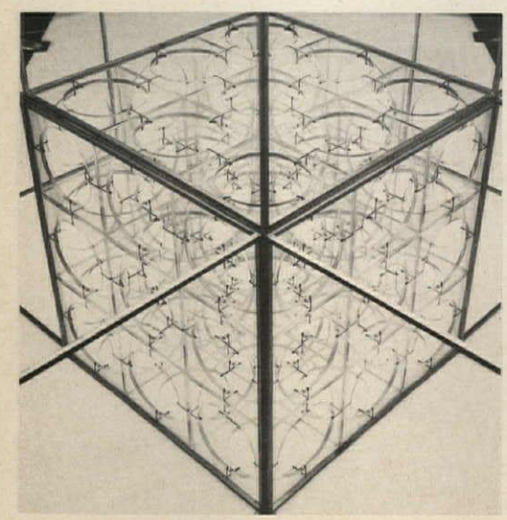


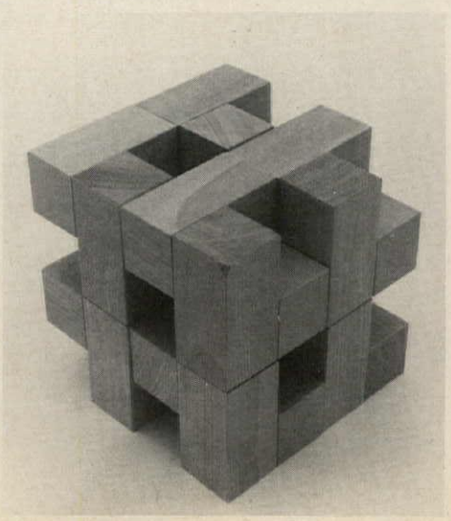
Modular coordination classification project (1951). These three diagrams are prototypical modular grids for assembling building systems data in a standardized comparative form. This frame of reference for any three-dimensional approach to structural design analysis was developed as part of a research project for the HHFA.

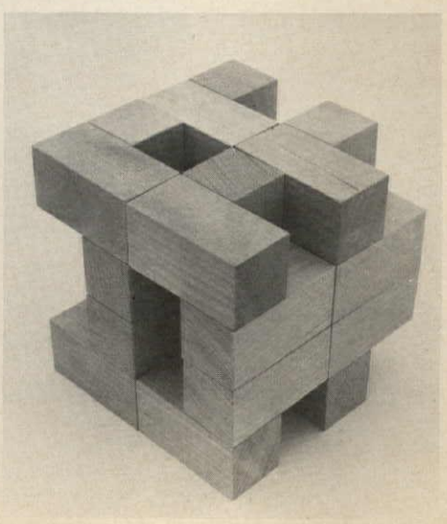
The Locomotion Orientation Manipulator (1969-71). The LOM is a physical tool for the control, measurement and display of the kinematics of design of production and assembly. This device is ordered about a Cartesian coordinates system and at present has 7 degrees of freedom. The research and development to study motion in time and space was accomplished in cooperation with two doctoral candidates at USC, John Bollinger and Xavier Mendoza.



A 27-cube study of geometric systems (1967-70). This study concerns the properties of particular growth of regular geometric systems. Symmetry and asymmetry, positive and negative, growth properties and motion and growth phenomena formed the program of this special inquiry which was conducted by the Building Institute of USC with Fritz Haller as principal investigator. Clockwise and counter-clockwise rotations and positive and negative characteristics are investigated by the use of solid cubes simulating any anticipated system of geometry (below). Viewed at the left is a detail of a basic group made up of 27 individual metal cubes with at-random display diagonals.







KONRAD WACHSMANN Predictions

Why and how to search, to plan, to create can only be resolved by looking at every problem in its universal comprehensiveness as part of the whole. Every fact, therefore, no longer permits decision making on the basis of like or dislike. Many reasons, oft hidden, will become more influential in design than esthetics. For example, in political and social structures of industrialized societies, science, technology and economy have created a new original—not the finished product—but the positive tool. Subsequently, the real product is a negative copy.

In regard to academic disciplines, rather than the renewal of the status quo of departmental structures, entirely new systems of higher learning will be developed. The perpetual feedback of informations requires a new comprehensive program of the whole as mirror of the numerical accumulation of the smallest part: the cell. New organisms, for example, an interdisciplinary center, with advanced methodologies of operations, timetables and purposes, within a comprehensive superprogram, as an autonomous institute in a university, may emerge.

The task will be to relate in supreme ordering systems in space, time and motion all factors which shape, form and make function the human environment. This requires as *conditio sine qua non* the simultaneous involvement of every imaginable discipline.

The supreme master team, without preference for any subject matter, should pierce the barriers of the self-imposed limits of a department. The unanimous collective body of such a team will generate the creative act of universally advanced theories, methods, tools and control mechanisms.

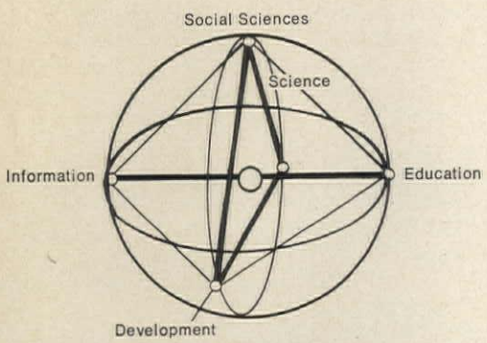
Furthermore, the structure of an academic institution will completely change by the removal of the invisible, rigid borderline with the real world, the community.

But other changes will also occur. For example, as in medicine where hospitals are integrated parts of their programs, in building, the creation of a directly attached building products industry can be envisioned. Such an expanded laboratory in the form of a producing industry should cover everything that is container or structure or envelope, whether it is on the ground, on wheels, floating or in space.

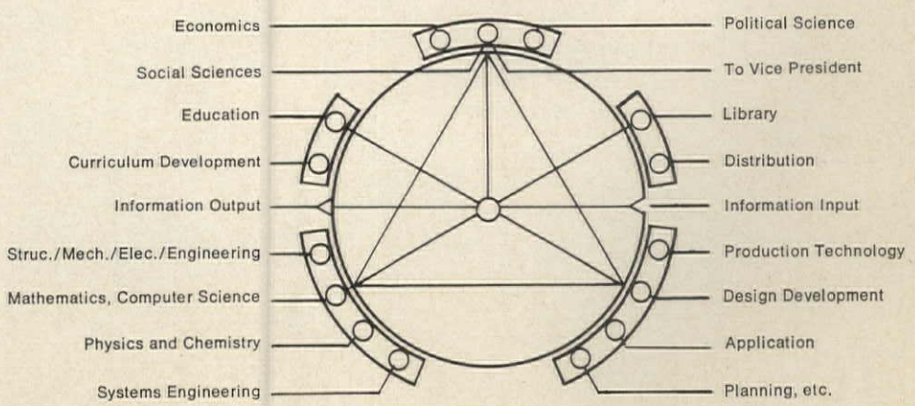
This sort of pilot plant keeps the learner—the decision maker—close to the real world, pioneering toward a new industry that will exceed the scale of the existing automobile, chemical or electrical industry.

Consequently, a private university with an annual budget below the $100 million mark will, long before the turn of the century, require operating capital of many hundreds of millions of dollars; but it may present less economic problems through its incomparably greater effectiveness.

Therefore, a traditional academic institution, absorbed by its own constantly expanding interdisciplinary center, more and more unified with the community of man in a system difficult to imagine today, will finally merge in a universal interdisciplinary forum of a universitas. Such may be fractions of facts which architecture must deal with now, long before 2001. □



Diagrams of the relationships between the three divisions—Social Sciences, Science, and Research and Development—their relationship to Educational and Informational Divisions of the Building Institute of USC, expanding into an interdisciplinary center.

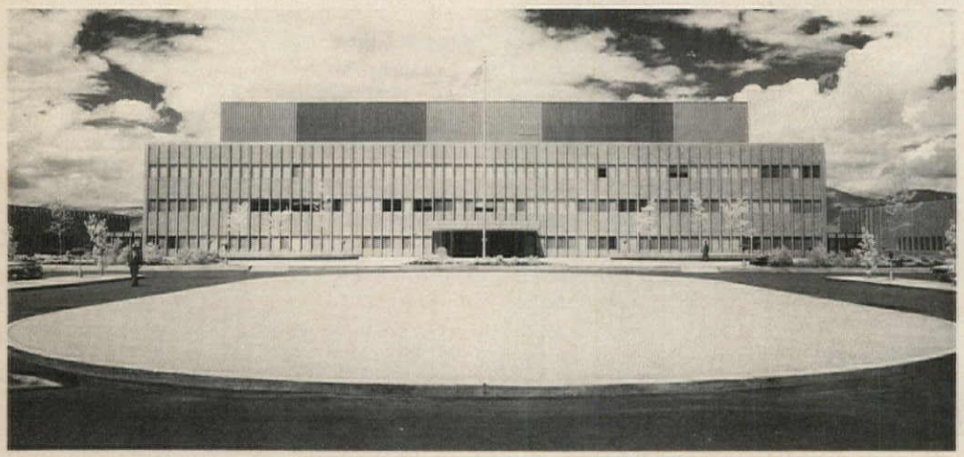


The five divisions form a rotating triangle of which the vertices represent Social Sciences, Science, and Research and Development, with the perpendicular axis through its centroid pointing from Information to Education.

SYSTEMS MANUFACTURING AND DEVELOPMENT DIVISIONS INTERNATIONAL BUSINESS MACHINES CORPORATION

Boulder, Colorado

Ministudy of a Project



The three-story administration building (center) serves as a counterpoint to the one-story manufacturing and engineering structures in the complex. Aerial view and site plan show what has been completed to date except for one building which has since been added.

Architects: Smith, Hinchman & Grylls Associates, Inc., a firm founded in Detroit in 1903. Its 400 employees include 61 architects, 43 engineers and a 30-man planning and landscape architecture division. Recent construction volume has been in the neighborhood of $600 million.

Type of Architectural Contract: Six different contracts utilized over the various phases of development, some multiple of payroll and others fixed fee.

Additional Services: Master planning (land use analysis, site utilization, traffic analysis and control, utilities planning, food services), accelerated project management, cost control, interior design, landscape design, waste treatment design, cathodic protection design, contract analysis and full-time project representative.

Consultants: Waste treatment—Chester Engineers, Inc.; traffic study—Meurer, Serafini & Meurer; landscape architects—Gerald F. Kessler & Associates.

Type of Construction Contract: General contracts for each phase of construction with subcontracts as needed.

Construction Costs: Data unavailable.

Program Requirements and Solutions: The primary concern was the creation of a flexible master plan that would enable IBM to expand its operation. Construction of portions of the project had to get underway before completion of the total design in order to meet the occupancy schedule of the client. The 679-acre site fronts on a major highway, is served

by a rail spur and has the Rocky Mountains as a backdrop to the west.

IBM needed facilities for the manufacture of present computer systems and for the development of subsystems for future manufacture. Administrative quarters had to be provided, along with warehousing space and engineering development laboratories. From the beginning, the program envisioned possible expansion of all elements.

Manufacturing buildings were to be one floor, in 48x48-foot bays with a 14-foot vertical clearance. Steel columns, trusses and purlins make up the structural system, and exterior walls are of precast concrete panels with exposed fieldstone aggregate, 1½ to 2 inches in size. Engineering buildings are of similar design, except for 24x32-foot bays with a 10-foot vertical clearance, a suspended acoustical ceiling and open web steel joists.

The administrative building has the same exterior treatment but is a three-story structure with a one-story attached cafeteria.

The decision to stack the administration building was based on a desire to reduce the amount of horizontal travel within the operational area, as well as to provide a vertical element to the essentially horizontal complex that would serve as a badly needed focal point. The earth berm upon which all the buildings sit ties the entire complex together and provides a stage for the mountains in the rear. The cut-and-fill requirements of the site justified the earth berm, raising the buildings and lowering the parking areas.

All utilities are buried, including electrical, telephone, gas and steam lines, water, compressed air and a sprinkling system, and all are distributed throughout the site from a central source. The utility building contains gas-fired boilers (with standby oil); compressors for chilling water for the airconditioning system which incorporates all the space—manufacturing, engineering and administrative areas; switchgear for electrical distribution to the entire complex; a central control center for fire protection and security; and air compressors to serve the whole project.

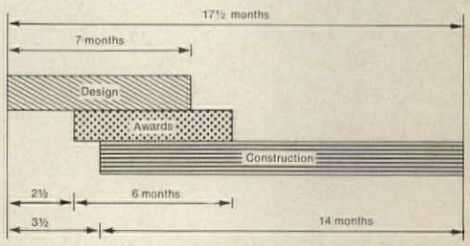
An underground industrial water treatment tank handles all wastes from the buildings. Water discharge is separated into storm and domestic sewage, with the latter being channeled into the municipal system.

A complete cafeteria and kitchen have been developed with cooking capacity for 70 percent of the initial manpower. Provisions have been made for future expansion of the kitchen capability. The seating is based on a 2½-turnover basis during a serving period of 1½ hours. Vending machine areas are provided for each 50,000 square feet of space.

A medical office in the administration building is augmented by first-aid stations located in both the manufacturing and engineering buildings.

An area of about 4,000 square feet has been established for multiple use as conference rooms, classrooms or as one large meeting room with a seating capacity of 250 persons, with presentation equipment.

Special Benefits to the Owner: The original master plan has permitted the economic and planned expansion of the complex with minimum dislocation of existing operations and at

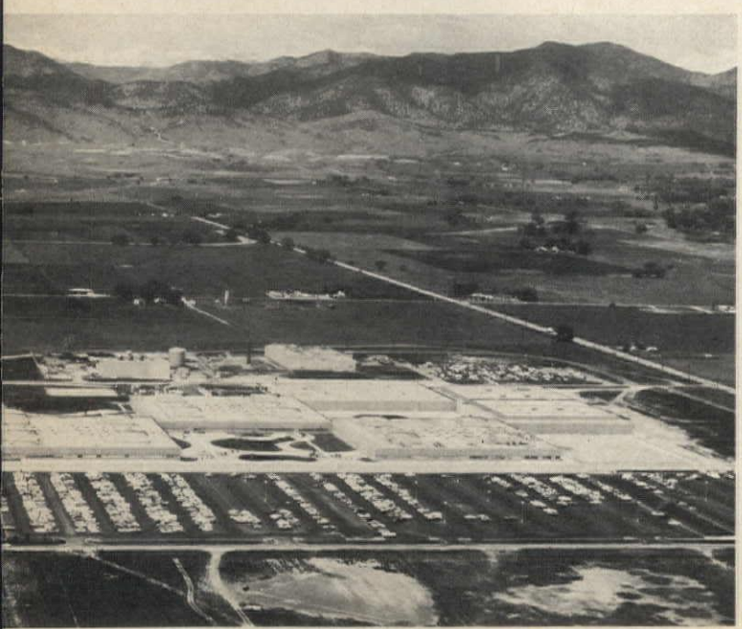


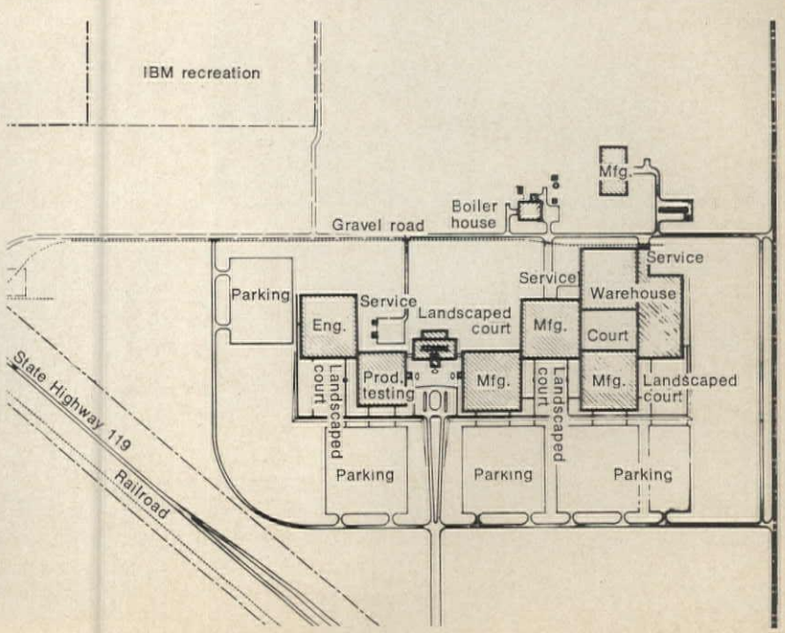
minimum cost. All of the client's time schedules have been met, and the costs have been kept within the agreed-upon budget.

The large piece of land provides ample room for any foreseeable expansion by either or both divisions.

Architects' Comments: The phased construction system used on the IBM project and the letting of contracts in sequence allowed the architects to exercise control from start to finish. This system further provided occupancy of space barely a year after the start of planning.

The design relied heavily on a rigid budget and a construction time limitation vital to the client's needs. The record is that the architects have bettered the schedules established by management and stayed well within the budget allocated for construction work. □





Open Space

A park is the most obvious open space in a city's makeup. Chicago's lakefront (top) has recreational uses. Broadly defined, open space is a portion of land unoccupied by buildings, but a structure itself can provide for open space, as in the Kaiser Center Rooftop Park, Oakland, California (center): Welton Becket & Associates, architects; Osmundson & Staley, landscape architects. Too often a city dweller finds open space where he can, an example being the Roxbury, Massachusetts, playground (below left). Better is planned space which is both beautiful and functional, as illustrated by the Golden Gate Park in San Francisco (below): John McLaren, designer; and by the Putah Creek Recreation Area and Arboretum in Davis, California (across page): Theodore Osmundson & Associates, landscape architects.

"To save our lives and our posterity we must become as professionals and citizens, comprehensive architects of a balanced environment, transforming ourselves into steadfast guardians of the surface of the earth and its air and water. We must go beyond our traditional preoccupation with stone, mortar, steel and glass, our concern with what to build and where. Instead, we must design within a much broader scale of values which in many instances will force us to focus upon what not to build and where not to build it." This statement is made by Mildred F. Schmertz, AIA, editor of the book *Acquisition, Conservation, Creation and Design of Open Space for People.*

Published by The American Institute of Architects, the book is an illustrated anthology of papers presented at the 1970 International Conference of the Commission on Town Planning of the International Union of Architects held in Washington, D.C., under the sponsorship of the AIA. The report, published with funds provided through an Urban Renewal Demonstration grant awarded by the Department of Housing and Urban Development, contains 12 papers by international authorities.

The papers are categorized into three large groups, the first of which is concerned with "The Joy of Open Space." Here Chloethiel Woodard Smith, FAIA, writes poetically about her two favorite open spaces and planner George Marcou calls for open space to be "an integral part of the city's environment and daily life," an asset which is physically, psychologically and socially accessible. Bulgarian architect and planner Luben Tonev wants a broadened conception of what recreation really is.

The second section of the book is on "Open Space for Future Needs." Carl Feiss, FAIA; Matthew Rockwell, FAIA; and John Keith give the American viewpoint. Antonio Perpina Sebria of Spain and Jean Henri Calsat of France join our countrymen in stressing "the urgent need for a far greater magnitude of advance acquisition of open space than is presently practiced anywhere in the world."

The final grouping with papers by men in government service concerns "Open Space and Public Policy." James H. Scheuer, Hon. AIA, New York Congressman; George B. Hartzog, Director of the National Park Service; Dwight F. Rettie, Director of the Open Space and Urban Beautification

Open space has the possibilities of endless variety to give the city economic and social vitality. One example is The Cannery in San Francisco (right): Joseph Esherick & Associates, architects; Thomas Church & Associates, landscape architects. Different use of meticulously planned open space to meet urban physical, psychological and societal needs is evidenced in the Civic Auditorium Forecourt in Portland, Oregon (above): Lawrence Halprin Associates, landscape architects.

Division of HUD; and Samuel C. Jackson, General Assistant Secretary of HUD, relate what our government is doing and hopes to do about open space planning and acquisition.

Miss Schmertz, who is a senior editor of *Architectural Record,* has the final statement with an essay on "Open Space: A Last Word," in which are presented concrete proposals for a plan of action. She calls for advocacy by the public, saying, "The idea is beginning to take hold that the public, if given strong leadership and kept informed, will respond in strength to bold plans."

Whatever harm we do the ecosphere we have to pay for in one way or another. As Miss Schmertz remarks, the conference speakers warned time and again that we must beware of our "so-called 'scientific' technology with its attendant waste of resources, air and water pollution, urban sprawl and the relentless exploitation of our rapidly diminishing open space." If we continue to deny our basic need for open space, we will pay dearly for that denial. The UIA conference and this report of it are reminders of our responsibilities. Both are aids in letting the public know of the need for "bold plans." □

The Pabst Mansion: A Glory of 'Sauerkraut' Boulevard

Rescued from destruction, the cruel fate that befalls so much of our architectural past, the Fred Pabst Jr. mansion on Milwaukee's Highland Boulevard is now headquarters for an architectural firm. The house is being restored to its original order and beauty.

"Its saving helped signify the architectural profession's concern for progress in its appreciation of the past," says Mark A. Pfaller, AIA, about the old Pabst mansion on Highland Boulevard which the Milwaukee architectural firm of Mark F. Pfaller Associates, Inc., purchased in 1970 for its headquarters. There was another reason as well for the salvation from probable destruction of one of the city's finest mansions. "It is ideally suited," states Pfaller, "to the expansion needs and other opportunities open to the firm."

Pfaller, who is president of the firm which was founded by his father 50 years ago, points out that his organization more than

Almost in its original state, the mansion's exterior is graced by the handsome Ionic columns.

Interiors have contrasts with classical, Renaissance and Gothic elements blending dramatically. Paneling and carved woodwork are now restored to their former handsome splendor.

tripled its past quarters which were located on State Street in Wauwatosa. Ironically, the old 19th century structure, designed by Max Ferneckes Sr., lends itself to new architectural methods. "The team approach has been stressed for some time," the architect declares. "This is the pulling together in one room of all of the persons involved in a project: architect, designer, production head, engineer and special consultants. Thus everybody who is relevant to a job is on the team and in one area where there can be close, frequent and rapid exchanges. Our new headquarters provides seven such areas for such teams."

The Greek Revival mansion has had a checkered career. Back in 1897, Fred Pabst Jr., the original owner and onetime brewery head, built the house on what was then called Prairie Street. According to H. Russell Zimmerman, student of early Milwaukee history and architecture, Cold Spring Park flourished in the area before it became a residential neighborhood. It was there that such diversions as cock fights and harness racing were enjoyed. The property also had other uses before this, serving as state fair grounds, Civil War camp and a place for traveling shows.

After Pabst's dwelling was erected, occupying three lots, other distinguished citizens built mansions nearby. Highland became known as "Sauerkraut Boulevard" because the majority of the owners of houses were of German extraction. Most of them built Romanesque or Gothic "castles," but Pabst's home had a classical style which was of a gentler nature.

Pabst lived in the house for eight years. He sold it to Thomas J. Neacy, president of the Milwaukee Valve Company. After Neacys' death in 1926, the structure was used as a church and then as a rooming house. In 1944, it became the property of the Engineers & Scientists of Milwaukee, Inc., who used it as a clubhouse.

Reportedly, the society bought the $100,000 structure for $18,000 and invested an estimated $100,000 in remodeling and additions. The engineers moved to new quarters in 1970 and placed the mansion on the market. Because of the encroachment of new apartment buildings in the area, it was feared that its days were numbered. But the Pfaller firm came to the rescue, buying the mansion and expending additional funds on repairs, restoration, electric service, heating and air-conditioning.

In spite of its various uses over the years, the mansion's exterior is still almost in its original condition. The graceful Ionic columns, made from a single slab of limestone, dominate the south facade. The classical style is reflected in the entrance vestibule and main hall. The oak-paneled library and dining room are more Gothic in character, and the main parlor glories in delicate Renaissance touches.

Asphalt tile had been placed over the inlaid wood floors and perforated acoustical tile was pasted to coffered ceilings, but the Pfaller firm has restored them to their former beauty. Wood paneling and carved woodwork have been cleaned and sealed. "Other desecrations," says Pfaller, "have been and are in the process of being corrected. Ugly lighting fixtures installed with no 'feeling' are gradually being replaced." Crystal chandeliers and sconces have been added where appropriate.

The firm's offices are primarily on the second floor where almost nothing of the original interior has remained. The reception area on the first floor, as well as the main parlor, are used for conference rooms; the library is utilized as office space. "Large areas," Pfaller reports, "are available for additional drafting rooms on the first floor and lower level and another large 'Gothic' room is being reserved for an exhibition area where our work is on display." The firm hopes that this part of the mansion will someday house traveling exhibits; already it has been offered a collection of antique wrought iron pieces for permanent display.

It is appropriate that the old mansion, the last of the stately ones that once graced Highland Boulevard, should be occupied now by a firm of architects who are dedicated to its safekeeping. Leopold Arnaud remarks in the foreword to Talbot Hamlin's *Greek Revival Architecture in America* that "the new architecture will have its roots in the past and will bear fruit accordingly. It is expedient, then, to examine the past, and in so doing, we can take heart, realizing that we are heirs to a fine and strong tradition." Mark F. Pfaller Associates, Inc., demonstrate that they are worthy heirs. □

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tions for practice. The meeting was declared a first important step in "opening new channels of communication and cooperation among the closely related and interdependent disciplines." Public service and government sponsored projects being undertaken by both groups were discussed also.

In another development, NSID and the American Institute of Interior Designers have passed a joint resolution on the qualifications of interior designers. The resolution calls for the formation of a council whose aim is to prepare and present recommendations on the development of a single qualification examination and to determine the feasibility of jointly pursuing legal qualifications for the practice of interior design.

Lighting Film Will Take to the Road

A 27-minute, sound-color film entitled "One Glow of Hope," depicting how the District of Columbia is using highly improved street lighting to reduce night crime in many areas of the city, is being made available for nationwide distribution. It was produced

Light levels have been tripled along Pennsylvania Avenue in the nation's capital.

by *Newsweek* magazine and General Electric Company in cooperation with the City of Washington.

The film, which includes interviews with Mayor Walter E. Washington, Police Chief Jerry Wilson and a number of government officials, business leaders and private citizens, reports that the reduction of night crime in some areas has been as much as 30 to 35 percent.

Printed Census Reports, Computer Tapes Source for Population and Housing Data

If an architect has a client who wants to build a store and needs to know what locality has a high proportion of likely customers, the Census Bureau can help.

Results from the 1970 Census of Population and Housing are ready for purchase as printed reports or computer tapes. Most of it is summary data, i.e., tabulations or counts of individuals, families and housing units in specified areas according to various characteristics, such as age and income. One household in every five throughout the country answered sample questions in addition to the 100 percent questions answered by everyone.

Information requested concerned such subjects as income, number of years of school completed, occupation, place of work, heating fuel used and number of automobiles.

For large quantities of data or greater detail, the use of summary census data on computer tapes may be considered. The tapes may be bought from the bureau or may be used at one of the many organizations around the country which have bought them and provide computer services.

Both report order forms and additional information on the computer tapes may be obtained from Data Access and Use Laboratory, Bureau of the Census, Washington, D.C. 20233.

Housing for the Elderly Continues to Get High Priority on a Variety of Levels

Interior spaces for the elderly should be organized so that each area has "a singular and unambiguous definition and use," according to a University of Michigan researcher.

For example, spaces which denote private uses such as sleeping, reading, letter writing,

Edward Durell Stone & Associates are designing houses especially for the elderly as part of overall program for National Homes.

or just plain withdrawing from others should be distinctly bounded. Spaces for social and public uses should be similarly treated.

Speaking at a conference on "Environments for the Aged" in San Juan, Puerto Rico, before a gathering of architects, social scientists and government officials, Professor Leon A. Pastalan of the university's Department of Architecture and the Institute of Gerontology offered some other recommendations on future building designs.

Facilities should be planned so that an elderly occupant can possess an area of his own which he can manage in any way he wishes, with minimal intrusion by others. "Possession of a tangible piece of space seems almost essential for one's identity," Pastalan pointed out.

The Michigan researcher also noted that the aged face difficulties functioning outside their home environment. "Accessibility to services and support systems such as shopping, transportation, church, safety, etc., are of prime importance," he said. "But for the elderly, the scale of a neighborhood frequently is too large and complex."

What is needed, Pastalan suggested, "is to systematically test design concepts" for applicability to aged populations. "It is imperative that part of the construction cost of any future environment designed for the elderly have a required research and evaluation component."

The San Juan sessions came close on the heels of the White House Conference on Aging. Since the latter was held in the nation's capital, the President's new Cabinet-level Committee on Aging already has met to consider the recommendations submitted by 14 technical committees, one of which was housing (*see* last month's AIA JOURNAL, p. 46).

Meanwhile, the Department of Housing and Urban Development has issued *The Built Environment for the Elderly and the Handicapped*. The 46-page bibliography involves not only the structure but the relationship of its site to other segments of the community as well as to medical and shopping facilities and to transportation. Lists of publishers, cited periodicals and interested organizations are included among the 400 references.

The publication (HUD 115-A) is for sale for 50 cents by the Superintendent of Documents, US Government Printing Office, Washington, D.C. 20402.

Florida Firm Challenged by Appointment, Named Democratic Convention Architects

Florida's Governor Reubin Askew has appointed the Coral Gables architectural/engineering/planning firm of Ferendino, Grafton, Spillis, Candela as architects for the 1972 National Democratic Convention to be held at the Miami Beach Convention Hall.

The firm is charged with the responsibility for the planning of the interiors of the hall to accommodate delegates, guests and media representatives, including major TV networks providing continuous coverage of sessions and special events.

Rome, Italy, Considers No-Fare Bus Rides

Residents of some metropolitan areas in the US are bemoaning proposals for an increase in public transportation fares. But in Rome, Italy, a proposal has been made by Benito Cazora, the traffic commissioner, to abolish bus and streetcar fares in that city permanently during the rush hours.

Cazora also wants additional downtown areas closed to private motor vehicles. Those who agree think it's the only way to relieve chronic traffic congestion and to lower the level of air pollution which is killing Rome's trees and causing its monuments to crumble.

From December 30 to January 7, Rome tested a no-fare transit project which cost the city at least half a million dollars in lost fares. Italian newspapers reported that there was an increase of passengers on public transportation by almost 50 percent, but the bumper-to-bumper chaos continued. Many of the riders were vacationing youngsters.

Dean Emeritus, University of Michigan; Contributor to Arts and Architecture

In 1968, Philip Newell Youtz, FAIA, received the Frank P. Brown Medal from Philadelphia's Franklin Institute for the invention of the lift-slab building method. He was the recipient of other honors as well, including a decoration from King Leopold III of Belgium in 1939 for his activities in promoting interest in the arts and architecture as a director of the Brooklyn Museum.

Youtz, who was a professor and dean emeritus of the College of Architecture and Design, University of Michigan, died at his home in Walnut Creek, Calif., on January 12 at the age of 76.

Active in both governmental and professional affairs, he was a member of the Detroit Chapter AIA's board of directors from 1959 to 1964 and of the national AIA accrediting team for collegiate schools of architecture in '59 and '61. Youtz authored several books.

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St. Louisians See Buildings of the World Through the Eyes of Architects

The St. Louis Chapter AIA, which has great success with its "Architects' Sunday" guided tours to structures not usually open to the public (*see* AIA JOURNAL, May '71), has launched a once-a-month lecture series, "Armchair Tours Through the Architects' Eyes." Besides being entertaining these events, initiated by Betty Lou Custer, AIA, help people become more conscious of their environment. The "Armchair Tours" will show architecture from all parts of the world. The opening lecture in February was given by Joseph D. Murphy, FAIA, who discussed historical and contemporary buildings in Russia and whose sketch from Rostov is shown above.

outlook *from page 55*

Newslines

■ **Factory-built housing legislation** has been passed in 12 states, according to a report issued by HUD. Eighteen others are in the process of introducing legislation. The laws in general require that the housing shall be accepted on any building site within the state and provide for inspection.

■ **The control of automobile air pollution** will be studied under the aegis of the Environmental Protection Agency at a recently dedicated building which is the first federal laboratory specifically designed to deal with the problem. Located in Ann Arbor, Mich., the structure has 100,000 square feet of floor space and a wide range of equipment for test purposes. Consulting architect for the $10 million project was S. T. Gerganoff of Ypsilanti, Mich.

■ **The Steel Deck Institute** has issued its 1972 *Steel Roof Deck Design Manual* which incorporates revised load tables and includes recommendations for site storage and erection. It is offered free from SDI, 9836 W. Roosevelt Rd., Westchester, Ill. 60153.

■ **Geoffrey Platt,** FAIA, of New York City is the seventh recipient of the Medal of Honor for City Planning, given for his "distinguished contribution to the Plan of the City of New York and for his dedicated and continuing efforts in the preservation of the city's architectural and historic heritage." Initiated in 1939, the award is a joint effort of the Metropolitan Section AIA, the American Society of Civil Engineers and the New York Chapter of the American Society of Landscape Architects. Platt is the first architect to receive the honor.

■ **Signs and billboards** as well as other stationary media of communication along streets and highways is the subject of a 10-minute, 16mm color film called *Street Graphics*. Made with HUD financing, the film resulted from a study by the American Society of Landscape Architects. It is available on loan from Modern Talking Pictures Service, 2323 New Hyde Rd., New Hyde Park, N.Y. 11040, and its 28 local offices.

■ **A new magazine,** *Design Methods Journal*, hopes to begin publication soon. The quarterly claims that it will provide a forum for environmental designers, architects, industrial designers, planners, engineers and others. Subscription rate for institutions is $12; for individuals, $6. Checks may be sent to Design Methods Group, Department of Architecture, University of California, Berkeley, Calif. 94720.

■ **The American Subcontractors Association** headquartered in Washington, D.C., recently held its first annual convention. With 3,200 members in 27 states, ASA says that "it is beginning to be a voice to be reckoned with in the construction industry." Its goals include improved payment policies, elimination of bid shopping and better lien and bond laws.

■ **Of the 2 million housing units** projected for 1972, nearly 700,000 will come under some form of government-assisted housing program, reports the National Association of Building Manufacturers. The rapid growth of the programs has resulted in myriad rules and regulations which pose stumbling blocks. To provide for clarification of procedures, NABM has initiated Government Housing Programs Workshops, the second held in New Orleans recently. For information write NABM, 1619 Massachusetts Ave. N.W., Washington, D.C. 20036.

■ **Planners of educational facilities** will be interested in a package of publications available from the Center for Architectural Research, School of Architecture, Rensselaer Polytechnic Institute, Troy, N.Y. 12181. It contains a revised edition of *New Spaces for Learning: Designing College Facilities to Utilize Instructional Aids and Media* and a reprint of an article from the October 1970 AIA JOURNAL, "Designing for Educational Technology," by David S. Haviland and William F. Winslow.

■ **Three new color slide lectures** are among 12 now available from the National Trust for Historic Preservation. They are "Belle Grove," "The Savannah Story" and "A 4th Dimension of History." Each 30-minute illustrated lecture may be rented for two weeks at $3 plus insurance. Contact the Visual Aids Coordinator, Department of Education, National Trust for Historic Preservation, 740 Jackson Place N.W., Wash., D.C. 20006.

■ **Norman DeHaan, AIA,** of Chicago has been elected chairman of the national board of governors of the American Institute of Interior Designers.

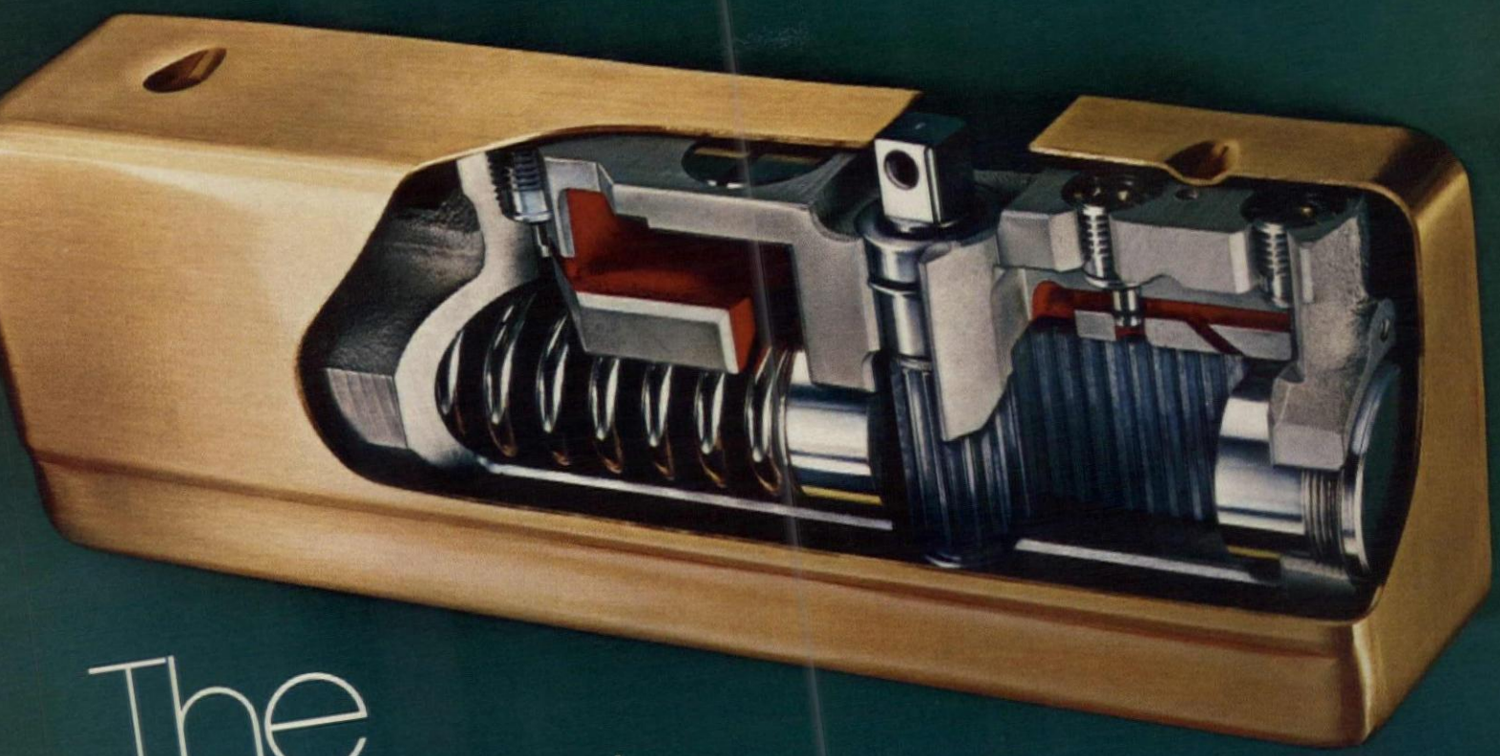
■ **A showing of "Architectural Studies"** marked the opening of the fall season of the Grafton Potter Art Gallery in New York City, with two local architects—Sam Anson Haffey, AIA, and Grafton W. Potter Jr., AIA—among the artists represented. The gallery is housed on the garden floor of a reconstructed brownstone in which Potter lives behind the Museum of Natural History at 106 W. 78th St. Hours are from 10:30 to 5:30, Tuesday through Saturday.

Deaths

JOHN W. BEAL
Hanover, Mass.
DANIEL M. DORR
Oak Brook, Ill.
J. WELLS HASTINGS
Oakland, Calif.
OWEN A. LUCKENBACH
Birmingham, Mich.
R. C. VOGLER
St. Petersburg, Fla.

Members Emeriti

LOUIS C. HINCKLEY
Springfield, Mass.
EUGENE H. KNIGHT, FAIA
Birmingham, Ala.
EMORY OHLER
Dayton, Ohio



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books

Hospital Modernization and Expansion. E. Todd Wheeler. New York: McGraw-Hill, 1971. 261 pp. $22.50

To his extensive contributions to periodical literature and his book *Hospital Design and Function* published in 1964, the author, a Fellow of the Institute, has added this highly informative and useful volume.

The book is organized in four major parts. The first three bear titles describing what for many of us is the accepted process of architecture. These are analysis, design and execution. The fourth part is an appendix illustrating methods for carrying out certain kinds of special analyses and evaluations peculiar to hospital planning.

Wheeler begins his discussion on hospital modernization and expansion by describing the forces which generate such needs. Along with the basic factors of population and changes in the methods and standards of health care, he points out that physical improvement may be indicated (generated) by reorganization of the community's health care system (merger, etc.), recognition of a need which is not presently being met, physical obsolescence and depreciation.

The author recognizes that while not as straightforward and socially benign as those forces just listed, hospitals may improve or expand to assume a larger role in the community in response to the unexpected availability of capital funds—a grant or gift—or as a manifestation of the competitive instincts of the hospital's leadership and medical staff.

His purpose in describing these generating forces is not to assign priority to them. Instead, he writes, "The expansion urge can break out anywhere. The important thing to recognize is that such an outbreak can and should be anticipated and encouraged, under control." He further urges that all of the generating forces be explored to assure that the program reflects all of the needs and "not just those most obvious or most vigorously represented." Similarly, in the chapter on long-range planning, he advises the hospital and its planning team against yielding to the temptation to meet only the immediate demand.

On the planning process, the book offers sound advice on organizing the planning team, defining the roles of its members and scheduling its work. Included are useful forms with which the realities of the process can be illustrated. Foremost among these are planning, design and construction schedule and forms for numerical tabulation of existing spaces and immediate and long-range goals. Wheeler points out the importance of the written word, tabulation and verbal explanation in communicating with nonarchitect members of the planning team, not all of whose members are accustomed to drawings. His strong advice: "A good rule to follow is to assume that the viewers know nothing (of plans, symbols, etc.) and to present all the elements."

Just as the planning team may err in concentrating on an immediate need in the absence of a master plan, the design effort may be seriously crippled by proceeding without adequate functional programming.

In the chapter on the planning process, Wheeler writes that a precise measure of the demand for a space be based upon answers to three questions: 1) What is to be done in the space? 2) What persons will be doing it? 3) What special equipment will they need? To satisfy the need of the *functional program*, he adds: 4) What are the relationships to other departments? Answers to the first three are all fairly straightforward if we ignore the fact that a space under consideration may not be needed at all, as for example, a duplicated service or activity.

The fourth is a somewhat more complicated question which may turn up a few clear relationships plus a whole series of conflicting requirements; the resolution of these is in large measure what hospital design is all about.

The chapter called "Modernization Eco-

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nomics" is somewhat disappointing in that it concentrates on construction cost and is silent on some of the more subtle economic factors of hospital modernization versus replacement. Perhaps the only satisfactory modernization plan is by definition more economical than new construction, but it would be helpful to point out that the whole answer is usually not in a direct comparison of construction costs but also includes such factors as the lost income in departments in which services are curtailed during construction, the cost of staffing and operating each of the alternative solutions upon completion and the possible loss of staff and clientele as a result of temporarily disrupted service during construction.

In what may be a ray of hope to those architects who regard modernization projects as frustrating nonarchitecture, the author describes as "fascinating and challenging" the evaluation of existing buildings and "the identification of elements in the building and mechanical plant which show a potential for continued use and then the evolution of a scheme which will use them."

Two kinds of evaluation are described. First is the evaluation of structure, finish and mechanical and electrical systems; second, examination of each department to determine the quality arrangement, size, functional program and modernization potential. The text is generously supplemented with illustrations on how such evaluations are carried out.

Part 3 describes some of the special problems the existing hospital faces in executing modernization and expansion projects. These include construction sequencing needed to maintain operating continuity and funding implications. Along with some of these more obvious concerns is offered a special section on pitfalls which we are entitled to assume was developed, in part at least, from the author's 35 years of experience.

The appendix contains several useful illustrations including a study on community need, functional programming and economic analysis. Also the reader will find data which is rare in the current literature: guidance on determining hospital parking requirements and a breakdown of gross floor areas by departments and services for more than 100 hospitals ranging in size from 100 to more than 1,000 beds. PAUL S. PIERSON, AIA

Hospital Architecture: Integrated Components. Isadore Rosenfield. New York: Van Nostrand Reinhold, 1971. 324 pp. $26.50.

In an attempt to produce a publication containing thought-provoking concepts, enlightening design information and insights into a cross section of hospital activities, Rosenfield has created a book that architects, hospital administrators and physicians may not read to the end.

The book is divided into seven parts, the first four of which are discussions of hospital departments grouped into major divisions, such as diagnostic and therapeutic, patient quarters, ancillary services and administration. The volume does contain usable data, but there is so much history and personal observation relative to planning, as well as explanations of elementary subjects, that it is virtually useless to an architect who is looking for planning aids.

Approximately half of the book is taken up with illustrations. These were taken primarily from the author's practice, US Public Health publications and hospital equipment advertisements. Principles of planning are obscure in the text. The book is neither comprehensive in the viewpoints expressed nor in the examples and illustrations that it contains. The items taken up in the book do not relate well to the illustrations, and in many cases the illustrated equipment is outmoded.

In the preface, Rosenfield says that he has been thinking in terms of principles and has experimented with them and "that the rest of the world seems to feel that there are no principles except one: that is to stack the hospital vertically."

He says little about systems design techniques, nor does he cover any of the significant contributions made to planning innovative hospital forms. Such examples include the concept of John Weeks in the design process used at Northwick Hospital and Research Center, London (*see Architectural Record*, Dec. '70, pp. 101-104 and *Transactions of the Bartlett Society, 1963-64*, Vol. 2) and the "Unit Theory Design" described by John V. Sheoris, AIA, about the design process used by Smith, Hinchman & Grylls at the Michigan State University Teaching Hospital in a

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Professional critics have been virtually unanimous in regarding Harry Weese's Arena Stage as a major landmark in American architecture. Wholly original in concept, superbly functional, and elegant in detailing, it has "an ambiance which suggests that magic is made, after all, in a working place," as one commentator remarked. Among other significant developments which were foreshadowed in this exciting structure was the utilization of roof perimeters as an important element in contemporary design, particularly when executed in metal.

Our initial gratification when Mr. Weese and his associates selected Follansbee Terne for these roof areas has thus merely been enhanced with the passage of time. And we were therefore doubly gratified, nearly a decade later, when Terne was again specified on the adjacent Kreeger Theater, a building of comparable distinction.

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NORMAN R. McGRATH photo

KREEGER THEATER, WASHINGTON, D.C. WITH ARENA STAGE IN BACKGROUND.
ARCHITECT: HARRY WEESE AND ASSOCIATES, CHICAGO, ILLINOIS, WASHINGTON, D.C.
ROOFER: MATHY COMPANY, FAIRFAX, VIRGINIA.

books *from page 60*

paper presented at the American Hospital Association's Institute on Hospital Design in 1970.

Little of the new concepts of care have been given true emphasis, such as health maintenance organizations, mass screening, the impact of Medicare and other federal programs, new forms of psychiatric environment and many other current factors which do have their effect on program and design.

In brief, the book is dreary lecture, primarily subjective rather than objective

JASON W. FRYE JR., AIA

Labor and Material Requirements for Hospital and Nursing Home Construction. Bureau of Labor Statistics. Washington, D.C.: US Government Printing Office, 1971. 50 pp. 60 cents.

Hospital and nursing home construction represents a growing proportion of nonresidential construction. Its value rose from $1 billion in 1959 to $3 billion in 1969, and the Public Health Service estimates that it will rise to $4 billion by 1978.

This study measures labor and material requirements for such construction in the late 1960s. By comparing the findings of this project with those of a similar study done in 1959 and 1960, insights are given into trends of these requirements, occupational requirements and costs.

Among the highlights: Construction cost per 100 square feet went up 10 percent, with labor and residual costs climbing substantially but materials only a little; hospitals were larger, with fewer beds but more floor space; there were more additions to existing hospitals, fewer new hospitals; more projects were in metropolitan areas; occupational requirements changed little; hospitals took longer to build. There is detailed information on the number of man-hours required for each $1,000 and for each 100 square feet of hospital construction.

Uncoupling the Radiology System. Roslyn Lindheim. Chicago: Hospital Research and Educational Trust, 1971. 85 pp. $2.95.

Mrs. Lindheim is a member of the AIA who has helped plan and design both large and small medical facilities. In this study she is concerned about how the system of radiology in a hospital can be analyzed and spatially uncoupled.

She selected radiology, she reports, because it "presented, in capsule form, many of the problems encountered in the design of hospital departments." Her aim is to provide the architect with a sounder basis for arriving at design decisions. The methodology she has developed will help the architect in such matters as the study of an organization, the observation and recording of relevant facts prior to design decisions, the identification of problems, the evaluation of a client's opinions and the isolation of valid ideas.

Genius and the Mobocracy. Frank Lloyd Wright. New York: Horizon Press, 1971. 247 pp. $20.

It was in 1931 that Frank Lloyd Wright completed his autobiography. Because of it, many of us joined the master in 1932 to help form and live in the Taliesin Fellowship. At that time, for us at New York University's School of Architecture, FLLW was acceptable only during the first year; thereafter, Paul Cret's sandpapered classicism would get us through. Schools of architecture were fairly bankrupt, most architects being unemployed anyway. For Wright, unemployment was a creative force; it meant time to write, lecture and even start a "school."

Wright's life was an intertwining of architecture, nature and literature. We at Taliesen soon became accustomed to his writing a good share of his time and then reading to us from his manuscripts or from Whitman, Blake or, especially at that low period in the economy, from some new economist who promulgated a new way of life for America.

Wright's best tools as a window to the world, besides his architecture, were literature and the press, radio and later television. When he got the fellowship to the point of practicing real architecture, he granted *Architectural Forum* an issue in 1938. Editors Paul Grotz and George Nelson came to Taliesin to collect material. But I will leave it to them to describe their introduction to architecture via FLLW's eyes—and they will never forget it.

After that, Henry-Russell Hitchcock came to gather the work for what was to become *In the Nature of Materials;* later there were more books. We apprentices would hear them in bits and parts—at picnics, in the morning and in the evening. With a burst of laughter, Wright would often read something he had just written, adding, "And that'll tell them." To him, much of the world was hostile; the "architectural establishment" was dividing up the architectural spoils, as if all were a political election or war: Winner take all. After all, he was hardly considered for any government project or even large-scale private work. How it must have hurt to see the lesser ones obtaining the commissions and designing in a "foreign" style!

In only eight years, the Taliesin Fellowship became an accomplished fact. "Fallingwater," the Johnson building in Racine, the house "Wingspread" and many other projects were being built or were on the boards—all done, incidentally, in FLLW's own hand without any foundation or university funding during a time when there was little building for anyone. For him, the fellowship was a day-to-day occupation seven days a week, trying endlessly here and there, this and that, publishing papers, being interviewed, lecturing in far-off places, starting a desert camp, keeping us apprentices mobile, interested, creative.

Through all this period, he often told us that one day he would write the definitive book on Louis Sullivan: He had a debt to pay. And hadn't Sullivan come to Taliesin and given him the marvelous drawings? They would be the backbone of the book. And he would also tell us of Adler—what a man!—and of his great power which made Sullivan possible. I always felt that FLLW had just as great a debt to Dankmar Adler. The motto we had up in Taliesin's kitchen was: "We have poetry like that because of prose like this." Adler was the prose that made Sullivan's poetry possible.

Wright thought about the book for many years, but the actual writing of *Genius and the Mobocracy* was started about 1940. Long in coming, it was revised, changed, enlarged and revised again. It was not a book on Sullivan per se. Read *The Autobiography of an Idea*, or Morrison or Connely for that. But FLLW could no more write a single-minded book on another person than Leonardo da Vinci could fly. He could render the facts as he saw them, bring forth his own philosophy and relate history as he viewed it. His history was alive—today, everyday and not just a recital of yesterdays.

Why did we apprentices work so hard, helping him in his work and becoming part of his cause? It was history too for us each day, making it, being it, living it. It was not unusual to be awakened at 5 a.m. and asked to pull out a drawing. There might have been a problem, and FLLW had awakened us with the solution. To him each day was alive, a new creation, the day when the utmost might happen—and often did. During all that time, he was proceeding with his writing.

I think that his trip to Russia during this period also had deep roots in the formation of the book. Wright had studied single tax and other solutions, and the Russian way was a new form in the economics of the world. It was a country without banks, insurance companies, money manipulation, bonds, stocks, debentures, interest, investments, real estate sharks, speculators, etc. But Wright was also disappointed with Russia, for he saw it as an example of mob rule, with little intellect or higher moral direction: a mobocracy.

Horizon Press has devoted years of effort to the publishing of some 15 books by FLLW. This new edition of *Genius and the Mobocracy* is a landmark. In addition to the first 39 Sullivan drawings, there are 20 more magnificent drawings never published before and

From left to right: FLLW and Henry-Russell Hitchcock in 1939 at the Taliesin Fellowship, preparing copy for *In the Nature of Materials;* FLLW and apprentice Robert K. Mosher, who now practices in Marabella, Spain; FLLW and Hitchcock; FLLW; and the reviewer at the drafting boards.

55 new photographs by Richard Nickel, Aaron Siskind and others of the ornament in all the major Sullivan buildings, from the Chicago Auditorium to his very last building. The whole format is generous, almost opulent, and ends with Sullivan's tribute to Wright's Imperial Hotel.

No architect's library should be without this book. I say this with complete partisanship. But then what is architecture without being partisan? We are all open books: Our plans, elevations, buildings are real and there to see. And so is this book.

EDGAR TAFEL, AIA

The Architectural Awards Directory. Berkeley, Calif.: Guidelines Publications, 1971. 26 pp. $2.

Many architects are not aware of how many architectural awards programs there really are. Here in an unbound guide is a listing of them. The guideline is divided into three parts: architectural awards; fellowships, scholarships and student awards; and possibilities for the future.

Available only by mail order from Guidelines Publications, 2813 Telegraph Ave., Berkeley, Calif., 94705, the list is one of a series of 14 titles. Among the other manuals are *Architectural Production; Breakthroughs in Architectural Practice;* and *Architectural Hiring Tests.* In such a brief coverage, it is not possible to achieve much depth. The aim, says the publisher's office manager, is "to focus on the nuts-and-bolts problems of the profession, keep the manuals very simple in format and condense the content of each manual as much as possible."

The Language of Cities: A Glossary of Terms. Charles Abrams. New York: Viking Press, 1971. 365 pp. $10.

If you want a succinct but informative definition of "boondoggling," of "ecumenopolis," of "street sleeper," of "turnkey job" or of "white backlash," this is the book for you. Here are set forth with wit and clarity the terms associated with modern city life. Under the letter E, such terms as encumbrance, entrepreneur, environment, eviction, exurbia and many others are defined. The letter M brings forth definitions for such terms as master plan, motel, multiple nuclei theory and municipality.

Abrams completed the book just before his death in February 1970. He was assisted in its preparation by Robert Kolodny, an instructor in urban planning at Columbia University. From A to Z, the book demonstrates Abrams' love of cities. It should be on every planner's bookshelf.

Modern Chairs, 1918-1970. Boston: Boston Book & Art Publishers, 1971. 152 pp. $12.50.

Over the past 50 years, there has been a radical development in the design of chairs. The traditional concept of the four-legged chair has been destroyed by technological innovations such as pressed steel, formed plywood, molded fiber glass, etc., making new shapes and forms possible.

This hardcover version of a catalog prepared to accompany an exhibition at the Whitechapel Art Gallery of the Victoria and Albert Museum is illustrated by the chairs of Mies van der Rohe, Marcel Breuer, Alvar Aalto, Arne Jacobsen, Le Corbusier and other architects and artists.

The Structure of Praise: A Design Study—Architecture for Religion in New England from the 17th Century to the Present. Arthur B. Mazmanian. Boston: Beacon Press, 1970. Unpaged. $19.95.

The 200 photographs beautifully presented in this book have been selected not on theological or historical grounds but through the use of esthetic criteria "to judge how well the structure took its place in its environment." The photographs, by Mazmanian, are complemented by his brief text and captions.

Urban Studies: An Introductory Reader. Edited by Louis K. Loewenstein. New York: Free Press, 1971. 539 pp. $9.95 hardbound, $5.95 paperbound.

A discerning anthology of articles, primarily problem-oriented, on urban affairs in contemporary America.

Dimensions of Change. Don Fabun. New York: Glencoe Press, 1971. 230 pp. $8.95.

Here assembled in one volume are six issues of *Kaiser News* which were devoted to "The Markets of Change." The sections of the book are concerned with ecology, shelter, energy, food, mobility and telecommunications. Handsomely illustrated. □

letters

More Than a Footpath

The article in the October issue by Hugh B. Johnson, AIA, entitled "The Appalachian Trail and Beyond" is an excellent job. He has made the project live in a way which gives a zestful sense of triumph to the valiant host of workers who brought the trail into being.

I have noted his inclusion of the Adirondack region. This shows that he has grasped the full concept of the "Project in Regional Planning" proposed in 1921. This was for something more than a foot-wide path from north to south along one skyline but rather a regionwide influence throughout Appalachian America. BENTON MACKAYE, HON. AIA
Shirley Center, Mass.

Equal Time Suggested

I wish to express a spontaneous, and indeed irrepressible, note of praise for the October issue on regionalism. It is the high watermark of editorship for the AIA JOURNAL as far back as I can remember.

The issue was just about perfect—with one wistful cavil: I would propose, after Reclamation Commissioner Armstrong's apologia for the Grand Coulee superproduction that you offer equal time to David Brower and the Friends of the Earth version of "the rivers be dammed." I am especially mindful of the electric account of the joint descent of the Grand Canyon of the Colorado by Brower and Floyd Dominy in John McPhee's *Encounters with the Arch-Druid*, just recently published. LANDIS GORES, AIA
New Canaan, Conn.

Housing Occupancy Cost . . .

In his introductory article to the excellent housing issue in December, AIA President Max O. Urbahn, FAIA, expresses many general truths and desirable sentiments as to the objectives of the Institute and architects for the future of housing.

However, I believe that he and his partner J. Karl Justin, AIA, who is quoted, are making a considerable error when they try to analyze the cost of material and labor in its effect on monthly housing occupancy cost. While it is true that interest, amortization and taxes make up a large percentage of the occupancy cost, this cannot be deducted from the total to show that construction cost is only 25 percent of the occupancy budget.

After all, the interest, amortization and taxes are continuing *expense* items, all based on the original *capital cost* of the construction itself. A 50 percent reduction of capital cost would result in a 50 percent reduction in interest, as well as lower amortization and taxes.

Let us not mix up pumpkins and peanuts in this matter. GERSON T. HIRSCH
Walnut Creek, Calif.

. . . and a Reply

Hirsch is quite correct that the benefit of reductions in capital cost would be magnified by reductions in interest as well as lower amortization and taxes. It was by no means our intention to suggest that reductions in construction cost off-site or on-site are not a goal most worthy of pursuit. But we wanted to make the point that corresponding and proportionately far more productive efforts can and should be made on the financial and socio-political level toward reduction in interest rates and taxes if we are to achieve the housing production levels and quality which we feel are required nationally.

It is my interpretation that this view is in keeping with many of the ideas contained in the first report of the National Policy Task Force, just released (*see* p. 8), and which will be discussed at the forthcoming AIA Houston convention. J. KARL JUSTIN, AIA
New York, N.Y.

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events

National

Mar. 26-29: US Institute for Theatre Technology Conference, Mark Hopkins Hotel, San Francisco

Mar. 27-29: Housing and Mental Health Symposium, School of Architecture, University of Maryland, College Park

Apr. 15-20: American Society of Planning Officials Conference, Cobo Hall, Detroit

Apr. 17-21: Conference of States on Building Codes and Standards, Boise, Idaho

Apr. 27-28: Annual Conference on Religious Architecture, Regency Hyatt House, Atlanta

May 1-3: Apartment Builder/Developer Conference and Exposition, Anaheim Convention Center, Anaheim, Calif.

May 1-3: National Aviation System Planning Review Conference, Washington, D.C.

May 2-5: Symposium on the Performance Concept in Building, American Society for Testing and Materials Headquarters, Philadelphia

May 7-10: AIA Convention and Exposition, Albert Thomas Convention Center, Houston (Mexican portion, May 12-13, Mexico City)

May 10-12: National Conference on the Building Team, Albert Thomas Convention Center, Houston

May 23-26: Conference on Industrialized Building Processes, West Virginia University, Morgantown

June 21-23: National Exposition on Contract Interior Furnishings, Merchandise Mart, Chicago

June 28-July 1: NCARB Convention, Washington Plaza Hotel, Seattle

International

May 27-June 4: International Transportation Exposition, Dulles International Airport, Va.

June 5-16: United Nations Conference on the Human Environment, Stockholm, Sweden

June 10-14: Panamerican Congress of Architects, São Paulo, Brazil (reconvenes in Asunción, Paraguay, June 14-17)

June 17-22: International Design Conference, Aspen, Colo.

July 3-20: Ekistics Month, Athens Center of Ekistics, Athens, Greece

Awards Programs

Mar. 31: Entries due, Biennial HUD Awards for Design Excellence. Contact: Fifth Biennial HUD Design Awards Programs, Department of Housing and Urban Development, Washington, D.C. 20410.

Fellowships

Apr. 1: Applications due, Cintas Fellowships in the Arts. Contact: Institute of International Education, 809 United Nations Plaza, New York, N.Y. 10017. □

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