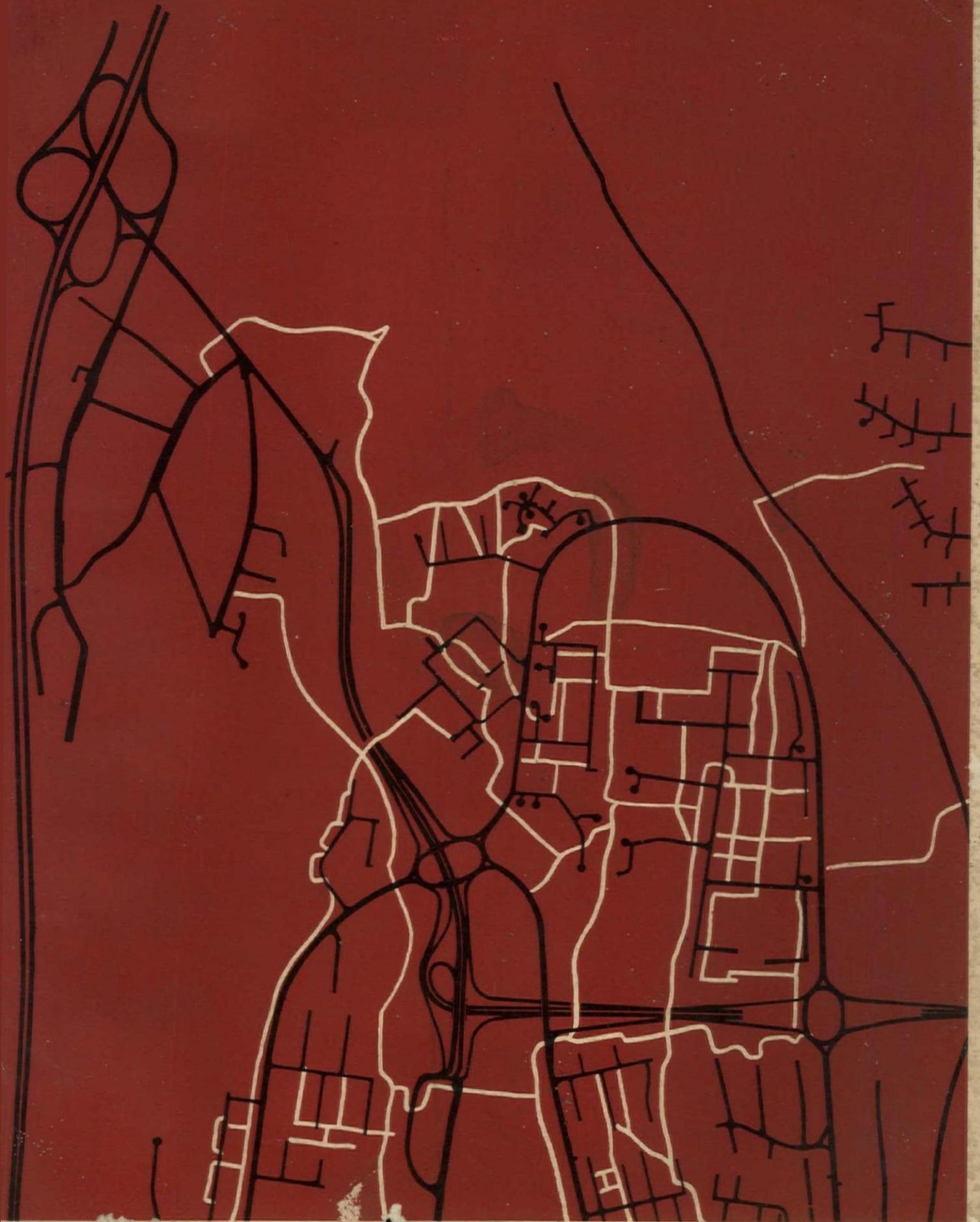


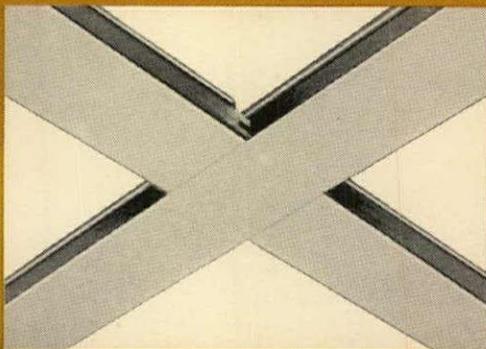
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JULY 1967

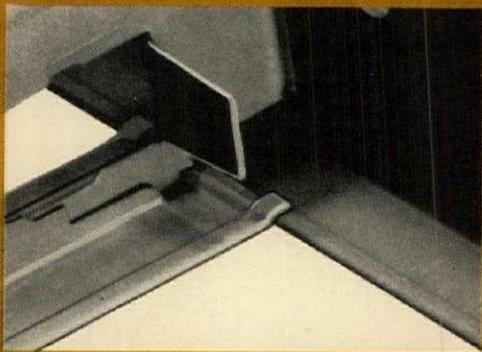


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VOL. XLVIII, NO. 1

Comment & Opinion

The Wright Record: Any plans for official celebrations or recognition of the centenary of Frank Lloyd Wright's birth already are out of date. For several recently discovered documents in the University of Wisconsin Archives show "conclusively" that he was born on June 8, 1867—the day and month have never been disputed—rather than on that date in 1869, as has been commonly accepted. In a telegram to the AIA JOURNAL following the traditional birthday dinner at Taliesin near Spring Green, Mrs. Wright herself acknowledged the date. The documents also throw some light on his early Madison days.

Threefold Evidence: These facts have come to life in an article "Frank Lloyd Wright—the Madison Years" written by Thomas S. Hines Jr. in the Winter 1967 issue of the *Wisconsin Magazine of History*, published by the State Historical Society. "Three documents relating to Wright's Madison years, hitherto unnoted by historians, show conclusively that Wright was born in 1867," Hines declares. He cites the following:

"The United States Census of Madison for 1880 lists the names and ages of the family of William C. Wright and his wife Anna, giving the age of a son, Frank, as being 13. If Frank was 13 in 1880, he would, therefore, have been born in 1867, not 1869. The census taker undoubtedly consulted one of the senior members of the household, who at that date would hardly have been mistaken in giving the ages of the children.

"Another document from old Madison High School dated some three years later confirms the census report. Wright's name appears only once in the surviving records of his high school. In the oldest volume maintained in the school's collection—a ledger type of book entitled '1884-85—Room Four,' Wright's name appears near the end of the book, with his father's name, his address, 804 E. Gorham, and his birthdate, 'June 8, 1867.' In view of the absence of an official birth certificate for Wright, the notation in the old school files, recorded during his teens, is possibly the oldest extant notation of his actual birthdate, since the corresponding census notation gave only his numerical age. The date in the school records was likely given to school officials by his parents upon the son's enrollment or by himself at their instructions.

"A third document of Wright's Madison period, the record of his parents' divorce proceedings, also

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Cover

A bit of Cumbernauld circulation—people and cars go their separated ways.

confirms the 1867 date. 'The plaintiff further shows that the parties hereto have three children, the fruit of their marriage,' it stated, 'whose names and ages are as follows: Frank L. Wright, 17 years. . . . Listed by his father, under oath, as being 17 on June 8, 1884, Frank Lloyd Wright would, therefore, have been born June 8, 1867.'

The College Days: The Hines article, which will be reprinted in its entirety in the December issue of the *Journal of the Society of Architectural Historians*, also clarifies some of the confusion which has existed regarding Wright's tenure at the state university. In two books, his *Autobiography* and *A Testament*, Wright claimed that he had neared graduation.

"Such appealingly wistful recollections unfortunately do not square with the facts," Hines points out. "Wright attended the university for no more than parts of two academic years and received grades in only two courses. Admitted in January 1886, Wright by his own count would have had to remain at the university through at least 1889 or 1890, or, if leaving in 1887, would have had to enter the university as early as 1883 or 1884. Both possibilities are completely contradicted by solid documentary evidence."



His First Job: It is interesting to note, too, that while on the Madison campus, Wright was employed by Allan D. Conover, professor of engineering, as a part-time assistant. Science Hall, shown here as it appeared about 1890, was the first building on which Wright worked. Begun in 1885 and completed two years later, it was one of the first to employ steel beams.

As Hines explains, "The young man's appreciation of Conover was one of the few positive influences he acknowledged experiencing during his undergraduate years." Be that as it may, he accepted an Honorary Doctor of Fine Arts from Wisconsin in 1955.

ROBERT E. KOEHLER

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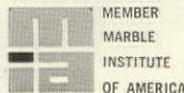
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Newslines

Convention Gives Approval To Octagon House Sale; New HQ Designs Unveiled

For Charles M. Nes Jr., FAIA, it was "a good going-away present." The gift: approval of the sale of the Octagon House to The American Institute of Architects Foundation.

In unanimously sanctioning the sale, key feature of the Institute's expanded building program, delegates to the AIA's 99th convention completed a two-step approval procedure begun last year in Denver.

Himself a key figure in the building program, Nes drew personal satisfaction from the action which came as he stepped down from the Institute presidency.

Succeeding Nes, of Baltimore, toward the close of the May 14-18 New York convention—the attendance at which exceeded by 1,000 the previous high—was Robert L. Durham, FAIA, of Seattle.

And to succeed Durham by virtue of his election as first vice president is George E. Kassabaum, FAIA, of St. Louis, who along with Dean F. Hilfinger, FAIA, of Bloomington, Ill., candidate for treasurer, emerged victorious from contested races.

New designs for the AIA Headquarters were unveiled and appeared to win the delegates' wholesale endorsement. The designs already had received the unanimous approval of the Institute's Board of Directors. The funds campaign enabling the sale and restoration of

The August AIA JOURNAL will carry a full report of the convention.

the Octagon and a greatly enlarged headquarters building had traveled four-fifths of the route toward its \$1 million goal.

The business and student sessions, social events and a professional program canopied under the theme of "The New Architect" generated a total registration of 5,120 and a corporate membership registration of 1,738, easily outdistancing Washington's 1965 combined Pan American Congress of Architects/AIA Convention.

Change and Smallness: If the portrait of the new architect could

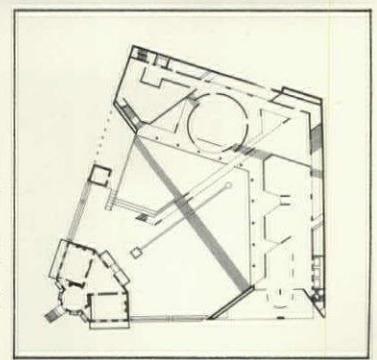
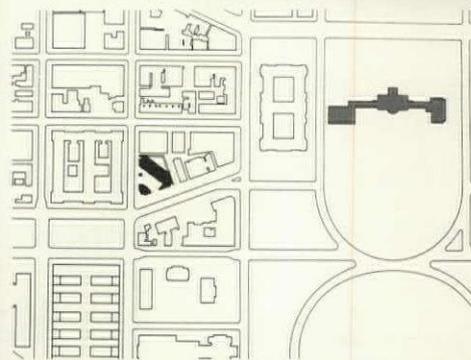
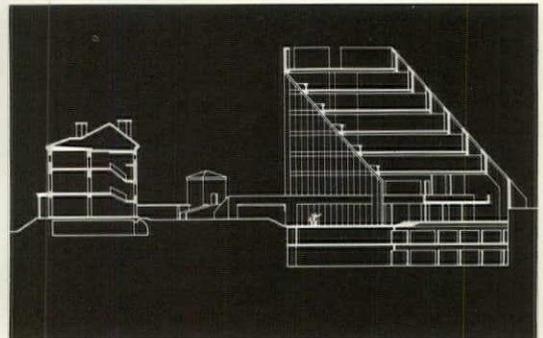
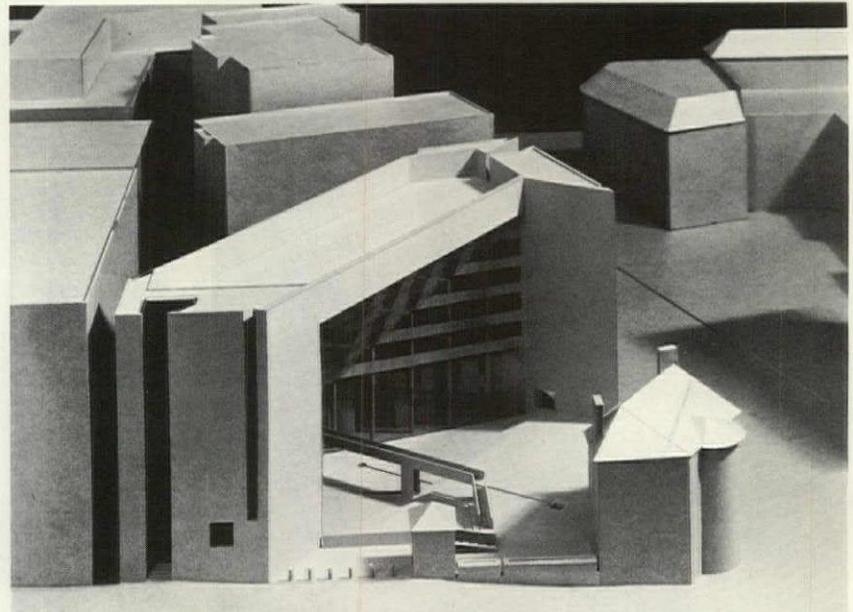
not be drawn beyond misreading, the principal characteristic of his new world could. Change. Accelerating change with attendant mysteries.

Notwithstanding all the portents of a more complex, challenging and fast-paced professional environment, President Durham calmly told a press conference gathering

that he is convinced "the small office will survive."

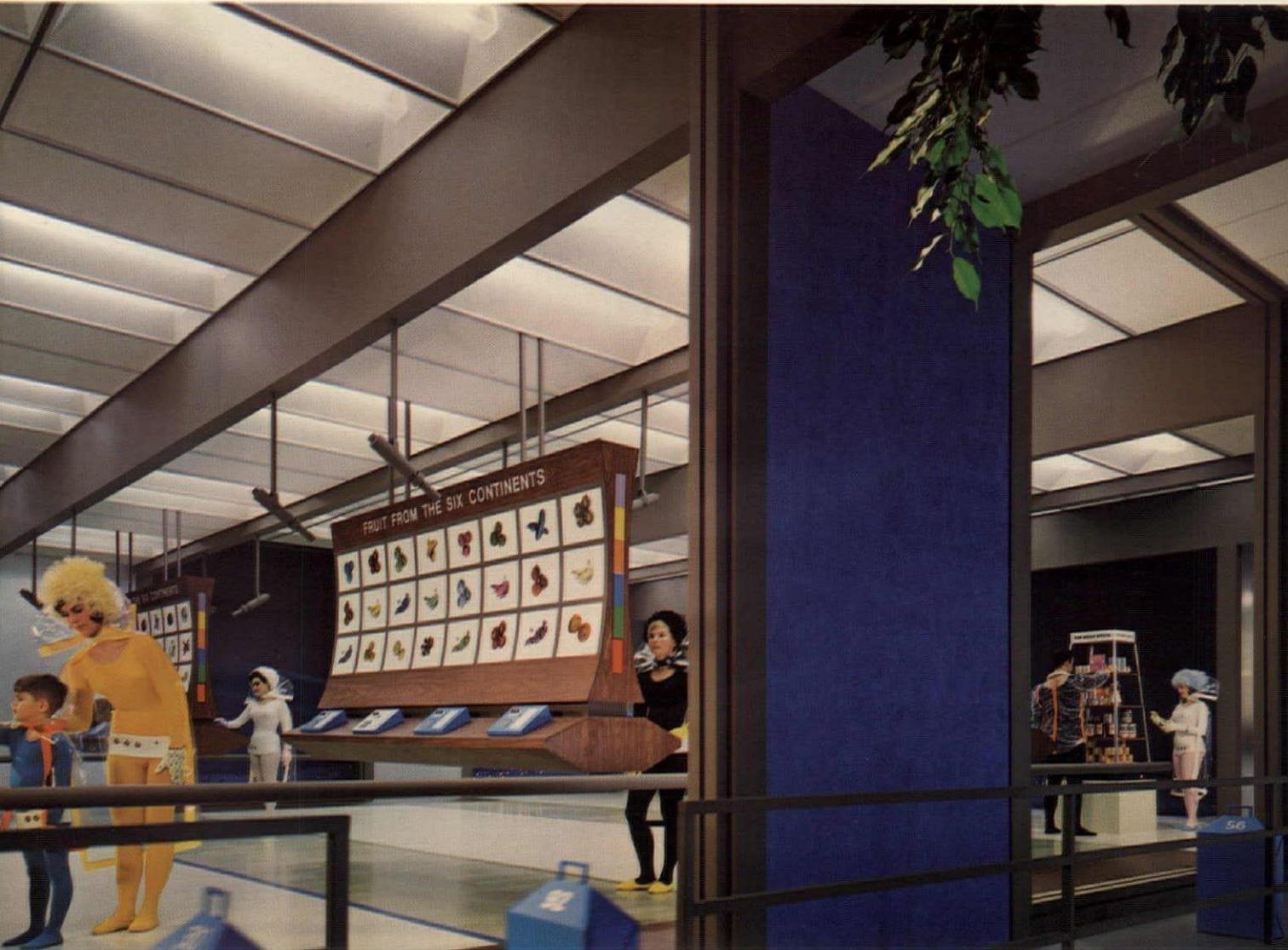
But to "find out what can be done," he said, the profession will have to pool its resources so it can boost its ability to compete in an age of sophisticated methods and hardware. If computer technology offers benefits to the profession,

Continued on page 8



New headquarters design, from top clockwise: model's five office floors above two-story exhibit area step forward; section through the building on axis with Octagon House; again, axial relationship and first-floor plan with reception, exhibit, workroom and auditorium spaces; the neighborhood, with White House at right; view of main entrance, northeast glazing for office floors.

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he said, then maybe it ought to be made available to the entire profession.

"Conceivably, the AIA chapter office could have a computer room and staff," Durham ventured.

During his year at the helm, Durham said, he will stress public relations, a two-way communication with the membership and the development of practice aids.

The convention's inaugural speaker and Purves Memorial lecturer was the educator, author and communications theorist, Dr. Marshall McLuhan. Theme speakers were Dr. Harold Taylor, educator and author, "Education and the Future of the Profession"; Charles Luckman, FAIA, "Practice"; New York Mayor John V. Lindsay, "Design"; and astronomer, science fiction writer, lecturer and inventor, Arthur C. Clarke, "Technology."

A business session item that drew from delegates both sharp criticism and eloquent defense was a proposed bylaw change introduced in response to requests at Grassroots meetings. It would have empowered chapters to admit practitioners in other design fields as "professional affiliates."

Substitute Introduced: Debate ended only with the introduction of a substitute measure by Morris Ketchum Jr., FAIA, a past president of the Institute.

The Ketchum measure charged the board with the responsibility for a thorough study of the affiliate question and a report to the 1968 convention.

Opponents of the affiliate idea said it would create a "split-level membership" and cause the public to regard affiliates as architects—due to confusion stemming from their Institute status.

Defenders advocated chapter option, and several praised membership widening as consistent with the design team trend.

On another matter, delegates voted 410 to 213 to change the Standards of Professional Practice, eliminating a prohibition against architects working for nonarchitects who offer architectural services, and substituting a requirement that no AIA member shall be employed by an individual or firm whose practices are inconsistent with the AIA Standards.

The action was taken to clarify the Institute's policies with regard to members employed by non-architects.

Nes said by adopting the new

provision the Institute served notice that "it welcomes into membership any registered architect who agrees to abide by AIA's Standards of Professional Practice."

The Way Cleared: The approval of the sale of the Octagon to the AIA Foundation clears the way for the construction of the new headquarters. The foundation was established in 1942 to handle gifts and legacies for research and educational purposes.

Its members are the officers and directors of the Institute, who appoint the foundation's trustees.

By using the property flanking the Octagon garden and occupied by the present headquarters, along with the adjacent Lemon Building



The Institute's new president, Robert L. Durham, FAIA, at lectern.

property purchased as part of the program expansion, a larger and freshly designed building was made possible.

The new \$4 million building will provide more than 130,000 square feet of floor space; the original design competition called for approximately 70,000 square feet.

The models and drawings architects Mitchell/Giurgola, Associates presented showed what they called a building order that "develops naturally from the conditions of the site and from the exigencies of the program."

It is a building order that would be "ambiguous and incomplete in itself" were it not "clarified and completed by the presence of the Octagon House, by the reassertion in the planes of the building of the geometry of the Octagon and by the space of the garden that is made by them and joins them into one building composition."

Principal Differences: In addition to the gain in floor space, the principal differences in the design

are in the handling of the facade that will provide a backdrop for the Octagon—the Octagon, indeed, will stand at the footlights of a proscenium arrangement—and the provision of a single main entrance to AIA functions and to office floors from New York Avenue.

Above the two-story exhibit and conference area, five office floors successively step forward over the garden space. The architects said that this transposes the building alignment from the property lines to a line perpendicular to the main axis of the Octagon.

The projected configuration of the seven-story, reinforced concrete building that results from the transposition "makes the space of the garden, develops the maximum area for the garden and shields each floor from the direct rays of the sun to the southwest." It also introduces northeast light to all office floors.

Construction of the building, to be faced in Octagon-like brick, is to begin in about a year, it was reported.

The AIA Foundation, which is receiving the fund-drive contributions, will restore the Octagon and its garden at a cost of some \$350,000. The appraisal price of the house is around \$600,000. Its sale enables the Institute to increase its equity in the headquarters venture.

Tops for Response: The "Practice" theme session appeared to produce the greatest audience response. Luckman told his peers that "architects will be set back 100 years" unless the word "design" is integrated into total practice.

"Actually, architects today are sharply divided by two schools of thought. One believes design is all-important, an overriding influence, with construction costs and engineering function secondary. I cannot, and do not, subscribe to this," Luckman said.

Luckman, who in the words of Nes "has more practice than the rules should allow, went on to say:

"The second school believes that while design is of utmost importance, it must be a partner in the total concept. It must be brought into focus with the total process of architecture which includes design, fine arts, engineering, construction and the economic elements of the project. To this I must, and do, subscribe with all my heart."

The theme speaker warned that "we must never permit ourselves to be boxed in by the narrow view-

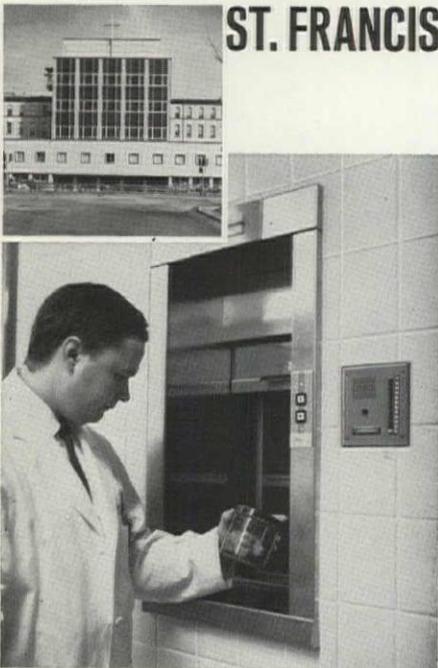
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Newslines from page 13

"Our commitment to design," said the latter, "transcends the design of a few richly conspicuous buildings. . . . It mandates a design quality that will carry through all sections of government, and as far as possible, through the private sector as well."

Rockefeller was present for both opening and closing convention ceremonies, the latter being the Annual Dinner at which his friend and longtime associate, Wallace K. Harrison, FAIA, was presented the Institute's richest honor, the Gold Medal.

The Governor, accompanied by Mrs. Rockefeller, said Harrison "possesses that rare ability to combine human values—the worth and dignity of the individual—with the beauty and form of architecture and with the function and cost of buildings."

He called Harrison "a man of great modesty, of deep humility; and yet, a man of vast imagination and a clear vision of the kind of world we want to create."

Earlier in the evening, Victorine du Pont Homsey, the only woman architect among 82 members received into the College of Fellows, was given a standing ovation from the crowd that filled the Grand Ballroom. And four of the five foreign architects on whom Honorary Fellowships were conferred came to New York for the occasion.

Vietnam Protest Meeting Held During Convention

A special kind of architects-at-home party was held on an AIA convention evening set aside for at-home parties—but this one was concerned with war.

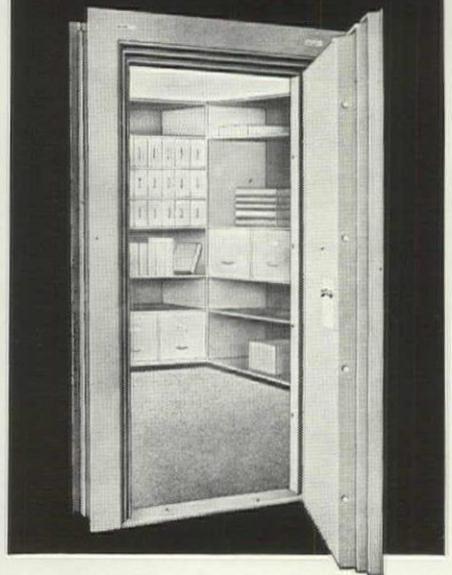
Held at the Warwick Hotel, hard by the Hilton headquarters of the convention, the event was attended by some 350 persons responding to an open invitation from the Committee of the Planning Profession to End the War in Vietnam.

Since the attendance was greater than expected, many stood to hear speeches objecting to the war on two grounds.

The first, the moral objection, was summed up by Percival Goodman, FAIA, Columbia University School of Architecture professor, who said: "I have come to the conclusion that we are not our brothers' keepers; rather we are our brothers' brothers."

The second objection was eco-
Continued on page 20

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conomic and the speakers declared that vast social programs could be carried out with the money being spent for war.

Other speakers included Mario Salvadori, also a professor at the Columbia School of Architecture; Christopher Tunnard, chairman of city planning at Yale University; and Sibyl Moholy-Nagy, Pratt Institute professor of history.

The Committee to End the War is a nationwide group of 600-plus architects, engineers and city planners which was formed late last year and has taken out "open letter to the President" advertisements.

Socio-Physical Conference Told Much to Be Learned

Social scientists have yet to find many of the answers to human behavior, architects were warned at the first Conference on the Socio-Physical Environment, held in New York the day after the May 14-18 AIA convention.

Raymond Studer, professor at the Rhode Island School of Design, made the warning, and Dr. Robert Beck, a clinical psychologist, said that one reason for the limited knowledge of interest to architects is that psychology has concentrated on interpersonal rather than physical relationships.

"Until psychology returns to the physical world and architecture returns to man, no meaningful dialogue will be possible," Beck said.

About 40 persons attended the conference, planned as the first of an annual series and sponsored by the AIA Committee on Urban Design.

A specific research proposal on the social impact of the environment was described by William Michelson of the University of Toronto and the Ontario Institute for Studies in Education.

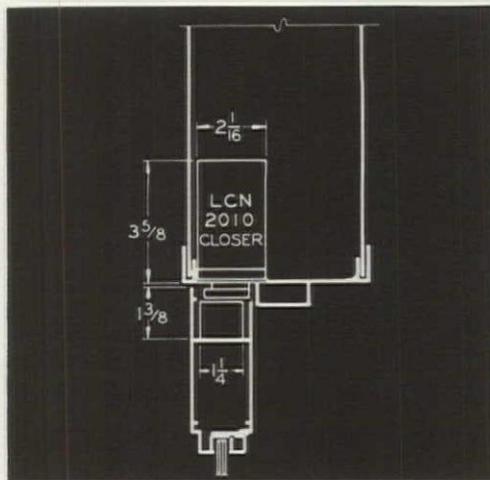
He would have a study of new residents in four different residential environments to ascertain such points as the extent to which a particular environment tends to attract a certain type of resident and the extent to which people live as they had planned.

The need for architects and behavioral scientists to join forces in planning the physical environment was stressed during the conference, but the two disciplines will first have to understand each other, several panelists noted.

Studer, while cautioning archi-

Continued on page 24

LCN for modern door control



Detail at head for LCN overhead concealed closer installation shown in photograph

Main points of the LCN 2010 series closer:

- 1 Provides efficient, full rack-and-pinion, complete control of the door
- 2 Fully hydraulic, with highly stable fluid giving uniform operation over a wide range of high and low temperatures
- 3 Easily adjustable general speed, latch speed, back-check and spring power (may be increased 50%)
- 4 Closer arm disappears over door in closed position
- 5 The basic 2010 series closer is available for use with doors hung on butts, center pivots or offset pivots. Regular or hold-open arm.

Full description on request or see Sweet's 1967, Sec. 16e/Lc



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A Division of Schlage Lock Company

Canada: LCN Closers of Canada, Ltd.
P. O. Box 100, Port Credit, Ontario

PHOTO: Troy Municipal Building, Troy, Michigan;
Frank Straub & Associates, Architects.



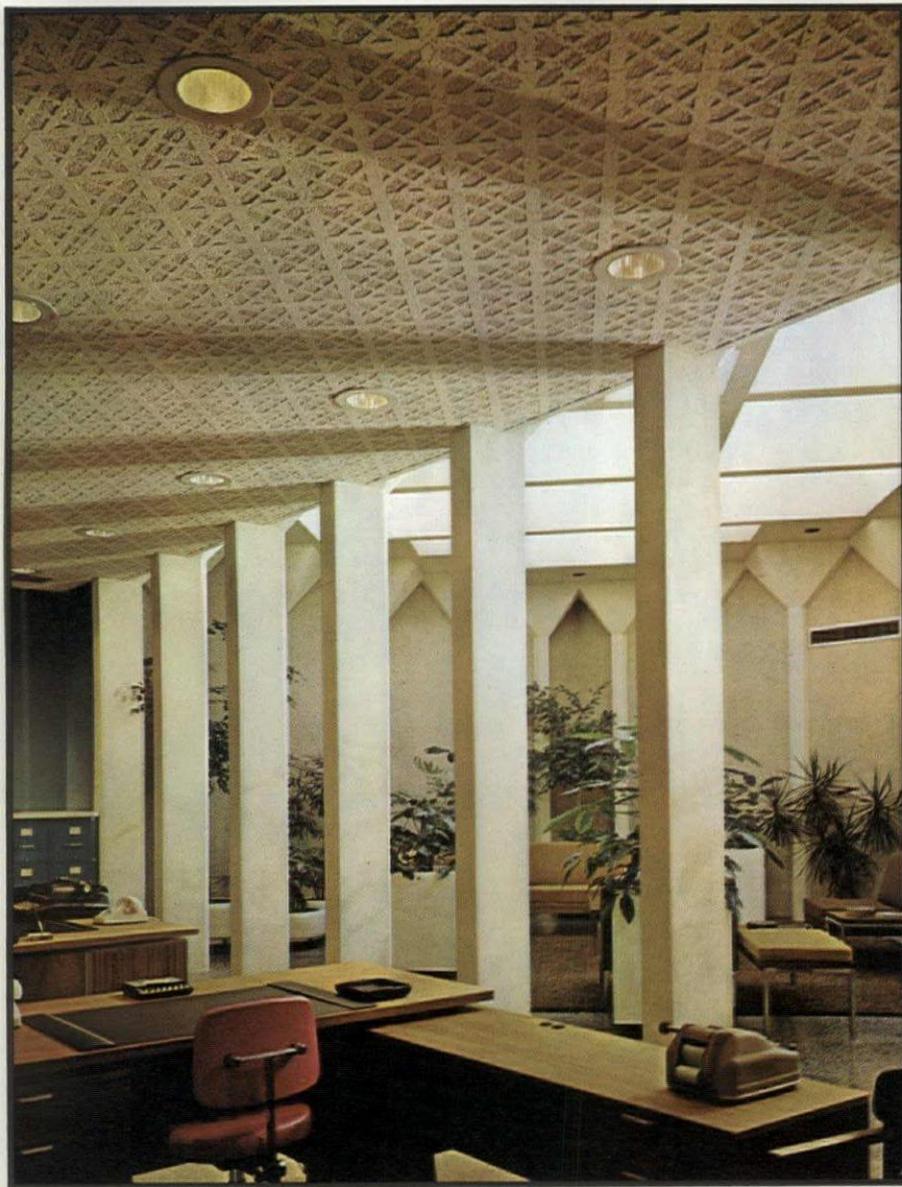
ROY MUNICIPAL BUILDING



"THE INTERIOR OF THE PANTHEON" BY GIOVANNI PAOLO PANINI, NATIONAL GALLERY OF ART, WASHINGTON, D. C., SAMUEL H. KRESS COLLECTION

Beauty that endures

Ceiling of the Pantheon, A. D. 120—124,
reign of the Emperor Hadrian.



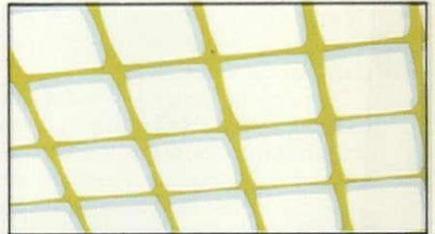
Design for Enduring Beauty with Conwed® Ceiling Products

The dome of the Pantheon is a classic example of a ceiling that combines several functions. The 28-foot diameter opening in the crown achieves both lighting and ventilation with integrated beauty.

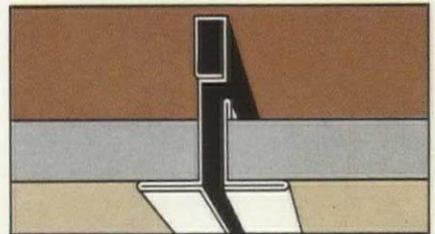
Today, a designer using *Conwed* ceiling products can accomplish a multitude of objectives... sound control, fire protection, air distribution, lighting... and can do so at no sacrifice of the original design intent.

Consider the Crounce Corporation Office Building, Paducah, Ky., shown above. Here, architects Lee, Potter, Smith & Associates, have selected *Lo-Tone*® mineral Trafalgar design tile from the *Conwed* product line. They have blended ceiling design with proper lighting... and with the desired acoustical properties for this particular application.

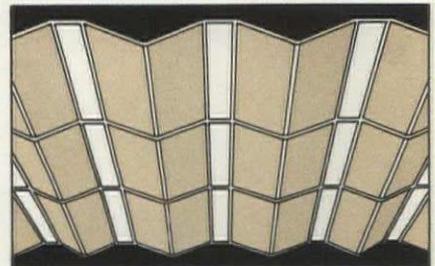
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Dimensional Depth in Lighting The *Conwed Modulux* system is dramatic. It's designed to reduce room noise, while the double panel lighting diffusers hide dust—cut maintenance costs. Ideal for entire ceilings or bays.



Efficient Air Distribution *Conwed Ventilating Grid* is the newest of the *Conwed* ventilating systems. It features a continuous ventilating channel that is unobtrusive and conceals light leaks from above. It is compatible with standard suspended ceiling dimensions.



Unusual Design and Lighting Effects It is possible to create a variety of vaulted ceiling designs with the new *Conwed Co-planer* suspension grid, lighting fixtures, and *Lo-Tone* ceiling board.

Information Please See our *Sweet's File AIA 39-B*. Complete product application information and samples are available from your *Lo-Tone* and *Conwed* products representative or acoustical contractor. To get your next job rolling... just give us a call.



WOOD CONVERSION COMPANY

First National Bank Building, St. Paul, Minnesota 55101

jects not to expect a mother lode in the behavioral sciences, also said designers seem reluctant to move into the behavioral sciences and attributed this to their overestimating the complexities involved.

House-Pared Model Cities Program Goes to Senate

The Model Cities program of the Department of Housing and Urban Development, after a money mauling at the hands of the House, is now in the Senate.

Appropriations for Model Cities and all other HUD programs were scheduled to undergo the consideration of the Senate Appropriation Subcommittee on Independent Offices in mid-July.

Generally, it is expected the Senate will report a bill more liberal than that of the House. Yet the House action was so decisive as to make a major change unlikely. Additionally, the continually increasing costs in Vietnam worked against government outlays untied to the war effort.

The House granted HUD's request for \$12 million for Model

Cities planning but cut \$250 million of the \$400 million sought for actual project grants.

House members said they saw no need for the full allotment because testimony indicated it would take six months to a year to prepare plans.

HUD Secretary Weaver, in fact, in House Appropriations Subcommittee hearings, had said that, "what we are trying to do now is to anticipate that period (post-war period), and we are trying to see how we can devise programs which . . . will offer us models."

If HUD's Model Cities program was subjected to some stern handling by the House, it fared less badly than the Rent Supplement program. The rent request was for \$40 million; the House refused to fund the program.

The House made the rent deletion in a role-call vote, 232 to 171.

In other HUD programs the House:

Provided \$27 million of the \$42 million sought for neighborhood facilities; approved the entire \$750 million requested for advance funding of the fiscal 1969 urban renewal program; approved \$275 of the \$290 million sought for public housing; \$40 million of the \$50

million asked for urban planning grants; recommended \$75 million, \$50 million less than requested, for grants to states and local public bodies to acquire land in urban areas for parks, recreation facilities and urban beautification; recommended \$175 of \$230 million requested for urban mass transportation grants; and cut \$15 million of the \$20 million sought for urban research.

'Experimental City' Study Funded to \$320,000 Tune

To come up with concept plans for an "experimental city" for a quarter million persons, the University of Minnesota has received a \$240,000 federal grant and another \$80,000 from private sources.

Planning for the experimental city is to be overseen by a steering committee that includes Buckminster Fuller—who said he wasn't out to sell domes—and experts in economics, sociology, city planning and related fields.

The federal money is being supplied by the Department of Housing and Urban Development, the Department of Health, Education and Welfare, and the Economic

Continued on page 28



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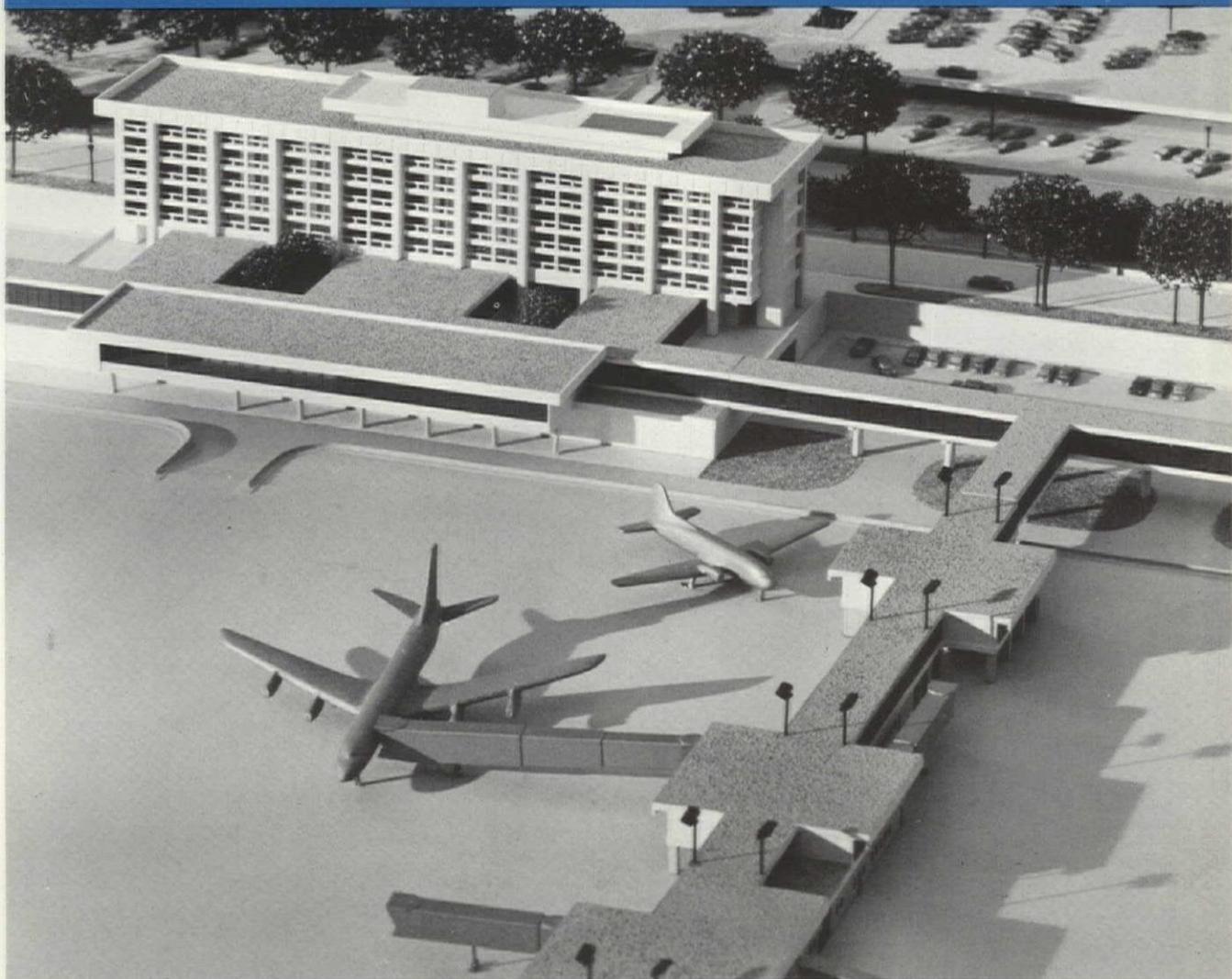


PHOTO BY LENS-ART

Q: How did this hotel, located 1000 feet from an airport runway, silence the noise of the jets.

A: With Amerada ACOUSTA-PANE[®] 40

This rendering shows how close jets come to the Metropolitan Hotel at the Detroit airport. 500 windows of glare reducing Acousta-Pane 40 (1/2 inch), provide peace and quiet for hotel guests. Owner: Wayne County Road Commission. Architects: Smith, Hinchman & Grylls Associates, Inc. Glazing by West Detroit Glass Company.

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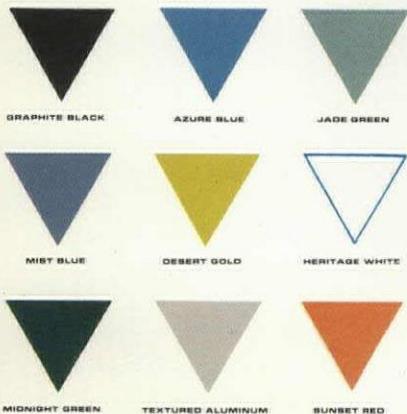
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DISTINCT



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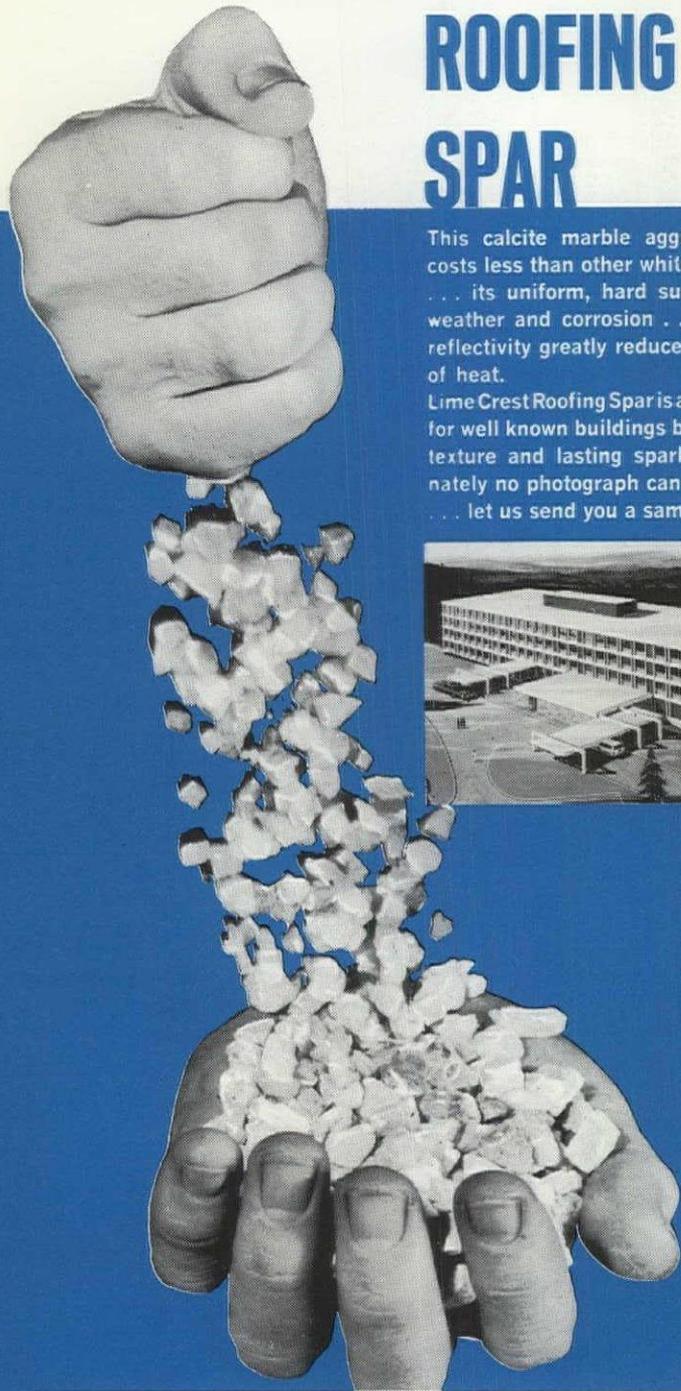
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Please send me a sample of Lime Crest Roofing Spar.

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Circle 257 on information card

Newslines from page 24

Development Administration of the Department of Commerce.

The experiment will test the systems analysis approach as well as technological, social and economic innovations. The effort will be "people oriented" rather than "real estate oriented," said a member of the steering group.

The city—which the government has not committed itself to build—would be situated well away from existing Minnesota urban centers.

The study report is expected to be made available next spring.

Specialists in Aging To Attend Institute

A four-month residential institute which will provide training in three specialties—retirement housing management, multiservice centers and milieu programming—will be sponsored by the University of Michigan-Wayne State University Institute of Gerontology in Ann Arbor Sept. 4 through Dec. 12.

The programs are directed especially to those in mid-career entering the field of housing for the aging for the first time and to those already employed in the area but who lack formal training in their specific occupations.

Details concerning entrance requirements, financial assistance, etc., can be obtained by writing Wilma Donahue, Director, Institute of Gerontology, 1510 Rackham Building, Ann Arbor, Mich. 48104.

VA Sees Fee Limitation Without Any Exclusions

That Congress should act on fee limitations and other questions concerning the procurement of architect-engineer services was borne out by a recent Veterans Administration regulation.

Under the regulation, VA will interpret the 6 percent fee limitation as permitting no exclusion from the total compensation payable to A-Es.

The fee limitation will cover all services including preliminary planning, preliminary site and subsurface investigations, consultant fees, travel costs, reproduction costs and the like.

The VA regulation came even after the General Accounting Office advised federal agencies that "present procedures may be followed" pending Congressional

Continued on page 30

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clarification of the situation. GAO urged Congress to repeal statutes setting the 6 percent ceiling.

While a Hoover-type commission on government procurement is a possibility pending before Congress, the Institute, mindful of the two-year period which the commission would require for its mission, has urged Congress to take action in areas such as the fee limitation.

The VA action mirrors recent GAO opinions, which though recommending repeal of the law, took

a hard line on the 6 percent limitation in the present statutory context.

There is some concern that other federal agencies doing construction will tend to follow suit notwithstanding the business-as-usual counsel of GAO.

The VA regulation says that the total cost of all A-E services contracted for may not exceed 6 percent of the estimated cost of the construction project to which such services apply, even though the various phases of the A-E effort are contracted for separately with the same or different A-E firms.

Design Committees Named To Advise HUD Regions

Regional advisory committees to assist the Department of Housing and Urban Development on design and planning have been created.

The committees, serving each of HUD's seven regional offices, include an architect, a landscape architect, a planner and an engineer. They are listed by regional office in that order:

New York—Ulrich Franzen, AIA, New York; Kevin Lynch, Cambridge, Mass.; Hideo Sasaki, Watertown, Mass.; and George H. Leland, Newark, N. J.

Philadelphia—George W. Qualls, AIA, David A. Wallace, AIA, and George E. Patton, all of Philadelphia; and James A. Romano, Harrisburg, Pa.

Atlanta—James H. Finch, FAIA, and Andrew E. Steiner, both of Atlanta; Hubert B. Owens, Athens, Ga.; and Clarence R. Jones, Augusta, Ga.

Chicago—Matthew L. Rockwell, AIA, Chicago; Charles A. Blessing, FAIA, Detroit; Eldridge H. Lovelace, St. Louis; and Robert B. Richards, Chicago.

Fort Worth—E. G. Hamilton Jr., AIA, Dallas; Samuel B. Zisman, San Antonio; Robert M. O'Donnell, Denver; and T. Carr Forrest Jr., Dallas.

San Francisco—Donald L. Hardison, FAIA, Richmond, Calif.; Sidney H. Williams and Robert N. Royston, both of San Francisco; and Leo W. Ruth Jr., San Jose, Calif.

Puerto Rico—Osvaldo L. Toro, FAIA, Santurce; Frank A. Molther, Rio Piedras; Hunter Randolph and Octavio R. Picon, both of Santurce.

A HUD regional administrator will act as chairman of each advisory committee and the committees will counsel regional administrators on ways to encourage and give recognition to good design on a continuing basis in all HUD programs, for which regional offices have operating responsibility.

Necrology

KENNETH M. RHODES

Whittier, Calif.

MICHAEL STILLMAN

Northfield, Mass.

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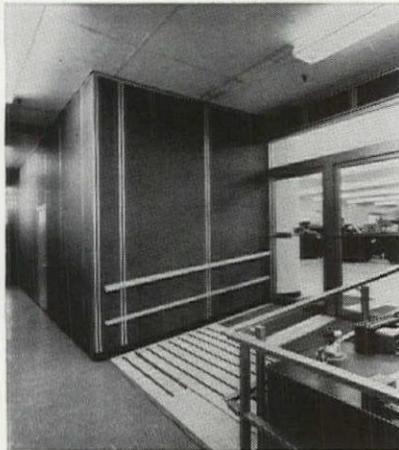
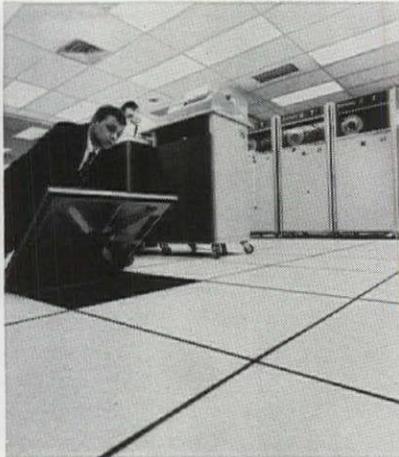
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Much of that beauty is captured in Sonoco's new booklet, "A Portfolio of Round Columns." It describes and illustrates the worldwide uses of round in ancient and modern architecture.

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Most important, the Sonotube form achieves real beauty. Like the column at the TRW Space Technology Center shown here and in the booklet.

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UNFINISHED BUSINESS

BY ROBERT L. DURHAM, FAIA
Institute President

Pooling Our Resources

If the Institute were not already in existence, we would have to invent it. The forces of today's society are such that individually we cannot cope with them. You and I, banded together in chapters, can do an effective job on local issues, but many jobs can be accomplished only by pooling our nationwide resources.

This does not detract from the increasing recognition that a large part of the AIA's public service is rendered on the chapter level—chapters all over the country are giving significant service to the public as well as the profession. The job of the Institute nationally is to limit itself to those projects and services which can be undertaken no other way.

But we "local architects" need help. In our organization's purpose "to promote the artistic, scientific and practical efficiency of the profession," we have lagged behind. The modern industrial plant makes our drafting room resemble the studio of the 13th century. Yet, the computer age is upon us.

Attention will be focused in the year ahead on programs and techniques of communication that will bring increased service to chapters and individual members. The national headquarters staff and the board members need to know more about problems, progress and projects on the local level so that the strength of the AIA can be marshalled fully.

The AIA is run by the membership, making it unique among national societies. Institute leaders have consistently sought ways in which eager individual members might contribute. We must continue this search.

Many chapters can carry out projects and share the results with all other chapters. Members of the Chicago Chapter, for example, are working with an equal number of American Bar Association members in a study of courtrooms. The Philadelphia Chapter is making significant progress in an improved program for internship. We must make full use of such contributions.

The pressing needs of the profession have to be carefully studied and pinpointed and the routes to our goals plotted. We will be required to consolidate the position, won by hard work in the past, of weeding out unnecessary activities in order to strengthen vital ones. There is no intention of relaxing our push in education, the Institute's Education Research Project, technicians' training, continuing education and a breakthrough in the teaching of environmental quality in primary and secondary schools.

But there must be new thrusts in these four areas:

1) Professionalism is under attack all over the world. We are used to competition from the unscrupulous, the package dealer and the fast-buck promoter. We may have to face even the federal government in defense of professional concepts. We can, however, defend professionalism only if we are honestly providing for the needs of society and to do this we need to pool our effort with all other professions.

2) Much of our attention this year will go into an improved program of public relations. We must first determine what this requires, then implement a unified strategy. Our effort must not only achieve a better understanding of our profession and its service but we must also team up with the public, which also means business and government, in order to make ourselves more effective.

3) Many of our most successful firms are growing in size. Their size and success is making possible the use of new tools and techniques not available to the small office. A majority of our membership, however, clings to the freedom and creative climate of the small office. And so the national society has a unique opportunity to provide aids to practice, information retrieval, up-to-date information and, hopefully, the benefits of the computer.

4) One of the greatest opportunities for improvement in Institute service is better two-way commu-

nication. While architects have too much to read and prefer to-the-point digests, we must, nevertheless, do a better job on the national level of letting our chapters know about progress and projects by national committees—and somehow we must learn to find out about local projects.

During the last two months a great deal of effort has been put into bringing harmony to our relationship with the AGC. The new 1966 General Conditions to the Contract with minor modifications is being used without difficulty all over the country. The indemnification provisions protecting both owner and architect from third-party suits arising out of safety procedures are now covered under contractor's insurance.

I expect distinct progress to be made in public relations. Much of our effort will be directed toward supplying you with tools for chapter use. Our "War on Community Ugliness" must enter new phases.

If we are to exert the leadership to which we aspire, I urge a new quality of liaison with the public from the smallest village to the capital of our country. We have given much attention to liaison with the federal government and we must now give equal attention at state and local levels.

We follow lofty motives but we must not forget to nurture the individual member, whether employee, teacher or practitioner. I feel a special responsibility toward the one and two-man office. But whether large or small, by pooling our resources, by exchanging information, by establishing reasonable limits on our professional liability, we can bring renewed vigor to our profession. By discovering new methods of production, by making the benefits of the machine available to all of us, we will be able to afford time for added civic leadership—and have more time for design.

When we lose our interest in quality and cannot give our first emphasis to design, we will not be worthy of the name AIA. □

When the carpet went down
Steve Sefchick's grades went up



The Old Schoolhouse in Palisades, New York, has one classroom. One teacher (Mrs. Pauline Lewis) and 24 students. Steve Sefchick, 9, is one of them. Steve's bright. Above average for his age. Yet, six months ago, Mrs. Lewis was seriously worried about him. Steve wasn't concentrating. His marks were falling off. Perhaps it was the atmosphere. Too much note-passing. Too much giggling. Too much noise.

Then, everything changed. Suddenly it was so quiet in that one-room schoolhouse you couldn't hear a pencil drop. What did it? Carpet. 96 sq. yds. of World Carpet. Namely,

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Steve Sefchick, a dropout? Never. Mrs. Lewis predicts he may one day be principal of a school.

Would carpet be a credit to your school? Think about it. Investigate.

Then write us: **WORLD CARPETS**

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Bright ideas

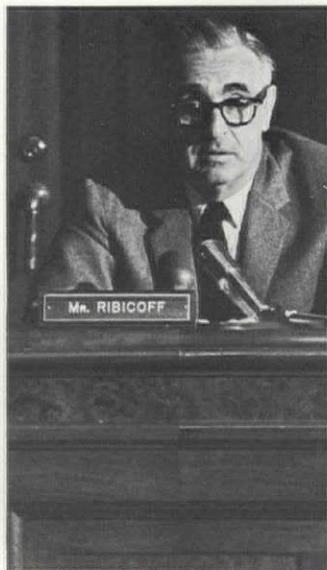


You see them here. You see them there. You see them everywhere... those thrifty, space saving Bradley Washfountains. That's because Washfountains are used throughout modern schools. In washrooms. Corridors. Shops. Gyms. Labs. Classrooms. Kitchens. Cafeterias. Faculty lounges. Dormitories. Why are Washfountains so popular? Compare them to ordinary lavs. Washfountains cost *less* to install, use *less* water, require *less* space. And they're foot operated, so they're much more sanitary. Available in the widest choice of models, colors, and compositions. Bradley Washfountains—the brightest ideas in modern schools. See your Bradley representative. And write for latest literature. Bradley Washfountain Co., 9109 Fountain Drive, Menomonee Falls, Wisconsin 53055.

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from Bradley!





From Three Emerged One 36

Exclusively presented, the report of the jury for the R. S. Reynolds Memorial Award for Community Architecture, covering:

- *Stockholm*—strong at a metropolitan scale
- *Tapiola*—great in social concepts, buildings
- *Cumbernauld*—in urban design, the greatest!

Budgeting of Probable Costs 59

When properly used, the budget can become a stimulus rather than a limitation to design—another in the Creative Cost Control series

A Whole New Approach 64

The AIA suggests to the USA that it rebuild itself through a radically new process; and a senator solicits the views of an urban design panel

Expressing Educational Requirements 71

A school building is only as good as the communication between the educator and the architect

Making a Model River 76

A preview of the Potomac Planning Task Force report indicates some new regional guidelines

It is a rare and wonderful thing to find a building material manufacturer who thoroughly understands the world of architecture, how it is developing and how to help promote that development.

For more than 10 years, the Reynolds Metals Company has co-sponsored, with The American Institute of Architects, a yearly international award to the architects who created the most worthy building utilizing the company's product—aluminum. About two years ago, the firm decided to add another, broader-based international award.

After consultation with the Institute, it was decided that this award would be given every two years to that group of architects who had produced the best example of community architecture whether it be a new or redeveloped city or a satellite community. Community architecture was defined as a practical basic solution for the fundamental social, economic and political needs of a given community, now and in the foreseeable future, expressed in significant terms and either completed or sufficiently complete to demonstrate clearly the architectural achievement involved.

Like the previous Reynolds Award, the amount was set at \$25,000 and the jury was appointed by the Board of Directors of the Institute.

Unlike that award, the jury was empowered to examine the worldwide scope of urban design in order to select nominations, then to narrow its choice to a final two or three examples, and, finally, to visit these examples in order to make a thoroughly informed final decision. It was also left to the winning group to decide how to utilize the financial award. Furthermore, the use of aluminum was not made mandatory.

The jury for the 1967 R. S. Reynolds Memorial Award for Community Architecture — Archibald C. Rogers, FAIA, John Fisher-Smith, AIA, and myself—was mindful of the requirement "to put prime emphasis on architectural design regardless of the size of the community and the variety of uses provided for." No "paper plans" were eligible.

We reviewed more than 20 significant examples of executed urban design located throughout the world, including existing metropolitan areas under development, new satellite towns and new major cities, then selected two or three for final consideration, and after that visited each of these towns or cities before arriving at a final decision.

Our task was not an easy one! It was only after long and thoughtful consideration that we decided, *first*, to restrict our choice to the Western World of Europe and North America, and, *second*, to narrow down that choice to three urban communities in northern Europe—Stockholm, Sweden; Tapiola, Finland; and Cumbernauld, Scotland. After that, it was still very difficult to make a comparative decision between a large metropolis, a loose-knit, garden-type satellite community, and a compact urban unit. After much down-to-earth discussion, it was decided that the brilliant urban architectural achievement of Cumbernauld was the most significant cur-

rent contribution to the art and science of urban design in the Western World.

By a remarkable and happy coincidence, Princess Margaret of Great Britain dedicated the town center of Cumbernauld on Thursday, May 18, 1967, on the same day that a formal announcement of the award was made at the Annual Dinner of The American Institute of Architects at its convention in New York City. This announcement included the decision of the architects of Cumbernauld and their allied professionals to found a scholarship in urban architecture which would enable a British citizen to undertake graduate study in the United States.

This award is a timely one!

No longer are architects chiefly concerned with the design of individual buildings. Instead, they are once again expanding their horizon to include interrelated groups of buildings, the spaces around and between these buildings, and the neighborhoods, communities and cities of which they form a vital part. Architecture, today and tomorrow, is and will be an environmental architecture.

Right at home, the two most urgent questions facing our country are, *first*, what to do about our cities and, *second*, how to do it. Most of the time we are answering these questions largely on a trial-and-error basis. Whatever our talents and opportunities may be, it would seem logical to supplement them by a searching analysis of other people's successes in this field, instead of learning everything the hard way.

Cities like Stockholm, Tapiola and Cumbernauld point the way whereby our hopes and dreams can be translated into practical reality.

They prove that public and private enterprise, working together, can create cities which are more than solvent, healthy, efficient, livable machines; cities where there is endless variety, surprise and delight to stimulate the thinkers and innovators who set the pace of urban living; cities which form an environment where men can truly grow with the times and truly know their fellowmen; cities which are more than battlegrounds for rich and poor, for privileged and underprivileged, for racial majorities and minorities; cities which stimulate democracy.

The architecture which serves these cities will be an architecture of controlled and balanced auto traffic, pedestrian circulation and public transportation, of urban neighborhoods where close-knit building groups add diversity and spice to living, of well-organized satellite cities within easy reach of nature and revitalized countryside.

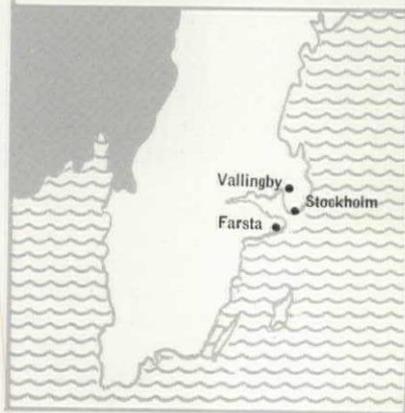
The means are at hand!

The wealthiest, most powerful nation on earth is fully capable, in terms of technical knowledge, professional planning skills and collaboration between business and government, to produce the world's most livable cities.

All of us must work together to achieve this goal!

MORRIS KETCHUM JR., FAIA
Jury Chairman

Stockholm



Stockholm enjoys a level of metropolitan planning achievement of the highest order, one probably unequaled anywhere else in the world.

Here is a modernized metropolis planned as a single entity for a population of 1.23 million in 1965 and 1.7 million in the year 2000. Its planning concepts, site development and total achievement form a striking example of intelligent urban development.

The Site: Stockholm consists of an inner city, including the original ancient city on an island in the har-

From

**For America, three lessons from Europe:
Stockholm, Sweden; Tapiola, Finland; and Cumbernauld, Scotland,
each saying something different, each
"significant in its own right."**

**From this lofty triumverate would come
the winner of the first R. S. Reynolds Memorial Award
for Community Architecture—Cumbernauld,
a new town which "holds great significance" for the profession
and for community architecture,
said the jury in its report. Holding great significance, too,
and presented here, is the jury report itself.**

bor, and more recent development on the adjacent islands and mainland. Surrounding the inner city is the Greater Stockholm area.

The site of the original city was chosen in the 13th century as a fortress to protect a single inlet from the Baltic to a great inland waterway system. The old "City of Stone" in the center and the numerous lakes and waterways give Stockholm many challenging planning problems (including some 40 bridges) but at the same time provide the discipline and natural beauty that has led to such success.

City Planning Policy: The present city planning office has been in existence for 330 years. It is no wonder that lessons have been learned, one of which gave rise to a policy that allows the city to buy lands in areas where development is desired—before plans are completed.

This farsighted policy permits the city to plan for its own expansion while enjoying sound and controllable fiscal advantages. Benefits from the so-called unearned increment in land values can be used to finance the necessary public works and development costs.

Objectives: During the last 15 to 20 years the major thrust in town planning and development has been directed toward renewal of

the downtown core area; planning and construction of comprehensive metropolitan rail rapid transit and highway systems; and planning and completion of 18 new communities having a total population of 250,000 with five more under construction.

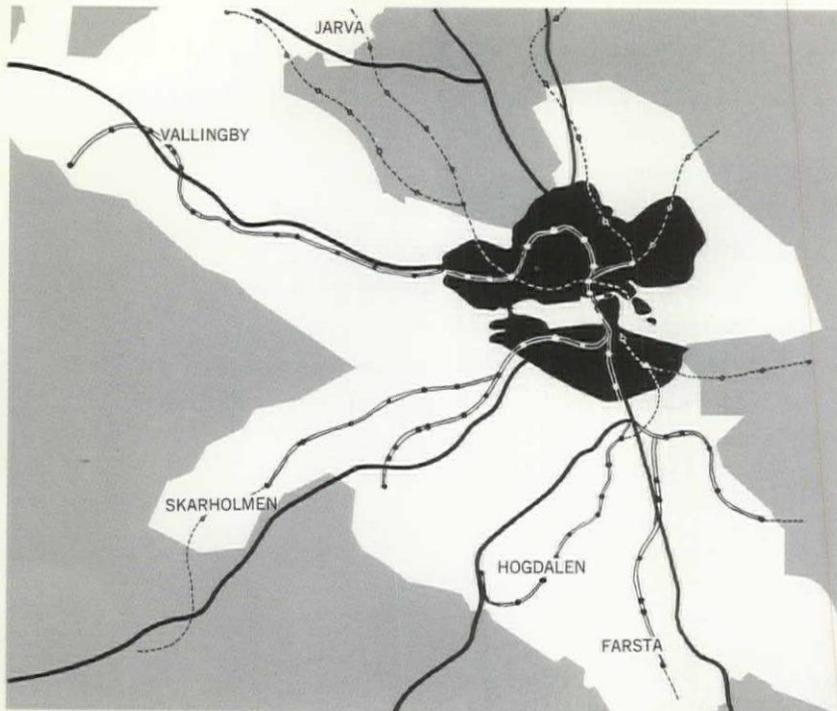
These major activities are based on the following objectives:

- To preserve as intact as possible the very beautiful old parts of the inner city, the City of Stone, with its palaces, parks, bridges and some of the historic narrow streets.
- At the same time, to revitalize the core area by providing the modern facilities needed and allowing for the growth of central business, institutional and cultural needs of a major metropolitan city.
- To limit the geographic growth and population of the inner city by providing new satellite towns for present and future growth, thus preventing urban sprawl and its resulting blight.
- To define the old city and its satellites by greenbelt open spaces in which building is precluded and recreation is encouraged and developed.
- To provide employment opportunities in the satellite communities primarily in services, office work and light industry.
- To provide each satellite with its

own multipurpose town center, including shopping, cultural, administrative and recreational activities—all scaled to appropriate size.

- To concentrate major large-scale activities of this type in the redeveloped downtown core.
 - To install an effective rail rapid transit system so that residents of every urban community can enjoy the facilities of the entire Greater Stockholm area for work as well as recreation and culture.
 - To provide an adequate expressway network to handle growing traffic needs. (Sweden has the highest rate of private car ownership in Europe; it is a rate expected in the near future to reach the US level.)
 - To focus the entire transportation system on the downtown core.
 - In addition to the foregoing internal metropolitan planning objectives, to link a ring of existing and new outlying cities and communities to Greater Stockholm by converting segments of the existing national railroad system to rapid transit service which, in turn, is to be interconnected with the rail rapid transit system of Greater Stockholm.
- These objectives and their implementation are the fruit of a prolonged city planning effort under the directorship of Sven Markelius

Three Emerged One



Highways (dark) and transit lines (with extensions and stations indicated) link inner city (dark) with new districts inside city limits (white).

in the 1940s and the current director, Goran Sidenbladh, author of the 1952 Master Plan for Development.

Besides the city planning program, the major part of which is conducted on city land, Stockholm has an active regional planning section. The regional plan was accepted in 1958 by the 46 municipalities in the region.

Urban Design: The urban design resulting from these objectives appears to have been influenced by two factors: a strong commitment to industrialized building (using prefabricated elements) as a device for creating a large number of housing units each year at low construction cost; and an acceptance of some aspects of the garden city philosophy although densities are such as to produce increasingly urban environments in the newer satellite towns. This philosophy is apparently consistent with Swedish tradition.

The satellite communities are designed as units to accommodate about 25,000 people with well-articulated pedestrian ways separated from vehicular traffic. The pedestrian radius from outlying dwellings to the town center ($\frac{1}{4}$ to $\frac{1}{2}$ mile) determines the geographic area covered by each such satellite.

Despite a popularity of detached houses, the vast majority of dwellings in these satellites is made up of apartments — from low-rise walk-ups to multistory towers — and most of them are rental units.

This emphasis is caused by:

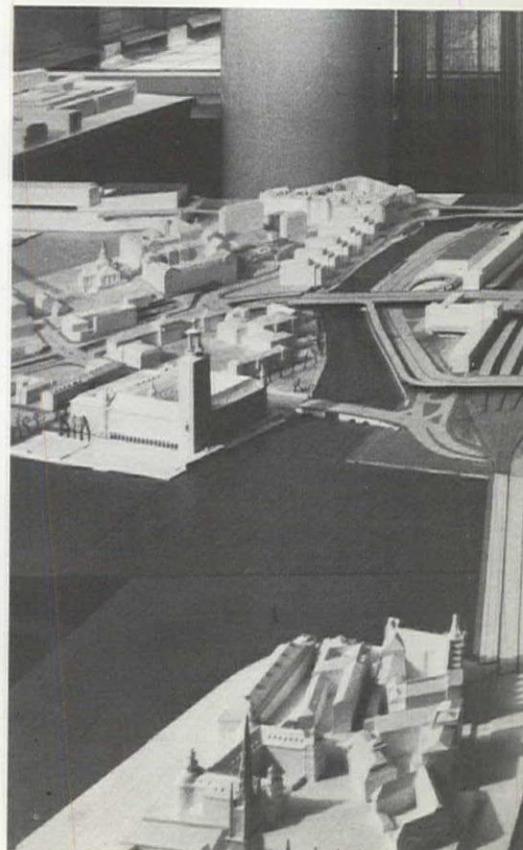
- The commitment to industrialized building which is less adaptable to single-family dwellings.
- The objective to create densities that can support the metropolitan railroad system.
- The corollary objective of preserving the greenbelts from encroachment by low-density development.
- The pedestrian radius.
- The postwar housing shortage and the continuance, since the war, of rent control.

The municipal policies of Stockholm have resulted in the city's acquisition, over many years and by private purchase, of a large reservoir of undeveloped land outside the old city. Land thus purchased is included within extended city limits of Stockholm and is used for the satellite communities.

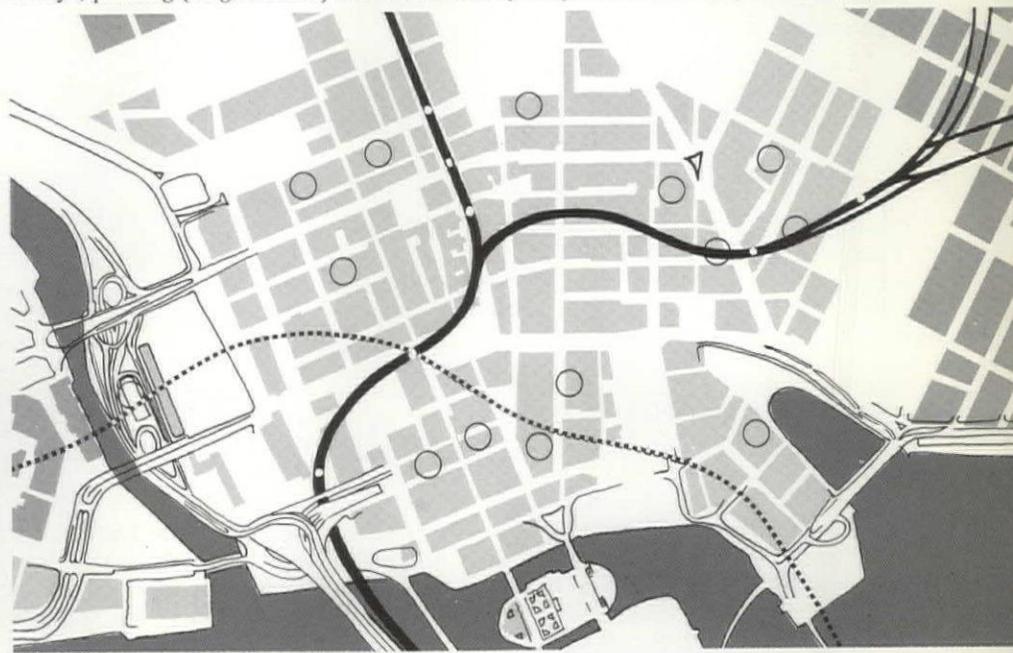
These communities, by virtue of the regional plan which focuses on downtown Stockholm, apparently are not intended to evolve into separate cities with their own governments, personalities and citizen loyalties. While each is physically a distinct town, with its own physical qualities, all are governed by the municipality of Stockholm and individual loyalties and personalities are subordinate to that of Greater Stockholm itself.

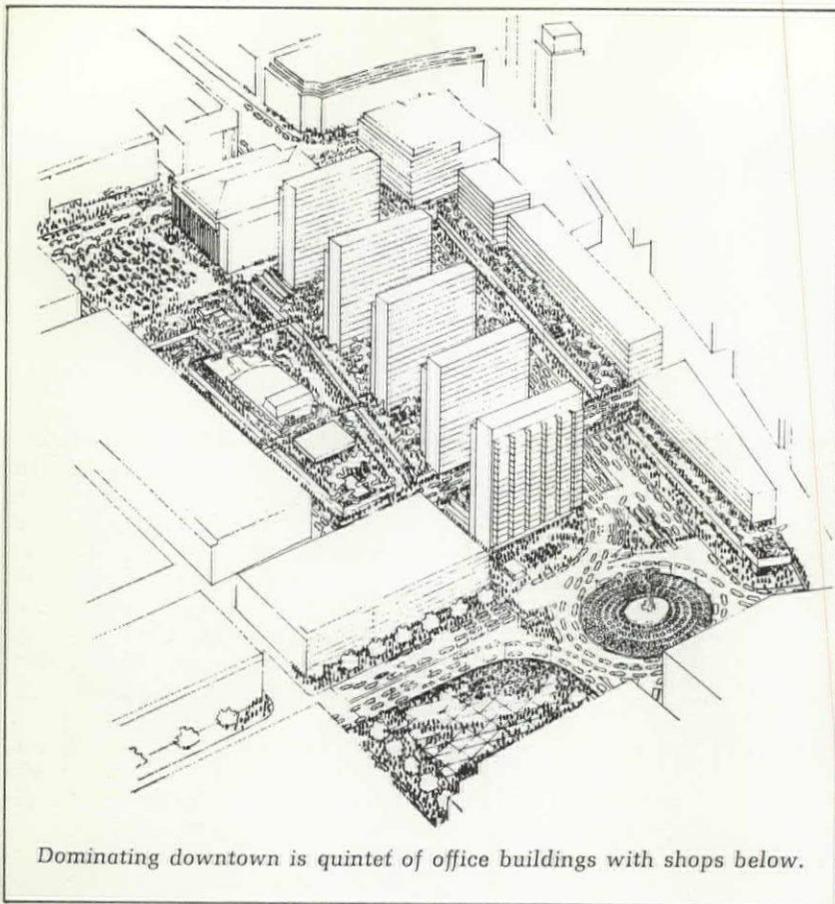
- The community centers are pedestrian islands, quite compact in their design and served by, but separated from, expressway and railway arterials.

View of Stockholm and commercial center



plan, right, with existing and planned subways, parking (large circles) and residential (dark). Below, model for huge project.





Dominating downtown is quintet of office buildings with shops below.

• The influence of climate and geography is strong. A long, harsh winter and a brief but sunny summer dictate pedestrian shelter but not enclosures which would inhibit a national tendency toward summer sun worship. Forests, hills, rock outcroppings and waterways are preserved as controlling factors in the urban design for satellite towns.

Implementation: Responsibility for planning in Sweden is left to the local municipality, much as it is in the United States. The Stockholm effort appears to the outsider to be the result of a "bootstrap" operation by a mature city.

Perhaps the most remarkable results are, *first*, that so much has been achieved; *second*, the commitment of the city to getting the job done; and *third*, the high quality of the process followed.

From an American point of view, it looks somewhat like a miracle.

But it would be a great mistake to see only the process, or only the achievement, without measuring the serious commitment.

For example, the city is currently engaged in a massive land acquisition program in the Lower Norrmalm downtown core area. In order to build new streets for modern traffic and provide the office and

institutional requirements needed in the core of the city, it became necessary to acquire 230 sites. Since Sweden is a democracy, the City of Stockholm had to propose to the Swedish Parliament the legislation needed (similar to urban redevelopment laws in the US) to get the job done.

It would also be a serious error to overlook the time schedule.

The present striking development is the crown of an iceberg of effort going back many years. The guiding principles of the downtown core development, for instance, were settled and adopted in 1946 under Director Markelius even though an important architectural competition for the area had been held in 1931-33.

In 1950 the excavation of the central subway terminal allowed the first new major element to be built in the downtown core. "Sergel's Torg," the key transportation hub and meeting place, is still under construction. Major land acquisition started in 1956 following the new Zone Expropriation Regulation of 1953 and by 1964 progressed to 120 sites.

Planning Process: The Stockholm approach might be simplified as follows:

Goals formulation—The period

in which the objectives of a certain effort are debated and the policy established. This may be 10 to 35 years prior to realization.

Analysis—The schemes are worked into economic feasibility concepts.

Physical planning—The scheme is defined in the round by the use of plaster models which are worked on concurrently with drawings and are continually revised as the concept develops.

It should be clearly stated that the economic principles alone are not the guiding element in goals formulation. Rather, the entire effectiveness of a given program is weighed against other standards—social, cultural, political.

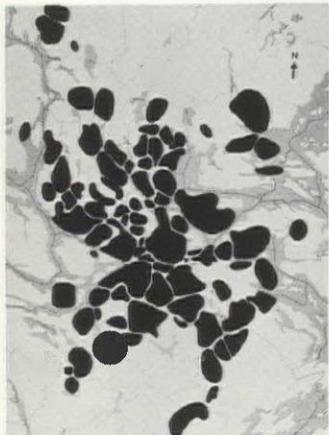
The unique quality of the Stockholm city planning effort is that it is three-dimensional planning.

In planning a new neighborhood, for example, a large-scale plaster contour model showing existing conditions is made of the entire neighborhood. The programmed facilities are represented by approximate forms, and the planning begins. As planning advances the model continues to be revised, even to represent topographic changes resulting from planned earth movement, until eventually it has been transformed to represent the final scheme adopted.

When a key element or feature is planned and a design of great merit is needed, an architectural competition is held as a way of bringing many talents to bear on the problem.

Comprehensive Approach: A significant part of the success of the Stockholm effort lies in the economic strength of the comprehensive approach.

Population centers and transportation systems are planned to complement each other; power plants, built to serve a population of 60,000, are located on waterways so fuel can be cheaply delivered, and are close enough to the hous-



Above, 1990 development pattern planned for Stockholm, and the Vallingby center. Below, a closeup scene at the center and Vallingby as viewed from its outskirts.



ing served to allow the generated by-product, heat, to be piped to the dwellings; rapid transit goes underground even in outlying areas, since experience proves that savings in land coverage offset the additional first cost to the city.

Revitalized City Core: Between 1953 and 1962, the "Haymarket" project was built over the central subway terminal, at the core of downtown Stockholm. The subway stations serving this city center have been calculated to handle 300,000 passengers a day.

The scheme includes five 18-story office shafts rising out of a two-story superblock of shops. A pedestrian mall at the street level allows free circulation and access to all facilities and to the subway. Under the mall is a large farmers' market for specialty produce items, along with parking areas and truck loading and service facilities for the buildings above. Retail tenants include movie theaters, shops and restaurants.

The jury found this project to be a strong and viable basic scheme. The architectonic solution though bold and exciting in concept is not remarkable in detailing and execution. There is no question, however, that a busy "city within a city" has been created.

Rapid Transit System: The design of the T-Bana (Tunnelbana) is based on three factors: a basic branched cross plan designed to meet engineering balance considerations (minimum installation for maximum return); the planned location and priority of 28 inner city stations; and the location and priority of stations in present and planned satellite communities.

The subway stations are well lighted and far from dingy. Ceramic sculpture and wall decorations relieve monotony and add interest.

Many different experiments have been tried with station arrangements. In the neighborhoods, the central location of the stations is



From top, model of Vallingby town center; Vallingby houses enhanced by rock outcroppings; Farsta rapid transit station, left; and family hotel in still another community, Hasselby.



remarkable; it is not possible to visualize more convenient and immediate access.

Highway System: The motorways system may be described as a spider form with radial arms serving the community centers, the arms running between the centers of population, not through them. A ring road is planned around the inner city tying together the 10 major radials.

As in the subway system, the expressways are actually tunneled under the central city to avoid wholesale destruction, land loss and rupture of the city fabric.

New Neighborhoods: The original concept of the new communities on the periphery was to provide opportunity for growth of the city through planned decentralization. There has been some misunderstanding, however, in referring to these places as satellites or new towns. The planners of Stockholm understand that they are dealing with the fabric of Greater Stockholm and that these new communities are in fact modern, planned suburbs.

It was also intended that a high ratio of local employment (job and home in the same neighborhood) would result in decentralization of industry as well as housing.

Experience has shown both objectives can be achieved (even though the rate of local employment may be low) with these new suburbs operating not as isolated villages or towns but as neighborhoods of the City of Stockholm. In the long run, this effective plan will no doubt result in a closely integrated city.

The dominant theme of the new suburban communities of Val-



lingby, Hasselby, Farsta, Hogdalen, etc., is the completely planned environment. From the air, this environment is not visually satisfying, the order not being always apparent or at least not clearly recognizable. But at the ground level one is more aware of the success of the particular experience the architects wished to achieve.

The plans are based on a town center surrounded by high-rise apartments. Three-story structures are arranged around the center to a distance of about 1,500 feet. Beyond that, maisonettes, terrace houses and single-family houses reach out to about 2,700 feet.

Pedestrian walks are completely separate from automobile circulation.

The center is planned as a pedestrian mall with shops arranged in small blocks. Typically, theaters, churches and cultural facilities are to one side of the mall area. Truck service areas in the large centers are under the mall, with a drive-through circulation system and dock facilities next to the storage area of each shop tenant.

The jury felt the architecture of the buildings was in many cases not as good as the siting and planning. Three main causes seem to contribute to this deficiency:

- Much of the housing is constructed by large, publicly-owned, autonomous building societies and is governed by stringent economic controls.
- The architect is selected by the builder who makes an independent proposal to do a given portion of the total neighborhood on land leased from the city.
- The larger companies have invested heavily in plant equipment for constructing standard building types using large components. This tends to limit variety and design opportunity as well as to make change in design less flexible. The investment in plant tends to force further repetition of the building



Farsta's main shopping center, above, and high-rise housing at Vallingby.

type even when a fresh solution might be more desirable.

The jury also felt that the overall character of the neighborhood centers is almost restricted to that of a retail shopping district. This "shopping center" quality is not inappropriate to urban function but is disappointing to the soul

since one would like to identify oneself with community social and cultural aspects as well.

It is also somewhat disappointing though revealing to note that the more recent community centers, like many American examples, suffer visually from a sea of surface parking. At Vallingby,

however, this has been overcome by adding a well-sited and well-designed parking structure adjacent to the town center.

SUMMARY

Concept: In terms of scale alone, Greater Stockholm is the most significant of the cities visited. It is in many ways the "Model City"—a prototype for metropolitan areas in this country and in Europe. It has solved with clarity and force the basic problem of metropolitan circulation with a balanced rail-highway system. It has solved with equal clarity the basic problem of the allocation of roles between the core city and its suburbs.

While there is reportedly a continuing housing shortage, this is apparently caused by prosperity—by people "queuing up" for larger and better accommodations. In an absolute sense, there is no shortage of decent housing. Thus the expanding population has been housed—and well-housed—something we have not been able to do in this country despite 30 years of governmental housing programs.

At a subregional scale, the concepts for the new towns, the town centers for the older suburbs and the retail core of Stockholm display somewhat less strength and originality. Some of the basic ideas seem to have been transplanted—not always successfully and perhaps without regard for Sweden's strong and creative traditions.

Program: The physical planning has produced demonstrable success in the economic and social results achieved. Nonetheless, while it is clear that very careful economic land use and traffic programming preceded the physical plan, it is not so clear that equal weight was given to established Swedish living patterns.

It seems apparent that single-family dwellings have a strong appeal for the Swedish family and are in the national tradition. While a conflict clearly exists between low-density development and the objectives of the open space and the metropolitan railway plans, a compromise is probably possible that would have given more recognition to this aspiration for single-family dwellings. This compromise need not go to the extent of single-family housing subdivisions so common in our country—but it could include greater use of cluster houses and townhouses.

The controlling argument against these types of units may not be their conflict with other planning

objectives; it may instead be caused by a commitment—or perhaps overcommitment—to industrialized building.

Architecture: At the scale of overall city architecture there can be no question as to the excellence of the new communities and other new components in the Greater Stockholm plan. Yet, this excellence in urban design is inhibited by instances of the mediocre architectural design of individual building elements.

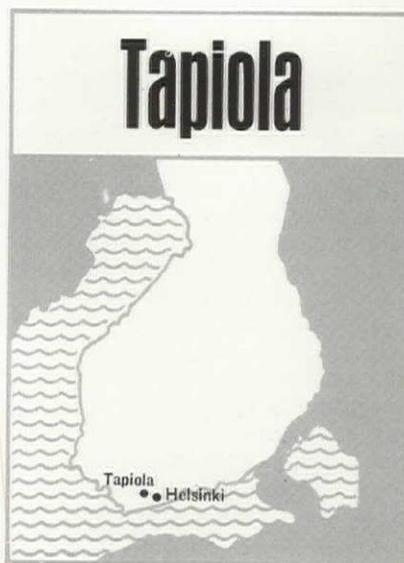
A neutral or understated architectural idiom often conduces to successful urban design—particularly where there has been, as in Stockholm, great care in the successful detailing of the circulation skeleton or streetscape. Conversely, an architectural *tour de force* in itself can be a stimulating focal point of urban design.

In Greater Stockholm's new architecture there seems, thus far, a qualitative inconsistency. Areas of neutral residential architecture (which, incidentally, seem quite in accord with the old urban fabric of Stockholm and much of the residential building completed between world wars) are sometimes interrupted by examples of quite crude design—as well as by less frequent examples of very fine design.

It is particularly distressing to see the initial development of Stockholm's new downtown core resulting in high-rise office towers of an architectural character more in keeping with the low design standards of America's speculative office buildings than with the distinguished and personal quality of earlier high-rise architecture in Stockholm.

The jury was most impressed that the basic creative work on the Greater Stockholm plan is being done by the municipal civil service and by the evident planning leadership on the part of architects both in the public employ and private practice. Their failure to carry this creative leadership through into the field of architectural building design itself seems somewhat surprising and may give some grounds to those who criticize bureaucracy.

These architectural shortcomings could, again, be due to the great emphasis on industrialized building—an emphasis which may come from political or technological objectives overriding esthetic considerations. If so, a clear warning has been sounded as we consider the possibility of industrializing our city building process.



The message of Tapiola is clearly that a well-designed city, as originally proposed by Ebenezer Howard, father of the British new towns movement, can be built today with private financing for a broad cross section of the community.

Regional Concept: Tapiola is a new town, satellite to Helsinki and sited on the Gulf of Finland about 10 miles west of Helsinki. It is designed for a population of about 17,000 which in turn will be the nucleus for a city of 80,000.

The larger new city is one of seven proposed by Asuntosäätiö (the Finnish Housing Foundation) to accommodate the population growth of the Helsinki region (Uusimaa Province). This plan assumes varying degrees of self-sufficiency in the seven new cities as well as varying sizes (from 50,000 to 200,000) in their population. It further assumes, and is designed to effectuate, a limit of about 600,000 upon the population within the Helsinki Peninsula itself.

The Seven Cities regional plan is proposed as a substitute for the official Regional Association plan for Helsinki. The latter assumes an accommodation of 1.5 million people by 1990 (a regional population

growth of 600,000 from 1960) in Greater Helsinki in which the population is to be accommodated both within the old city and within new dormitory neighborhoods in suburban greenbelts along arterial radials serving Helsinki.

Both the Seven Cities plan and the Foundation plan assume renewal of the inner city core (already under development based on Aalto's "Lakeside Plan").

The Seven Cities plan is now being implemented by the Asuntosaaatio which has acquired the land and is developing plans for the second and third of these cities—Espoo Bay for 100,000 persons and Porkkala for 200,000—both on the

Gulf of Finland to the west of Tapiola. The official plan has not been effectively implemented.

Organization: Asuntosaaatio, a private, nonprofit, beneficial organization founded by its director, Heikki Von Hertzen, is the developer of Tapiola which was begun in 1952 and is now largely completed. Von Hertzen, formerly the director of the Helsinki community fund, was able to enlist six large private organizations as founders along with labor unions and service organizations.

The aim of the founders was not only to provide housing but to create a society. To do this great care was taken with sociological aspects

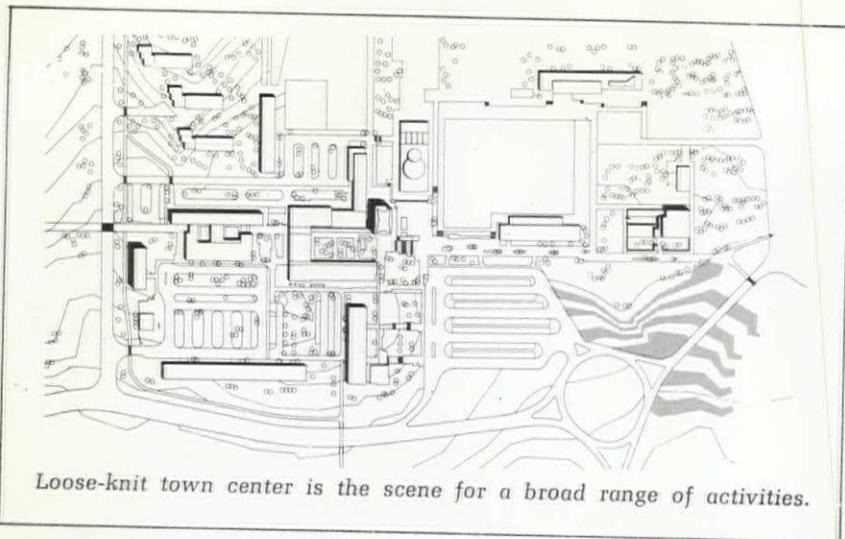
and a strong sense of community identification has resulted.

Of the housing foundation's 4,575 planned dwellings, 4,380 have been completed; and of 6,100 working places, 2,300 have been created. The population density of 57 persons per acre contrasts with 200 to 300 per acre in the Stockholm communities even though the ratio of about 80 percent apartment and high-rise to 20 percent terrace and single-family is comparable.

Tapiola is a true garden city of relatively low housing density. Of the present population, about 55 percent is white collar and 45 percent blue collar, meeting the premise of a cross-section community.

Tapiola plan seeks an accommodation with water and terrain in best tradition of the garden city concept.





Based on gross cubic measure, 50 percent of completed construction is in high-rise apartments, 15 percent in row housing and single-family houses and 35 percent in schools, industrial plants, a town center, churches, shops and service.

Tapiola is divided into a town center and three neighborhoods: East, West and North. Limited areas are set aside for light industry such as a large modern printing plant now being doubled in size.

Urban Design: Acceptance of the garden city philosophy leads to a low-density (26 persons per acre, gross) development; a suburban environmental quality and the concept of neighborhoods with sub-centers linked to the main town center itself. The philosophy accords with the tradition of Finland.

A very strong social program is the point of departure for the physical plan. The social and physical objectives are interpreted in "garden city" terms to create:

- A strongly contrasting physical environment to that existing in Helsinki—naturescape versus cityscape—with water for recreation and vistas, pedestrian safety and atmosphere. Rural fields and forests are incorporated in the plan along with gardens.
- A balanced community economically (45 percent of residents to be from the low-to-middle economic levels, 55 percent from middle to upper) and socially (artists, professionals, industrial workers and executives).
- Within the community, balanced neighborhoods — more expensive detached dwellings front on the same street as low-cost garden apartments.
- Maximum opportunities in terms of physical facilities and activities—educational, social and recreational for children, families and the elderly.

Tapiola is planned as a largely self-sufficient core city. In relation to its 4,575 residential units, 6,000 jobs are planned in all categories except heavy industry. The town center retailing functions will serve an ultimate market of 80,000 persons.

Its proximity to the capital city assumes, nevertheless, a strong linkage to job, cultural and shopping opportunities in Helsinki itself. The commuting involved by this assumption is handled by an expressway system and by buses for mass transit. Quite a low ratio of automobiles to residential units is at present recorded. There is no rail transit system.

Tapiola is privately developed under circumstances of a heavy capital shortage experienced in Finland as a result of war costs and postwar reparation payments. About 90 percent of its dwellings and mercantile units is sold to private occupants—either in fee or by condominium—in order to recover starting capital as quickly as possible. Due to this, most citizens are, in fact, stockholders in the community, and Tapiola has evolved into a self-governing, self-sufficient city with its own distinct personality.

Neighborhoods: A variety of housing types is provided consistent with the social and economic objectives. These include large and small detached dwellings, townhouses, atrium houses, garden apartments, walk-up and high-rise apartments. Costs (including land and public improvements) range from \$6,000 for a two-room unit with kitchenette to \$18,500 for a five-room unit with full kitchen. These costs include individual saunas in some instances and community saunas serving apartment buildings. If public improvements were deleted (as in the United

States) the costs would be decreased by about 7 percent.

The variety of housing is further heightened by the use of some 20 architects, each of whom produced a *different* architectural idiom.

The jury was not entirely satisfied by this approach. It was more pleased with the overall unity of a group of individual houses designed by different architects in the *same idiom* on the shore of the bay. This residential group suggests that the creativity of the many talented architects involved in Tapiola should have been directed toward variety within an overall idiom—a "Tapiola idiom."

The pleasant impression of Tapiola is the result of the careful siting of buildings in the natural environment with beautiful groves of birch, pine and fir supplemented by planting areas. This, in itself, helps to balance and compensate for the lack of architectural unity.

Town Center: The town center is a multipurpose focal point for the entire community. It has existing and planned facilities for shopping, administration, cultural events, social and recreational activities, all housed in separate building units.

In 1953 a competition was held for a town center to serve an ultimate population of 50,000 to 80,000. The winning design by Aarne Ervi deserves considerable praise for its clarity of plan, its unified architectural expression and for the mood or feeling of its execution. Unlike the Stockholm neighborhood centers, Ervi's center has achieved an urban feeling and a sense of community.

An artificial lake has been formed in the site of an old quarry. A handsome and delightful swimming hall, a church, planned small hotel, community theater, planned cultural center and library adjoin the lake. To one side is the main cen-

Sky view of Tapiola's low- and high-rise housing and town center, in middleground. At left, below, a closer look at the town center in its strikingly pronounced garden setting, and open approach to shops during busy Yule season.





ter which houses administrative offices and shops in a single point tower and a one-story shopping arcade.

The design is up to date, practical and most pleasant, but the jury felt it may have incorrectly anticipated the problem of motor traffic. Its circulation system is typical of most present-day solutions, treating the automobile in the same manner as the horse and buggy.

Circulation: A separate pedestrian walkway system has been planned for the entire town with major pedestrian "streets" leading from the center into the neighborhoods, with finger systems leading to dwellings. Its execution is marred only by pedestrian grade crossings with motor traffic arteries.

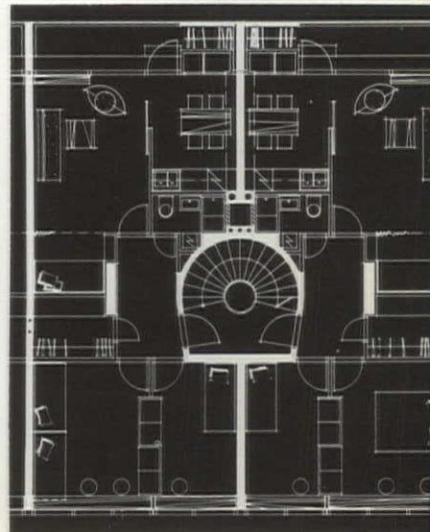
Financing: Revenues to finance the development have been derived primarily from the increase in land value and from the capitalization of power, heat and light franchises.

Individual housing groups are constructed and then sold on a condominium basis. Each resident group then has a representative voice in the maintenance and operation of the town. Rates are established per square foot of dwelling area to pay for utilities and operating costs.

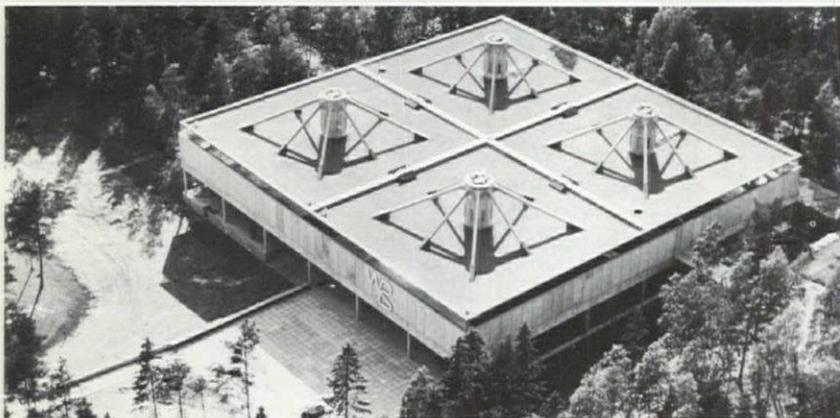
SUMMARY

Concept: The physical planning concept is that of a low-density garden city. There can be no quarrel with this planning philosophy: Tapiola without a doubt is one of the most pleasant living environments ever built with private funds, apart from purely luxury developments. It is consistent with the national tradition. It conforms to its social objectives of creating an environmental contrast to Helsinki.

The articulation of this concept, however, is somewhat weak. The plan proposes separate neighborhoods with their own neighborhood centers; separate pedestrian and



High and low, in cost and otherwise, is the great spectrum of housing choices in Tapiola. Everywhere, an appealing respect has been shown for the land; residential work is wedded to its natural surroundings. At right, a floor plan for apartments by Viljo Revell.



Work and play: an industrial plant and an indoor pool at the town center.

vehicular systems; and a major town center at the focus of these circulation systems. Yet these skeletal elements of the plan do not read clearly. While the neighborhoods are separated from one another by open spaces, their identities are not otherwise clear.

The separation of vehicular from pedestrian traffic is far from complete—a fact of only minimal concern now but one which may become a problem as automobile ownership increases.

The focal town center is not really the clear central symbol in a physical sense that the planning philosophy proposes. Thus a lack of orientation is possible in Tapiola despite the tall (and beautiful) office tower, with its lighted penthouse, dominating the center.

The town center itself, given the climatic conditions and the plan's objective of a lively, all-hours, multipurpose pedestrian heart for Tapiola, seems somewhat loose and dispersed. Its elements are separated from one another by considerable distances and there is no recognition of the need for all-weather protection.

The jury believes a more compact, but not necessarily enclosed, town center would have been more consistent with the plan's objectives and would have substantially increased the "life" in what is undoubtedly already a lively place.

Program: Perhaps the greatest success of Tapiola is in the quality

and strength of its social and economic plan and program. On this score, Tapiola is much superior to the other cities visited and holds great significance for our country in our current effort to link the disciplines of urban design, urban sociology and urban economics.

The social and economic mix of population was carefully structured in advance of the planning. The physical plan is, in one sense, no more than a tool to implement this social program. Perhaps this subordination accounts for some of the conceptual shortcomings.

Beyond the social plan and the physical plan that articulates it, there has been and is continuing a most sophisticated program of implementation involving careful selection and education of potential homeowners, a full program of cultural and recreational activities for all groups of residents and a far-higher-than-normal complement of physical facilities to accommodate this program.

These include an outdoor lake, an enclosed natatorium, a church and parish hall, a full range of school facilities, nursery facilities, youth centers, a planned concert hall, a proposed outdoor amphitheater, an art center and museum, a health center and gymnasium, a children's village, ski trails, gardens and garden allotments and a marina. This spectrum of important but "uneconomic" uses is an astounding accomplishment consid-

ering the financial difficulties faced by the developer.

Evidence of success in this social program is the fact that vandalism is nowhere apparent in Tapiola. While certainly not a major problem in any of the other cities visited, its complete absence in Tapiola is doubtless significant.

It is most impressive to the jury to note this great accomplishment and to recognize that it has been achieved by a purely private developer with slender financial resources and with no governmental support—in fact, reportedly with governmental opposition.

Although the developer, Asuntosäätiö, is a nonprofit foundation, it must operate under the same economic laws that govern other private investors. It must and has recovered its investment while achieving what may have seemed an impossible goal: a substantial increment of low-income housing while at the same time providing a unique quality and quantity of public improvements to serve the city.

Its creative economic planning and management has achieved a success which indicates that our sights could be substantially raised in this country as to what an urban environment can become. To suggest that in our case a profit must be recovered on top of the initial investment in no way changes the basic economic problems that Asuntosäätiö met and solved.

As a deliberate laboratory experiment in the creation of a living city, Tapiola must receive very high marks. It well deserves continuing study.

Architecture: Despite its disappointment in the architectural articulation of the urban planning concept, the jurors are greatly impressed with the quality of architectural building design in Tapiola. Particularly impressive to the jury is that this architectural success was achieved under circumstances of a most stringent capital budget limitation.

Cumbernauld



Scotland's Cumbernauld is undoubtedly the most comprehensive project of community architecture to date. Rarely has a group of architects and their allied professionals and consultants produced a more carefully developed scheme at this scale. Throughout the project evidence is found of devotion to the overall problem and superb skill in urban design.

The remarkable achievement of Cumbernauld is its mastery of concept. This is the direct result of a clearly understood and articulated body of design objectives forged into a total policy guiding every step of development. The forces that shaped the design policy range from political, social and economic goals through geologic and locational, climatological, practical and historical considerations.

Regional Concept: Cumbernauld, 14 miles northeast of Glasgow, is planned for 70,000 persons. It is strategically located at the intersection of two important motor arteries, the Glasgow-Stirling highway and the central trunk road from England. It is also served by the Inverness-London Railroad.

Its location was established by Abercrombie's Clyde Valley Plan which proposed this and other new towns as a means of solving the

housing and population problems of Glasgow—particularly of its depressed area known as Gorbals.

The Site: Glasgow has densities of 400 persons per acre with much of this population in slum areas which must be replaced. In the late 1940s and early 1950s it became apparent that new housing could not keep up with population trends and that a way had to be found to relieve congestion in the central city.

The new town's site of 4,150 acres is located on a ridge. It includes the nearby existing villages of Cumbernauld and Condorrat. The town's north boundary is the arterial Glasgow-Stirling road in the valley. The old village of Cumbernauld is at the eastern end near the intersection of the town's main highway with the Glasgow-Stirling road.

The Cumbernauld airport will be linked by air with Glasgow, Edinburgh and Prestwick so that excellent communications are assured for the growing industrial base.

The environs of the site are permanently zoned rural except for planned industrial areas. The site is crossed by some wooded areas and old hedgerows.

Objectives: The goal of Cumbernauld is the establishment of a new town as a part of the Greater Glasgow area. The new town is completely self-sufficient and planned to serve as a new regional center.

This goal has been substantially achieved during the last 10 years under the leadership of Chief Architect and Planning Officer L. Hugh Wilson and his successor, Dudley R. Leaker, of the Cumbernauld Development Corporation.

Housing is furnished in accordance with the political realities of Scotland; namely, low-rent schedules run from \$110-\$350 for a three-bedroom apartment or terrace house per annum. The Scottish government required that at least 50 percent of the dwellings be single-family units with gardens.

The commercial and industrial

base, planned for regional impact as well as a support for the new population, is an important factor in the economic success of the project.

Urban Design Factors: Among the more basic city-shaping decisions made before serious design proceeded were the following:

- Cumbernauld shall be a town on a ridge, crisp at the edges and surrounded by countryside.

- As the *genus loci* of Glasgow is the "gray and green" of the stone and heath, so shall be Cumbernauld.

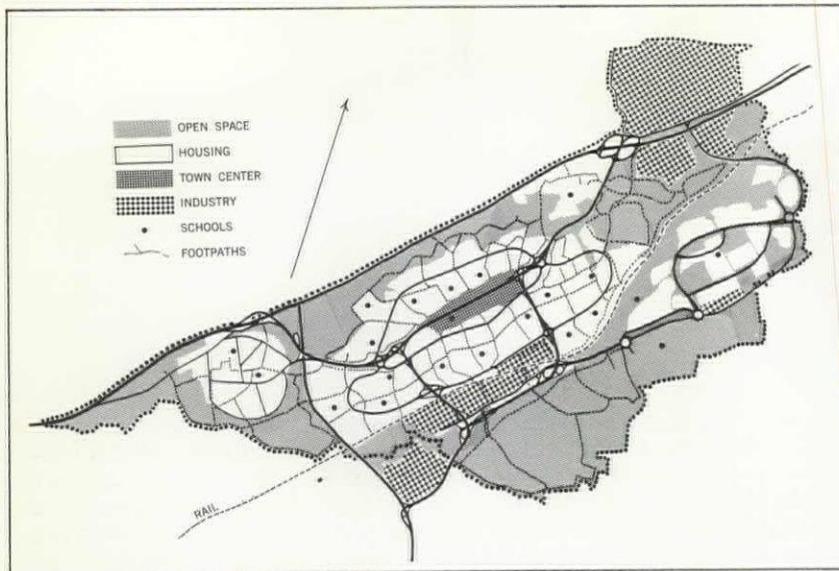
- Cumbernauld shall be a truly 20th century town accommodating the automobile, as a servant of man, but giving to the pedestrian intact and totally separate pathways.

- The town shall be treated as a whole, not as a group of neighborhoods, so that each citizen can feel himself a part of a total entity. The town shall be compact to make this sense of community possible.

- The town center shall be a totally enclosed multiple-use structure spanning the highway and connected to the footpath system. Parking shall be provided within the center adequate to serve the 35,000 regional market in addition to the 70,000 population planned for Cumbernauld.

- There shall be a sharp perimeter definition between the urban townscape and the rural countryside in which it is set. This rural green belt shall be readily accessible for recreation by the citizens and be an important feature in viewing Cumbernauld as well as viewing the countryside from Cumbernauld.

The Solution: The preliminary planning proposals of 1958, originally based on a population of 50,000, set the design of a hill town occupying 930 acres on the ridge, of which 590 acres were for housing areas. The remainder of the site was planned for open space and for the two major industrial zones. Two factors dictated this solution: the practical consideration of foundation conditions, difficult in cer-



tain areas of the site, and the conceptual and planning advantages of the limited area.

The key to the design solution of Cumbernauld is compactness; it is compactness that makes the town design work so well.

Compactness allows one to walk easily to the town center in a few minutes even from dwellings on the periphery, to walk to the edge of the town and look across the fields to distant views, and to see from the town center to the edge.

Compactness makes the entire concept of a separate pedestrian system economically feasible; it results in a superroad network of high standards and 40 percent less mileage than comparable towns.

Compactness makes Cumbernauld feel like a town while allowing enough open space within and around it to set it off from future development, with ample separation between the town and its major industrial areas.

This compactness is formed and contained by the town site. The ridge, running northeast to southwest, is the dominant feature of the surrounding landscape with distant views from its top.

The town design capitalizes on these views by clustering the houses on both sides of the ridge and by placing the town center on its top. The offices, penthouses and other areas in the town center are also designed to capitalize on the views. The resulting ridge-top town is two miles long and one mile wide.

Density: The average gross density of the housing areas is about 85 persons per acre (varying from 60 to 120), substantially more than the 26 person per acre gross density of Tapiola. The gross density

of Cumbernauld, however, comes down to 17 persons per acre.

Compactness is harder won at Cumbernauld due to the 50 percent ratio of homes with gardens (vs. 20 percent in Tapiola). There are those who will argue that the dwellings could have been more spread out.

Despite an overall high density and urban quality, there are some low-density residential areas (26 persons per acre). Many dwellings adjoin their own gardens. There are landscaped public pedestrian ways and areas where original groves and rows of trees have been retained. Thus some of the garden city features are incorporated, including open space for parks and playgrounds.

Privacy is achieved less by screening or separating residential units than by careful siting and interior design of these units so as to take advantage of distant vistas and to close out one's activities from the views of neighbors.

The jury is convinced the design group sensibly and sensitively conserved land coverage for the common good of the entire town. Experience will undoubtedly prove the solution has great social as well as physical advantages, jurors believe.

Circulation: If compactness is the key to Cumbernauld's solution, then the first door unlocked is that of the motor vehicle and pedestrian circulation system.

The road system is entirely unique not only in its design for the site but also in the evolution of special standards to make it workable. A hierarchy of roads has been evolved on these principles:

"Local development roads shall provide access to buildings either direct or by spur footpath; feeder

roads take traffic from or to local development roads but have no frontage development; main town roads in the form of radials or radial link roads connect with feeder roads only at controlled junctions and have no frontage development or other access; trunk roads connect with main town roads only at grade-separated junctions; no car parking on any carriage way."

The use of grade-separated interchanges has been extended to a degree surpassing current practice for urban roads. The greater cost of the miniature superhighway system has been offset to a substantial degree by the reduced mileage required by the design, the resultant cost being only 4 percent higher than other new town road costs while automobile accidents have been reduced by 50 percent.

Off-street parking is provided, with most cars garaged, at a ratio of one car per dwelling.

The combined road and pedestrian circulation system in Cumbernauld forms a finger plan similar to the Radburn Plan of traffic separation and articulation (a considerable irony in that the United States has apparently forgotten its own Radburn while looking enviously at Europe's adaptation of this plan).

Total separation of vehicular from pedestrian traffic is achieved by underpassage, overpassage and mid-block walkways and a complete system of vehicular facilities from expressways to minor cul-de-sacs.

The pedestrian system, though less unique, is remarkable in execution. The architects and landscape architects of the Cumbernauld Development Corporation seem to have mixed liberal quantities of Scottish and English heritage with ample doses of townscape (Gordon Cullen) and have developed an idiom that makes every play area, underpass and courtyard a real delight. Reminiscent of the Wizard of Oz and "follow the yellow brick

road" is a double line of old cobble stones down every path leading to the town center.

Schools and churches are plugged into the footpath system (not into the roads except for service drives) so that Johnny can walk to and from school or church without ever nearing a road.

It is most important to point out that the design of the pedestrian system requires more ingredients than simply providing paved surfaces. Three other factors play a role:

- The footpath must be the short route; the road may be longer. The footpath goes through and under buildings and roads—not around.

- The footpath must be so designed that no one would consider walking on the road nor easily find the opportunity to do so. At grade changes and undercrossings, ramps for baby carriages are provided along with steps.

- The footpath has its own series of experiences and events by its location and design: little stores, play areas, courtyards, hedgerows, views and schools.

Housing: Compactness is hard won at Cumbernauld since the program calls for a minimum of 50 percent houses with gardens. It is this part of the housing that has been so effectively concentrated.

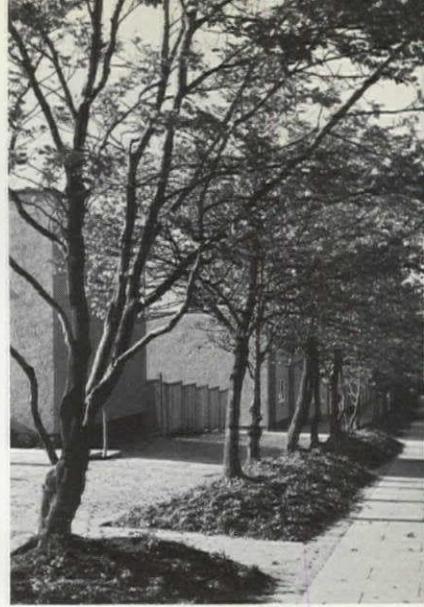
There is a strong rental tradition

in Scotland. Home ownership is the exception rather than the rule and rental payments, also by tradition, are very low. Cumbernauld is thus largely made up of rental units—units requiring economical construction if they are to prove feasible under the low-rent structures prevailing (despite long-term government financing). Most units rent from \$9 to \$12.50 per month, excluding utilities. Certain units are for sale and these range from \$11,000 to \$13,300 including land.

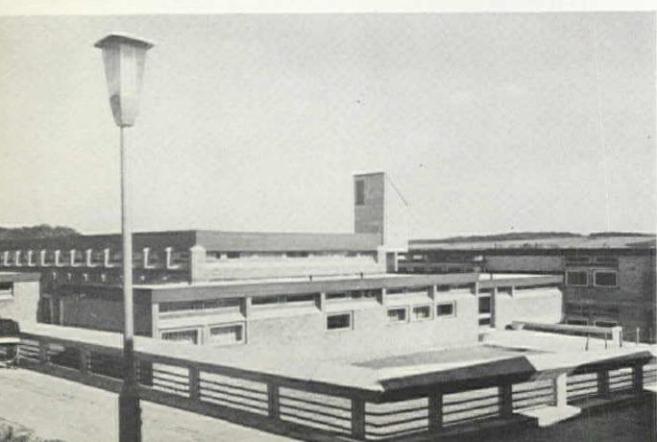
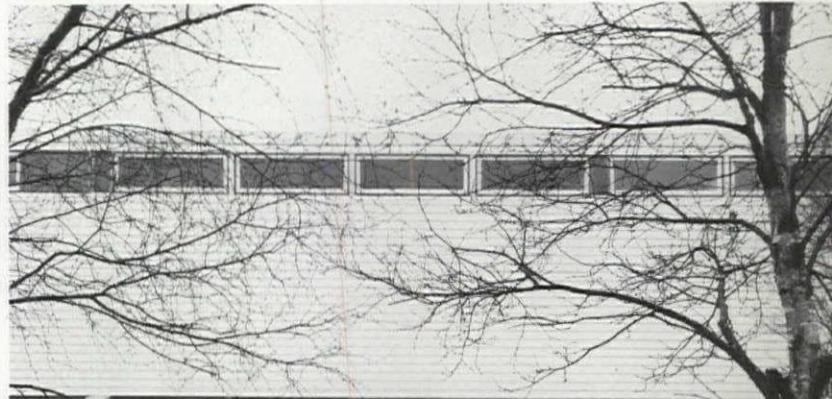
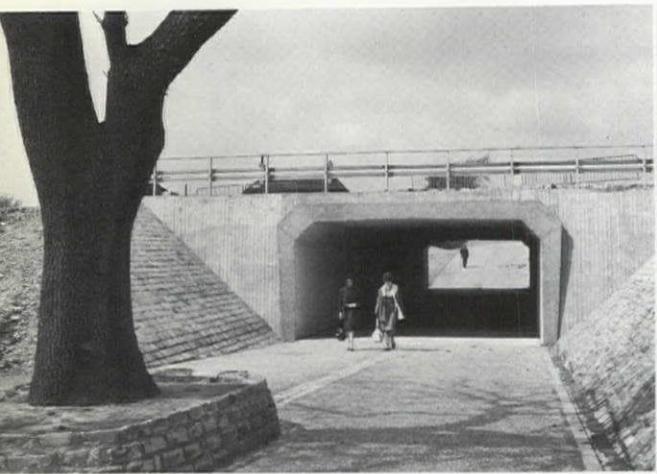
Economies have forced a simple architectural design relying heavily on local construction techniques. Little use of industrialized building systems has been made or found

Close clustering of Cumbernauld houses, road network and town center, middleground, is readily apparent from air.





From upper left, clockwise, children at play along a pedestrian way; those on foot get shortest route, through buildings if need be; walkways are made pleasant with landscaping; youngsters man their fort; a library and paving to be read; an elementary school; and pedestrians going over motor traffic; or passing safely below danger.





Cumbernauld's housing is subdued but not without poignant compositions.

necessary. However, earlier units have limited systems and services. They have fireplaces instead of central heating, for example.

Economic influences combine with the Scottish tradition of urban architecture to yield a consistency of architectural expression quite different from Tapiola's diversity.

The tone is a gray monochrome with occasional color relief. Stucco walls with slate or built-up roofs are the predominant exterior materials. Monotony is avoided by the fundamental variety in building types, by the nature of the site, by the meticulous siting of houses on the hillsides of the ridge, and by the carefully designed streetscape and landscaping.

It remains to be seen if the Cumbernauld Development Corporation and its architects can succeed in the higher densities planned for the area adjacent to the town center. It is perfectly clear that the Carbrain 9 district with a density of 120 persons per acre seems to have lost the amenities of Kildrum 5 with 96.

In Carbrain the automobile has taken over and one becomes aware of the pressure of solutions. Suddenly all surfaces are paved over; the sensitive townscape so noticeable in the Seafar and Kildrum districts is not so apparent here. The cost of a Carbrain 9 dwelling is roughly 50 percent higher, even allowing for a five-year escalation.

It appears that the design group is now facing a new challenge as the increased density and increasing auto ratio whittles away at amenities while increasing costs. This will be further aggravated by the trend in the United Kingdom toward standardized buildings.

Industry: Cumbernauld is conceived as a self-sufficient community with its own employment base. Industry is located in low-lying areas adjacent to, and screened by, the greenbelt around the town.

Rental floors are provided for small tenants, and large sites are made available for single industrial

occupancy. Standard factory buildings are also rented in units of 2,000 to 10,000 square feet to medium size enterprises. In one instance light industry employing women is located within the Seafar residential area.

The Center: The town center on top of the ridge is Cumbernauld's visual and functional focus. It is located at the center of the pedestrian and vehicular traffic systems and is penetrated by both.

This immense building, to be a half-mile long when complete, is split down the middle by the main artery of the motor traffic system which is depressed below existing ground level—left open to the sky instead of being encased in an expensive, mechanically ventilated tunnel.

The pedestrian walkway system crosses this roadway on bridges that tie both sections of the building together. Pedestrian traffic from the surrounding town arrives via these bridges at the middle level of the structure; persons arriving by car or bus at the lower level reach the middle level by escalator, depart by stairway.

At main roadway level, only 7 percent of the traffic entering the center is estimated to be through traffic. The 93 percent bound for the center is accommodated either in multi level parking garages, capable on completion of housing 5,000 cars, or at 60 truck docks.

At the middle level, pedestrian traffic circulates through covered arcades to just about every service a town needs. Shops and stores, meeting halls and cinemas, dental, medical and many other professional offices, restaurants and a hotel, and quarters for the town administration all border on this indoor Main Street. Duplex pent-

house maisonettes along the roof above will offer all the advantages of downtown living plus the best long-distance views in Cumbernauld.

Even though the center is incomplete it would be misleading to praise its design so highly without making at least preliminary comments on minor faults in execution. The most obvious of these is an apparent lack of continuity between the original design and the executed building. For example, the bold pyramidal vaulted skylights—so much a part of the exterior form—are hidden on the interior by flat, undistinguished luminous ceilings.

Some of these problems may result from the corporation's method of constructing the project on a scope type contract rather than on the basis of completely detailed plans.

The center when completed is scaled to serve a regional area considerably larger than Cumbernauld itself—including the northern suburbs of Glasgow.

This challenging concept, in which every problem of a town center is resolved within one multi-level, multipurpose megastructure created by three-dimensional planning, is a step into the future.

Planned Future Development: Cumbernauld will be even more compact upon completion.

The remaining open areas along the slopes of the ridge are to be filled in with appropriate housing. The existing open area surrounding the town center at the top of the ridge will be occupied by a series of institutional building projects, including a health center and a two-year college now in the planning stage.

The total townscape will then spill down from its ridgetop center

ARCHITECTS AND ALLIED
PROFESSIONALS RESPONSIBLE
FOR THE DEVELOPMENT OF
CUMBERNAULD

Original Team

Chief architect and planning officer
L. Hugh Wilson

Assistant chief planning officer
A. G. McCulloch

Assistant chief architect
Dudley R. Leaker

Chief engineer
A. Gibbs (deceased)*

Chief quantity surveyor
J. A. Denton

Consultant landscape architect
P. Youngman

Group leaders and others
R. Hunter, G. Callaghan, G. Copcutt, D. Lyddon, R. Simpson, W. Thomson, E. Browning and A. Kerr, *architectural*; G. K. Davie, A. Bannerman and A. Moscardini, *planning*; W. Gillespie, *landscaping*; A. Scott, L. Buckthorp, G. Crowe, D. H. Garside, B. J. Allan and J. Linn, *engineering*.

Present Team

Chief architect and planning officer
Dudley R. Leaker

Assistant chief architect
G. Callaghan

Assistant chief planning officer
G. K. Davie

Chief quantity surveyor
J. M. Simpson

Chief engineer
A. Scott

Deputy chief engineer
E. S. Traill

Consultant landscape architect
P. Youngman

Chief clerk of works
W. Highet

Group and team leaders include
H. Eccles, R. Thomson, N. J. Dadge, P. Aitken and R. A. Barlow, *architectural*; J. J. Read and J. B. Preston, *planning*; Miss E. Woodward, *landscaping*; D. O. Macgowan, *quantity surveying*; T. B. Love, *electrical engineering*; W. McKay, G. J. Riddell, L. J. Sheach, B. J. Allan and W. Fletcher, *engineering*; and B. J. Miller, *artist*.

Note: The original chairman of the board of the Cumbernauld Development Corporation was General Sir Gordon McMillan. The present chairman is Dame Jean Roberts. The general manager is G. R. B. MacGill.

to the surrounding valleys, framed by green, open countryside.

SUMMARY

Concept: Cumbernauld's high-density urban environment, built around a strongly articulated circulation system which totally separates pedestrian from vehicular traffic, is a single entity without subdivision into component neighborhoods.

Despite the introduction of gardens and public landscaping and the retention of original trees and the natural heath, its philosophical base is the antithesis of that underlying the concept of Tapiola and other garden cities. Rather than question which philosophy is right, the jury believes both are right for their particular situations.

The Cumbernauld concept is also a deliberate departure from the philosophy expressed in most other British new towns. It is, moreover, designed to conform to the Scottish tradition of the urban environment

rather than to contrast with it. The contrast is between the new community and its natural setting.

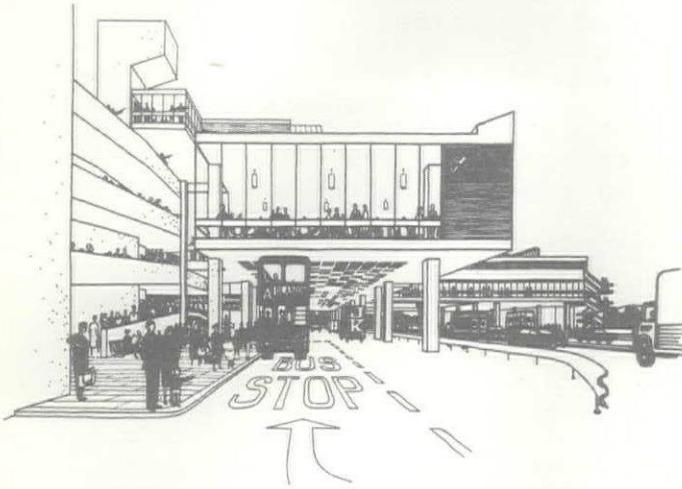
Accepting this philosophy, the jury finds that a great success has been achieved in expressing the concept. The Scottish living environment has been interpreted well in contemporary terms. Even the traditional Glasgow "close"—an urban courtyard and alleyway—has been incorporated in the plans.

The jury also finds that this basic concept was adapted equally well to the ridgetop site. A potential topographic problem has been turned into a major design advantage. The close-knit design entity of Cumbernauld comes to a logical climax in the town center. This symbolic and functional focus is a point of clear orientation for all travelers within the town.

The town center concept itself represents a unique departure from previous examples. Its multiple program of functions and its em-

Town center rises above ridgetop Cumbernauld; in foreground, rail station.





An artist's view of the lower level, left, of the Cumbernauld town center, and the middle-level pedestrian arcade.

phasis on the pedestrian are shared with Stockholm and Tapiola, but its multi level structure is a daring and original solution.

The jury believes that the Cumbernauld town center, at its proposed regional scale, is in fact the prototype of the form that must evolve, sooner or later, for the central business districts of cities in the United States.

The careful design of the pedestrian and vehicular traffic system results from a significant wedding of engineering, architectural and landscape disciplines to establish the circulation skeleton as a very positive urban design factor.

One measure of the success of this system, which at no point requires the pedestrian to cross a

trafficway, is a Cumbernauld accident rate far lower than that of comparable cities. Another is the complete absence of traffic lights and traffic policemen.

Program: Clearly the plan is based on a sophisticated program of traffic engineering and economic analysis.

While Cumbernauld is relieving population pressures by housing young families who would otherwise have to live in Glasgow, it apparently does not serve as a substitute for Glasgow's Gorbals slum—despite its very low rent structure and its uniquely Scottish urban environment.

Apparently this is due to older Gorbals residents' resistance to any kind of move since, despite the fact

their neighborhood is regarded as a slum, it *does* represent a unique life style that probably could not and would not be deliberately duplicated.

Architecture: With the exception of the town center, the urban architecture is generally quite neutral and tends to act as a subdued setting for the beautifully designed public streetscape. The success of this architecture is precisely due to this sophisticated neutrality and to the suitability of its character to the uniquely Scottish tradition of residential building.

It should be noted that this architectural success has been achieved without resort to standardized building systems except in a few instances.

URBAN CHARACTERISTICS COMMON TO STOCKHOLM, TAPIOLA AND CUMBERNAULD

Despite differences in scale, in philosophy, in urban design fabric and in national background of the three cities, the jury was impressed with certain excellent features common to all—features which deserve illustration and understanding for the benefit of those facing the urban problem in the United States:

Regional Setting: Regardless of the sponsorship of their development, all are carefully set into the framework of a regional plan—and are tangible steps toward realization of these regional plans.

Greenbelts: All include greenbelts, finger systems or other natural open spaces around or within them—and these are preserved as

open spaces not to be encroached on by future development at the whim of a "change-in-zoning" expert.

Basic Problem: All are aimed at solving the same essential problem—the accommodation of the rapidly expanding urban population in their respective metropolitan areas. The solution of this problem in a creative and constructive manner is used to give form to the region in place of the chaotic happenstance of suburban sprawl which can destroy regional character.

Private Involvement: Tapiola is a purely private undertaking located on privately owned land while Stockholm and Cumbernauld are publicly sponsored, governmental

programs, with substantial private involvement, located on publicly owned land.

Major elements of the Greater Stockholm plan are the contributions of private architects and developers through the medium of voluntary proposals, formal competitions, or as retained consultants. The core redevelopment in central Stockholm is the result of a typical private-public partnership familiar to Americans.

While Cumbernauld is financed by a long-term loan (at a quite high "conventional" interest rate) this loan must be retired by the earnings from the development. Much of these earnings will come from private enterprise tenancing

the town center and the industrial areas in addition to rentals from the housing.

In one form or another, all three cities, therefore, have involved private enterprise.

Siting: The new towns are carefully sited in relation to both communications and topographic features. Tapiola lies on the Gulf of Finland and is on an expressway serving Helsinki. The Stockholm communities are, of course, integrally planned with the regional rail and highway systems. Many of these towns have access to waterways and all have interesting topographic features.

The ridge at Cumbernauld and its rail and highway linkage are the rationale for its site selection. This is in contrast to much US development which gravitates toward flat, featureless sites and generally assumes that government will, thereafter, provide access to same.

Within these communities there is a consistently sensitive siting of individual buildings or groups of buildings. Views are exploited; privacy is generally a concern and existing features such as trees, groves, hills and rock outcroppings are related to the buildings.

Natural Features: As part of this design approach, natural features where possible have been preserved by contrast with our pattern of "cleaning the slate" before

construction and then attempting to re-create these features.

Elements of original forest are retained. Old farm hedgerows become linear walkways in the pedestrian system. Rocks, hills and large single trees are not only preserved but are design features adding surprise and contrast to the urban fabric imposed by man. A large abandoned quarry is converted from a visual and safety hazard into a beautiful and active lake.

Earthwork: An imbalance of cut and fill is accepted and exploited in many of the communities visited. While buildings are generally sited to conform to existing terrain (including rather steep hillsides in several instances), thus reducing earthmoving, excess fill is used to create hillocks or mesas. Between Farsta and Bredang outside Stockholm, an artificial mountain for skiing has been created by stockpiling excess fill. Storm drainage is often a surface system treated as floodable finger parks.

Streetscape: A consistently high quality of street furniture, landscaping and surfacing has been incorporated in the streetscape. Lighting and signing are specially designed and are fresh and appropriate variously to the pedestrian and to the vehicular scale of movement. Patterned surfaces are used for walkways—and often for

trafficways. Benches, shelters, litter baskets and other impediments are designed with careful attention to detail.

In Cumbernauld, children's play areas are everywhere and each one is a delight to the eye, with cobbles, sand, bollards and pilings. Some have little forts and stone mazes.

Traffic Systems: In all three communities there has been a careful articulation of the traffic pattern into pedestrian and vehicular systems. Underground truck service, expressways and rail subways are the norm in the new town centers of Stockholm. The vehicular pattern is also well articulated as a hierarchy of roads from minor cul-de-sacs to freeways. Pedestrian pathways are just as carefully planned and while interrelated are completely isolated from motor and rail systems.

Construction Economy: All cities visited have achieved these positive factors while operating under construction economies more stringent than those normally imposed on developers in America. In Stockholm and Cumbernauld, economical construction is forced by low-rent policies, and these are primarily rental towns. In Tapiola, economies are forced by the social objective of providing accommodations for a large increment of low-income purchasers and by a national shortage of capital.

THE R. S. REYNOLDS MEMORIAL AWARD FOR COMMUNITY ARCHITECTURE

In evaluating Stockholm, Tapiola and Cumbernauld, the jury found it difficult to make a competitive comparison.

Each city is different in its philosophy, its detailed objectives, its scale and its national setting. Each has a different development mechanism. Above all, each is significant in its own right—and is far superior as an urban environment to that which we are accustomed.

All three are strong in concept and execution. The only comparison possible is that Stockholm is stronger in basic concept as metropolitan scale; Tapiola stronger in social concept and building design; and Cumbernauld stronger in urban design.

On this basis, and without in any way discounting the great accomplishments of the other two cities, the jury decided that the 1967 R. S. Reynolds Memorial Award for Community Architecture should be awarded to the architects and allied professionals of Cumbernauld for

the purpose of creating a scholarship for the study of community architecture.

In so doing, the jury was mindful of its charge to base its selection on the quality of the community's design in relationship to its satisfaction of human objectives in terms of architectural values. The following elements of Cumbernauld's achievement particularly demonstrate this:

- The architects for the Cumbernauld Development Corporation have evolved a "Cumbernauld idiom" in keeping with Scottish tradition and in harmony with the site.
- They have shown through their work a touching concern for the residents as human beings.
- The town, though only partly complete, has already a real sense of community and place, endearing it to both residents and visitors.
- The architects have achieved "townscape on a shoestring" since the entire budget has been extremely limited. The most effective urban

design has been gained at moderate cost with a limited palette.

- The town center and the roadway system, the heart and circulation system of Cumbernauld, bring together the urban environment and the automobile into a powerful statement and resolution.

- The residential areas of Cumbernauld may remind one of a medieval hill town or even a 19th century mill town, but not the center. It is designed for the millenium and the dreams of the 1920s and 1930s are being built on a hill near Glasgow.

Cumbernauld has clearly exploited to the maximum its potential as a work of community architecture without sacrificing human values. In fact, it has recognized and enhanced these values as an integral part of its design goals.

As a work of urban design, Cumbernauld holds great significance for the architectural profession and for the future development of community architecture in the Western World. □



Budgeting of Probable Costs

BY ROLF SKLAREK, AIA

When properly used, the budget becomes a stimulus rather than a limitation to the creative process, as a vice president of Victor Gruen Associates, Los Angeles, points out. This article is adapted from "Creative Control of Building Costs," the McGraw-Hill book.

One of the most distinguishing characteristics of a preliminary budget is the fact that it constitutes the first written opinion on probable future costs of his building, in definite dollar amounts, which the client receives from the architect. Such first figures, whether they coincide with the client's preconceived ideas, have the uncanny tendency to implant themselves firmly in the client's mind.

Should any misunderstandings on costs occur during later stages of a project, a critical look will always find these first budget figures at the root of the argument. No matter how much the original budget has been "qualified" and regardless of how well any subsequent revision will be documented, this first budget, prepared under most difficult circumstances, can never be fully voided as long as the project is alive.

Unlike estimates, a budget is prepared at a time when definite and detailed information on the project is not yet available. Quantity take-offs and accurate evaluation of special conditions are not possible at budget time; and, at best, the budget analyst has at his disposal such tenuous information as a rough description of project scope, tentative ideas on types of construction and finishes and, if he is fortunate, a single line sketchy layout. Seldom, indeed, will the client's map of the project site be in the form of a useful

topographic survey at this time; and soil conditions, water table elevations and information on existing or available utilities remain a matter of speculation to be resolved at a later date.

In addition, no definite information will yet be available on such cost influence items as actual timing of construction, required off-site work, the "bidding climate" at a future date, special requirements of the client usually born and developed at a much later time, etc.

Estimates, produced at a later time on the basis of at least some definite information, are relatively easy to prepare compared to preliminary budgets. The preparation of such early budgets is in effect a preliminary design activity, and all future design and detailing efforts as well as future estimates will have to live with the budget in one way or another.

No effort should be spared, therefore, in budget preparation and, as in all professional services, a large amount of care, judgment, ingenuity and foresight is required in this phase of the work. The budget must represent a realistic forecast of probable project costs based to a large degree on carefully considered assumptions. To make a budget arbitrarily too high in order to avoid a possible future squeeze is no solution at all. Not only can such a procedure quickly kill the chances of the project's realization, but a budget that is too high is just as wrong and unrealistic as one that proves to be too low. Budgeting must be considered and treated as a highly sensitive creative design activity.

A Budget Is the First Step

Why, then, in the face of all the difficulties and possible dire consequences, are budgets necessary at such an early state in the proj-

ect? Why not rather wait for the time when more definite information will be available and an estimate can be prepared? Why all this rush; what is the real purpose of the preliminary budget?

The answer to these questions is really quite simple, once preliminary budgeting has been accepted as a design function—and closer inspection will disclose it as being an urgent and major one. Then preliminary budgeting will be found not to be a necessary evil at all but a most useful tool for orderly and logical—even imaginative—design. The much maligned limitations which a budget so often dictates will many times be found actually to stimulate designers and lead them to nonroutine solutions. Such a tool, such a stimulus, is of course needed early in the creative process.

The client, who needs a budget in order to evaluate the economic feasibility of the project, is entitled to a forecast of probable project cost before too much design time has been spent and certainly before any layout might become frozen. Even though some clients may think that they have thoroughly explored and evaluated the economic aspects of the contemplated improvements, this isn't necessarily so.

If properly handled and fully developed, the preliminary budget can, at the very outset, assure that architect and client are talking about the same thing, the same scope of work, the same type of investment, the same quality of building and even the same amount of professional fees.

The budget analyst—the person preparing the budget—is charged with a huge responsibility. His judgment and his opinion expressed in the form of a budget may make or break a project. His is the



task of laying the foundation upon which the work of the architectural and engineering design team will be based, and it is his budget which will remain the basis of all economic considerations until contractors' bid proposals eventually confirm or disprove it. All future estimates, based on more developed information, must, in order to be useful, be by necessity a logical refinement of the budget analyst's early work.

This is not the work for an outsider, nor for a consultant, nor for a mere technician. While contractors may be helpful in the refinement of later estimates, they cannot assist in this early stage of design, architecturally or economically. What this job needs is an architect, a designer, an imaginative, resourceful and experienced person with long standing in the particular architect's office. He must be fully familiar through experience with the firm's design philosophy, with its design and detail vocabulary—and a few single lines, possibly with reference to other of the firm's projects, must give him meaningful information which no mere technician or outsider could possibly fathom. In addition, he must be thoroughly familiar with bidding and construction techniques and the business end of construction.

The budget analyst will, of course, need the cooperation of, and information from, special technicians, engineers and designers experienced in comparative pricing of structural, mechanical, electrical and civil engineering work. On the other hand, he must also be analytically minded enough to question critically all such specialized information supplied to him. And he must be completely incorruptible, even with regard to strong suggestions from his superiors or the client for a budget which, in his opinion, would be too low. A "yes man" won't do in this job.

Architects, by tradition, have in the past generally stayed away from this kind of activity and considered it almost as menial work. Even in teamwork, many an architect wants to be identified with the more glamorous aspects of the pro-

fession—visual design—and wants to leave the chores of cost control to "others."

The true and effective budget analyst is, therefore, a rare person indeed. It is hoped, however, that more and more architects will begin to recognize construction costs and the budget as a creative stimulus. Placing more emphasis on the field of budgeting and cost control can help greatly to enhance the relationship of the profession to its clients and to the community as a whole.

The Target

To call a budget "realistic" sounds impressive, but what does it mean? Realism with regard to project cost budgets refers to the projected dollar amounts as well as to the usefulness of its form of breakdown and presentation, its adaptability to further refinement and its use as a basis for more detailed estimates. It must also serve as a basis of comparison with budgets for similar projects and must, at the same time, lend itself to segregation into separate bidding and construction contract items.

In order to function properly, it will be necessary for the budget analyst to think of himself as a bidding contractor, but he certainly does not want to turn out to be "the low bidder." Conversely, he can hardly afford to be "the high bidder" without endangering the project before it ever gets into the bidding stage. The ideal target, therefore, is a budget whose construction total falls into the middle or center third of an anticipated competitive bid range.

At times, under the pressure of economic limitation, such a target might have to be lowered and aim may have to be taken at a point within the lower one-third of such a bid range. This is a tricky assignment, requiring a large amount of experience, but it can be accomplished within reasonable limits of accuracy. A somewhat more difficult way to handle variation presents itself when bids will not be obtained by competition but rather on a negotiated guaranteed maximum basis.

Such a target should, of course, be stated in a preamble to the budget presentation and may take a form similar to:

"The budget herein presented is not intended to reflect the lowest bid possible to be obtained. It aims at a reasonable and realistic figure which, under competitive

bidding procedures, should fall somewhere within the middle third of the range of competitive bids from high to low. While, of course, it is hoped that this will result in a certain amount of contingency within the budget figure, it cannot be emphasized enough that the budget should not be reduced in the light of the above. The figures are not so much an approximation of expected actual cost but rather expressions of recommendations for a realistic budget at this time."

The probable future bid range and a future negotiated dollar amount depend on many factors, some of them predictable and others completely inaccessible even to guess work at the time of preliminary budgeting. Budget qualifications with regard to the second category will be discussed later.

Predictable influences on the range of competitive bids from high to low can generally be traced to the type of bids requested, the documents issued and the bidding procedure selected. Therefore, to a large degree, such influences are dependent on the quality and type of service rendered by the architect's team. The client is, of course, part of this team and often it is the client who, "looking for a miracle," makes demands in the preparation of bid documents which may result not in a miracle but actually in erratic, if not even higher than normal, bids by contractors.

The normal range of bid proposals of approximately 5 to 6 percent may widen considerably, may in fact even double, due to choices of bid documents, bid methods, bid proposal forms, type of bidders invited and the number of bidders on the list. Generally speaking, the bid range will tighten with a small number of bidders of the same "speed" invited to bid on clearly drawn proposal forms relating to clear and concise drawings and specifications.

Budget Breakdown

The target figures, once arrived at, must be broken down and organized in their presentation in such a manner as to allow them to be allocated toward various categories in case of segregated bidding. Such segregation must follow a pattern which will also form a useful format to be followed in later cost control using estimates and their unavoidable revisions. The use of a standardized form for

budget presentation will also make it easier to compare the anticipated cost of the project under consideration with figures obtained from previous and similar jobs.

Nothing, incidentally, will confuse and antagonize a client more than an ever-changing format in the presentation of cost information. The figures, of course, may change, but it must be easy to relate new and revised figures to earlier ones. The categories of the breakdown, therefore, should be chosen in such a way that future cost refinements can be made by further breakdown as required without change in the basic breakdown headings.

If, for instance, based on an anticipated construction time schedule, the budget included a category "add for winter work" and an allowance of, say, 3 percent was added to cover such extra cost, it might happen that later rescheduling of the project will make winter work unnecessary. Rather than completely dropping such category, it makes more sense, in terms of cost control, to continue to show the same item with the same heading with a notation indicating "Per new construction time schedule of (date) not required" and showing a dollar amount of "none." The client usually understands such orderly procedures better, and the cost control history of a project will be well documented for the benefit of owner and architect alike. No surprises will come up months later when schedules change again and open framing work will again be required during the winter months.

Similarly, a budget category of "interior finish" may be broken down further, in estimates to follow, into actual improvement descriptions such as partitions, doors, flooring, ceilings, millwork, etc.; and later on might still be further refined into actual trade sections as lathing, plastering, furring, or marble, hardware, painting, etc. The total of all such individual items should, however, still be shown under the heading of "interior finish."

Scope of the Budget

Up to this point the expression "project cost" has been used—with intent—rather than "construction cost." The budget, in order to serve all of its purposes, must include in its scope all costs to be incurred, and foreseeable as such, and the actual construction costs are only part of the total.

Other items to be included in the budget are not just those that only the owner can evaluate in dollar amounts (land costs, legal and taxes, administrative and advertising costs, etc.) but also such more definite items as architectural fees and reimbursables or off-site work which eventually will be required to make the improvements on the site perform properly. The latter may consist of such items as future street alignment, future sewer facilities, or even items to be done off-site during the project construction period, including additional water mains for sources of uninterrupted fire protection, bringing in additional power for X-ray or projection purposes, signalization of adjoining road intersections, etc.

Even experienced and enlightened clients too often lump together all project costs, divide by the square footage provided by the facility and then claim that the architect planned a project with an extremely high cost per square foot. At such time, these clients may not admit, or even realize, that a good proportion of the cost is actually composed of expenditures that could be rightfully charged to land costs or that were incurred to facilitate future expansions or enlargement of the project and would be chargeable to a category possibly entitled "advance toward future expansion." Into such a category should go extra costs in foundations or columns, floor slab in lieu of lighter roof slab to support future floors, as well as larger mechanical and electrical spaces to accommodate equipment which will be installed at some future time.

A little reflection on the subject will make it clear that restricting the budget scope to actual project construction cost is no solution to the dilemma at all and will often, as in the case of provisions for future expansion, not even be possible. The best budget policy is to call out all items and to arrange them in such manner as to show them clearly, as either within the scope of the architect-client agreement or as an additional extra scope.

There is a trend among developers of large projects to provide utilities to the tenants from a landlord-owned and -operated central plant, charging the tenant for such at a profit. When this happens, the landlord, in effect, is going into the utility business in addition to real estate ventures, and the cost of

central plant, space and equipment should be charged to such additional revenue-producing enterprise under the category often called "self-liquidating items." Examples of such items are all facilities which produce income in addition to rental income: vending machine spaces and space for other coin-operated devices such as storage lockers, cafeterias and even including public pay-toilet facilities. While the sum total of such items may not be significant in smaller projects, it will make a sizable difference on large improvements such as regional shopping centers or other large institutions for lease or public use.

The budget analyst, who must eventually state his budgets in terms of dollars per square foot of buildings, must be a penny pincher to a large degree. A 2-cent difference in square foot cost in a home, a small office or medical building may not be of any consequence, but in projects involving a million or more square feet, the impact of a total of such differences, if correctly accounted for, may sometimes spell the difference between life or death of a project.

While it is, of course, not possible within the framework here to give a definite prescription for each budget category, nor dollar amounts related to each, the following discussion may be helpful as a checklist in budget preparation. And reference to the sample budget form reproduced will be helpful in evaluation. There are, of course, many ways to set up such a form, and the format shown may be revised to suit the project. The intent here is to show the thought and the logic upon which the form should be based.

The dollar amount ranges indicated for the various categories are included here only for illustration. They represent the range of cost experience in different types of projects and are expressed in terms of dollars per square foot of rentable area, to be touched upon later. These cost illustrations should not be used for actual budget preparations, and the budget analyst must use good judgment, based on experience, in order to determine actual anticipated project costs in terms of dollars per square foot.

Categories where no cost illustrations are given must be treated almost as estimates, and their evaluation will have to be based on actual calculations. It is obvious that



categories such as unusual site conditions or soil conditions cannot be budgeted for unless some actual information regarding the project site is available. Should such information not be available, the category as such may be retained in the budget form, and an indication should be made that such categories have not yet been evaluated. Such a procedure generally works out better than leaving a space blank. The notation such as "no info. yet" will at least indicate to the client reading the budget that some figure will have to be inserted in this category at a later time. Other categories such as landscaping or the art and sign program can be established at budget time in consultation with the owner. Since it is his project, he must participate in setting up such programs and the dollar amounts related to them.

Basic Construction Cost

This category includes all items required for the construction of the facilities, excluding all unusual conditions, as listed under other headings, but generally in accordance with published codes and standard requirements of governmental authorities and utility companies. Included are items 1 through 9, discussed below and as listed on the sample budget form.

1. *Site Work*—Normal amount of grading, building excavation and backfill, paving, striping, curbs, driveways, lighting and landscape irrigation, site portion of storm drainage, electrical supply, water supply (domestic and fire loop), gas, telephone. Such work may run anywhere from 50 cents at a small project to \$2 per square foot in a large project with a large parking area.

2. *Structural Frame*—Foundations (or in the case of unusual foundation conditions such as piling, an equivalent amount as possibly represented by pile caps and grade beams), columns, girders, beams and joists, bearing walls, slabs on grade and suspended, framing of shafts, stairs, penthouses and roofs, and fireproofing of structural members where required. Structural frame costs may vary from \$3 per square foot for

a one-story Type-V building to \$4.50 per square foot in a high-rise building of Type-I construction.

3. *Exterior Finish*—Exterior walls (with exterior but without interior finish), free-standing walls (wing walls, etc.), entrance units, windows, store fronts, copings, flashings, caulking, roofing and waterproofing, exterior stairs and ramps, etc. Exterior finish costs may range from \$1.25 per square foot for a simple building up to \$3.70 for high-rise buildings with costly finish, such as precast concrete units hung onto a structural steel frame.

4. *Interior Finish*—Interior finish of exterior walls, interior partitions, doors, finish ceilings, finish flooring and bases, cabinet and millwork, painting and special wall covering, etc. Not included in this category, however, should be interior finish work as called out later under "tenant allowances." The cost of such interior finish work may range from \$1 per square foot for commercial stores to \$2.50 per square foot for office buildings to \$3.50 per square foot in medical buildings.

5. *Mechanical-Vertical Transportation*—Mainly elevators and escalators. This category should not include such items as dumb waiters, lifts or conveyors for the exclusive use by certain tenants.

6. *Electrical Work*—All electrical work from 5 feet outside the building, including switch gear, transformers where required, light fixtures, service to elevators, escalators, mechanical installations and signs, all other standard outlets. Not included would be special wiring for processing purposes, X-ray, computers or similar specialized equipment which will be listed in a separate category. The cost of such basic electrical work will run, depending upon the project's size and type, from \$1.25 to \$2.25 per square foot.

7. *Heating, Ventilation, Airconditioning*—Self-explanatory, but difficult to budget. A number of basic concepts must first be established before budgeting will be possible. Required decisions are related to such questions as heating only or airconditioning? central plant or dispersed units? central plant supplying heat exchange media, hot and cold water for example, with fan coils in various locations? etc. Climatic considerations with regard to project locations are, of course, to be taken into account at budgeting time, and it is imperative that the sys-

tem forming the basis of this budget category be defined. While the HVAC concept can always be changed at a later time, the budget figure should be tied to a particular type of installation.

In projects where the developer operates a central plant at a profit by selling conditioning to the tenants, the cost of a central plant, including the cost of the space housing it, should be segregated and listed under "self-liquidating utilities" as explained earlier. Airconditioning costs range from \$1.50 to \$2.50 per square foot depending on the type of system and the size of the project as well as on location, climate and occupancy.

8. *Plumbing Work*—All interior plumbing work, sanitary and storm drainage from 5 feet outside the building line, complete with fixtures and trim, but excluding special plumbing work in excess of code or "standard" requirements, to be installed for the benefit of special tenants. Cost of the plumbing category may range from 60 cents to \$1 per square foot.

9. *Fire Protection*—Sprinkler systems, (but not fire loop already under "site work") from a point 5 feet outside the building line, or fire warning systems, smoke detection systems, etc. The budget should clearly state which areas are fire protected. Sprinkler work will range in cost from 35 cents per square foot of protected area to 45 cents per square foot of protected area when double sprinkling may be required. The cost of fire protection per square foot of rental area will, of course, depend upon the extent to which the various areas of the project are equipped with sprinkler system or other fire protection devices.

The second category of costs discussed here as items 10-16, and listed in the same way on the sample form, refers to unusual building costs.

10. *Unusual Site Conditions*—Such items which make the difference between a normal unencumbered, freely accessible site of reasonably flat grade as compared with a site which requires demolition or special preservation of existing structures, special access roads to be built, rerouting or bridging over natural site features such as a river or creek beds or an abnormal amount of grading, particularly when cut and fill cannot be balanced.

11. *Unusual Soil Conditions*—Soil unsuitable for normal load

bearing, high water table requiring pumping, cofferdams or excessive waterproofing, rock conditions requiring blasting, and any other ground conditions which make the construction of standard foundations and basements impossible without additional and unusual construction and costs.

12. *Off-site Work*—Improvements to be done outside of the actual project limits, generally involving widening or realignment of streets and highways, signalization of intersections in order to protect project access, etc. This matter has been discussed in preceding paragraphs. Many times the financial cooperation of townships can be obtained in the preparation of a budget figure for many off-site items. The estimated amount of municipal participation should be deducted.

13. *Provisions for Future Expansion*—Oversizing of structural members as well as electrical and mechanical facilities to serve future extension or expansion of the project. Such expansion may either take place vertically or horizontally and appropriate allowances should be budgeted in order to facilitate such future work. The cost for such provisions are budgeted under the "unusual" category since they are actually advanced expenditures for the different and future project and should not be included in any sums which will be used to determine the cost of the proposed project.

14. *Special Equipment*—All special equipment—electrical, mechanical, plumbing or any other type—required for the business or processing operations of the occupants of the building in order to carry on their business activities. Such items include, among others, kitchen equipment, incinerators, dock levelers, trash or package chutes, conveyors, paint spray booths, pneumatic systems, ADT provisions, etc. In addition to the above, other equipment items should be included if they do not normally appear in projects of this kind in the locality, such as flagpoles, window-washing equipment, communication antennas, etc.

15. *Time Schedule*—Allowances for estimated overtime required or for special winter construction procedures in order to protect the work if the time schedule required by the client is shorter than the budget analyst believes feasible under normal working conditions or if the timing of construction involves critical concreting to be done during severe winter weather.

Preliminary Project Budget		Job No. _____	Date: _____
Job: _____		Rev. No. _____	Date: _____
Location: _____		Prepared by: _____	
Gross area: _____	Rental area: _____	Efficiency _____	%
Item	\$ per sq. ft. Gross	\$ per sq. ft. Rental	Total \$
1. Site work			
2. Structural frame			
3. Exterior finish			
4. Interior finish			
5. Mechanical vert. transportation			
6. Electrical work			
7. Heating, ventilating, air-conditioning			
8. Plumbing			
9. Fire protection			
Basic Building Costs			\$ _____
10. Unusual site conditions		\$ _____	
11. Unusual soil conditions		\$ _____	
12. Off-site work		\$ _____	
13. Provisions for future expansion		\$ _____	
14. Special equipment		\$ _____	
15. Construction-time schedule		\$ _____	
16. Type of bidding and contract		\$ _____	
Unusual Building Costs			\$ _____
17. Landscaping		\$ _____	
18. Art and sign program		\$ _____	
19. Tenant allowances (standard)		\$ _____	
20. Self-liquidation items		\$ _____	
Additional Budget Items			\$ _____
		Sub-total	\$ _____
21. Professional fees	\$ _____		
22. Surveys and insurance costs	\$ _____		
23. Land cost	\$ _____		
24. Legal and accounting costs	\$ _____		
25. Leasing and advertising costs	\$ _____		
26. Financing costs and taxes	\$ _____		
27. Promotion	\$ _____		
28. Pre-opening expenses	\$ _____		
29. Owner's administration costs	\$ _____		
30. Concessions to major tenants (above standard)	\$ _____		
Owner's Budget Items			\$ _____
Total Project Budget			\$ _____

16. *Type of Bid and Contract*—Allowances varying anywhere from 3 to 6 percent of the budgeted construction costs when, in the opinion of the budget analyst, the type of bidding required or the time allowed for bidding or the type of documents issued would induce the bidders to include "scare money" in their proposals. When contracts are let on a negotiated basis, the author as a matter of routine adds 3 percent to the budgeted construction cost.

The next category of costs, here and on the form, is composed of additional budgets, not actually part of the building construction.

17. *Landscaping*—In addition to

plants, planting and soil additives, such items as movable planters and indoor planting, benches and certain other improvements such as outdoor fountains.

18. *Art and Sign Program*—Exterior signs, project identification signs on the site and traffic signs required in parking lots. In addition, allowances for artwork should be made, including murals, statuary and other items which may be commissioned from independent artists.

19. *Tenant Allowances*—Allowances for the work which the landlord will have to perform for the tenant since at the time of pre-

Continued on page 80

*A new sponsor, a new designer,
a new process and new—and better—
environmental results.*

A Whole New Approach

When the Senate's (Ribicoff) Subcommittee on Executive Reorganization of the Government invited the views of the environmental design professions, The American Institute of Architects, appearing before the subcommittee along with representatives of planning and engineering organizations, submitted a 70-page document that reflected a decade of work on the part of the Institute's Committee on Urban Design. It is a document that advocates a creative, socially responsive and altogether new way of going about building and rebuilding the urban environment. More than that, it describes the form this approach might take.

A fresh and truly creative response to the urban challenge could lead the United States into its first Golden Age, the AIA document submits.

It is a document that, while recognizing the breadth of the urban problem, insists that physical sores require "no less attention" than do social and economic maladies. And it lays out a proposal that envisages a new kind of project sponsor, a new kind of designer and a new—and more socially responsive—kind of design process.

Acknowledging the subcommittee's chief mission as "the improvement of the urban environment," the document represents the Institute as a "credible witness" having learned with the profession "hard lessons" in the gear-up for the urban design.

It recommends broad proposals—a "national strategy for creative response"—as well as specific steps to more fully use existing programs.

It calls the urban environment the result of an incoherent process—"a discontinuity of decision making by the public and private sponsors . . . the subdivision of decision making into specialized areas of concern to the extent that decisions can rarely be taken as an integral whole."

Design is segregated from the decision-making process. It is an additive. The statement explains: "Design" decisions are viewed as differing in kind from "practical" decisions on program, site and budget and are therefore postponed until these latter decisions have been taken. Yet it is the practical decisions that largely determine basic form.

"Design, which is generally assumed to deal with the creation of environmental form, is in fact reduced to the role of embellishing a form predetermined by the practical decisions."

The document labels the basis for evaluating design alternatives as "too narrow." Social and esthetic considerations are omitted and "design

opportunities are rarely explored. Our new national values require the development of a far broader basis for evaluating costs and benefits."

Government, too, is out of the decision-making process. "Government is partner, silent or otherwise, in the great majority of physical design decisions," the presentation points out, but government, "in deference to attitudes of a simpler time, disclaims this role and thus does not involve itself creatively in decision making. The federal establishment, as senior partner on the governmental side, defaults in its creative participation with its private partner.

"The challenge of this urban crisis may, in its scale and intensity, indicate that we are experiencing a historic time of troubles marking the death of one great age (the Renaissance) and the birth of a new age. History evidences that the frontier nation in such a period emerges as the leader of its civilization into this new age (this seems to be the situation of the United States today); that this responsibility matures and drastically alters the frontier nation (again this seems true of our country); and that by creative response to the challenge of change such a nation gives the first form to the culture of the new age. A creative response to our urban challenge could, by the test of history, lead the United States into its first Golden Age.

"It seems clear that the federal government must provide the creative leadership."

National Strategy for Creative Response

The document notes that in the three decades remaining to 20th century man this nation will build and rebuild at a volume equal to the total building of our last three centuries.

Replacing the "thoughtless and alienating processes that have produced today's social chaos" with a new comprehensive and socially oriented

development process may benefit the social as well as the physical environment, it says.

"We therefore recommend a new development process which, by the test of its application to date, holds forth the hope of accomplishing the strategic objective posed," it says. The new process would include eight features:

- **National Goals**—These would be coordinated externally with other national goals (space exploration, etc.) to delineate the resources available for environmental goals. These goals should be promulgated by Congress, and Congress should establish a permanent agency charged with their continuing review and updating. Besides being coordinated externally, goals "must also be coordinated internally," the document explains, "in order to identify for each strategic objective its related subordinate objectives . . . and to establish the priorities for committing resources within a general time schedule."

If "strategic objective" sounds military it is by the choice of Urban Design Committee Chairman Archibald C. Rogers, FAIA, who in one of three exhibit papers (the document also contains two magazine articles dealing with embryonic examples of the new development process) describes planning stages in these terms:

Stage 1, reconnaissance, a general survey of the existing situation.

Stage 2, the selection of strategic objectives.

Stage 3, the consideration, and then the selection, of alternative strategies to reach objectives.

Stage 4, tactics—the final design process itself.

- **Public-Private Partnership**—"Within the coordinating framework of national urban goals," the document says, "the mechanism for their accomplishment should be established by the formalization of the public-private partnership which controls today's physical development."

This mechanism could be in the form of a public-private community development corporation or, as recommended in another of the testimony's exhibit papers, of a sponsor's team—but there must be decision-making authority within the limits of their character.

Rogers in his exhibit paper ascribes to the "new sponsor" the "key attributes" of being able to make decisions, of having the power to make binding decisions, of having the time to devote to the design process, of having the willingness to participate in and be committed to the design

process and of having continuity through it.

- **Partnership Charters**—Each partnership would require a charter stating its development target as a component of the national urban goals to be achieved. The target would be stated as a social purpose to be realized through physical development, the document says, adding:

"The charter must be adaptable to differing kinds of development projects and to differing scales of projects from small-scale rehabilitation to large-scale regional development. The charter should specify standards to govern the process rather than standards governing the end project.

- **Partnership Teams**—Each partnership team should include a government representative, the document says, particularly in large-scale undertakings, and he should have the power to act.

"A representative of the user should also be included," since the partnership is charged with accomplishing a public social purpose. The team is completed by its technical staff in the form of a design team."

- **Decision-making Process**—The document recommends that the partnership must accept the decision-making process as a single continuum from its initial statement of objectives through the implementation of the development project.

"It must recognize the sequence of decision making on a vertical scale, from broad strategies to the tactical details of design, and on a horizontal scale from broad environmental considerations surrounding its project area itself. It must make its decisions on both scales as whole decisions without departmentalizing the process. It must integrate design with each decision-making stage and it must require that the design process be supported by social research."

In his exhibit paper, Rogers describes design as "the conscious synthesis of each family of alternatives posed for evaluation and decision at each stage of the decision-making process. It is the depiction of the formal image that is inherent in each family of alternative decisions. It is the fitting together of the separate pieces of our physical environment at each stage of decision making:

1. Relating man-made to natural elements of our environment.
2. Ranging from the microscale of a single building to the broadest scale of a metropolis or region.
3. Coordinating the tangible program require-

Senators Ribicoff, center, listening to aide; Javits, left, hand to face; and Robert Kennedy, at right.





Testifying, from left, are Harold Wise, representing planners; Rogers of AIA; and Lee Ham, on behalf of engineers.

ments, such as functions and costs, with the less visible but more important intangibles—the social and psychological needs of those who will use and experience the final product.

4. Coordinating these requirements not only horizontally as a two-dimensional plan but vertically as a three-dimensional architectural concept from the smallest to the largest scale of development.

“Design is finally the creation, through each such concept at any scale, of that enduring architectural art which should properly be the final purpose of each segment of our physical environment,” Rogers writes.

On the integration of the social sciences with design, Andrew F. Euston Jr., director of Urban Programs for the AIA, in an exhibit paper he prepared quotes the behavioral theorist, Dr. Carl Rogers: “It is not upon the physical sciences that the future will depend. It is upon us who are trying to understand and deal with the interactions between human beings . . . who are trying to create helping relationships.”

The finer point here, in Euston’s words, “is that the act of building—and before that the deliberate acts of planning and design—constitute interactions between human beings. Building is a decision-making process based from the outset upon attitudes toward people.”

• Design Teams—These would be differently constituted depending upon the type and scale of the project. Normally, they would include a broad range of design and technical disciplines and each team would include an urban sociologist.

“The design team should be charged with posing the alternatives in each decision stage and with the evaluation of alternatives against the broadest spectrum of costs and benefits within the project and in its environs,” the document says.

In another exhibit paper, Robert D. Katz, associate professor of urban design at the University of Illinois, writes:

“The British have embarked on just such an interdisciplinary effort through the creation of

development teams. In Britain, the Ministry of Housing and Local Government has instituted a system whereby representatives from a number of disciplines—among them architecture, sociology, building construction—are assigned together throughout the entire design process from the formulation of briefs through building erection and occupancy.

Katz quotes from a paper submitted to the Architectural Association in London by Oliver Cox: “Essential to the way in which these groups work is that all skills are involved in decisions at each stage of the cycle. In this way a new dimension in understanding is gained. We are not just adding, for example, A’s knowledge on human behavior to B’s knowledge of building design, but A and B together are beginning to study the far more important subject of the relationship between human behavior and building design.”

The Institute’s document says design teams would also be charged with depicting the forms inherent in each set of alternatives selected. “Each concept must relate the project with its environs and must reconcile the social objectives (human renewal) with the physical objectives (urban renewal). These concepts must, in the end, be seen as vehicles for the art of architecture which is in itself a valid national goal.”

Rogers in his exhibit paper says that like the sponsor, the designer, too, must reorganize if he is to function effectively within the design process. Regardless of the scale of the project, he writes, the designer today is generally a team—no more than an architect, mechanical-electrical engineer and landscape architect for a small project, but for a large one as many as 15 or 20 different specialties.

He refers to one of the articles in the presentation’s appendix, an account of Baltimore’s Concept Team in which various disciplines are combined to integrate urban highway planning with the social and physical fabric of the city.

Rogers says that while such a team of specialists requires a coordinator, it functions best as a co-equal group of peers when developing or testing concepts. “It is this group which, in fact, is

the designer in the sense that the designer is the generalist who synthesizes all the specialties," Rogers submits, adding:

"If the chief attribute of the sponsor is power, that of the designer is creative conceptualization and imagination—the ability to forecast the image of decisions. Although each individual member of the team may have an isolated area of expertise, he must be capable of contributing toward this attribute which must be inherent in the team as a whole."

The architect is often best qualified to be the team coordinator because he is, by experience, a generalist rather than a specialist. Rogers warns, however, that the architect should not take upon himself the sole responsibility for synthesis "which is rightly the role of the team itself."

• **Governmental Programs**—All public environmental programs should flow through and be coordinated by the development teams of sponsors and designers, the document recommends.

"This will provide for the urgently needed coordination of federal programs with those of the states and of the municipalities as well as for coordination of federal programs each with the other. Certain programs may require restructuring, but even in their present form impressive results might be achieved by their coordination through the partnership mechanism.

• **Technical Innovation**—"The partnership and its design team should exploit in the evaluation process the newly developed computer technology and hardware to relate these evaluations to the real requirements of the social program," says the statement, "and to make the most efficient use of the resources available within the design professions."

Euston suggests in his paper that "much of what our civilization builds is less helpful than it should be. It is obvious that too many physical environments here in America are, from their inception, blatantly hostile or exploitative acts, long-lasting in the burdens they force their inhabitants to endure.

"This was true of the 'dumbbell' type of Harlem tenements as it is even today of most jails. Why are not malevolent environments prohibited? Why, moreover, are they unexamined? The truth is that the man-made environment has been largely neglected by behavioral science as a contributing factor in the quality of human experience—of life styles, of phenomena such as anti-social hostility or of personal growth and intelligence."

The New Product

The new process should evolve a product fitting the characteristics of our times, the document declares. "The new physical environment, to fit these characteristics, should accommodate

the values of our new society. We should continue and enlarge our efforts to preserve the physical heritage of the past, but we should not attempt to create in our new environment a nostalgic recollection of a prior time. . . .

"To accommodate the diversity of our national life, the urban environment should provide areas for congregation to replace the patterns of segregation. The development of architectural themes and urban areas suiting the personality of each congregation would be a more realistic and creative means for countering segregation than is our present effort toward uniformity.

"Uniformity of environmental standards may produce an environment fitting the life styles of those who sponsor and design it. In our nation, at this time, the life styles of the private developer, the government official and the design professional are generally the same. The hazard is that they will create an environment pleasing to them but perhaps quite displeasing to other segments of the population whose life styles may not be the same."

Research/Implementation Strategy

Research—The document recommends a national urban research function to support the new development process and to be charged with making an initial "and long overdue" investigation, on a comprehensive scale, of the realities of the urban problem.

This ongoing investigation would involve social, economic and physical factors and in addition to this basic research, specific project research would be undertaken on request of any sponsor.

"An important final area of research would include followup studies of completed development projects to discover the degree to which the original charge has been met," the statement says. Following up would be solely for the purpose of learning.

Implementation Strategy—The fundamental tool of a national implementation strategy would be a coordinated expenditure of capital investment by the federal, state and local governments, the document states.

"Where such funds are invested coherently, in accordance with a development plan evolved under the new process, they can create a strong public armature which should do much to ensure that the plan is carried out as proposed. Such a coordinated capital investment in highways, utilities, parks and buildings, if initiated prior to development, would encourage private development in accordance with the plan because of the economic benefits flowing from this public armature."

Conversely, the statement says, it could inhibit private development of areas not in accordance

with the plan by withholding public investment from such areas.

"Such legislation should take the form of guidelines relating to the development process. It should be sufficiently flexible to encourage private innovations. Insofar as possible, the governmental regulations, which are now descriptive of the desired end product, should be phased out at all levels of government in favor of more creative procedural controls."

Federal Administration of the Process

An executive reorganization of the federal government would probably be required, the document ventures, "in view of the national scale of the recommended process and of its supporting facilities for research and implementation." It is conceded that such a reorganization would be a long-range undertaking but it "could result in a simplification of the structure."

Whether at the cabinet level or by existing departments, the reorganization should provide for:

1. An independent national foundation or institute dealing solely but comprehensively with the urban environment, both social and physical. This institute could be administered by a public-private corporation or foundation.

2. The establishment of an agency reporting to the chief executive and charged with developing national goals for the urban environment and with a continuing reappraisal and updating of these goals and of their priorities. Such an agency would coordinate administrative functions.

3. The administration of the process would imply departmental or subdepartmental agencies charged with:

- Administering project research and programming functions and coordinating assignments to the development mechanisms.
- Administering the design and planning phases of these mechanisms.
- Administering the implementation phases and coordinating the governmental capital programs.

The Institute document also cites a number of chances for immediate implementation of the new development process. These "vehicles for testing" the process exist in current government environmental, housing and aid-to-planning programs, according to the document.

As for the long-term proposal, the document argues that "our recommendation as to process does not really depend on a massive commitment of public funds to get it started. . . . The recommended process holds out hope for increasing the efficiency of current environmental programs." Should hopes be borne out through use of existing testing vehicles, attention might well be turned toward implementation of the long-term program, says the testimony document.

The Senator

Making up the urban design panel appearing before the Subcommittee on Executive Reorganization, chaired by Sen. Abraham Ribicoff (D-Conn.), were Archibald C. Rogers, FAIA, chairman of the AIA Committee on Urban Design; Harold F. Wise, chairman of the American Institute of Planners' Legislative Committee; and Lee Ham, consulting engineer, representing the various professional engineering associations. All three witnesses spoke out for the increased use of design as a process, for more efficient government procedures and for the creation of incentives to promote private sector investment in cities, particularly in new cities. Some excerpts:

Ribicoff: Now, I notice through your (prepared) statements there seems to be very little participation on the part of planners and architects and engineers in the formative stages of urban design and urban development. . . . Why do you have such little influence?

Rogers: It seems to me that the term "design" has become bastardized in our time. It is felt to be something which is called in after the practical decisions are made without recognizing that the practical decisions—budget, program, site, funding, these sorts of things—in fact carry within them an embryonic form which is . . . design. I think the best answer is just one sentence from an editorial in the *New York Times* on February 13, which says:

"Urban design is the form given to the solution of the city's problems," which implies that when you start to make the decisions that lead to these solutions in the very beginning—goal-setting, objectives and programs, that is where design has to be and that is where the designer has to be to give image to these.

Wise: I think that designers and planners and engineers are in quite early in the game in many situations. I point to some very excellent, quite superior civic design on

Expressing Educational Requirements

BY PETER D. PAUL, AIA

Language must build the bridge between the needs of education and the techniques of architecture. School building is an important segment of public construction today; education assumes an important place among our national goals. The success of these endeavors depends upon how well community, educators and architects understand each other. Too frequently the answer seems to be, "Not well enough."

This study is an attempt to analyze, clarify and improve this process and its instrument, commonly called "educational specifications."

The point at which a community decides to construct a school build-

The author: Mr. Paul, a partner in the firm of the Associated Architects and Planners, is chairman of the Educational Facilities Committee, Baltimore Chapter.

ing is a critical one. It may be considered an intersection between the concerns of public, educator and architect. The success of the whole enterprise will depend upon the clarity with which the participants are able to make themselves understood.

At this point, educational specifications represent a form of initial communication from the superintendent's staff to the architect. They analyze the status of the educational system and, implicitly, the public values which guide it. When the new school is constructed these values are translated from verbal symbols—words—into the spatial language of a building.

Ideally, this initial communication should be an honest statement of the best public values as they are expressed in educational practice. It should form the basis for a building that works in every sense. If the community asks that "each child be treated as an individual" but the spatial language of the building says that each child is only part of a mass process, communication has failed.

There is an initial semantic difficulty in the term "educational specifications." To the architect the term "specification" refers to a detailed prescription for building components. There has been a tendency for some educational agencies to confuse the terms and to treat educational specifications as a listing of detailed building requirements. An initial step toward clarity would be to substitute the term

"educational requirements for school facilities."

Who Is Speaking?

The form of the educational requirements and the architect's role in their development are dependent on the nature of the organization from which they arise. We may differentiate between the following forms of organization: 1) authoritarian organization, 2) democratic authority, 3) technocratic authority.

The authoritarian organization follows a corporate or military model. It assigns value to the clarity and efficiency of the chain of command, in which each participant has an assigned role and responsibility for the development of broad policy direction originating at the top of the hierarchy. Educational requirements originating in such a system would tend to be in the form of a directive to the architect, distinguished at best by clarity and completeness. This system will value the efficiency and directness which it is designed to encourage. The architect will recognize his responsibilities and limitations within the chain.

Democratic authority recognizes as its basic value the consent of

One of a series of papers prepared by members of the AIA Committee on School and College Architecture and by selected specialists to make laymen aware of school building problems and trends and to stimulate discussion. They are not intended to be definitive last words and carry only the authority of their respective authors. New subjects are being developed and contributed articles are welcome. Reprints of these nontechnical articles are widely distributed to educators and interested laymen. One copy of each current issue will be sent free of charge; additional copies, 10¢ each.



those participating in the organization. Following the American political or social model, it seeks authority through consensus. Educational requirements under such a system would emphasize developing requirements from users and public. The virtues of this system are its sensitivity to need and public sentiment at the expense of efficiency and greater possibility of error. Such a system would have a tendency to moderate the extremes of educator, architect and public guardian. Probably the most satisfying results can be achieved under a form of democratic authority. Under such a system the architect may serve as a catalyst in the preparation of the educational requirements, attempting to develop a synthesis of physical means with educational objectives.

Technocratic authority would be expressed in the use of outside experts to prepare the educational requirements. This approach has a tendency to abdicate local authority to the outside expert. If the expert ceases to be adviser and becomes a technocratic authority, the distinction between policy and technical development is obscured, all of the vitality of the project is lost and its execution becomes routine.

What Is the Participants' Role?

The participants in the school planning process are 1) the educator, 2) the architect, 3) the community.

The educator has the responsibility of defining the functions of the educational process which the facilities will have to accommodate. The educational agency is the primary authority or client whose needs the architect is engaged to satisfy.

The architect has the responsibility of providing the physical means to satisfy these functions.

In the simplest terms of communication, the educator might write his educational requirements as a prescription to be filled by the architect. While this view is adequate to get the job done, it overlooks by its simplification most of the sources for vitality in the school plant.

To understand the entire area of material to be communicated, let us ask:

- What of the community?
- What of the users?
- How are changing techniques both in education and building to be understood?

In a static society, both educational techniques and building techniques would be constant and known, and their consequences would be thoroughly familiar. Where we do not accept such a static situation, interaction between architectural means and educational ends is necessary for progress.

An educator cannot visualize a program without considering the physical means to accomplish it. He cannot decide that he will pursue a certain program which he might consider optimum for his curriculum if he knows that the cost of facilities for the program would be prohibitive. In programming he therefore establishes a balance on the basis of what he knows to be possible.

The architect's area of knowledge is building design and construction

—physical means. We can expect that decisions could be made that are more realistic and more sensitive to the problems if there can be an interaction between the educator and the architect to consider what is desirable and what is possible. Under the forms of authority which we outlined, technocratic authority tends to preclude such interaction by assuming itself to possess all necessary information. Democratic authority tends to encourage interaction, and authoritarian organization to permit interaction, properly handled.

The educational authorities are ultimately responsible to the community, which will act as a generally passive participant, either assenting to the educator's programs or dissenting from them. Community assent may range from enthusiasm to the threshold of toleration. The possibility of utilizing talents and resources in the community to encourage quality in educational planning is an important objective to consider, if a difficult one indeed.

In any case, basic educational policies require community support. The educational requirements will be improved if they can accomplish the difficult job of stating them explicitly and meaningfully.

A significant possibility for participation by the faculty users of the school has been emphasized by Dr. Dwayne Gardner at the US Office of Education. He has urged that the educational requirements



be written by the faculty after careful analysis of their program objectives. In this way, the educational requirements become a means of in-service training for staff, with the building itself considered as their most valuable teaching aid.

When Is Communication Inadequate?

Frequently educational requirements fail to give the kinds of information which community and architect should expect for an enterprise as complex and expensive as a school building. There are several characteristically inadequate forms of communication.

Mathematical expression is too abstract. (It is quantitative by definition and incapable of conveying concepts of quality.) Such a form of educational requirements simply lists spaces as mathematical abstraction, assuming that the architect will know the qualities which the spaces are supposed to possess. The educator should not make such an assumption.

In some cases, educational requirements have been lacking entirely. Instructions have been vague or generalized. The educator simply requests a "24-classroom school with the usual facilities" or "a school like the last one we built." This is an unsatisfactorily casual approach to an important community investment. An assumption that the architect should provide the necessary knowledge to develop such vague instructions is contrary to a reasonable definition of the architect's role. It asks the architect to assume the educator's function.

At the other extreme is the kind of semantic confusion which results in an overspecification of the physical characteristics of building, usually without adequate description of its educational uses. In such a case, the educational authority may attempt to assume the architect's function, regarding the architect as his draftsman responsible for "dressing up" the exterior. There is a tendency here to overlook the educational purposes so that the writer's design conclusions might not be questioned.

What Forms Encourage Communication?

There are several forms of written educational requirements which seem to communicate clearly and to convey the essential information which the architect needs to design a school. It is not necessary

—perhaps not possible—to propose a model form appropriate to all educational authorities. I have tried, rather, to make a pluralistic analysis of valid alternatives.

A form of educational requirements which seemed most likely to suggest advancement in the quality of school design is one by the Educational Facilities Regional Laboratory at the University of Tennessee and suggested by Dr. Charles Trotter at the US Office of Education. It is based on an explicit and detailed explanation of the kinds of activities to be performed: a careful analysis of just what needed to be accommodated in the new building. It was devel-



oped by the faculty over an extended period of time. The example we reviewed is for a Greenville, Tennessee, elementary school.

Why Was it Significant?

First, because it carefully analyzes the fundamental raw material of the building design and its use. Second, the educators have assumed responsibility for their role in determining the function of the building. Third, it gives the architect the kind of necessary information about which he knows least—educational use—and omits unnecessary detail of his field of competence.

Many committees may want to have an approved analytical form providing a guide for general use. We would suggest a format prepared for the state of North Carolina,¹ where written educational requirements are required by state law for all projects.

It was developed by Dr. Dwayne

Gardner, now with the US Office of Education. Because it provides a comprehensive working outline of general application, the content of this format will be outlined below.

A short form of written educational requirements may serve to convey the necessary information if the form is comprehensive, and the content is carefully chosen and refined. The educational requirements for Hill High School in New Haven, Connecticut, designed by the Saarinen Office (now Kevin Roche John Dinkeloo Associates) ran to only 10 succinct pages, but they provide a clear statement of the program. Such a form may be

particularly useful in the larger districts building many schools because it is brief and fundamental enough to allow effective participation by superintendent and board of education. A short form would best be supplemented by a continuing generalized reference program.

The city of Atlanta,² facing the problems of building many schools, has developed generalized requirements for all city schools. As a careful assemblage of the work of many talents, such an approach is valuable. For detailed analysis in a larger system such an approach may be necessary. The Atlanta educational requirements are of par-

¹See also the planning guides of Connecticut, Minnesota and Ohio.

²Other educational specifications worthy of note: Los Angeles; Dade County, Fla.; Henderson, N. C.; Greenville, Tenn.; Baltimore City and Baltimore, Montgomery, Prince Georges and Washington Counties, all in Maryland.

ticular value in their assembly of policy statements based on public analysis and with public support.

A particularly valuable direction for development might be found through a combination and refinement of the New Haven and Atlanta approaches. The value of generalized requirements could be increased if it were made into a reference program, with each school individualized through short-form educational requirements. An effective reference program could accommodate not only local policy and experience but state and national publications as well. A frequent fault is the attempt to spell out too much and to overemphasize details at the expense of broader concepts.

Mathematical summaries alone are not a satisfactory form of written educational requirements. However, they form a necessary part of the total educational requirements when they focus on the economic question of allocation of community resources. Recognition and effective handling of this concern of the community participant in the educational requirements is vital to the success of the project. More refinement needs to be given to the mathematics of educational requirements so that areas are given in a modular series and quantities are understood as approximations within stated limits. Simple bookkeeping arithmetic is a frequent obstacle to mathematical communication.

Emphasis on written educational requirements should not overlook the value of other forms of communication. Ultimately the educational requirements should be written. However, some of the most valuable communication may come in the form of spoken communication or demonstration.

All communication cannot be translated to written form; much can only be approximated. The initial communication of the educational requirements may be verbal. If so the act of committing them to writing, by whatever agent, will make the written educational requirements a necessary form of record.

Communication by example, too, can be a valuable supplement to the written educational requirements. For clear communication, where an example is meant, direct reference should be made to the example. A frequent fault in written educational requirements is the attempt to translate an example of a past project into written



form in a way which is both unclear and tedious.

What Should Requirements Contain?

The most direct general form which was reviewed seemed to be one developed by Dr. Gardner, which includes:

1. school philosophy
2. general considerations about the total school beyond consideration of its parts
3. consideration of each separate use area in terms of the following seven points:
 - philosophy and objectives
 - activities to be housed
 - persons to be housed
 - space needs approximately stated
 - functional relationships
 - equipment
 - special provisions.

This list is not only comprehensive enough to serve as a checklist, but it suggests proper emphasis and order for organization of the educational requirements.

A major fault in many educational requirements (and checklists) is the tendency to consider the parts in more or less satisfactory detail without considering the



education program and the building as a whole. A notable exception is the short form cited above for the New Haven high school. We would recommend a form which moves from the general to the specific and shows the control of general educational policy over specialist demands in preference to a deductive form which analyzes the parts and concludes with a summary of the analysis. Dr. Gardner's outline is based on a general-to-specific program.

Written educational requirements should be prepared for every school project in a form appropriate to the specific educational authority and in a manner which provides a clear and comprehensive form of communication.

There is a range of appropriate forms of communication for educational requirements. Each educational authority should take advantage of the diversity of current experience to develop a method suitable for its situation. It should be a method in which the educator assumes his role fully and communicates his requirements clearly to the other participants in the school building process.

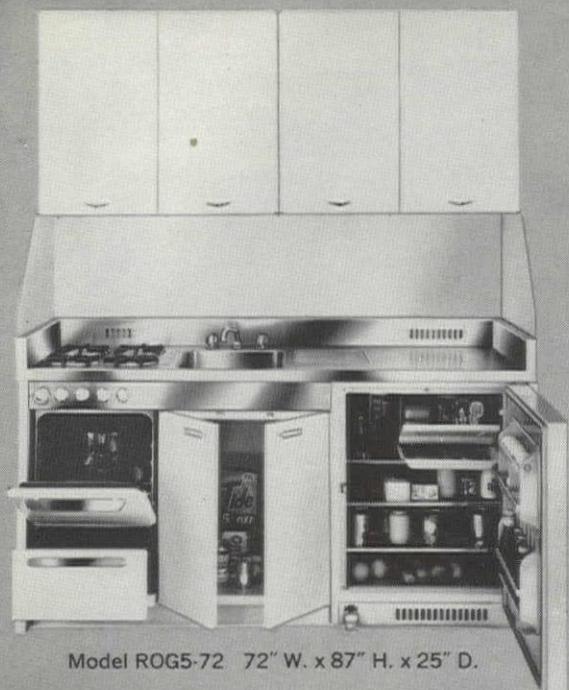
How will the best schools be achieved? Vitality in school design will come through a more sensitive understanding of the educational function of the building. It will be developed through an interaction between architectural means and educational objectives as both architects and educators assume their proper responsibilities and work together. Educational function provides the common meeting ground between the interests of community, educator and architect.

The educational requirements are the primary means of communicating these functions, needs and objectives. The clarity of communication of these written educational requirements is a matter of critical importance to the quality of our schools. □

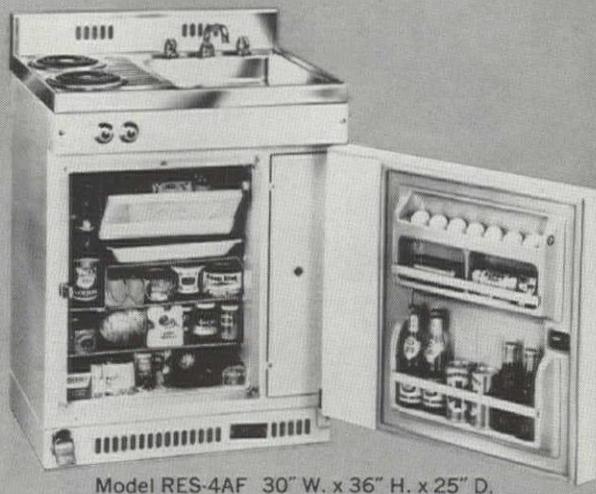
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Making a Model River

Following two years of inspections, study and evaluation, the AIA-assembled Potomac Planning Task Force has completed its report, scheduled for submission within a month to Secretary of Interior Stewart L. Udall. (Upon its publication, the AIA JOURNAL will feature an in-depth study.)

The task force report is expected to provide new guidelines for all river regions in the United States to identify, preserve and enhance the people's use of waterways and surrounding areas.

To be released under the title *The Potomac*, the report concludes with a recommendation that Congress establish a "Potomac Development Foundation as a channel through which federal funds, . . . technical and specialized knowledge and experience and incentive may be brought to bear on development of the basin."

In March of 1965, Udall asked the AIA to name an interdisciplinary task force to assist the Interior Department in carrying out President Johnson's directive to review the various existing plans for the Potomac and to develop a program to clean up the river, protect the natural setting and resources and provide improved recreation facilities. Such a review and program development was not only to formulate a comprehensive planning approach for the Potomac River Basin but also to "stimulate and inspire similar efforts" for other river regions.

The task force stated that the basin, because it is relatively undeveloped and because of its close tie with the history and government of our country, is "brilliantly qualified to serve as a model of scenic and recreational values for the nation as a whole."

The task force report first proposes that a "Potomac River National Landscape" be designated, extending the full length of the river and its major tributaries. It would have three zones, each requiring specific planning:

1. *The River* where "quality of waters and reasonable public access to and use of major streams must be assured."
2. *The Riverside* where "land use practices must ensure reasonable public access to the water and prevent dispossession of the landscape and pollution of major streams."
3. *The Setting* where "all proposed

development should be subject to approval by a public review agency charged with protection of environmental quality."

The task force further recommends that "there should be conducted in the Potomac basin the nation's first comprehensive ecological inventory. The findings of the inventory should be made a requisite part of every developmental group's agenda."

The report suggests that "suburban development districts" could be formed and empowered to acquire land and water rights ahead of urban development and "to plan their uses so that adequate water areas and other spaces for natural landscape, recreation, schools and other community necessities will be provided."

There is a unique opportunity, the report points out, to develop model new towns. In the Potomac Valley, river-oriented communities could be created that would use the "waterfront not only for recreation, which is commonplace, but for the civic and commercial center of the town."

Finally, to carry out the projected program of protection and development of the Potomac basin, the task force recommends that Congress establish and provide funds for a Potomac Development Foundation.

The report specifically recommends a federal appropriation of \$50 million a year for five years to purchase scenic easements and crucial sites to "investigate the means of establishing by law appropriate basinwide review of all structures and changed land uses proposed within the *Riverside* and *Setting*."

Chairman of the 11-man Potomac Planning Task Force was A. G. Odell Jr., FAIA, a former Institute president. Other members were Edward A. Ackerman of the Carnegie Institute; Edmund N. Bacon, AIA; R. Max Brooks, FAIA; Grady Clay, Hon. AIA; Donn Emmons, FAIA; Frederick Gutheim, Hon. AIA; Francis D. Lethbridge, FAIA; Ian L. McHarg, chairman of the University of Pennsylvania department of landscape architecture; Dr. Thorn-dike Saville, dean emeritus of the New York University College of Engineering; and Dr. M. Gordon Wolman, chairman of the geography department of Johns Hopkins University. □

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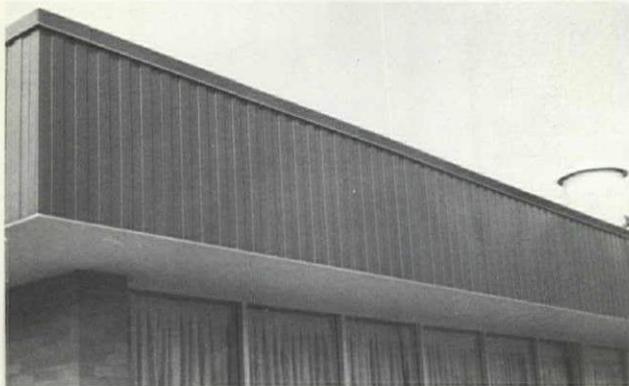
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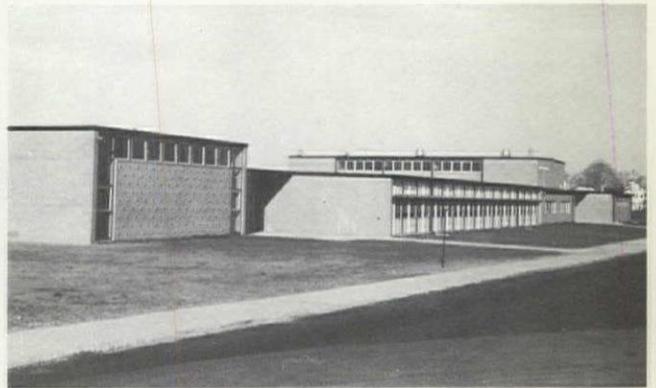
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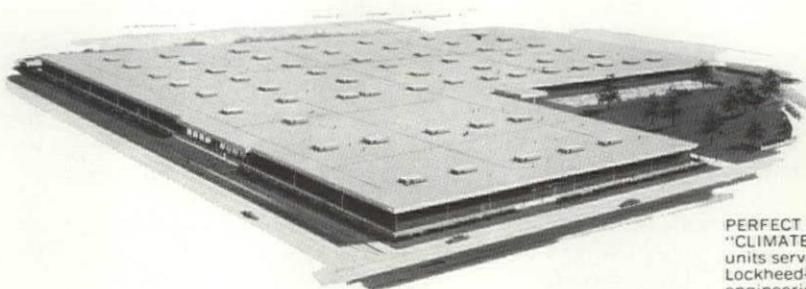
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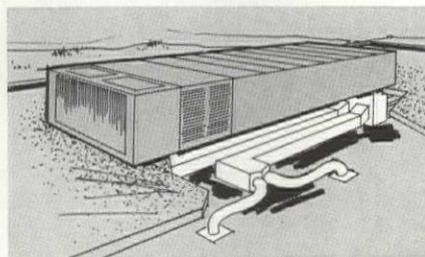
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Budgeting from page 63

liminary budgeting, leasing negotiations have generally not yet taken place and tenant requirements will not be known. Such allowances should be maximum, and the leasing agent of the owner should be encouraged to obtain leases at lesser amounts for the work than the allowances multiplied by the leased area would indicate.

This category should further include an allowance for special work which the landlord may elect to furnish at his cost to certain prestige and anchor tenants. Such allowances, of course, are subject to large variations and have in the author's experience ranged all the way from \$2.75 to \$4.50 per square foot of rental area. Such allowances are generally intended to cover such items as stair fronts, finish, ceilings and interior distribution of the electrical and air-conditioning systems.

20. Self-Liquidating Utilities — This category has been discussed in previous paragraphs and need not be amplified further.

The categories of architectural and engineering fees as well as the items under "owner's budget items" (Nos. 21 through 30 on the form) are self-explanatory and intended to add such amounts as required to develop an overall budget for the project. Since the owner will be familiar with his contractual obligations under his agreement with the architect, and since he is the one to make decisions affecting items 22 through 30, these should be left blank by the budget analyst whose work will stop at the subtotal including the "additional budget costs."

In breaking down the total preliminary budget into the above indicated categories, sufficient contingency should be included in each category in order to counteract the fact that the budget has been prepared on the basis of a minimum of definite information. This is preferable to the system of calling out a certain percentage factor as contingency since it will not as easily lead to a bargaining session with the budget analyst and attempts to have him reduce such contingencies.

Some budget analysts prefer not to list categories 21 through 30 within the budget and prefer to list them as exclusions from the budget. This, for certain types of clients, makes for a better and more understandable budget presentation. One system is as good as the other as long as the items required for a total project budget are either listed or specifically excluded in writing.

Budget Qualifications

A large number of assumptions have to be made in the preparation of budget figures, and such assumptions should be explained in writing in order to give meaning to the projected dollar amounts. Therefore, it is necessary to make some sort of outline specification and a listing of assumptions part of the budget presentation. This will properly define the scope of the budget in writing and will facilitate making changes at a later time when more or different information becomes available. In the interest of forestalling any possible future dispute with regard to the original preliminary budget, such a listing of assumptions should be quite extensive and specific.

Also, somewhere in the preamble to the budget presentation, reference should be made to the fact that the budget is intended to cover only such items as are called out in the outline specification and that the budget is based on the assumptions listed. A small amount of care and caution at this stage of the game by properly defining the scope of the budget and qualifying its validity can insure against an untold number of arguments at a later date.

What Is a Square Foot?

It is a customary procedure to express budget costs in terms of square foot costs. This will allow comparison, if thoughtfully done, with costs of similar projects and will allow, in many instances, adjustment of budgets by prorating when project areas are adjusted during later design stages.

The quoting of costs in terms of building area has unfortunately become a widely accepted practice without a proper definition of what is meant by it. Even though standard documents exist, defining the measurements of buildings, the gross area of a project alone does not impart too much meaning to such cost figures without reference to the actual usable area provided within its total. Confusion reigns

in square foot cost quotations and all too often such confusion leads to interpretations of budgets which can only result in arguments and strained relations between architect and client.

A much clearer definition of costs can be obtained by quoting them in terms of number of beds in a hospital, number of seats in a theater or restaurant, number of students provided for in a school, etc. The number of such units provided in a project determines the income potential or the efficiency of the contemplated improvement and, in the last analysis, this is the prime reason for the whole undertaking. Expression of costs in terms of such units provides much better information and comparison than pure square foot figures.

In projects primarily planned for leasing to tenants or for the owner's own use, a different unit based on areas has been developed. Since it is the usable area for the owner's own purposes or the area which he can lease to tenants that determines the income to be obtained from the project, costs should be based on net rental area. The cost of the building is then brought into meaningful relationship to the revenue-producing potential of the project.

Net rental area is obtained by deducting from the gross building area all areas on which tenants will not pay rent or which are not directly contributing to the owner's own space requirements.

Such nonrevenue-producing areas generally consist of public accommodations, lobbies, corridors, code-required toilets, stairs, etc., as well as functional mechanical spaces such as shafts for elevators, mechanical risers or other mechanical equipment spaces.

Columns and pilasters within the remaining rental area are traditionally not deducted, and the rental areas are computed to center lines of interior partitions and walls and to the glass line, or an equivalent distance, in the case of exterior building walls.

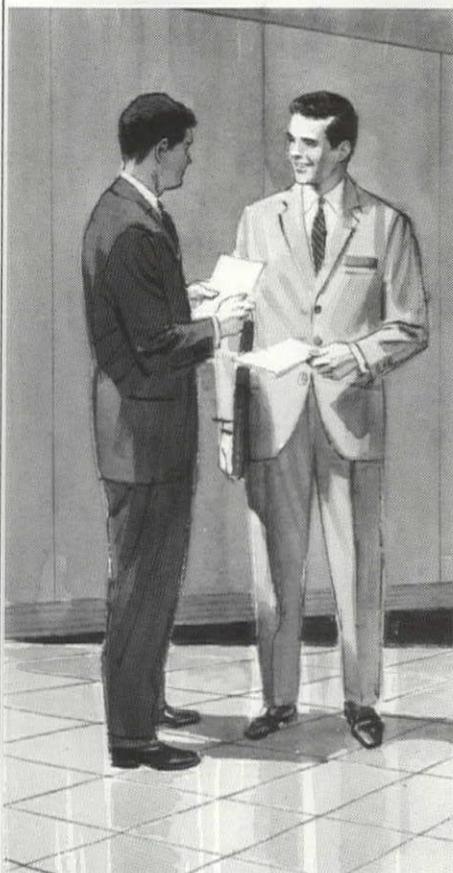
Expressions of cost in terms of such square footage reduced to net rental areas are, of course, higher than costs per square foot of gross building area. It is quite important that the client be made aware of the definition of the square foot so that his projections of costs will be in line with the architect's budget for the project. Since the time-honored square foot cost, based on gross areas, is so deeply ingrained in the

Continued on page 82

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Budgeting from page 80

minds of the public, it is advantageous to call attention to these matters by relating the budget to both types of square foot cost.

The concept of useful areas, or net rental area, in addition, gives the architect and client a useful tool for comparing various schemes

for a project with regard to efficiency. Of course, efficiency is not the only factor in planning and design, but it does have to be considered.

Previous experience from similar projects must be the budget analyst's main tool in arriving at the units costs to be used. In addition, published cost information and indexes are available; when used with caution and understanding, these will be helpful in budget preparation.

Common Pitfalls

Insufficient description of the

scope of work covered by the budget is probably the most prevalent source of misunderstanding. In order to avoid such misunderstandings, a preamble to the budget should explain its target, and a brief but concise outline specification and a listing of assumptions made should be part of the presentation. Figures alone, without an explanation, are meaningless and dangerous.

Another source of potential budget trouble lies in "special deals" which owners sometimes propose. A case in point would be "owner-furnished light fixtures to be installed by the contractor." Large owners often exercise their buying power in this way with the aim of not having to pay the contractor's markup. What is often forgotten is that the advantage of such deals is nullified by the subcontractors adding into their costs the profit or rebates which they would have obtained had such purchases been made through them. Great care must therefore be exercised before lowering a budget cost for such special deals.

Contingencies are important even at such an early stage as the preliminary budget period. As outlined earlier, such contingencies should be distributed throughout the budget categories rather than showing them in a single lump sum, which may become subject to "negotiation" with the budget analyst—or with the client. When cuts are to be made in a budget, the client's first impulse is to be optimistic and to cut out or reduce the contingency. This should never be permitted.

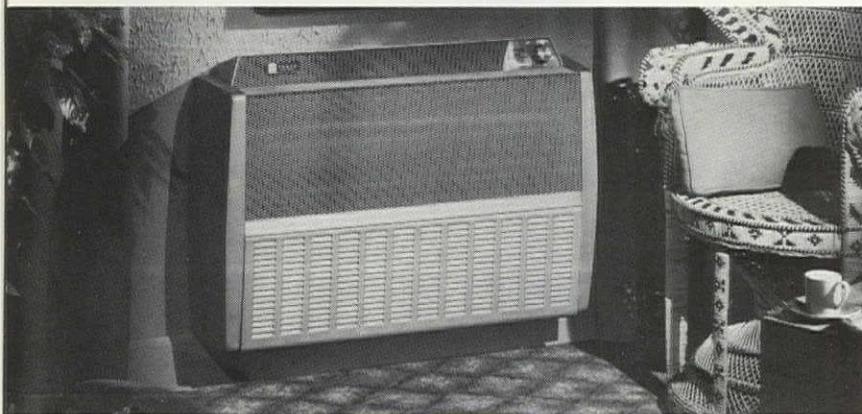
Budgets, once prepared, should not be forgotten. They will have to live and stand up for a long time and must be constantly kept up to date, in writing, whenever changes occur in the scope of the work or when further development warrants a change in the underlying assumptions. Changes should not be left to accumulate; and budget revisions should be presented to the owner, in writing, as soon as they become necessary.

It is not possible to place too much emphasis on the need for orderly and organized procedures in budget preparation. A carelessly prepared budget is nothing but insurance for future trouble. Just as visual design must be treated with sensitivity, engineering design must be based on knowledge applied with judgment and sensitivity to the creative activity of preparing a budget.



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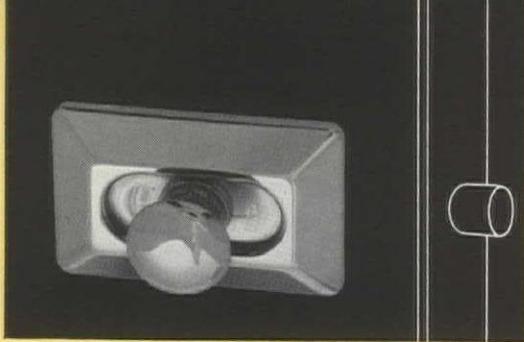
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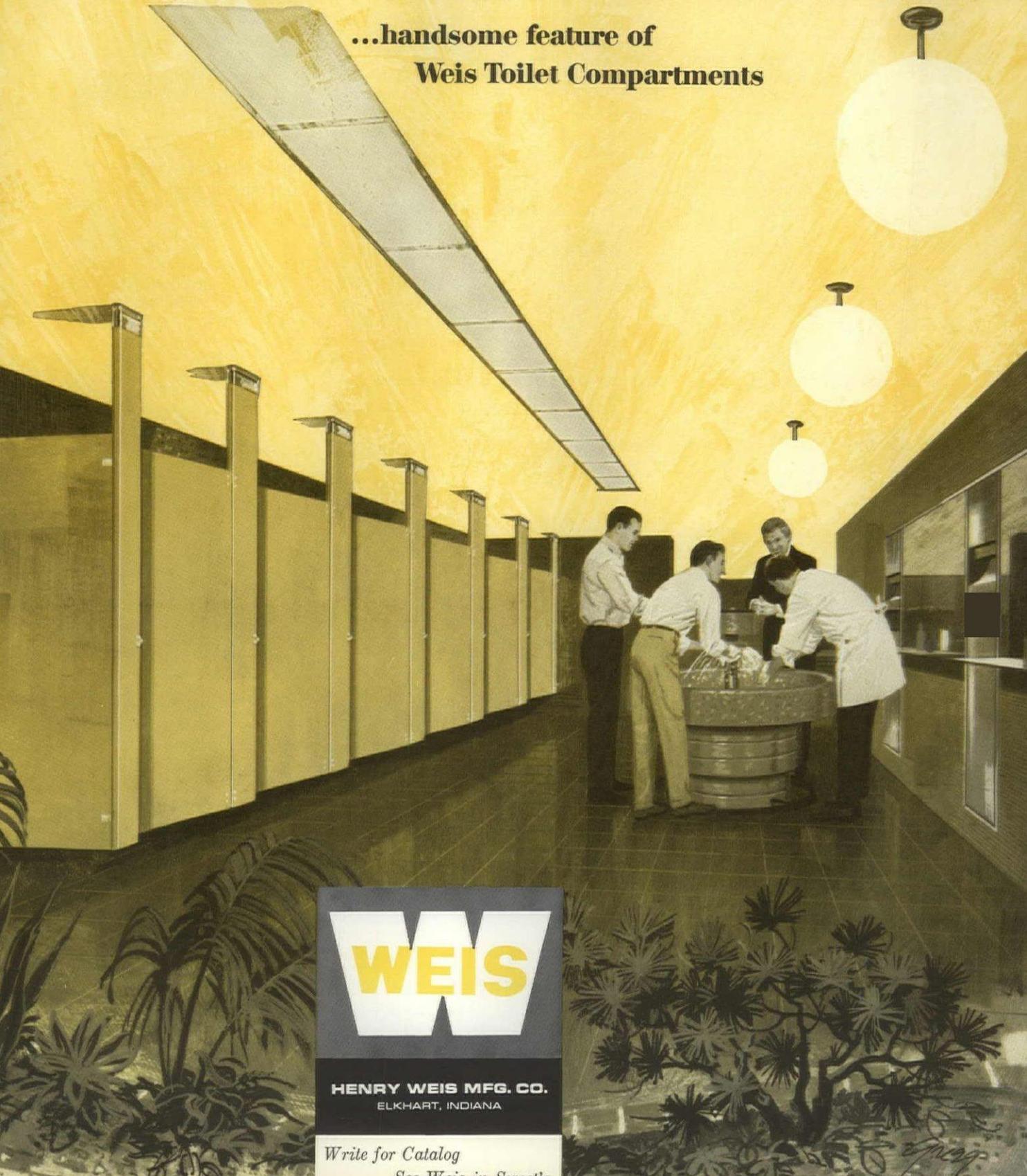
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Living Architecture: Egyptian, Jean-Louis de Cenival, 1964; **Mayan**, Henri Stierlin, 1964; **Roman**, Gilbert Picard, 1965; **Ottoman**, Ulya Vögt-Gokuil, 1966. New York: Grosset & Dunlap. 192 pp. each. \$7.95 each.

The books in this series are uniformly attractive, well illustrated with splendid photographs and published at what seems a reasonable price. Each volume is introduced by a distinguished person. For example, Marcel Breuer has written the introduction to the volume on Egyptian architecture, and Jürgen Joedicke pays tribute to the Turks. These concise and provocative essays lead one into the main body of the book.

The aim of the series is to bring the reader into an understanding of a specific period of architecture by a study of relatively few of its characteristic buildings. An effort is made to relate the architecture to the political and social conditions of the time, and there is mention of town-planning principles as

well. Sculpture and other arts are studied in their role as parts of the architectural form.

Each volume has a bibliography and chronological table. For such a modest price it would seem that any library might wish to consider adding the volumes in this series to its collection. Other works in preparation include Baroque, Gothic and Romanesque architecture.

Runcorn New Town. Runcorn, Cheshire: Runcorn Development Corp., 1967. 136 pp. 60 shillings.

This is the master plan for Runcorn New Town, located 14 miles from the center of Liverpool. The town is projected for a possible population of 100,000 by the end of the century.

Developed by architect-planner Arthur Ling in association with the Runcorn Development Corp., the plan of the town differs from other British new towns in that Runcorn already has a population of 30,000 persons, and the old is made an essential part of the development of the new. The plan aims to create unity between the two.

The residential areas are planned so that every person is within a five-minute walk of the local social

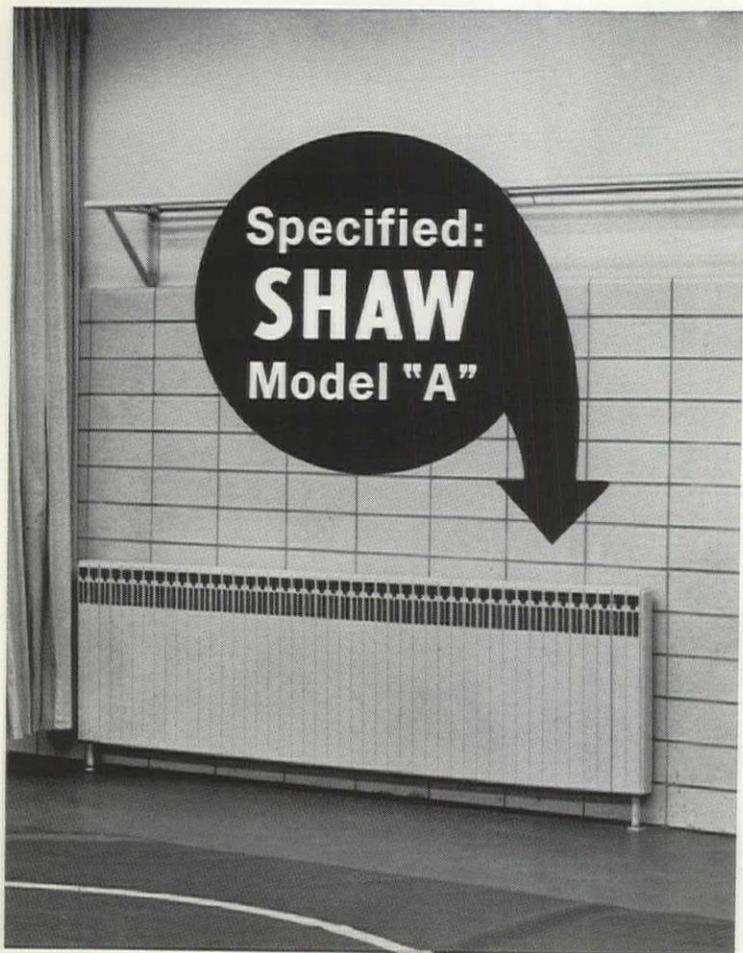
and shopping centers where rapid transit stops are located. The plan here presented in detail is illustrated with nearly 200 plans, sketches and photographs.

The Modern Metropolis: Its Origins, Growth, Characteristics, and Planning: Selected Essays. Hans Blumfeld. Edited by Paul D. Spreiregen. Cambridge: MIT Press, 1967. 377 pp. \$12.50.

Hans Blumfeld, presently consultant to the Metropolitan Toronto Planning Board and to the Service d'Urbanisme, Montreal, writes with perception and clarity, with simplicity and directness. The essays assembled here were written during the past quarter century for many occasions and for many audiences.

Spreiregen, formerly director of Urban Design Programs for the AIA and now program director of architecture, planning and design for the National Council on Arts, is justifiably enthusiastic about Hans Blumfeld's contributions to the literature of urban planning, and he has edited the papers judiciously, organizing them carefully into a unified order.

Continued on page 88



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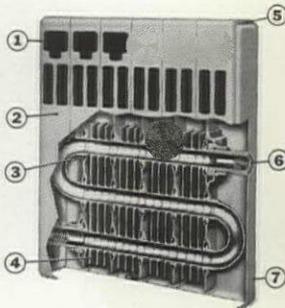
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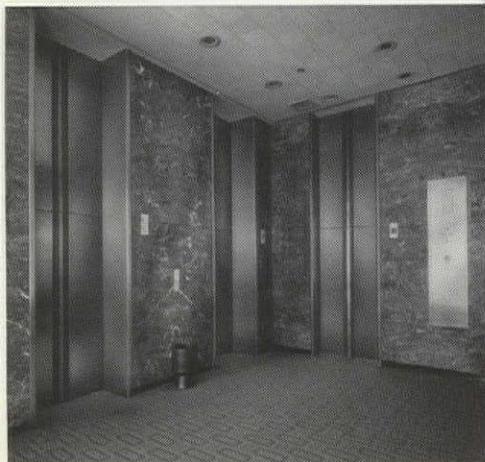
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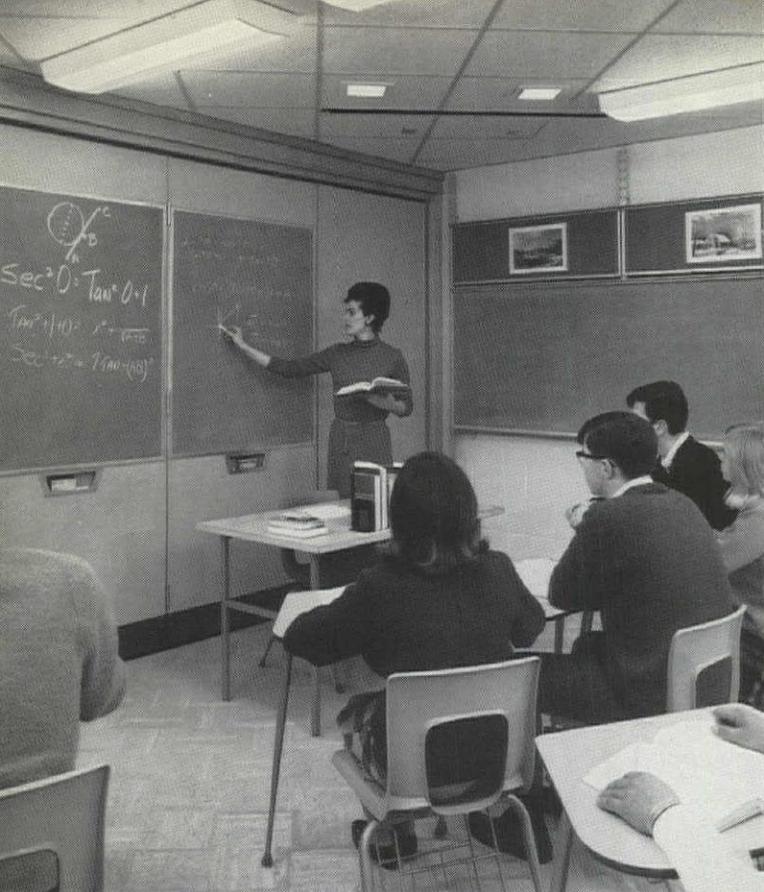
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The Effect of Windowless Classrooms on Elementary School Children: An Environmental Case-Study. Architectural Laboratory, Department of Agriculture, University of Michigan, 1965. 110 pp. \$2.

The present study is part and outgrowth of the recently reviewed SER 1-3 research project which was conducted by the above laboratory under the direction of Prof. C. Theodore Larson and sponsored by Educational Facilities Laboratories, Inc.

To investigate windowless classrooms is an important attempt to apply previous research and to answer some of the many questions which have been raised since the advent of a large number of windowless schools.

While the foregone conclusion was entertained that windows are no longer needed for reasons of ventilation or daylighting, thus making more room for furniture and blackboards, the question arose: Are windows still desirable for other reasons?

The major consideration seems to have been whether a "deprivation of a view" has a bearing upon "classroom learning activities." Having thus limited the scope, other considerations such as visual changes in apparent scale, visual extension of space and other matters of space perception as well as psychosomatic disorders caused by motion through space under varying light conditions are outside the discussion. In addition, we know next to nothing about how all this pictures in the child's mind. Therefore, the statement that "literature review had revealed no factual information" can prove no more than the fact that plenty of research still has to be done.

The experiment was conducted in two existing small school buildings of rectilinear modular design with interchangeable wall panels of opaque or transparent material. The latter being tinted acrylic plastic was not comparable to clear vision glass. The behavioral investigation was carried out in three stages: 1) with windows, 2) windows removed and 3) windows restored.

The findings derived from the experiments are based a) on individual responses from teachers and children to the features of the room, with and without windows, and b) on tests of academic performance of the pupils under those respective conditions.

Many teachers were satisfied that the pupils are no longer distracted by outside happenings when the classrooms become windowless. The research team acknowledges that the experiment was directed to find research methods rather than final answers. The available size of sample was found too small, and certain methods were found in need of change for any repeat performance. Also, adult opinion seems to have colored the statement made by pupils.

There is further a question in this reviewer's mind whether any conclusion may be drawn from pupil, teacher or parent interview with regard to long-range influence of spatial environment. More was ascertained, however, about the monetary influence on academic learning. The study indicates that no significant disadvantages

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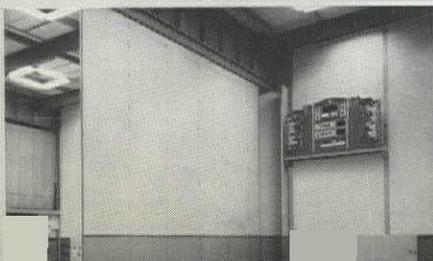
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in the learning process could be detected which were due to the windowless situation. In fact, there were no significant differences in performance by pupils in classrooms with or without windows. One of the project consultants states that "the curious child in a well-conducted classroom already has an *information input overload* [emphasis added], adequate sensory and social stimulation, and apparently has little need for whatever might be added by looking out the windows." This certainly is a classic statement with which to bypass neatly all criteria that are germane to design.

Considering the fact that man is adjusting remarkably well to changes in environment and that maladjustment would most likely show at a much later time, there is no way of telling whether the experience of learning in a windowless school would have a delayed influence on learning in later years—not to speak of other influences, which were outside of consideration in this study, such as psychosomatic conditions in pupils.

It would seem highly desirable that further studies will be done, not only to verify, correct and broaden the present findings but also to expand the scope to include all factors within a total situation of educational space.

H. H. WAECHTER, AIA

Critical Path Scheduling; Management Control Through CPM and PERT. Joseph Horowitz. New York: Ronald Press, 1967. 254 pp. \$8.50.

Horowitz is manager of planning and design, facilities engineering department, Columbia Broadcasting System, and his aim is to write a book on CPM which will be useful to business and industrial managers as well as to architects and engineers. His book is both comprehensive and comprehensible. He views CPM as a "discipline of planning" and emphasizes manual (noncomputer) methods of application. Two chapters deal with computers, however: one on "Computer Applications" and the other on "Selecting a Computer and a Computer Program."

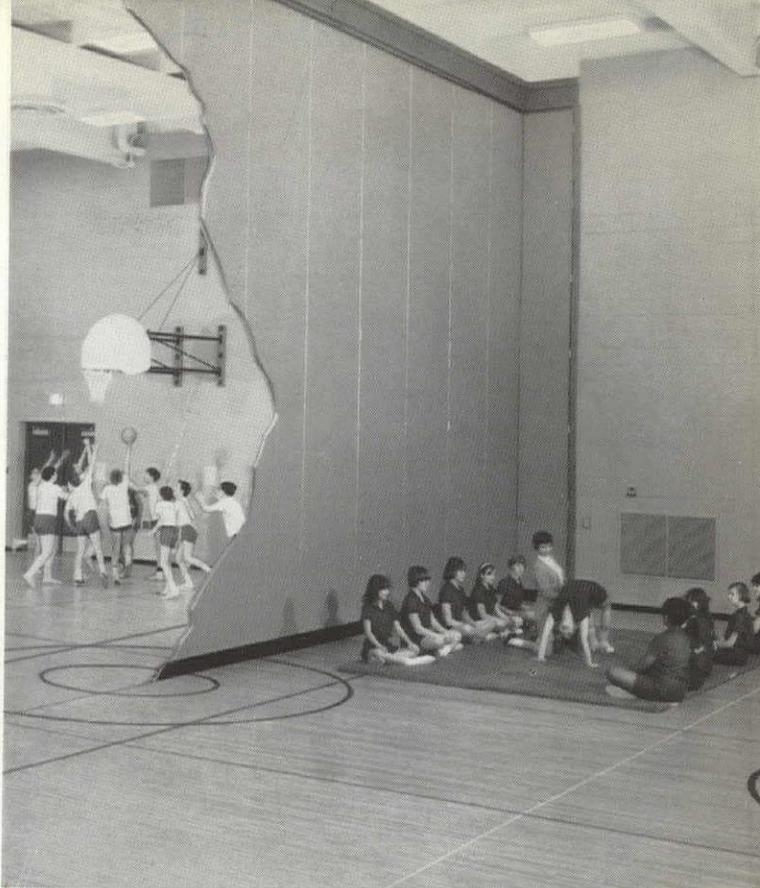
A selected bibliography is provided, as well as a glossary of terms. Various problems accompany the text, and the solutions are provided in the back of the book allowing the reader to test his knowledge as he proceeds.

Architectural Drawing and Light Construction. E. J. Muller. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1967. 449 pp. \$10.

The aim of this textbook is to introduce the student to a "graphic language" whose understanding is required at the drawing board. The first five chapters cover such basics as equipment, architectural lettering and drawing, drafting geometry, projection principles and freehand sketching. Continuing progressively, these chapters are followed by materials designed to help the learner understand construction problems and to give him further background in those principles needed to draw small buildings.

The text is clear and concise; there is a variety of illustrative material. The appendices offer further useful information by including a bibliography, a glossary, abbreviations used in architectural drawings, heat-loss calculations and still other architectural data. □

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Calendar

National

- July 5-8:** National Society of Professional Engineers Annual Meeting, Hartford Hilton Hotel, Hartford, Conn.
- Sept. 19-22:** Producer's Council Annual Meeting, Hotel America, Houston
- Oct. 8-12:** Prestressed Concrete Institute Convention, Queen Elizabeth Hotel, Montreal
- Oct. 18-20:** Architectural Woodwork Institute Annual Convention, Drake Hotel, Chicago
- Oct. 19-22:** National Trust for Historic Preservation Annual Meeting and Preservation Conference, Chase-Park Plaza Hotel, St. Louis, Mo.
- Oct. 31-Nov. 3:** American Concrete Institute Fall Convention, Hotel Fort Des Moines, Des Moines, Iowa
- Nov. 16-17:** International Commission on Environmental Design Interprofessional Conference, Education Center, University of Maryland
- Dec. 3-7:** National Association of Home Builders, 1967 Convention, International Ampitheatre, Chicago

AIA Regional and State Conventions

- Sept. 13-15:** New Jersey Society of Architects, Berkeley Carteret Hotel, Asbury Park
- Sept. 25-28:** New York State Association of Architects, Nevele Hotel, Ellenville
- Oct. 3-7:** Florida Association of Architects, Diplomat Hotel, Hollywood-by-the-Sea

Oct. 5-8: California Council, Vacation Village, San Diego

Oct. 6-8: New England Region, Portland, Me.

Oct. 12-14: Ohio Region, Nationwide Inn, Columbus

Oct. 26-28: Illinois Council, Sheraton-Rock Island Motor Inn, Rock Island

AIA Committees and Related Meetings
(at the Octagon unless otherwise noted)

Sept. 15-16: Building Regulations

Sept. 27-29: Board of Directors, Chatham, Cape Cod, Mass.

Oct. 19: Institute Honors

International

Aug. 28-Sept. 4: 1967 International Ecumenical Congress on Religion, Architecture and the Visual Arts, Hilton Hotel, New York, and at the Royal Victoria College, McGill University (Sept. 2-4) in Montreal

Sept. 25-28: International Council for Building Research Symposium on Weathertight Joints for Walls, Oslo

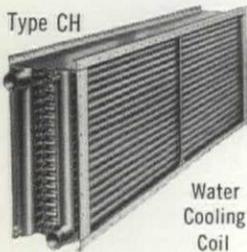
Nov. 30-Dec. 2: International Conference on Masonry Structural Systems, University of Texas, Austin

Tours

- Mexican Architecture and Interior Design Seminar-Tour, meeting Mexico City, Sept. 17, 14 days. Reservations accepted in order received with deposit of \$50 per person toward cost of \$358, airmailed to T. H. Hewitt, Apartado Postal 5-251, Mexico 5, D. F.
- Architecture & Gardens Tour of Japan, Oct. 7-31, with special optional extension to Hong Kong, Oct. 31-Nov. 3. Directed by Kenneth M. Nishimoto, AIA, 263 S. Los Robles Ave., Pasadena, Calif. 91106

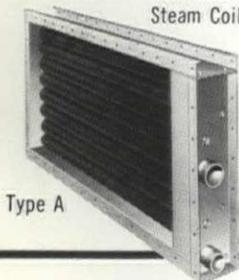
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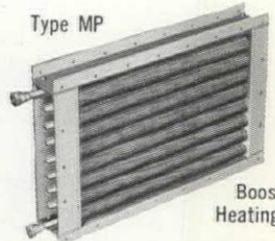
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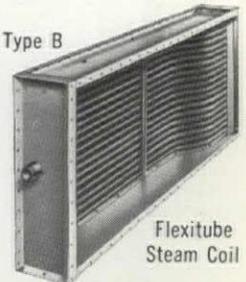
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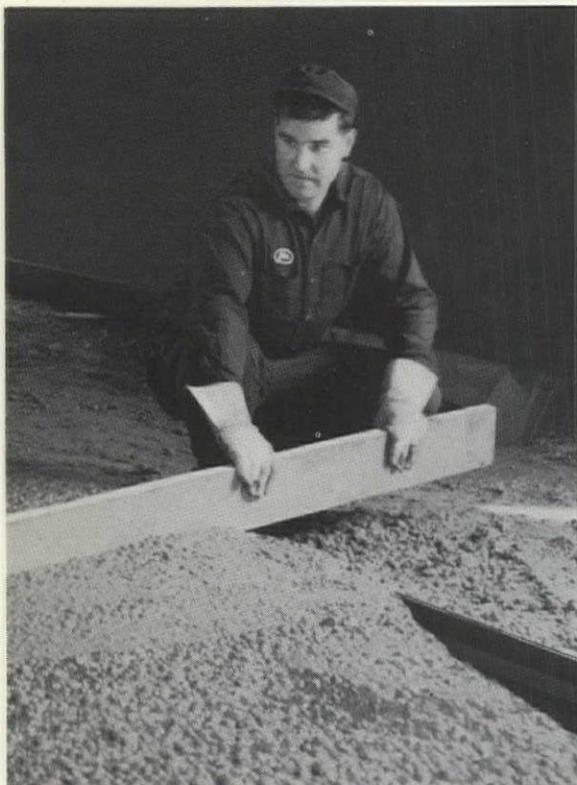
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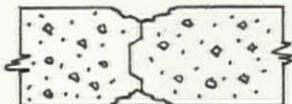


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Letters

Speaking for the Artists

EDITOR:

As a sculptor I was much interested and gratified to find that last November's issue, which recently came to my attention, was largely given to consideration of the arts in their relationship to architecture. Many excellent points were made, and among them was one upon which I as membership chairman of a local chapter of Artists Equity am endeavoring to act.

To quote from an introductory statement: "Collaboration between architect and artist is possible but only if both show a certain amount of knowledge, discernment and modesty. It can be successful only if architect and artist know and respect each other."

Finding that few architects know any artists at all and few have the time to visit galleries, my colleagues feel that we as the artists should come forward to try and remedy this situation—at least in our area. It is our thinking that perhaps a good start might be made by offering one or two artists to speak for a few moments at one of the AIA luncheon meetings.

This introduction to local artists might be followed up by invitations to visit certain studios at a time convenient to the architects' busy schedule, possibly evenings or weekends.

UNA HANBURY
Artists Equity Association, Inc.
Washington, D.C.

In Memory of Corbu

EDITOR:

We take the liberty to apprise the members of your Institute that our society has decided to celebrate the 80th birthday anniversary of Le Corbusier on Oct. 6 in Bombay. On this occasion we intend to bring out a brochure on the life and works of the master, written by those who were in close contact and knew him personally.

We are sure many of your members must have availed themselves of such opportunities and would be interested in extending their cooperation to make this attempt successful. Interested architects are requested to send their manuscripts for consideration to the address below.

SANTOSH KUMAR

Hon. Secretary, International
Cultural Organisation
Daphtary Wadi, S.V. Road
Bombay 64, India

Next Month

The 99th: It was the biggest ever—and black tie all the way, with Governor Rockefeller on the podium when the convention was called to order and again when the architects and their guests assembled for the Annual Dinner to wind up the proceedings of the 99th. What was said and done during that week in New York City is the subject of the Convention Report issue.

While it may appear to be relatively easy on the surface, the task of reviewing, selecting, editing and assembling all the material and photographs is a mammoth one.

It is the job, then, of the JOURNAL editors to put the convention in what we hope is its proper perspective, to ferret out the important thoughts and ideas and, at the same time, to convey the spirit that is peculiar to each and every annual gathering.

The Making of an Architect: Up to this point, our Practice Profile series has concerned itself with architectural firms, and rightfully so. But the follow-up to the May article on the 1967 Gold Medalist is an exception to the rule, for the focus is on the architect himself as a team leader who has directed numerous significant projects over a period of more than 30 years.

Wallace K. Harrison, FAIA, "has demonstrated the new dimension architectural endeavors assume in the second half of the 20th century" as revealed by an in-depth study of his major works.

PHOTO CREDITS: University of Wisconsin Archives—p. 3; Birns & Goldberg—p. 8; Foto-Hennried/American Swedish News Exchange/Swedish Information Service—pp. 38-39 (upper left); Swedish Information Service—pp. 38-39 (bottom); Oscar Bladh/Swedish Tourist Traffic Association—p. 41 (upper right); Refot/Swedish Information Service—pp. 41 (middle and bottom), 42 (middle and bottom right), 43 (bottom); Swedish Tourist Traffic Association/Swedish National Travel Office—p. 42 (bottom left); Sundahl/American Swedish News Exchange—p. 43 (top); Museum of Finnish Architecture—pp. 45, 46, 49 (bottom right); Lehtikuva/Consulate General of Finland—p. 47 (top and bottom left); E. Troberg/Museum of Finnish Architecture—p. 47 (bottom right); Heikki Havas/Museum of Finnish Architecture—pp. 48 and (with Consulate General of Finland) 49 (top right); Pietinen/Finnish Housing Association—pp. 49 (three on left) and 50 (bottom); Pietinen/Museum of Finnish Architecture—p. 49 (middle right); Valols, Teuvo Kanerva/Finnish Housing Foundation—p. 50 (top); Cumbernauld Development Corporation—pp. 52, 54 (top middle, top right); Bryan & Shear/CDC—pp. 53, 54 (top left, bottom right), 55, 57; Douglas Scott/CDC—pp. 54 (middle right, bottom left and third from bottom, left), 56; John Jochimsen/CDC—p. 54 (second from bottom, left); Capitol Photo Service—pp. 65, 69; Mel Chamowitz—p. 66; National Education Association—pp. 72-74.

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AIA JOURNAL/JULY 1967 95

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AIA JOURNAL



JUNE 1967

AIA Honor Awards





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Grylls Associates for design of the Federal Office Building in Detroit. ■ *Wilson, Morris, Crain and Anderson* received the Western Regional Scholarship for the design of the Kelsey, Leary, Seybold Clinic in Houston, Texas. ■ *George Nemeny* FAIA of New York City was awarded the Northeastern Regional Scholarship for his design of an addition to the Pagliaro residence in Mt. Kisco, New York. ■ Winning architects will select both the student and the school of architecture to which the scholarship awards will be granted. ■ These award winners were chosen from entries of all types of buildings which were completed between January 1, 1962, and December 31, 1966. Each winning entry will be displayed at the AIA Convention May 14-18 in New York City, and at the 23rd Annual Convention of the Marble Institute of America scheduled for October 3-6 at the Equinox, Manchester, Vermont.

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