


AIA JOURNAL



AUGUST 1968





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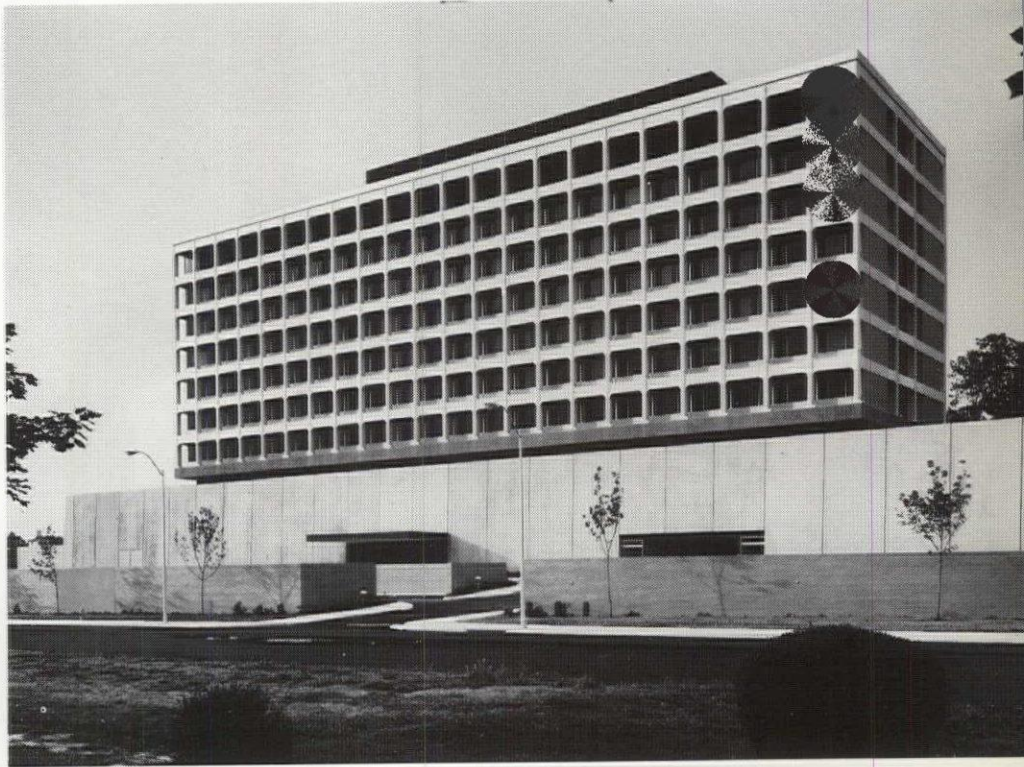
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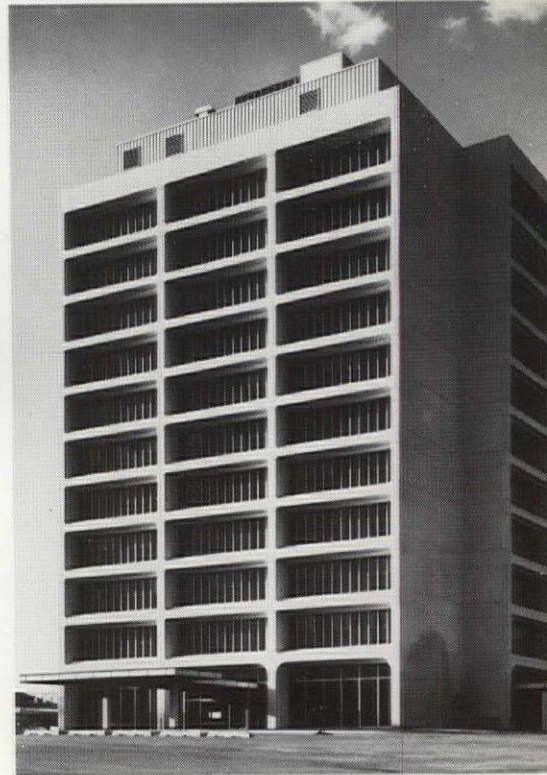


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Comment & Opinion

Kudos for the Critics: For at least two reasons that will be cited later, this seems like a particularly good time to say a few words about architectural criticism.

Perhaps our readers will recall that in January we began a series of articles on the subject, exploring it from a historical, philosophical and practical point of view. Within the next year we hope to be able to publish the initial critique by an AIA member of a colleague's completed building. The format will be developed along guidelines established by the Institute's Committee on Esthetics, with whom the AIA JOURNAL is collaborating in this effort, and will provide an opportunity for rebuttal by the designing architect.

It is the committee's intent that a "model" piece of criticism will result, paving the way for further endeavors by other architects—a concept which has been endorsed by the AIA Board of Directors.

We hasten to point out, then, that the article which appears in this issue, "Coventry Cathedral Six Years Later"—subtitled "An Analysis That Concludes with Success"—is not being carried as part of the criticism series. This is to say that

while we feel it to be an interesting, worthwhile contribution, published with the blessing of the cathedral's architect, we do not want to inadvertently suggest by its presentation that it meets the criteria to be developed by the Esthetics Committee. So we have chosen to label it an "analysis," although we realize that the line between such an examination and that which is called "criticism" is a very fine one indeed.

All of this brings to mind a recent occasion in New York City when Robert L. Durham, FAIA, bestowed

General Articles

Complete listing 44

Departments

Newslines 8
Unfinished Business 40
Books 108
Calendar 113
Letters 114
Asides 116
Information Service 116

Cover

Artist's interpretation of Spokane's Parkade, a bright new addition in the Inland Empire.

the initial Architectural Critic's Medal on Lewis Mumford, Hon. AIA (see cut). Durham's remarks were brief but especially pertinent in that he set about to review the AIA's motives in establishing the award—"motives which will arouse your sympathy, if not your admiration."

The then president of the Institute began by explaining that "the ceremony to be performed is, in and out of itself, somewhat ambiguous. For a profession to honor its critics,



it must first judge them. But if this is done, the criticized become the critics, and the critics are asked to behave with uncharacteristic docility." As for the factors that were considered by the Institute directors, Durham went on to say:

"The first of these was the conviction we all shared of the importance of the critic's role in environmental design today. In the life-or-death struggle which now engages every one of us, we must depend on the critic to help us define the values for which we fight and illuminate the goals toward which we strive. Without him, the struggle tends toward a primitive thrashing-around in darkness.

"With this in mind, it was fitting, perhaps even incumbent upon us, to show that we were conscious of our profession's indebtedness to its critics."

There was still another factor, Durham added. "This was the certainty that the choice of a man to receive the first model recognizing a lifetime of achievement in criticism was a foregone conclusion."

Finally, "To say that Lewis Mumford is an architectural critic is much like saying that da Vinci was an anatomist. But there is ample evidence that he believes in the importance of architecture as the man-made part of our environment."

Juries to follow the first one, which unanimously selected Mumford, will find their task much more difficult, but the results of their decisions should be no less significant to the profession.

ROBERT E. KOEHLER

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
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Convention Raises Dues, Elevates 'Man' and Blocks Princeton Report Action

The year 1969 will see an expansion of key programs of The American Institute of Architects and the creation of new activities, including an urban affairs center.

This was the outlook furnished by the Institute's 100th convention in Portland, Ore., where delegates voted without floor opposition to boost corporate membership dues for the first time in 18 years.

The action upped regular dues from \$50 to \$75 and new-member dues, previously \$20 for the first year and \$30 for the second, to \$25

September's AIA JOURNAL will carry a complete convention report.

and \$50. The increase is expected to yield about a half million dollars additional revenue yearly.

But more than dues was raised by the delegates who elevated one portion of the triparted convention theme, "Man/Architecture/Nature," to a position of pre-eminence. "Man is more important than architecture and nature," declared an adopted resolution.

That resolution—and much of the convention's tone—were hinged to messages brought to Portland by such speakers as Mrs. Lyndon B. Johnson and Whitney M. Young Jr. Said Mrs. Johnson:

"I know that the nature we are concerned with, ultimately, is human nature. That is the point of the beautification movement—and that, finally, is the point of architecture."

At a Loss for Will: But it was Young who perhaps most stirred the 3,000 convention-goers with a speech that found the urban crisis not so much in the cities as "in our hearts." What is needed, Young said, is not know-how; we "are at a loss for the will."

Moved by the civil rights leader's address, George E. Kassabaum, FAIA, the Institute's new president, said he will call a meeting "of a commission or task force, or whatever name might be given to it, to implement the challenging suggestions of Mr. Young."

Kassabaum said the group would gather by mid-August (a preliminary meeting in this connection was held at the Institute late last

month), and assured delegates that "we are going to make a very, very serious attempt to develop some positive programs in response to his [Young's] challenge."

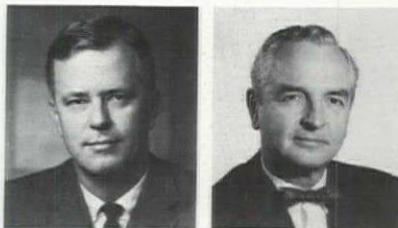
Young urged architects to join in the civil rights/poverty fight, warning that by not doing so "you are risking the respect of a generation that has not yet reached maturity, as well as generations still unborn."

The business session was marked by a spirit to move ahead with Institute programs and to move out into the public arena. A dozen solutions were given ringing approval.

Princeton Resolution Iced: Falling by the wayside, however, was a measure in support of, and toward the implementation of, the so-called Princeton Report's recommendations for architectural education.

The report on the AIA-financed study, formally called *A Study of Education for Environmental Design*, was discussed a few days before the June 23-29 convention, at the annual meeting of the Association of Collegiate Schools of Architecture, also held in Portland. The upshot was an ACSA resolution labeling the report "an insufficient statement." The resolution added:

"We feel that the report cannot be regarded as more than a departure point and that present proposals for implementation are not justified. We suggest that AIA and ACSA should determine jointly the direction of further study."



Nos. 1 and 2: President Kassabaum, left, and First Vice President Allen.

At the AIA session, Gerald M. McCue, FAIA, of San Francisco, introduced a motion to table the Princeton Report resolution. The motion was carried after a floor discussion from which emerged a feeling that 1) educators have not had enough time to evaluate the report, and that 2) some of the preliminary evaluation indicates possible shortcomings. Robert V. Mosher, of San Diego, said he

viewed the study as "a—well—minimal attempt."

Rex Allen Elected: Kassabaum by virtue of his position as first vice president automatically ascended to the Institute helm to succeed Robert L. Durham, FAIA, of Seattle. Elected first vice president for 1968-69 and thus to become Kassabaum's successor was Rex Whitaker Allen, FAIA, of San Francisco.

The convention also elected three vice presidents—Daniel Schwartzman, FAIA, of New York; David N. Yerkes, FAIA, of Washington; and Jules Gregory, of Lambertville, N. J.—and a new secretary, Preston M. Bolton, FAIA, of Houston.

No Purposive Policy: The annual Purves Memorial Lecture was given by author and economist Barbara Ward who warned that our rapidly urbanizing world "threatens to become an urban mess" because "urban change is, on the whole, not subject to rational control or purposive policy."

Miss Ward advocated the systems approach to solving urban problems. It is an approach, she said, that exploits that "liberating instrument," the computer, and "calls on the most exciting pattern of work to emerge in this century—the team of diverse talents and disciplines working within a common strategy."

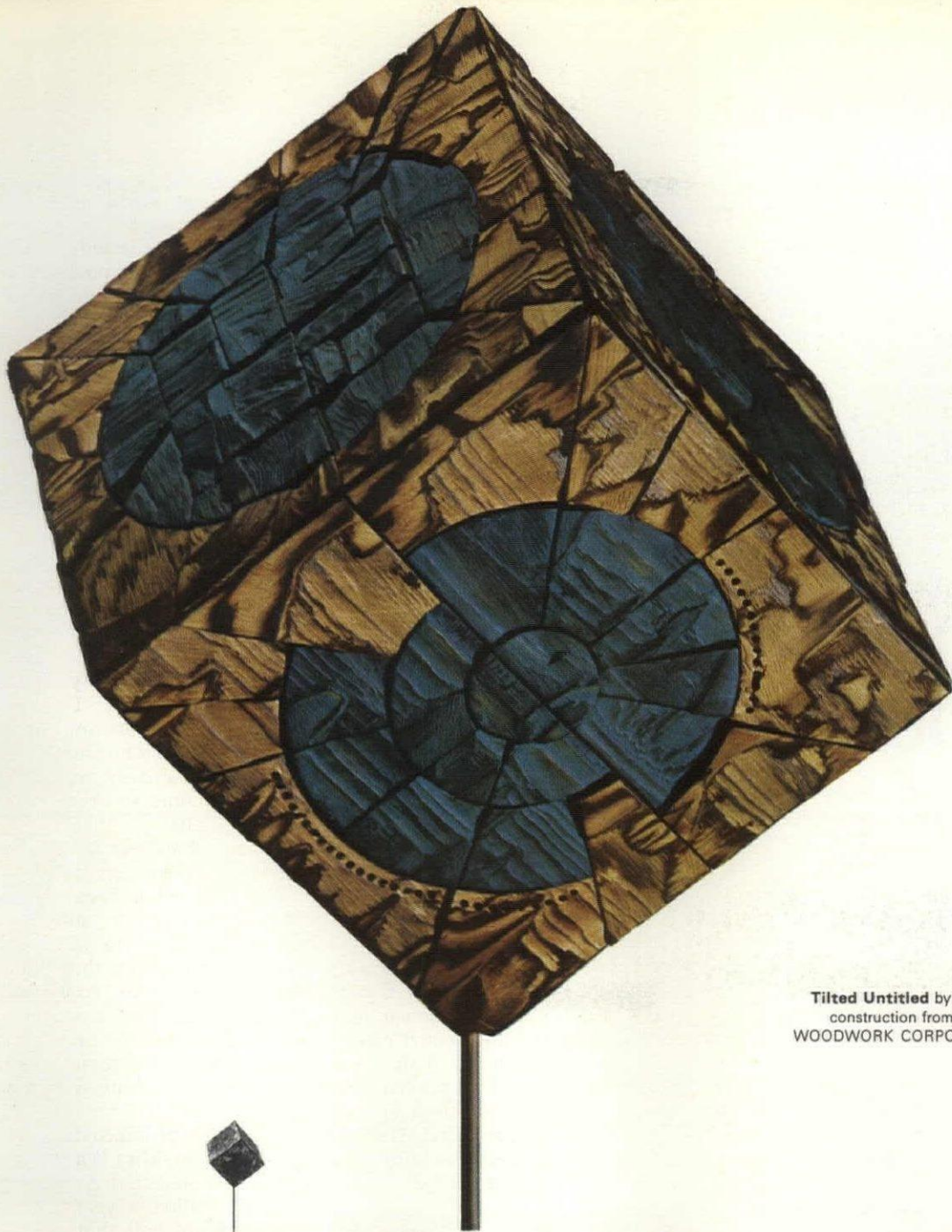
The cost of improving our cities will be great, Miss Ward conceded, but she noted that America grows by \$50 billion a year and asked: "Should not half that new wealth be devoted not to the increase in private affluence but to reversing the trend to public squalor?"

She said architects as a first responsibility should see to it that "a great nation, forerunner in a new urban era, thinks greatly enough about its cities to be able to survive."

The delegates' action on the dues question was, in a sense, a silent but powerful response to Miss Ward's charge.

Besides making possible the creation of the urban affairs center, which according to plans is to be funded in the neighborhood of \$200,000 over its first two years, the added AIA revenue will work to beef up programs in government relations, public relations and education.

Continued on page 12



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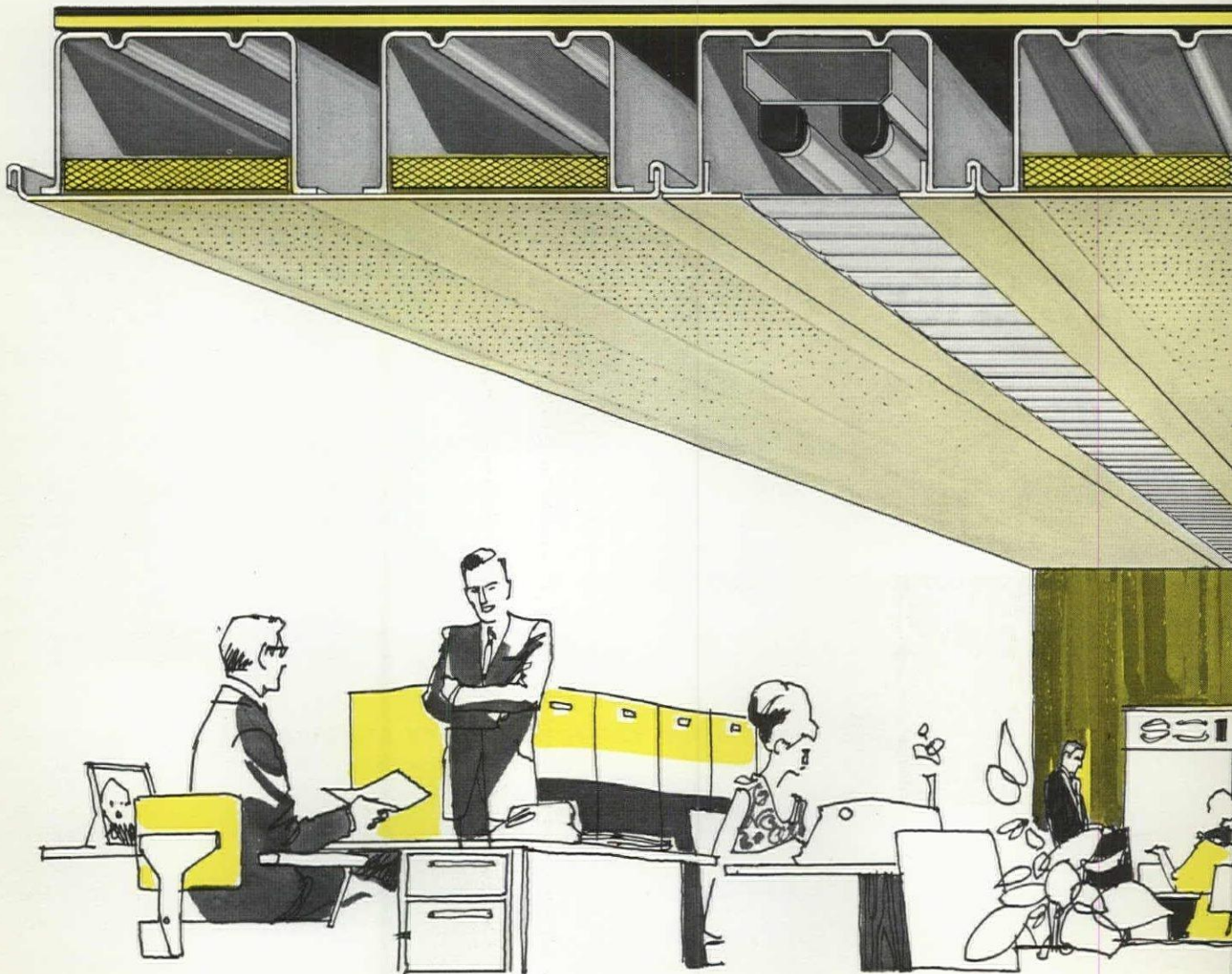
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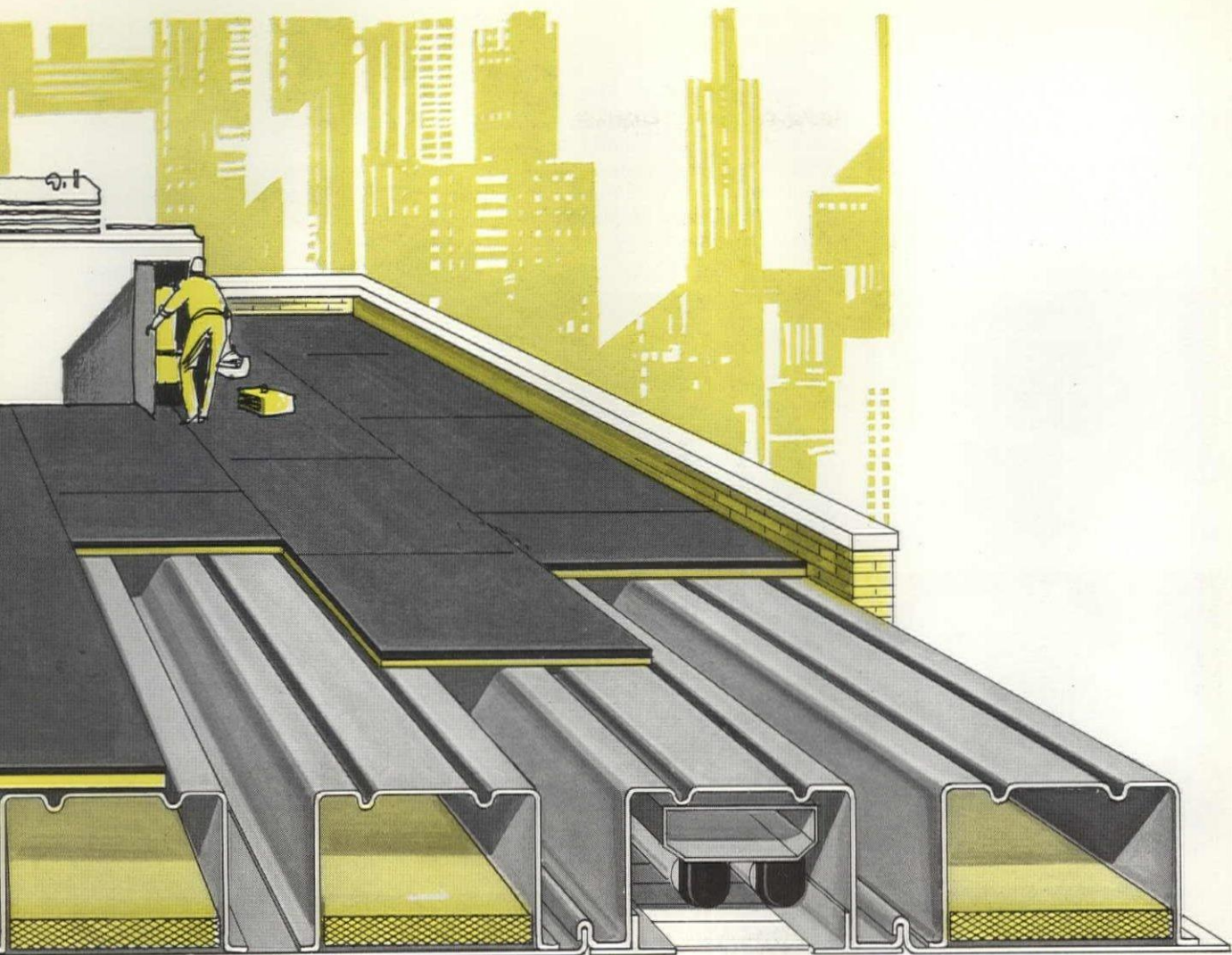
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Notch Is Said to Be Nub Of AIA Building Holdup

The proposed design for the AIA's new headquarters has a space well where the building's two wings would meet, and it is in this

well that approval for the project is said to rest.

Approval must be won from Washington's Fine Arts Commission. George E. Kassabaum, FAIA, Institute president, said it appeared that the space well or "notch" was the commission's sole objection to the latest design of Mitchell/Giurgola Associates.

The AIA Board of Directors at its preconvention meeting approved the design but requested Mitchell/Giurgola to "attempt to resolve the single remaining difference with the commission"—the notch.

Kassabaum said the Institute will seek to have an informal meeting between representatives of the AIA, the architects and the commission to resolve differences over the "single detail."

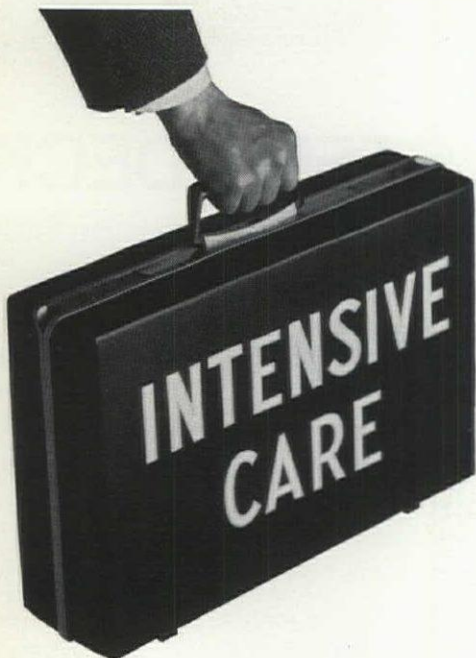
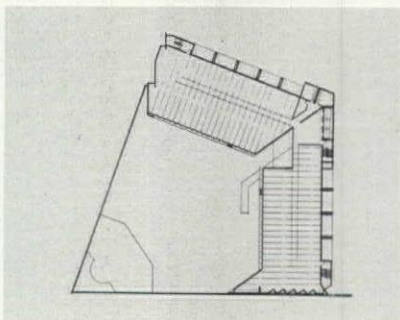
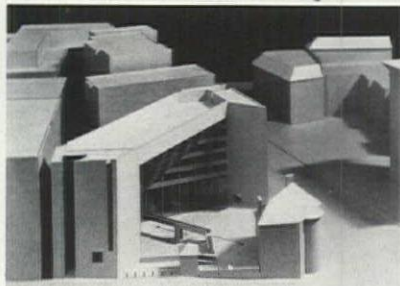
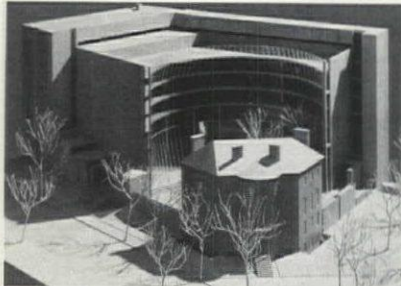
The commission is empowered by Act of Congress to regulate the height, exterior design and construction of private buildings adjacent to public buildings and grounds of major importance. The Institute headquarters falls in this category.

The latest Mitchell/Giurgola design, the firm's third, includes a reduction in floor area and a height reduction of from 90 to 72 feet. The setback from the Octagon garden has been increased.

The first two stories of the notch would serve as a glass-enclosed lobby with open space above.

The Octagon House, meanwhile, has been closed to the public preparatory to its restoration. Following restoration it will be opened to visitors as a National Historic Landmark. *Continued on page 17*

Competition (left) and intermediate designs; bottom, latest concept.



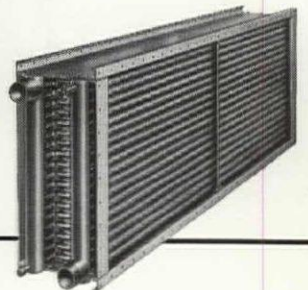
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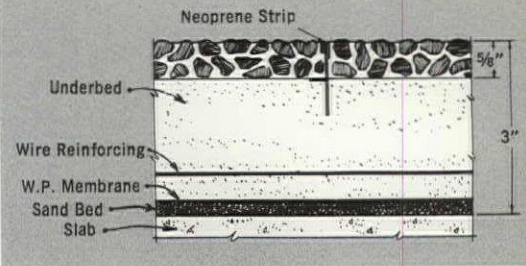
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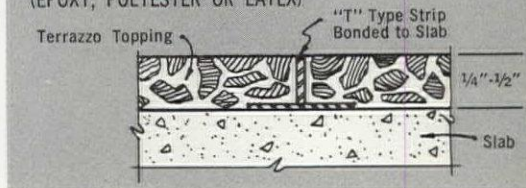


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Gen. Contractor: Albert M. Higley
Co., Cleveland, Ohio. Split Block:
Charles Svec, Inc., Cleveland, Ohio.



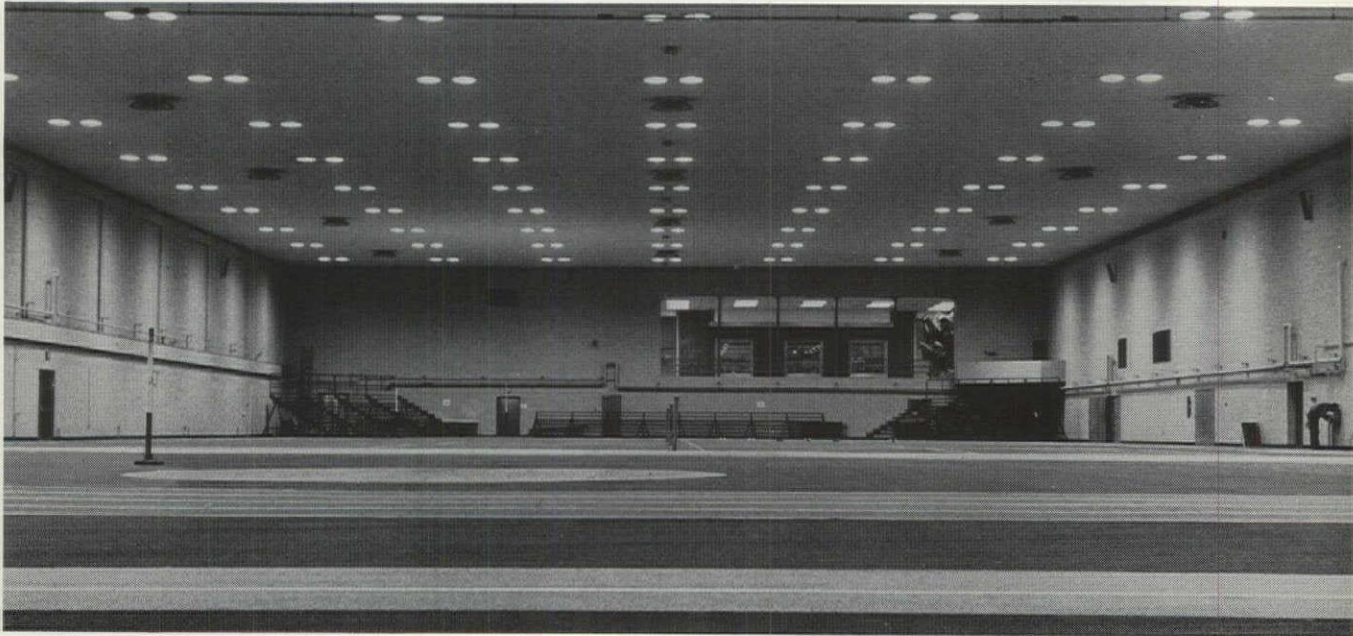
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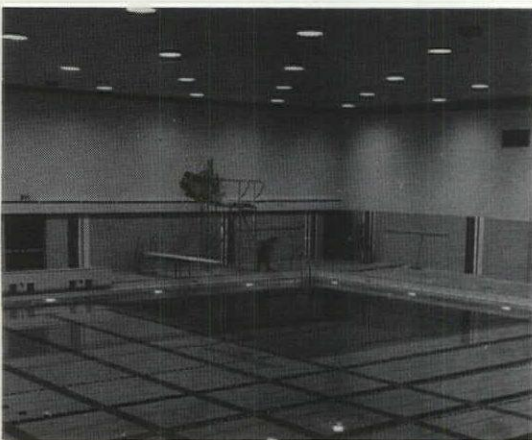


Right, new field house at Colby College, Waterville, Me.



Architect: Richard Hawley, Cutting and Associates, Cleveland, Ohio.
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Newslines from page 12

D.C. Planning Unit Under New Head; Mrs. Rowe Out

After seven years as chairman of the National Capital Planning Commission, Mrs. Elizabeth Rowe last month handed over the reins to Philip G. Hammer.

Mrs. Rowe said she expected Hammer and another NCPC newcomer, social scientist James O. Gibson, to extend what she considers the commission's foremost accomplishment during her tenure—an emphasis on planning for people.

Hammer, 54, is president of Hammer, Greene, Siler Associates, urban economic consultants with headquarters in Washington and a regional office in Atlanta.

Gibson, 34, has specialized in ghetto problems and is active in Washington civil rights, housing and kindred affairs. He succeeds Walter C. Louchheim Jr., a lawyer.

Mrs. Rowe and Louchheim were strong opponents of freeway construction ventures, urging more progress on the national capital's rapid transit system.

Hammer said his position on highway programs will await detailed study. As a general principle, however, he said he is not opposed to urban freeways but that they must, when built, fit into the city's overall makeup and help to solve social and economic as well as transportation problems.

Hammer and Gibson are Presidential appointees.

People: Rockefellers Tie Up N.Y. Awards Market

David Rockefeller will be the sixth person in 30 years and the second Rockefeller to receive the Medal of Honor for City Planning, given "for distinguished contribution to the plan of the City of New York."

His father, the late John D. Jr., philanthropist and Colonial Williamsburg benefactor, in 1942 was recipient of the medal which is sponsored by the New York Chapter AIA, the Brooklyn Chapter AIA, and New York units of the American Society of Civil Engineers and the American Society of Landscape Architects.

David, Chase Manhattan Bank president, was selected because of his "achievements as one of our outstanding civic leaders who has

Continued on page 22

Rambusch-designed for lobbies, churches, auditoriums and other medium-to-high ceiling areas.



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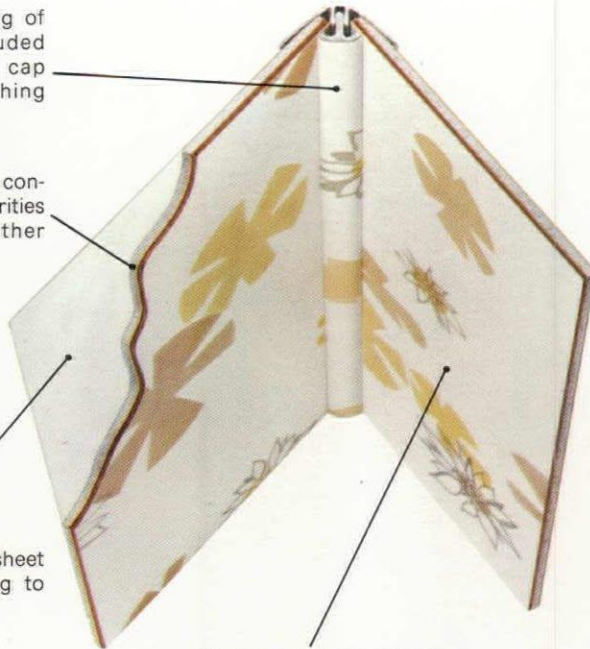
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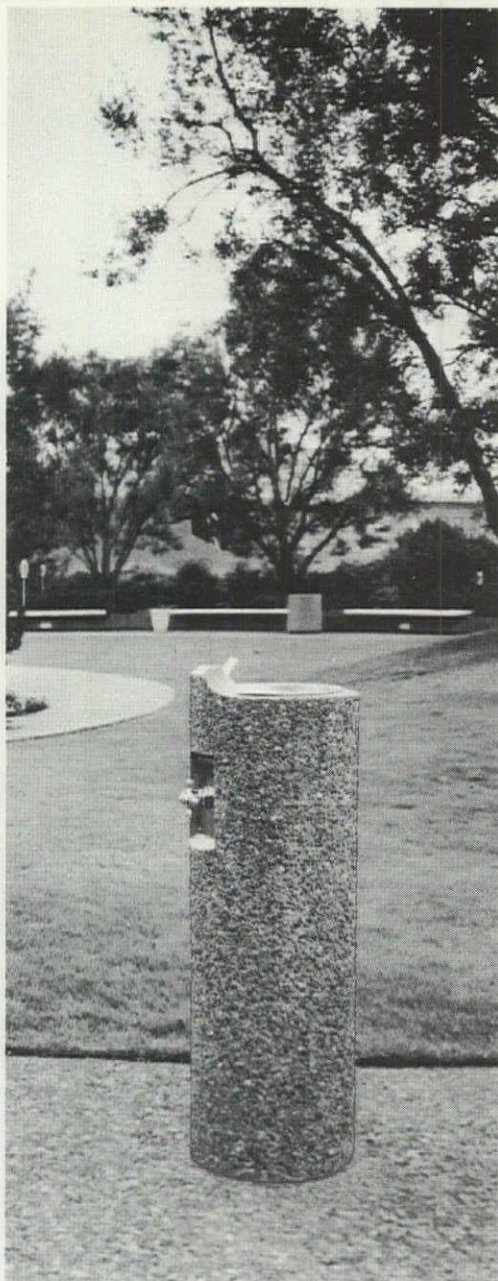
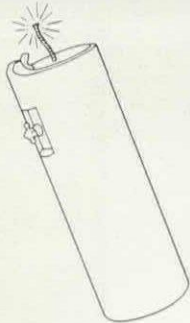
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DRINKING FOUNTAINS

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contributed much to the development of our city and has helped to make the citizens and public officials more keenly aware of the need for good city planning."

The medal will be presented in the fall as will still another honor to yet another Rockefeller.

Nelson A. Rockefeller will receive the New York Chapter AIA's Award of Merit in "recognition of his leadership in the reshaping of our physical environment." The New York governor is a brother of David, who won the award three years ago.

Leonard H. Dagit, AIA, is president of the Philadelphia International Airport Flying Club. A partner of Henry D. Dagit & Sons, he is known as the "flying architect." Recently he winged his way to the Midwest and the Pacific Coast to inspect and photograph 27 hospitals for a report on hospital planning.

Kenneth C. Rickey, AIA, and **Fred E. Brooks** accepted on behalf of their firm, Rickey & Brooks, the 1968 Forest Products Industry Award for Wood Structure Design for the Del Mesa Carmel 289-unit community for middle-aged and older persons, which has also won the *American Builder* magazine's Grand Prize for Multifamily Dwellings.

Terry Sanford, former North Carolina governor, is president of Urban America, Inc., the 4,000-member city improvement group. Sanford, partner in the law firm of Sanford, Cannon & Hunter of Fayetteville, N.C., succeeds **James W. Rouse**, Baltimore mortgage banker and Columbia, Md., developer.

Robert L. Geddes, FAIA, dean of Princeton University's School of Architecture, has been elected to Urban America's board of trustees.

Wallace J. Holm, AIA, has been appointed by Governor Ronald Reagan to the California Advisory Commission on Marine and Coastal Resources, which will coordinate a state plan for conservation and development.

A. Edwin Kendrew, FAIA, has retired from his position as senior vice president of Colonial Williamsburg after 40 years as a key man in the restoration of Virginia's former capital. He will continue his research in architectural history.

Leo A. Daly, AIA, of Omaha, serves on the Board of Trustees of Catholic University of America.

Continued on page 24

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Twenty-five Projects Win Steel, Prestressed Awards

A total of 25 structures have been named winners in two materials-oriented awards programs—the ninth annual program for steel-framed buildings and the sixth annual program for buildings using prestressed concrete and precast concrete.

The steel event, sponsored by the American Institute of Steel Construction, premiated 15 entries which, the jury said, were representative of "the wide variety of imaginative designs that are being created to satisfy the environmental requirements of the 20th century."

The jury was impressed with what it said was an increasing number of buildings that "include steel as a part of the architectural expression and use it nicely."

In the concrete program of the Prestressed Concrete Institute, the jury, citing excellence in contemporary architectural and engineering design using prestressed concrete and precast concrete, selected 10 winners.

The jury was impressed particularly "with the ample evidence of efficient employment by today's architects of the inherent and distinctive characteristics of prestressed and precast concrete."

Steel winners were: C. Thurston Chase Learning Center of Englebrook School, Deerfield, Mass., the Architects Collaborative, Inc.; manufacturing and research facility for Teledyne Systems Company,

Northridge, Calif., Daniel, Mann, Johnson & Mendenhall; Abraham Lincoln Oasis, South Holland, Ill., David Haid, AIA; Minges Coliseum, Greenville, N. C., F. Carter Williams; enclosed elevated concourse, St. Paul, Minn., Hammel, Green & Abrahamson, Inc.; Toprock Residence, Charleston, W. Va., Henry Elden & Associates; Los Angeles Federal Savings and Loan, Honnold & Rex; Syntex Interim Facilities, Palo Alto, Calif., MacKinlay/Winnacker & Associates; and Ford Automotive Safety Center, Dearborn, Mich., Nordstrom-Samson Associates.

Steel Bridge Studio, San Luis Obispo, Calif., Paul Neel, AIA, advisor, and students of the School of Architecture, California State Polytechnic College; Fairchild Semiconductor Headquarters Building, Mountain View, Calif., Povl Rasmussen, AIA, Simpson, Stratta & Associates; Lindheimer Astronomical Research Center, Evanston, Ill., Skidmore, Owings & Merrill, Chicago; Alcoa Building, San Francisco, Skidmore, Owings & Merrill, San Francisco; Superior Oil Company Geophysical Laboratory, Houston, Todd-Tackett-Lacy; and Bank of Houston, Wilson, Morris, Crain & Anderson.

Prestressed winners were: San Diego Stadium, Frank L. Hope & Associates; Burlington Research and Development Center, Greensboro, N. C., A. G. Odell Jr. & Associates; Gulf Life Tower, Jacksonville, Fla., Welton Becket & Associates, and Kempt, Bunch & Jackson, associated architects; Office Building for Brady Motorfrate, Inc., Des Moines, Iowa, Charles Herbert

Continued on page 26

Bank of Houston, left; Ford Safety Center; and Fairchild building, bottom.



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Housing Bill Less Subject To 'Extravagant' Misuse

That long enduring but hardly endearing impediment to quality design in federally sponsored housing has finally met its deserved fate.

Under discipline is that little phrase that has always been in housing legislation, and in the way of good design, the phrase requiring that government-aided housing "not be of elaborate or extravagant design."

The Housing and Urban Development Act of 1968, reported out of Joint Conference late last month and awaiting action on both floors, sets straight the negative wording.

Included in the bill is positive wording which shares the objective of language suggested by the AIA in testimony on the bill.

The amplifying language is due to Rep. Thomas L. Ashley. It does not replace "elaborate or extravagant" but registers Hill intent.

"The Congress finds that federal aids to housing have not contributed fully to improvement in architectural standards," begins the amendment of the Ohio Democrat. "This objective has been contem-

plated in federal housing legislation since the establishment of mortgage insurance through the Federal Housing Administration."

Budget limitations notwithstanding, housing for low- and moderate-income families could be more attractive and accommodating, says the Ashley insertion, adding:

"The Congress declares that in the administration of housing programs . . . emphasis should be given to developing housing which will be of such quality as to reflect its important relationship to the architectural standards of the neighborhood and community in which it is situated, consistent with prudent budgeting."

The bill is aimed at 1.2 million new and rehabilitated housing units over a three-year span. It would authorize the appropriation of \$5.3 billion.

Ecology Training, Probes, Get \$4 Million from Ford

The Ford Foundation has made grants totaling nearly \$4 million toward the advancement of ecology to seven universities.

The grants are mainly for the expansion of ecological training programs but a couple of research

projects will be undertaken, one by the University of California which will use its \$174,000 to forecast the consequences of continued population gains in the state.

Gordon Harrison, head of the foundation's natural resources and environment program, said the grants are intended to aid man exploit his environment wisely. They are to help overcome problems caused by careless exploitation in the past, Harrison said, and to meet the population increase that "has begun all over the world to put unprecedented demands on natural resources."

The University of California, Davis Campus, will use mathematical models and the computer to predict the impact of continued rapid population growth on the state's urban transportation, pollution, public health and welfare, natural resources and the law. The idea is to get foreknowledge of perils so they might be avoided.

Colorado State University will also use mathematical models to study the interrelations of vegetation, animal life and climate in western grasslands and to predict the consequences of modifying weather by controlling rainfall.

Continued on page 34



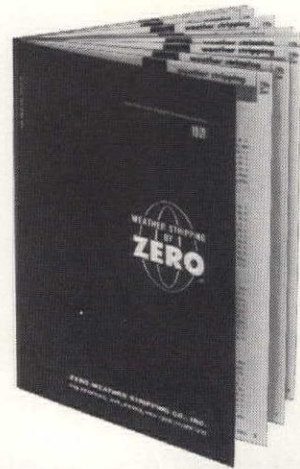
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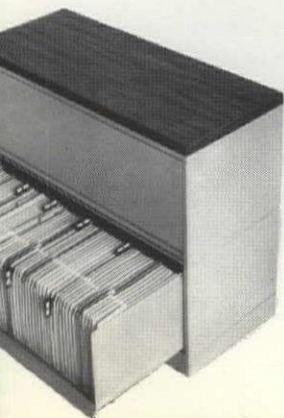
Concrete Association award in 1967 for "the best use of precast concrete in an Ohio building." Precast Contractor: Marietta Concrete Co., Marietta, Ohio. Architects: Fred E. Wright, W. W. Gilfillen, Ronald W. Keske & Assoc., Columbus, Ohio. General Contractor: Timmons, Butt & Head, Inc., Columbus, Ohio. For full information about ATLAS White, write Universal Atlas Cement Division of U. S. Steel, Room 5426, Chatham Center, Pittsburgh, Pa. 15230. ATLAS is a registered trademark.





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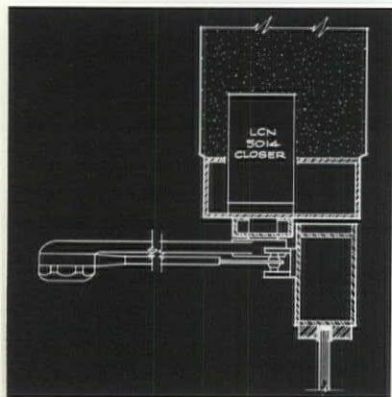
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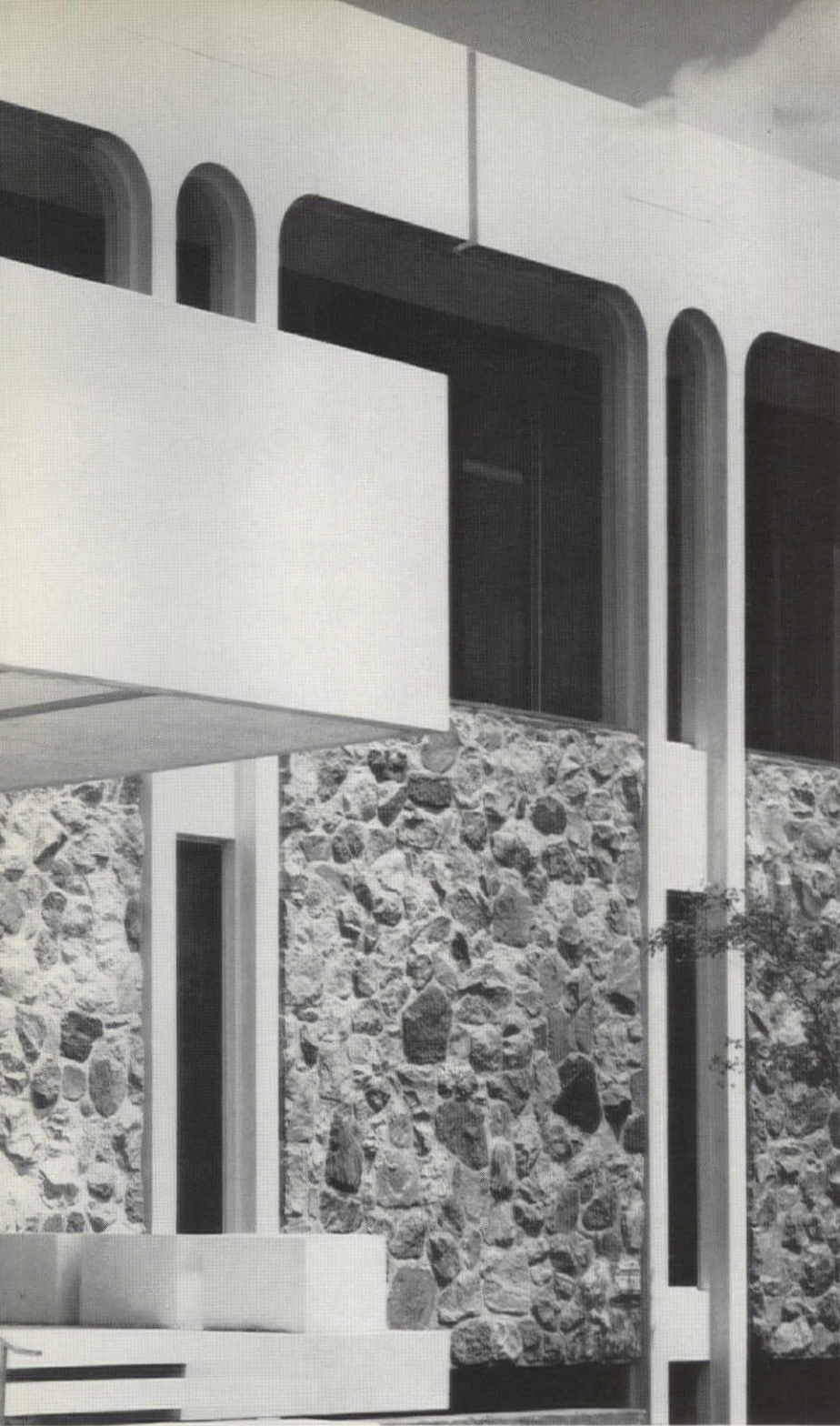
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PHOTO: Lake Michigan Hall, Grand Valley State College, Allendale, Michigan; Meathe, Kessler and Associates, Architects.

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Newslines from page 34

Across-the-Sea Gathering At Aspen Plies Currents Of Differing Philosophies

The 18th annual International Design Conference drew some 700 participants from both sides of the Atlantic to Aspen for an exchange of comments, ideas and opinions.

Program chairman Reyner Banham, author of *Theory and Design in the First Machine Age* and member of the teaching staff at London's Bartlett School of Architecture, indicated in his opening address that it would be a down-to-earth, "nuts and bolts" dialogue between American and European architects, designers and urban planners.

The principal contrasts between design traditions on the two continents were discussed by David Gebhard, associate professor of art history at the University of California, Santa Barbara, and Alf Boe, director of the Norwegian Design Center in Oslo.

Said Gebhard: "Objects produced in the United States are not meant to last for a long time. They are meant to be enjoyed by consumers for the moment, prior to moving on to other feasts. The result has been a lack of attachment to specific objects, with the thrill of acquisition of a new object subsiding into mere acceptance of it and ultimately leading to the urge to discard it and replace it with a new one."

Therefore, continued Gebhard, "the design package that surrounds an object frequently becomes more important than the function of the object. If you take a moral approach to design, you find reprehensible the idea that the design form makes no contribution to the function of the item, and may, in fact, impair its function."

A Desire to Brighten: "While Americans have invented and improvised a culture as they progressed and changed," commented Boe, "Scandinavian design grew out of native arts and crafts of considerable longevity. The basis of this design is a desire to brighten the lives of the people who use the objects."

Reminding the conference that "consumers frame demand which, in turn, is satisfied by production," Boe observed that with the influence of John Ruskin and William Morris in the mid-1800s, an emphasis was placed upon the responsibility of both manufacturer and consumer to accept only articles of good design. *Continued on page 38*

Noting that the Bauhaus tradition associated morality with design, Gebhard ventured that the difference between design traditions in Europe and America appears to rise from the serious and moral attitude prevalent in Europe throughout this century.

"Governmental and intellectual acceptance of design is complete throughout Western Europe," remarked Misha Black, senior partner in the London design firm Black, Bayes, Gibson & Partners. But still, he added, "most designers are struggling for recognition, struggling for work, and perpetually underemployed."

While British industry, unlike the British Government, remains "hostile" toward design, said Richard Latham, the industrial designer, "American industry has embraced design so warmly that design students today are worried that they will become mere numbers on huge industrial design teams."

The Ultimate Fruit Isn't: "Part of our problem," said Latham, "is that our culture thus far has concentrated too heavily on producing and marketing things. The ultimate fruit of the industrial revolution will be a lack of things."

"We are now moving in the direction of systems, and the end result of our current technological revolution will be the development of systems to help us get rid of all the little steel and aluminum items that are cluttering up our world, ultimately making it a fit place for human beings to live, if they can learn how to do that."

Irving Grossman, Canadian architect who designed the Expo 67 Administration and News Building, summarized trans-Atlantic architectural contrasts: "Americans build whole towns with private initiative and investment; most European towns are built by government. In America, we build and tear down and rebuild within a generation; European structures reflect the value of investment and respect tradition, quality and longevity."

John Allpass, urban planner and director of Denmark's Institut for Center-Planlaegning, advocated open-ended planning, open-ended structure, room for change and a respect for the fact that young people of today will form their own society. Warning American city planners against falling into the trap which he said most European planners have created for themselves, Allpass declared: "If you fix



Week-long tent scene at Aspen where architects, designers and planners met.

values today, you create the basis for future chaos."

Accommodating Growth: Allpass viewed as a necessity the keeping of only central functions in the heart of our cities. "Earlier theories," he observed, "are not fitted for our dynamic growth."

"We cannot tear down the Bronx or Manhattan," said Peter Eisenman, director of the Institute for Architecture and Urban Studies in New York, in support of planning that acknowledges and builds upon the existing environment.

Eisenman saw political interference in the US as inimical to sensible urban planning and called for the insertion of a "new mechanism into the fabric of decision making in city planning. We must structure sociological, physical and economic information into the creation of a plan. This can be done best in the educational sphere because city planning commissions are so involved with the problems of today that they cannot concentrate on the future."

Visionary architecture came in for a share of the discussion through contributions by Hans Hollein, Austrian architect and editor of *Bau*, and Dennis Crompton, editor of the London-based *Archigram* magazine.

When we realize the necessity for utilizing modern technology fully, Crompton observed, then the gap between fact and fantasy narrows and the choice range widens.

Life and Death House: To make the audience more aware of a fuller range of possibilities as well as the possibility of transformation of scale in architecture, Hollein illustrated the concept of "taking a building into possession," i.e., walking on and through it, and showed a "telephone booth" house which can become the owner's coffin at death.

Said Hollein: "That architects think only of buildings means that

they think only of their own history." He asked that they think in a wider context, of the effect a building has and how the human being uses it.

Summing up the June 16-21 conference, Jivan Tabibian, political scientist and UCLA teacher, stated that designers don't have group characteristics but really divide themselves along philosophical lines.

This division, Tabibian said, is between the utilitarian or pragmatic man, who takes a fragmented approach to the problems of society, and the dialectical man who is reflective and who integrates the consequences of his action within his system.

He said that when the designer addresses himself to the crucial problem of our age—the individual and collective alienation of man—the importance of freedom of choice and the meaning of one's actions become of paramount importance. Thus, he concluded, the social responsibility of the designer is profound.

Necrology

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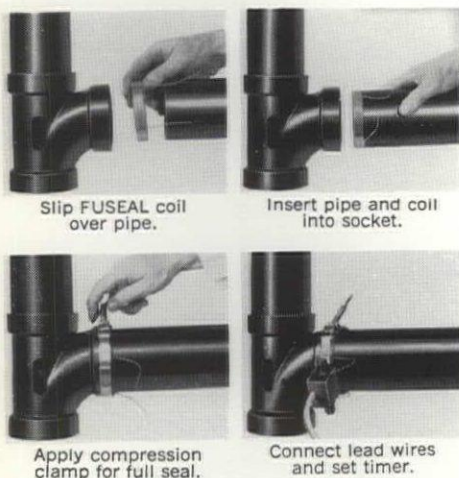
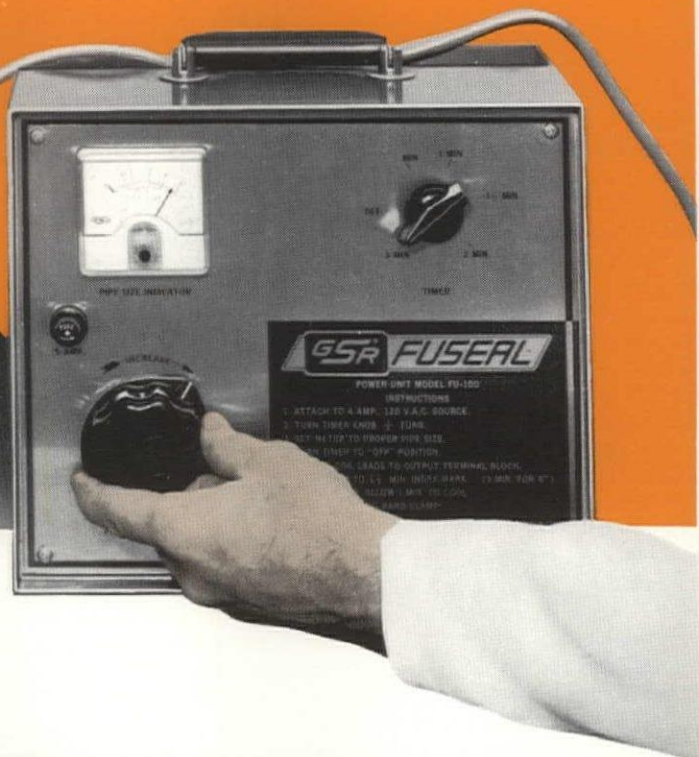
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UNFINISHED BUSINESS

BY PAUL H. ROBINSON JR.
 Administrator, AIA retirement investment program
 and AIA tax-qualified retirement program

The Retirement Act's New Look

Federal legislation granting tax benefits to self-employed persons who provide for their own retirement should be reconsidered by self-employed architects.

Previously not every architect has been able to fully assess, in terms of his own circumstances, the significance of the original Keogh Act. Now that this act has been amended and liberalized, it merits fresh investigation.

The important thing in trying to size up the advantage to you of the Self-Employed Individuals Tax Retirement Act is to include *all* factors in your consideration.

The act, commonly called the Keogh Act after the New York congressman who sponsored it, was signed into law in 1962 amid great expectations. It was to give tax relief to self-employed persons providing for their own and their employees retirement.

But because of certain provisions of the act—notably, that only half of the self-employed person's contributions toward his retirement was deductible—interest in participating was minimized.

However, with the amendment signed into law in 1966, becoming effective Jan. 1, 1968, full deductibility is now permitted.

Other principal provisions of the Keogh Act as amended are:

- A self-employed individual may each year set aside toward his retirement up to 10 percent of his net income from his business or practice, or \$2,500, whichever is the lesser.

- He must make contributions on behalf of employees as a percentage of salary at least equal to that percentage of net income put aside

for his own retirement. Again, he receives 100 percent deductibility for such contributions.

- His invested funds accumulate tax-free until distribution.

The requirement that employees (full-time and with at least three years of service) must also be covered is generally regarded as an impediment to fuller participation in Keogh programs. What must also be kept in view, however, is that the tax-free status of invested funds until distribution, together with full deductibility, add up to a much greater accumulation than otherwise possible.

Consider, for example, a self-employed architect who this year nets \$25,000 and has no full-time employees. Assuming a joint return and standard deductions of \$5,000, he would be in a 32-percent tax bracket. Were he to invest \$2,500 in a Keogh-qualified program he would avoid paying tax on this sum which at 32 percent is \$800.

Under an unsheltered program he would have only \$1,700 to invest

(\$2,500 minus \$800 in taxes). And he would be without the Keogh advantage permitting interest and dividends to accumulate tax-free until distribution.

In Table 1, assume that funds invested produce an annual return of 7 percent, including interest, dividends and long-term capital gain on the securities.

In an unsheltered fund, the 7 percent annual yield is before taxes; consequently, the return for an architect in such a fund is reduced to about 5 percent.

After the 25th year, the table shows, a tax-qualified fund has almost doubled that of an unsheltered fund.

Fundamentally, the Keogh Act is a tax deferral measure. It gives to the participant in a qualified program deductions and certain exemptions during high-income years and it requires tax payment on program returns during retirement years when, presumably, he is in a lower tax bracket.

Continued on page 115

TABLE 1
 Illustration of a Tax Free Accumulation

Years of Accumulation	Unsheltered Fund *	Tax-Qualified Program**
5	\$ 9,863	\$ 15,383
10	22,451	36,950
15	38,518	67,220
20	59,023	109,663
25	85,193	169,190

* Assumes an investment of \$1,700 a year compounded at 5%.
 ** Assumes an investment of \$2,500 a year compounded at 7%.



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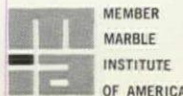
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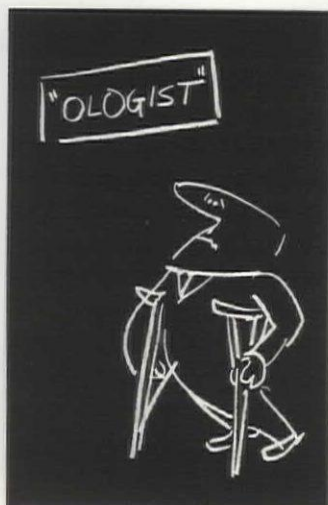
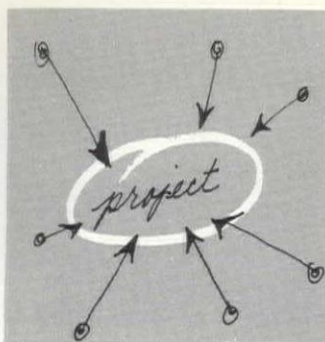
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Contrary to the Sound of Battelle	44
Through industrialization, a new life for the "constraint" on prefabrication: the profession	
Coventry Cathedral Six Years Later	50
From the day of its dedication, an enthusiastic public has kept it a center of attraction. Why?	
Our Vanishing Landscape	56
Out of necessity, Europeans have found a way of land preservation that we would be wise to adapt	
A Case for an Honest Awards Image	59
Through the camera, a story of fact or fiction	
Last Days of a Beaux Arts Ghost Town	67
In a desolate New Mexico landscape, Goodhue's model mining town sprang up, only to fade away	
The Gala Garage	71
For pedestrians as well as parkers, a better lot	
Financial Analysis of Real Estate	74
For architects, a primer on how to compare complex investment alternatives—the simple way	
From the General to the Practitioner	82
With more specialization, more specitects	
A Second Go in Seattle	86
Down but not out: the rapid transit planners	
Focusing on Research	92
From the Gatlinburg conference, a list of papers	

Contrary to the Sound of Battelle

For building, industrialization is inevitable. For architecture, the future is radiant with hope. For mankind, the promised blessings are countless. For Battelle, a sooner-than-you-think word of warning.

BY C. THEODORE LARSON, FAIA

The environmental designer who rises to the rank of vice president of research and development of a total-building corporation will have a power greater than that ever exercised by any architect of the past.

Such giant corporations will emerge, most likely appearing first in the guise of consortiums capable of financing and conducting all phases of building activity.

Already there are numerous straws in the wind that point in the direction of greater industrial

The author: Mr. Larson is professor of architecture and architectural research coordinator in the department of architecture, University of Michigan.

integration. They are visible in any wide-perspective view of the building field.

Conversely, these indicators of the future lie outside any view which fails to scan the full spectrum of relevancy. This is a failing, it appears, of the so-called Battelle Report.

The Battelle Report does not say so explicitly, but the message nonetheless comes through strong and clear: *The architect is in grave danger of losing his historic role of leadership in the building field. His modus operandi is being questioned, the report says. The implication is that the architect, in the onward sweep of prefabrication, is being swallowed up by industrial organizations with entirely different goals and objectives, and*

that his professional stature shrinks as he becomes a hired hand serving at the beck and call of others.

Contrary to the report, professional leadership will not so much shrink as it will switch—passing to the design specialists in the large total-building corporations. Instead of working as one-shot designers who disappear as soon as the building is up, they will be responsible for keeping it continually up-to-date as long as it exists—and they will work and be paid accordingly. They will have greater freedom in design since industry will be able to produce the new materials and equipment systems they might specify.

But in the Battelle Report, architects are seen as a "constraint" upon new ways of building. The lengthy report was made by the prestigious Battelle Memorial Institute, which in 1966 was asked by the AFL-CIO Building and Construction Trades Department to undertake a research program on "The State of the Art of Prefabrication in the Construction Industry."

Presenting the findings of the study, the report offers numerous statistics to support a contention that prefabrication has already reached an advanced state of the art—"more than most people realize," confided the Battelle researchers.

But in looking ahead to 1975, the target date set by the AFL-CIO building trades for assessing the impact of prefabrication on their union members, the researchers abruptly become less than enthusiastic. Prefabrication's growth will be "evolutionary rather than revolutionary," they

say, and they point out that the reductions in initial building costs which can be attributed to prefabrication have not met expectations.

Prefabrication is not likely to register any further cost reduction in the near future, the Battelle people say, but not because of any technological lag. They take the dim view in the belief that industry constraints on prefabrication will continue to prevail.

The two principal impediments are seen as a) tradition and the lack of public acceptance and b) the fragmented and decentralized organization of the industry itself. Closely linked are other cited restrictions: building codes, zoning regulations, transportation, capital requirements—and the various craft unions and architects.

Repeatedly—eight times to be exact—the architectural profession is pictured as standing in opposition to industrial development in building.

Of Larger Firms, Larger Teams

Far from being a constraint, it can be argued that architects have been taking the lead in promoting corporate growth within the industry.

The architectural profession has itself been changing radically in make-up and scope of activity. The design of buildings is now being done largely by sizable firms of design specialists—experts who continue to identify themselves individually as architects, structural engineers, mechanical engineers, electrical engineers, landscape architects, interior designers, planning consultants, and so on, but who work as integrated teams offering complete planning and design services.

Some firms have found it necessary to include economists, cost accountants, psychologists, sociologists and other specialists in their team arrangements as they move into a detailed analysis of user requirements and the establishment of desired performance standards before they even begin the task of conceiving a design solution and preparing sketches and models.

As a conglomeration of specialists, each firm tends to specialize in the design of certain types

of buildings and prospers accordingly. The same growth toward corporate bigness and a widening range of professional efficiency can be observed in other segments of the industry.

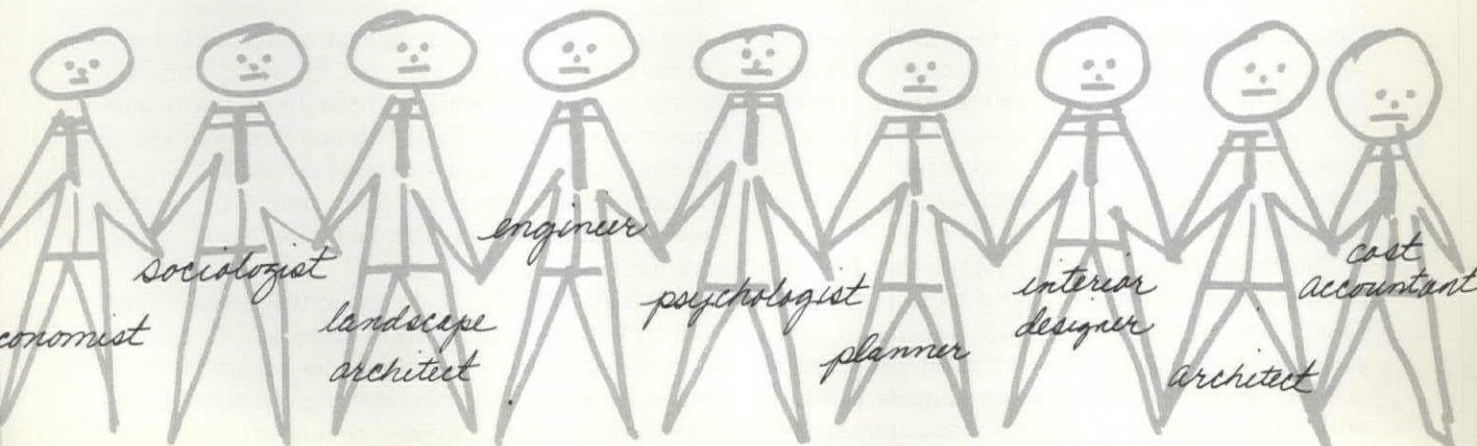
Indeed, it is inferred that this very growth elsewhere in the industry is what the Battelle researchers seem to see as engulfing the architect. Until recently, their report argues, the entire construction process has been controlled by three factors—the owner, the architect and the contractor-builder. Now, however, the larger building projects are being initiated and controlled by a new factor—the developer, entrepreneur, or financier.

As a result the architect finds it necessary to work with a larger team and to work with it earlier in the construction process. In so doing, the researchers say, he loses some of his professional control and influence. He often is forced to compromise creativity for economy by this new breed of businessmen who have turned their interests from Wall Street to the construction industry, they say.

By education, according to the report, the architect is not easily oriented to systems engineering. Being trained to design in terms of esthetics and art, he views as a professional threat any effort that impinges upon his freedom “to express his own personality,” says the report.

While the report credits most architects with readily accepting preassembled components which permit design flexibility, it portrays the profession as less than willing to accept “pre-engineered” buildings or other types of unit prefabrication. Such buildings, it suggests, obviously offer very little opportunity for what is called “architectural input.”

It is the future expansion in building systems that presents the biggest area of conflict for architects, the Battelle researchers believe. They distinguish, incidentally, between “systems building” (the assembly of prefabricated parts) and “building systems” (control of the entire construction process). They even see as a new and promising approach “systems design”—the de-



velopment of components which are interchangeable with other dimensionally-coordinated components, as a repertoire of subsystems capable of forming a variety of integrated systems which are all basically open-ended, offering the potential of flexibility in building design.

Building systems patterned after the European models can be expected to incur the unfriendliness of American architects, the report correctly judges. Such systems, now looking for licensees in the United States, are what the researchers had in mind in their estimate of sustained architect resistance.

They are systems that encompass the entire construction process, starting with basic design and concluding with the finished structure. All the operations in between, such as site preparation, manufacture of components, materials handling and field assembly, are usually concentrated in a single organization. Compared with our own fragmented approach to construction, these systems have much to offer, particularly in overcoming shortages of labor, high construction costs and site work time. In the European version of building systems, however, sole responsibility for a project passes to the contractor, leaving the architect to take a back seat.

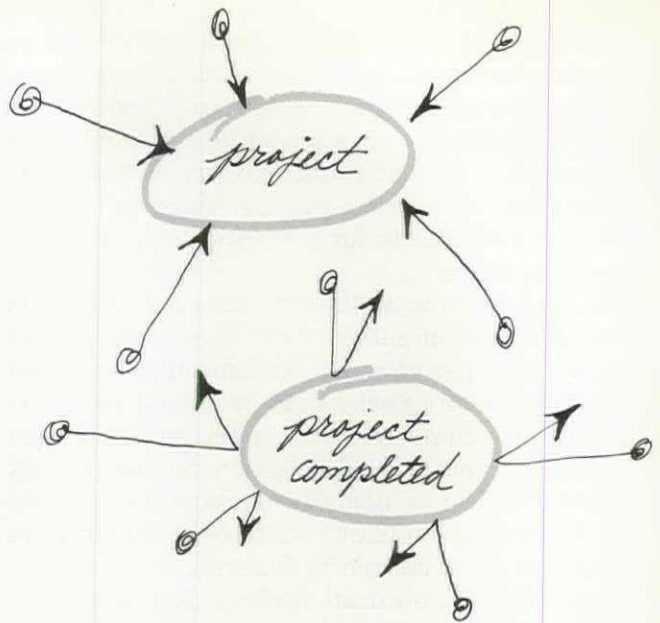
The Battelle researchers, in attempting to nail down concepts, fret a great deal in trying to reach a definition of "prefabrication." Curiously, though, they fail to explain that prefabrication does not itself necessarily signify a forward step in industrialization.

Much of what is identified as "prefabrication," i.e., sectionalized homes, is merely a shift from construction in the field to building the same old thing in a central plant. Rarely is there any qualitative change. The use of old, traditional materials and methods is continued, and whatever savings might be gained by working indoors are offset by the cost of transporting the preassembled components to the building site.

At the Horseless Carriage Stage

Building, according to its more loving critics, is the industry the Industrial Revolution overlooked. If the advances described in the Battelle report have any long-term significance, it is simply that this industry has now reached the horseless carriage stage of development. It still has a long way to go to catch up with the potentials suggested by other more advanced areas of industrialization in this country.

The hard and inescapable fact is that building is still organized largely along handicraft lines. Many of its practices are grossly traditional, some even dating back to biblical times. The various role players in the industry—promoters, realtors, architects, engineers, general contractors, sub-



contractors, the various building trades and crafts, materials processors, equipment manufacturers, lending institutions, building managers—all continue to come together, strictly ad hoc, to perform the work required to erect a particular building on a particular site. When the building is up, they then disband—only to re-emerge, usually in a different combination, as soon as another project is undertaken.

Because of this fragmented, temporary and localized system of organization, the building industry is characterized by high unit costs and low volume output. It can hardly be called a modern industry so long as it remains a conglomeration of local entrepreneurs operating in a feudalistic and restricted fashion.

The shift, when it comes, will be marked by an emphasis on high volume production and diminishing unit costs. Operations will be on a nationwide, even worldwide scale. The pattern of development is indicated by what has happened in other American industries. There is a steady expansion in the number and scope of individual enterprises, culminating in mergers and the emergence of a few giant organizations that dominate the field. Along with this organizational growth goes an increasing emphasis on the introduction of new techniques like mechanization and automation—not for the sake of eliminating labor but to achieve greater worker productivity (more output with less effort) as well as a higher level of performance capability in the end product.

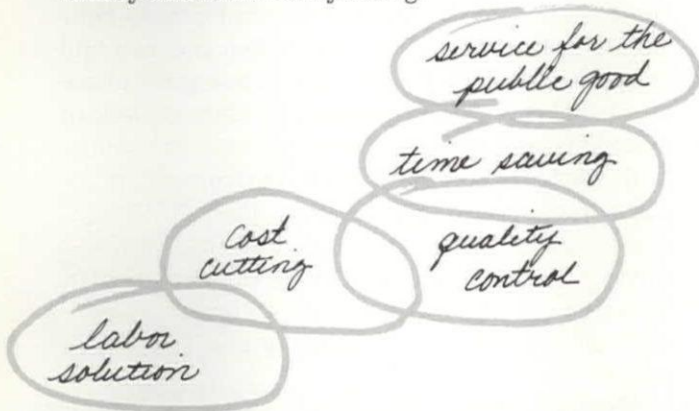
Gradually there arises the concept of service for the public good as the ultimate goal in industrialization.

A good example of advanced industrial development is a monopoly like American Telephone and Telegraph. As an industrial organization it sells a communications service. To expand its earnings, it has to make its service ever more

efficient and ever more desirable. To do this, it has had to create its own research subsidiary, Bell Laboratories, the largest in the world.

From this research unit comes a continual flow of new ideas which find expression in the design of new systems of communication, like Telstar. As a result the communication networks have become global in scope and are being extended into outer space. With increasing mechanization and automation, service costs tend to go down as service quality goes up; even an employee strike now has little effect on the performance of the communications systems. Although it no longer has a competitor, as does Hertz, to urge it to try harder, AT&T is nonetheless under compulsion to excel itself continually—the public can always be expected to make new demands.

As the industrialization of building moves forward, it is certain to move in this same direction—the emergence of a superindustry capable of performing building services that will provide progressively higher and higher standards of family and community living.



Such industrial development is likely to come much sooner, and in a much more revolutionary fashion, than Battelle seems to think.

Needs of Monumental Dimensions

As many observers have been saying, between now and the end of this century our urban populations will double and we shall have to build in our cities as much as has been built since the first American settlers arrived.

It is a truly enormous potential market. There is no question that the building industry as it now exists cannot meet this challenge.

The rate at which new dwellings are being produced does not match the rate of population increase. It is barely enough to cover the number needed to replace units which have been destroyed by fire or nature or made obsolete and undesirable by time. According to the statistics on housing starts, annual production has been running only slightly more than 6 units per 1,000 population as against a high of almost 10 per thousand in 1955. It is apparent that the home-

building industry has been pricing itself out of the market; the general trend is downward.

Most countries have even lower housing outputs. In Africa and South America the annual production runs only 1 or 2 new dwellings per 1,000 population, or less. Even in Sweden, the Soviet Union and West Germany, the only countries where yearly output has ever gone higher than 10, the charts show downward curves. In short, the housing problem is not only acute but it is worldwide. Nowhere is production keeping pace with the combination of increasing population and a growing accumulation of urban obsolescence and blight.

If we are to cope with the social turmoil already being manifested in the rebellion of our ghetto populations against their congested and outmoded urban environments, then the building industry's productivity will have to be stepped up sharply.

In view of its past record, the answers to the following two questions must be "no": As now constituted, can the building industry on short order turn out annually as many as 20 new dwelling units per 1,000 population, to say nothing of the schools, shops and stores, recreational and health care facilities, and all the other physical amenities needed to achieve a more desirable kind of family and community living? Can it also, at the same time, supply housing assistance to the underdeveloped areas of the world in the interests of international peace?

A cessation of hostilities in the Far East along with a shunting of government expenditures into the rebuilding of American cities will catch the building industry in a most embarrassing situation. The industry simply could not do an adequate job quickly enough—unless it were suddenly to acquire a vastly enlarged productivity.

This is a situation which has been overlooked by the Battelle researchers.

It is a need situation that is *not* being overlooked by the big mass production companies, however. Firms identified with aerospace and defense activities in particular have sensed the potential market demand and are looking at the housing field with zealous eyes.

A Promise of Lower Unit Costs

They see a possibility of applying to the production of buildings the same systems engineering that has been so successful in the space program and in military logistics. With any turn in national policy from war to peacetime activity, it is a foregone conclusion that these companies will devote full attention to housing and urban development.

General Electric has already entered the field with its new Community Services Systems De-

velopment Division. Other large industrial concerns are similarly thinking of tooling up for large-scale urban building work.

The advent of such producers in the building field holds the promise of entirely new materials and processes which can speed up the production of dwellings and other community facilities through mechanization and automation and thus bring about lower unit costs.

Aerojet-General, for instance, has developed, in collaboration with the University of Michigan's Architectural Research Laboratory under a research contract with the Department of Defense, a system for the production of dwellings for military families based on the use of filament winding, a process originally developed for the manufacture of rocket casings. In this proposed building system the concept of a mobile factory is introduced to avoid the dimensional constraints highway transport imposes on the size of structural components.

On the site, after the production facility has been set up under a tent, it proceeds literally to spin a series of large cocoon-like structural shells by depositing glass fibers and polyester resin on cores of polyurethane foam placed on a revolving mandrel. These structural shells can be joined together and fitted with a variety of prefabricated plastic end walls, partitions, cabinets and other equipment before being hoisted onto previously prepared site foundations. Clusters of 20 or 25 dwelling units can have their own self-sustaining water supply and waste management systems, eliminating the need for any elaborate municipal service hook-ups. Considerable variety in the shape, size, color, texture and planning of individual dwellings can be obtained.

A new kind of domestic architecture based on new materials and new concepts of industrial production is clearly in the making.

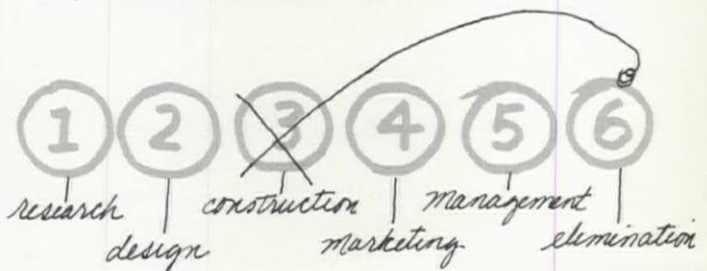
The old-line building specialists quite naturally view such technological and industrial innovations with considerable consternation. To them a massive invasion of the housing field by aerospace and defense producers is likely to become a period of industrial tumult accompanied by political strife and uncertainty. A few go so far as to raise the spectre of a militaristic intervention by the federal government to force the abolition of obsolete local building codes and to establish new patterns of community organization and land use throughout the nation.

Actually there seems little reason for entertaining such fears. The accumulated need for new housing and related urban facilities is so great that even with a full mobilization of outside industrial resources the conventional building industry will still be hard pressed to do its own proper share of the task.

The important point is that neither the old-line building producers nor the newcomers will be able to do the total job alone. Each group needs the other; each has much to learn from the other, and each will benefit accordingly. Out of such team collaboration between industries, and between industry and government on all levels (local, regional, national, even international), is certain to emerge an entirely new kind of building industry, one endowed with an unlimited and truly fabulous capability.

It is highly significant that the Department of Housing and Urban Development has been urging the formation of large industrial consortiums to deal with the problems of housing and urban development. HUD's new "in-city" experimental housing research and development program stresses a systems approach and the use of new building technologies.

Whether coming from within or without the building industry, these consortiums will look on a building as an enterprise involving a repetitive cycle of development including: 1) research, 2) design, 3) fabrication and construction, 4) marketing and distribution, 5) management use and operation, and finally—the most important phase of all—6) elimination of the structure or any of its component parts as they become technologically obsolete and undesirable.



The development of an environmental facility, large or small, will not be considered complete until it is eventually replaced by something more desirable.

The Battelle researchers see the government, in its effort to rebuild American cities, initiating programs conducive to the creation of building consortiums and building systems, leaving the inference to be drawn that it is quite likely that architecture's *bête noire*, the package dealer, will directly benefit and that this, in turn, will spur an expansion of prefabrication opportunities.

The Battelle Report singles out the package dealer for some discreet commendation. The researchers view the package approach as an attempt within the industry to change its basic structure, thus overcoming one of the major obstacles to the rationalization of building.

As for architects, they are not a major concern of the report; the researchers are content in pointing out that architects at present, so far as the

study could discern, appear bound by existing technology.

The researchers regard the profession as made up of two types—the conservatives and the innovators. It is the innovative architects, a minority “continually exploring new ways to interpret our times,” in whom their hope for the future of prefabrication rests.

Meaning to the Trades, the Profession

Battelle's main concern was the fate of the AFL-CIO unions and here the researchers carefully pull their punches. They indict the unions for having been skeptical in the past of any innovations that reduce manpower or eliminate skill requirements—the very objectives that systems building and prefabrication are striving to attain. Nevertheless, they believe the advances anticipated in technology over the next decade will offer the various union affiliates as many “opportunities” as they do “threats.”

Like market analysts calculating the growth potential of different Wall Street stocks, the Battelle researchers proceed to analyze each union affiliate accordingly. In their evaluation of future increases in manpower needs, they see the operating engineers and electrical workers coming out on top. At the same time, decreases in manpower needs are expected to be greater for the painters and bricklayers. The carpenters will enjoy most of the positive influences of prefabrication, while the granite cutters will have the least. And so on down the line does the report assess prefabrication's meaning to the various trades.

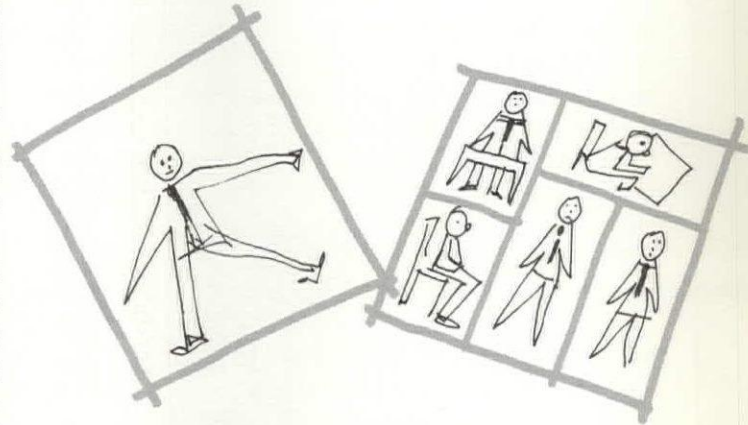
Although the report in its side-issue commentary on the future for architects was not especially hopeful, there is, all the same, an exciting and challenging vista opening up to the profession. It is a view that holds that the human environment has no limitations in either space or time—except as these may be set by the environmental designers themselves in accord with the concept

Predictably and quite understandably, Thomas F. Murphy, president of the Bricklayers, Masons and Plasterers International Union, issued a testy press release on the heels of the Battelle Report ascribing to it mistaken conclusions about the ability of his constituents to compete in today's construction market. He expressed confidence that in the next decade working bricklayers will be “significantly larger” in number. He urged further research by the AFL-CIO into the productivity of on-site construction workers as against those of the factory. Branding some of the interest in prefabrication and industrialization as mere “escapism,” he defended competitive bidding as essential for the “design flexibility required by architects.” This, he said, assures “the best product at the lowest cost.” If we dispose of the architect and flexibility in design, Murphy said, “our society will have arrived at that point where environmental mediocrity is our highest hope.”

of industrialization as an endless cycle of evolution which links a progressive elimination of obsolete things with research for ever more desirable modes of family and community living. This kind of industrialization of building could mean immeasurable gains for man and his society.

What happens to the traditional architect with his own small office in this inevitable advance toward industrial bigness?

Trained to work independently as a freelance virtuoso who alone encompasses the whole gam-



ut of building design, he finds it increasingly difficult to compete with his corporate peers. The big jobs go to the big design firms with their expanded services. Although numerically still a majority of the architectural profession, as shown by the AIA membership list, he has shrunk in economic importance to the point where his continued professional existence is openly questioned by the architectural and building press.

But predictions of the demise of the small-firm architect seem hastily made. In the face of the accumulated demand for new buildings, he will have an important role to play for years to come, particularly in the smaller communities—much as does the general practitioner in medicine.

But leadership within the profession will pass to the large-firm environmental designers. That vice president in charge of research and development—that veep with all the power—will be powerful because of the primary importance of research and design in the cycle of industrial development. He will have a lot to say as to how the other vice presidents operate. He could easily become head of the whole industrial enterprise.

For this to happen, however, the environmental designer must be trained to exercise leadership within the framework of industrial development. He must have a better understanding of the dynamics of American industry and its ongoing capabilities and limitations. He must also have a clearer perception of the goals of an advancing industrial society. □



Coventry Cathedral Six Years Later

An Analysis That Concludes with Success

BY LANCE WRIGHT

Shortly after its dedication in 1962, Coventry Cathedral was described in one review as "an uplifting place to take the girl friend on a wet Sunday afternoon."

This judgment, which caused great offense at the time, hit nearer the mark than its writer could have known. For the girl friend *has* been brought there in great quantity ever since, and not only on wet Sundays. Of all the buildings of recent date in western Europe, Ronchamps included, Coventry Cathedral is probably the most visited by tourists; and because of this, it is in striking contrast to most modern buildings which are not visited for their own sake at all, except by those who have a specialized interest in architecture.

What sort of building is this to attract such widespread and sustained attention? What do its

visitors see in it? And what conclusions should be drawn for the practice of architecture?

Architectural analysis these days is inescapably influenced by an evolutionary optimism. Buildings (so we tell ourselves) are getting better and better, closer and closer to the clients' real needs. As a consequence of this determined opinion, we tend to value each separate building less for what it is than for the promise it holds for the future development of its building type, for its innovations. Another consequence is that we find it difficult to focus on buildings which are frankly regressive, which do not pretend to any deep rethinking of the brief, and which not only fail to bring new architectural values into the world but deliberately reassert old ones. And a third consequence is our rejection, *a priori*, of the notion that a building should be designed to become a monument.

Coventry Cathedral is a building which stands firmly outside the evolutionary development of architecture. Designed by Sir Basil Spence on the basis of an architectural competition in 1950, it represents a modern paraphrase of the English medieval cathedral. To understand the architect's approach, it is necessary first to recall the special place which the cathedral holds in English popular culture. Ever since the earliest days of *char*

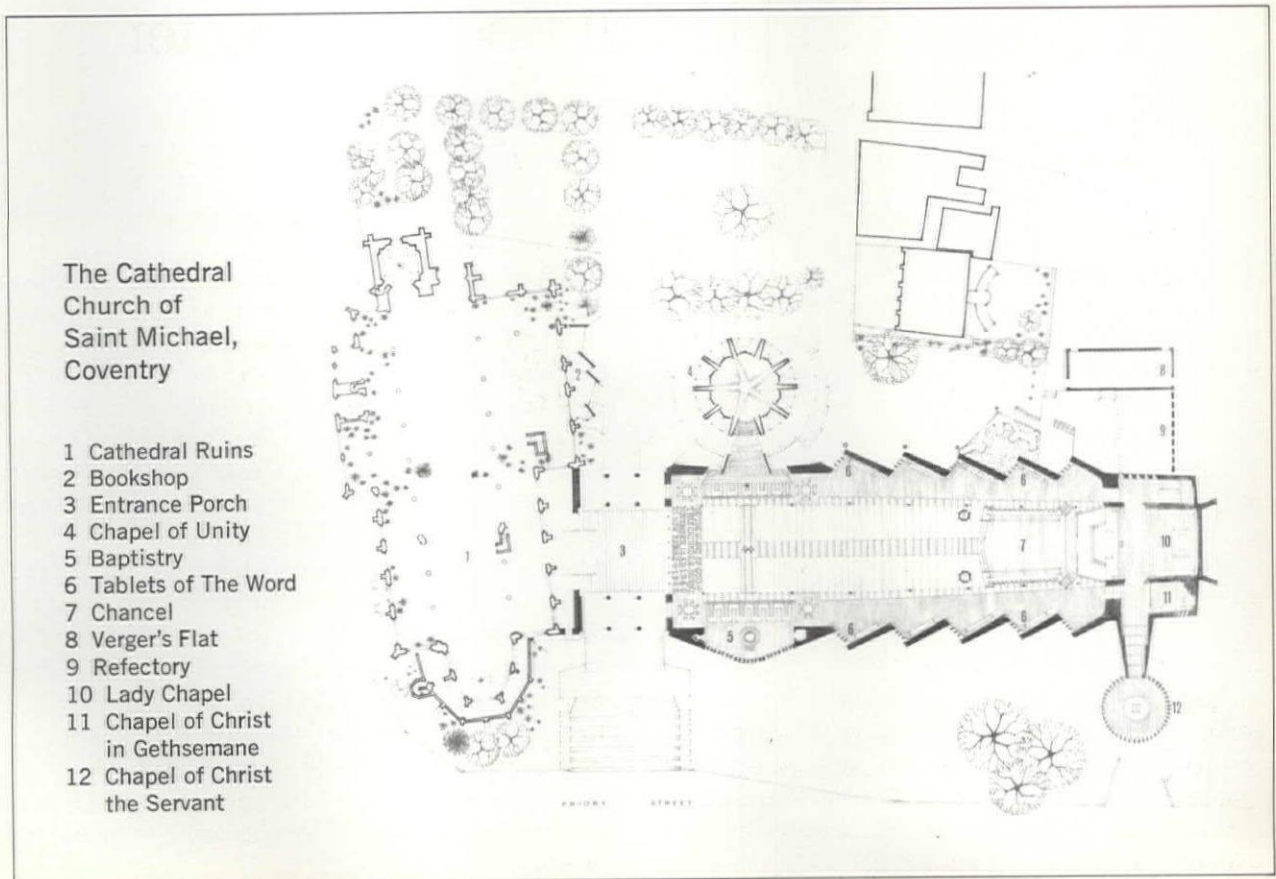
The author: Mr. Wright, of the London architectural firm of Melhuish Wright & Evans, is technical editor of the *Architects' Journal* and *Architectural Review*. He is an associate member of the Royal Institute of British Architects.

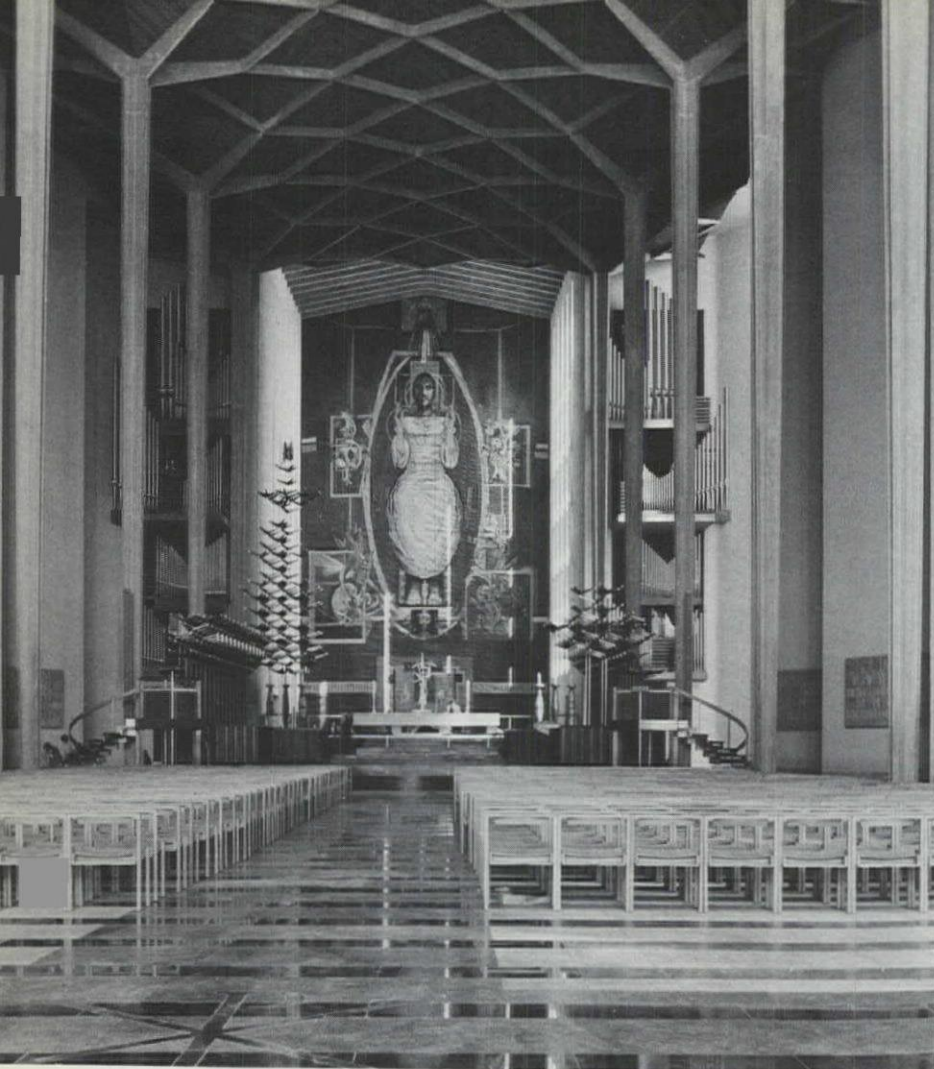
à bancs, Englishmen of all classes have been accustomed to visiting their medieval cathedrals on weekends. This is not pilgrimage in the traditional sense for there are no longer active shrines to be visited in these places. Though it would be wrong to exclude absolutely the religious intention from these jaunts, the main object was and is—though confusedly—architectural. As the visitor pushes through the red base curtain and enters the dark stupendous space inside, he experiences, as at no other time in his life, the impact of *architecture*. He talks in a whisper, stubs out his cigarette against a base molding and feels pleurably awed.

Appreciating this, Spence did not waste time as other, perhaps more serious entrants in the competition did, worrying fruitlessly about how the cathedral function was likely to change to meet the needs of the modern world: about how clergy and congregations might want to change their liturgical practices. I say "fruitlessly" not because these issues are unimportant but because in 1950 the debate surrounding them on the church-client's side had hardly begun.

Spence, who came to the task hot from designing one of the pavilions at the Festival of Britain, seemed to approach the problem not from the angle of the corporate users of the building but of the individual visitor sauntering around outside the times of service. Accepting the idea of a cathedral as it was lodged in the mind of the Englishman in the street—misty and evocative—he sought to reproduce this idea while using the sort of detailing he had used on the South Bank Exhibition. His nave was long and narrow (as the naves of monastic cathedrals had good reason to be) and roofed at a great height by a paraphrase of fan vaulting. Where the medievals would have been intricate, as in the backs of choir stalls, Spence, too, was intricate, but in his own idiom.

The nature of Spence's approach is well brought out by his treatment of certain ideas which the cathedral provost and his committee had put before the competitors. They had, for



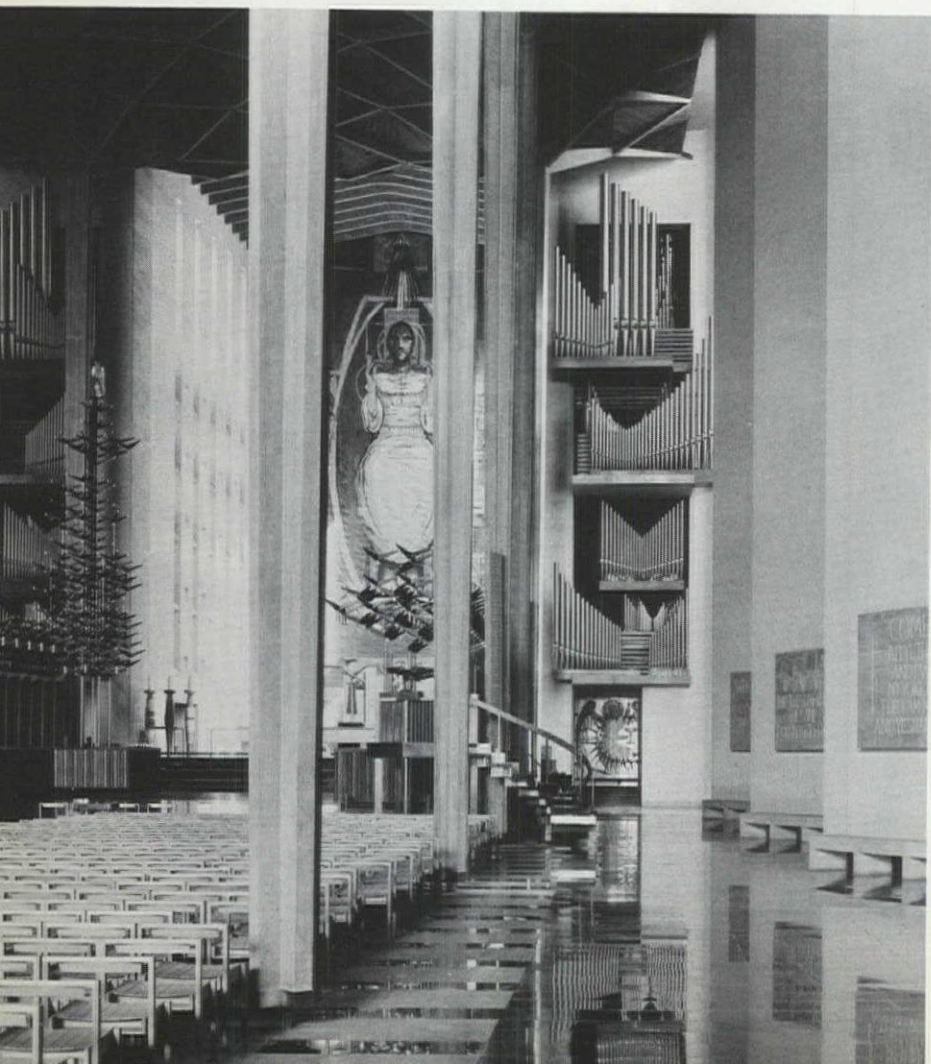


Coventry's Architect Replies

After reading Wright's manuscript on the cathedral, Sir Basil, an Honorary Fellow of the Institute, wrote the *AIA JOURNAL*: "While I must disagree with some of the conclusions, I recognize that this is a personal assessment and I do not have the right to insist on modifications."

In particular, Spence pointed out: "The reference to the long and narrow nave puzzles me because it is quite spacious. Some critics wishing to make this point—it is a fashionable one and partly wishful thinking on the part of architects who like round churches—unfairly had photographs taken with a wide angle lens to give the effect of a tunnel. I enclose an accurate photo (left) without distortion, taken from the central door of the great glass screen, therefore revealing the entire length of the nave.

"My favorite photo is the shot, also looking toward the altar (lower left), which shows the hallowing places, the organ and an oblique view of the tapestry."



instance, asked the entrants to think carefully about what to do with the remains of the old bombed cathedral.

As these remains occupied the most imposing part of the site and since they were squat, blackened and unattractive, most competitors opted to leave only the undamaged tower. Spence, gauging accurately the English passion for ruins, slid his cathedral off the high ground where the old had stood so that he could leave the quadrangle of the old nave to serve as a forecourt. Though contrary to the dictates of ordinary architectural wisdom, this was a Godsend to cathedral guides, handing them on a plate a good 10-minutes' patter before they led their groups into the new work.

In 1950, the Church of England was much concerned (as indeed she still is) with two overriding problems: Christian unity and the more all-embracing problem of how to bring the church more in touch with everyday life. Sharing these concerns, the sponsors of Coventry had called for a Chapel of Christian Unity, for what they referred to as hallowing places and for a Guild Chapel.

There was no particular social ritual envisaged for any of these three. English Christians of different denominations had at that time no settled plans for mutual contact, and the social basis for the hallowing places and for the Guild Chapel was even more vestigial: There was no established devotional practice in connection with the first and there had been no craft guilds in Coventry for four centuries.

Spence's approach to these rather awesome challenges was uncomplicated. He did not twist himself into knots trying to work out what people would do in these places; he saw the places as affording an opportunity for so many sideshows which would intrigue and perhaps illuminate the visitor on his tour. The Chapel of Unity was conceived as a small hexagonal building placed near the main door and "roofed like a crusader's tent." The allusion was not a happy one but the space itself, though unsuited by glare and acoustics for corporate activity, was and is an admirable place to peer into.

The Guild Chapel, though physically different, is similar as a design solution. It is round, fully glazed and, leading off from the east end of the cathedral, faces toward the industrial zone of the city. The significant ploy here is the wall-to-floor glazing, designed to emphasize the link between what goes on inside and outside. As such, it is a very early example of the hopes placed by Christian revivalists in the evangelistic possibilities of clear glass. It was argued that if worshipping Christians are enclosed transparently, they will be reminded that they are still one with those outside; and those outside will be intrigued by what they see going on within.

The truth or falsity of this idea has never been formally tested, though it seems likely that the damage done to the activity itself through glare and distraction might offset any advantage gained by two-way publicity.

Spence's treatment of the hallowing places was exceedingly imaginative and brings out clearly his overall attitude toward the structure: his concern for it less as a place for corporate action than as a place for visiting by the individual. He comprised his hallowing places in the side walls of the nave. These are serrated on plan and the flanks tilted toward the east are filled with stained glass. These glazed walls contain the lightest colors at the westernmost end, and the colors deepen progressively toward the east. The idea is that each window represents a different phase in the individual's journey through life; and the arrangement of the windows is such that as one walks eastward and looks backward, one can see the earlier phases in serried receding tiers, but cannot see what is to come.

Whether this succeeds, the window arrangement still adds greatly to the crowning effect of the cathedral's interior, to the impact of the Graham Sutherland tapestry on the east wall and to the admirable daylighting from indirect colored sources.

Continuing to look at the cathedral from the standpoint of evolutionary theory, we must pose the question: How will the structure continue to serve the client's purposes?

In the intervening 18 years, there has been little effective dialogue on the function of a cathedral. There is, indeed, a school (in which Anglicans conspicuously share) which says that cathedrals should not be built at all. Not only, so the argument runs, is there no real call for the large assemblies they suppose, but, by their emphasis on power, they misrepresent the action of Christ in the world.

This is a respectable view, but probably not widely shared. One thing certain is that the evolution of the cathedral must wait for the evolution on the diocese itself and that this, up to now, is hardly even a talking point.

In the absence of a clear lead on function, the actuary will be quick to point out that if the cathedral is to continue to provide room for much greater numbers than its regular local worshippers can muster, then it must continue to serve as a showplace. For being the last big noncommercial public building not paid for by the State, it must depend on distant visitors for money. On this score, therefore, Spence's assessment finds ample, permanent justification.

As a useful religious plant, however, the concept has not worn so well. Not only has there been a general turning away from the Middle



The hexagonal Chapel of Unity, "roofed like a crusader's tent," seen with the spire of the old cathedral beyond.

Ages as a suitable source of Christian inspiration but congregations themselves want to share more actively in what goes on than Coventry's medieval plan can ever permit. Again, the Chapel of Unity, admirable as a symbol when the prospect of real unity seemed comfortably remote, seems less admirable today when people actually want to use it.

But on balance, the Church of England has had good value from the design. It represents faithfully the aspirations of the Church as they were in 1950 and has worn as well as they have.

Admitting, as we must, that the cathedral stands outside the historic development of modern architecture, its popular success serves to underline certain social disadvantages under which orthodox functionalism labors and also, perhaps, some shortcomings in the way in which function has been interpreted.

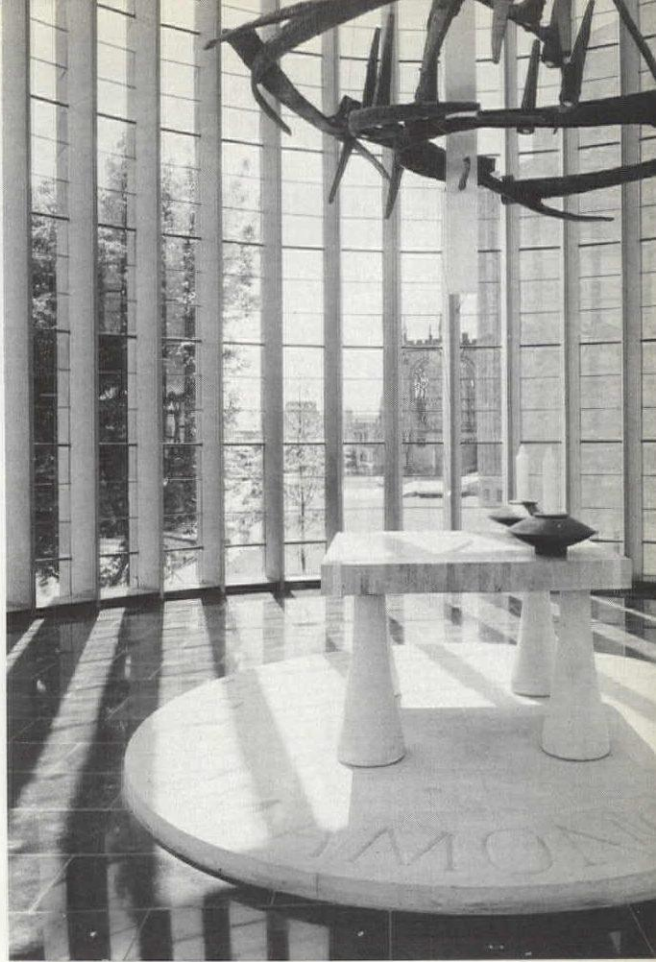
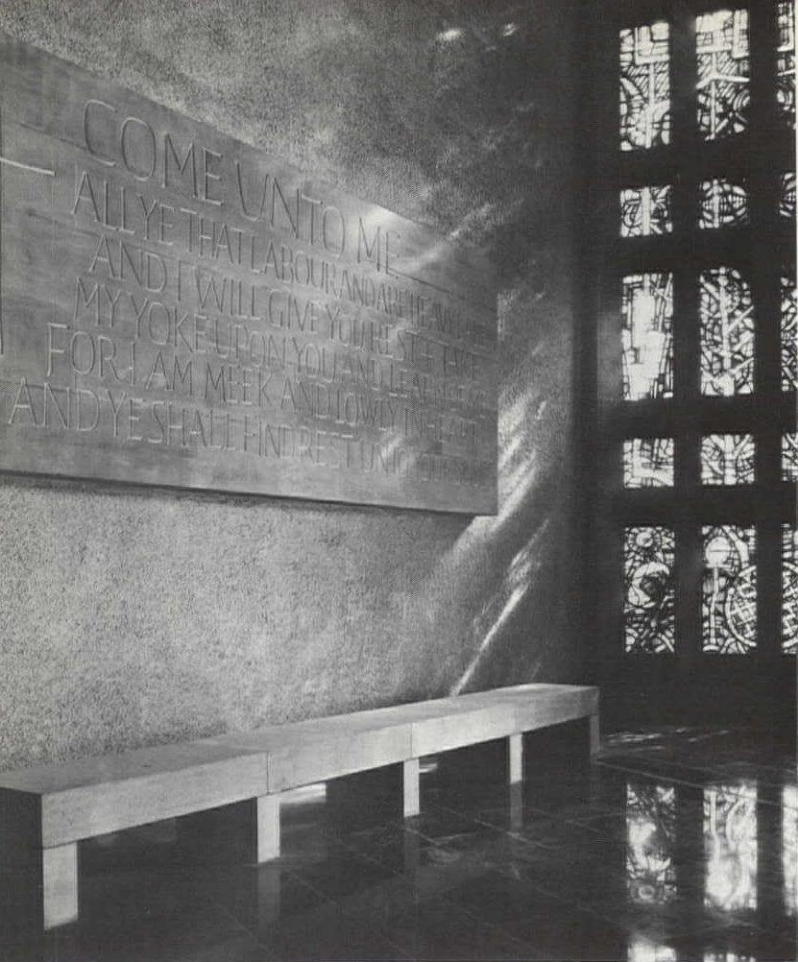
This success reminds us, for instance, of the extent to which the appreciation of architecture is a *memorative* act: So much of the pleasure consists in recognizing forms seen often before. In this respect, a revolutionary architecture which sets out deliberately to wipe the slate of architectural memory automatically puts itself at a disadvantage. Coventry, with its echo of archetypal experiences, will evoke a response where the Royal Festival Hall will not.

This success also serves to remind us of the

extent to which the evolutionary view of architecture represents a professional bias in architects which is not shared by the public—or, indeed, by building owners. For these members of the public, each building is a be-all and end-all. Indifferent to the future development of the building type, they are indifferent also to the architect's horror of the monument, of the building designed to last forever. For them, the apparent permanency of a building—of virtually any building—is part of its attractiveness. It is a lasting point of reference in the visual scene. It gives them pleasure to think of it standing there, immovable, in the confusing flux of life, and they feel a pang when the demolishers come to shovel it away. For these reasons, neither the stylar regressiveness of Coventry Cathedral nor its monumentality seem like defects to them.

It is typical of architectural analysis that hardly a mention has been made until now of the architect's personal skill in design. Skill in this sense has become an old-fashioned word. The faculty most looked for in modern architects is creative ability, by which we mean a fluidity of mind and a power of thinking out new and unexpected solutions.

By contrast, architectural skill means power of obtaining the desired visual effects which come from close observation and the development of visual experience. The quality it produces is, on



One of the hallowing places by nave window, left, and Chapel of Christ the Servant with view toward the ruins.

the whole, missing in works of modern architects. It is this quality which gives structures that unpremeditated look, as though they were sketch schemes, not finished buildings.

The skill displayed in Coventry Cathedral, therefore, is something of a rarity. Those who do not like the building come out nonetheless with the cross, baffled look of people who have been persuaded against their better judgment. For the effect of skill is to impose. A point to notice here



is that in this respect Coventry differs not only from the general run of good modern buildings but also from the architect's secular works. This suggests that it is not only a personal quality in him but also something attaching to a traditional approach.

The final respect in which Coventry stands out is its vindication of a specialized environment. Its interior is firmly ecclesiastical. Those who say

that this character should not be determined by the reuse of so many medieval devices might even think it corny.

It is one of the tenets of the modern movement that the environment is one and indivisible. People carry out different activities in it for which they need certain spaces and certain physical climates. There is no doubt that this limitation to the meaning of function has made modern buildings humanly unattractive. We still await an authoritative theory of the psychology of architecture; but we are beginning to see that all human activities, even the most mundane, have a ritual quality. They gain in pleasure and in meaning by being repeated and by the sense people have that they are somehow playing a part.

From this it follows that buildings must not only make these activities convenient but must reinforce this ritual character. Doubtless there are many ways of doing this, but all must tend to the creation not of one but of many separate environments.

Sir Basil Spence's creation is triumphantly specialized. In it there is no unwelcome ambiguity. When a man approaches the high altar, one does not wonder, as one might in an authentic modern, assembly-type church, whether he is about to dissect a frog. In Coventry Cathedral his presence and his role are clear. □

Our Vanishing Landscape

America's conservationists and preservationists might well take a lesson from western Europe where the national park "is not necessarily considered an inviolate sanctuary free from the contamination of man."

BY JOSEPH E. HICKEY JR.

Twentieth century America has been a place of change and growth and of increasing national and personal prosperity. It has also been a place characterized by a breakdown in the normal man-land relationship. The average American now has more material possessions than ever, but at the same time he is living in an increasingly chaotic, disordered environment. Worst of all, he no longer is surrounded by countryside, an environmental factor once taken for granted.

The rapid growth of population and its increasing decentralization cannot be used as the sole scapegoats for this condition. The fact is that the rural landscape in metropolitan areas has been blighted to a large degree by a wasteful, disorderly use of land, resulting in a bland, if not distasteful, settlement pattern which is neither urban nor rural in character. This drab milieu lacks both the stimulus of the city and the serenity of the native landscape and thereby impoverishes the mental and emotional life of its inhabitants.

To date, attempts to remedy this situation have consisted largely of "open space" or "outdoor recreation" programs to purchase and set aside land. Such programs, aiming at the protection of parkland to meet the needs of present and future generations, are fine but only partially answer the problem of saving substantial elements of the landscape of America. What is needed instead is a comprehensive approach to evolve an efficient, ordered and therefore attractive landscape which includes both man and nature in varying degrees.

West Germany's Naturpark Pfalzerwald has been extended to include Weinstrasse, a heavily populated wine district.



Why hasn't such an approach been used in this country? Much of the blame lies with the historic American laissez-faire attitude toward land ownership and use. The resulting antiplanning bias has had a continuous effect in inhibiting any such effort. Because of this hostile environment, land planning here is still in its infancy and more honored in the breach than in the observance.

Another portion of the blame must rest with the conservationists and preservationists. Historically, their efforts in this country have tended

The author: Mr. Hickey is state open space and recreation planner for Connecticut.

to operate from the narrow standpoint of protection of natural resources from outside dangers, with resource use presumably an evil to be avoided. Considering the rapacious actions of too many entrepreneurs—especially in the last half of the 19th century and even today—this reaction is understandable. Nevertheless, this exclusive attitude toward public recreation lands, seen in national, state and municipal parks alike, is not the only technique required to save landscape. Land should not be considered either public, and therefore inviolable, or private, and therefore thrown to the mercies of speculators.

The weakness of this approach is apparent around any large park area in the United States. On the one hand, there is the magnificent natural scenery found within the park, possessing no

signs of man and his customary activities. Yet, on the other, adjacent to the park, and indeed at its very gates, are seen some of the most squalid types of commercialism found in our society.

What Americans have not yet realized is that a beautiful landscape as such does not necessarily have to consist of natural or unspoiled country. Some of the most lovely countrysides have been cultural landscapes, formed by the interaction of a natural landscape and a particular society. In fact, it is these compound landscapes which are usually of most interest simply because they contain man and his works. A tourist can appreciate only so much natural beauty and then must turn to his fellowman to slake his insatiable human curiosity. It is unfortunate that most parks in America lack this human touch and that the traveler must resort to the local "Flush Toilet Row"* for the satisfaction of his other needs.

Perhaps America should look to western Europe, a region which has long since learned to live with a high population density, to get ideas for a more balanced landscape-preservation approach. The national park in Europe is not necessarily considered an inviolate sanctuary free from the contamination of man. In many such parks, agriculture and forestry are extensively practiced, with whole villages and towns also located within the park boundaries. Admittedly

* A popular name for the highway commercial strip of trading post emporia, "See the Bear" establishments and deluxe motels with flush toilets at the southern end of White Mountains' Franconia Notch.

England's Exmoor National Park has farms and villages; natural beauty is maintained by strict planning controls.





The United States' Olympic National Park is one of many with a sharp public and private land border.

western Europe, an ancient land which has been well lived-in for millenia, lacks as many extensive wild areas as there are in the US. Nevertheless, such cultural features are included within the park because of the popular recognition that they form an integral part of the landscape. Removal of all inhabitants from within the park would simply mean the destruction of many picturesque villages and the reversion of lovely pastoral landscape to scrub forest.

The European approach has been to find a way for man and nature to live together and continue their fruitful interaction in a manner satisfying to all parties. The resulting mosaic landscape with its rich flavor is a far cry from the no-man's land of the rural-urban fringe of America today. This comprehensive European approach to land use, result of the need to make the best use of all resources, could be of great use in the US as well.

Several European approaches with possible application here can be quoted. One is the British designation of scenic areas of national significance as Natural Parks and as Areas of Outstanding Natural Beauty under the provisions of the 1949 National Parks and Access to the Countryside Act. The chief differences between these two categories are the greater size of the national parks and the special administrative arrangements necessary for their planning. Nevertheless, strict planning controls are used in both cases to ensure the protection of the great beauty of these areas, a beauty which is often dependent upon the maintenance of the green pastoral landscape of upland Britain with its clustered villages nestled among the hills.

In West Germany, similar beautiful areas have been marked off as *Naturparke*. Although these districts are of interest primarily because of their natural beauty, cultural elements are not excluded. A particularly interesting example is illustrated by the Naturpark Pfalzswald, a hilly, forested district overlooking the western edge of the Rhine Valley. Here, the eastern boundary of the park has been extended down into the valley to include the famous vineyard area at the foot of the Pfalzswald hills, Weinstrasse, or "Wine Road," an intensely developed farming area

with a substantial agricultural population in its many villages. Undoubtedly the juxtaposition of this picturesque agricultural zone and the wild, forested upland intensifies the beauty and character of both.

Similar attempts would be desirable in older, densely populated portions of the US possessing a distinctive cultural landscape. Such regions should have the following characteristics: a visually pleasing landscape with an active agriculture or other cultural features and attractive villages or local architecture. Districts possessing these qualities could be designated as Areas of Outstanding Natural Beauty or, in the case of areas with a strong historical or regional flavor, Heritage Areas. Controls on land use similar to those used in the European examples should ensure preservation of the regional character.

Trial programs of this type should be started immediately, particularly in districts where developmental pressure is seriously endangering the character of the areas. Southern New England would be a good sample region to experiment with, since it has the natural beauty, a distinguishable cultural flavor and the existing threat of widespread shoddy development. What areas in this region appear to merit such special attention? Regional analysis of its landscape can point out a number of possibilities on the basis of function and topographic character.

Hill farming areas, characterized by dairy farming and the predominance of settlement on the hilltops, are a strongly characteristic New England landscape type which should be preserved to some degree. Another scenic aspect of southern New England is represented by the coastal landscape.

How should this program be attacked? The magnitude of the task and the novelty of the approach probably mean that the federal government will have to play a major role in its execution. The national interest in the preservation of more of these areas of cultural landscape also may merit federal attention. At the same time, it should be desirable for state planning to play an important role in this program. Perhaps the federal government could offer grants to the states, which would then coordinate their efforts with regional and local planning agencies.

At any rate, some coordinated approach of this type is required to preserve areas of striking cultural landscape. The current single-purpose approaches are not doing the job and in their piecemeal way are only creating islands or oases of greenery in the midst of environmental chaos. In contrast, a plan to define and protect Areas of Outstanding Natural Beauty or Heritage Areas will preserve some key parts of our vanishing landscape. □

A Case for an Honest Awards Image

BY JULIUS SHULMAN

Too often, it seems to me, there is a tendency among architectural photographers to use "tricky" approaches and to misuse wide angle lenses. The resulting photographs can not only distort and misrepresent the architect's statement but are likely to disturb the proportions and scale of the building as well.

I would venture to suggest that photographs for awards programs—and for most other purposes for that matter—be taken with as normal

The author: Mr. Shulman, Los Angeles-based photographer with a worldwide clientele, has worked with architecture for nearly a third of a century. Author of numerous articles on photography and of the book *Photographing Architecture and Interiors*, he presently is working on a textbook series, *A Primer of Architecture*, an introduction of the subject to the young aimed at developing their consciousness of community involvement.

a focal length lens as possible. This produces a close to visual scale which, when coupled with a one-point perspective or as close to it as possible, is almost the only method of giving a faithful image of a structure.

For instance, when a plan indicates that an area is 100 feet long it will, if taken with an extreme wide angle lens, appear to be twice that length because of the effect such a lens produces. This may easily mislead the jurors, and this is why we so often hear that in the picture, a building looks twice as long or high or fat as it is in reality.

Certainly, the graphic, pictorial photograph has its place in the "package" but for mood only, not as the essential attraction (for more about angles and lenses, see "Angles in Architectural Photography, AIAJ, March '68).

It is not always feasible to achieve a one-point (on dead center) perspective. However, architectural cameras have adjustments which make it possible to align horizontal and vertical elements to retain a 90-degree relationship between structure and photographic image to prevent architectural lines from converging in any distorted sense.

In addition, a building should be recorded so that the photographs may almost be overlaid by the plan to make it possible for a juror or a reader to "read" the plan and to understand the circulation of the structure. Camera locations must be selected on a strong visual axis and related to a particularly positive design element.

It is a must that the interrelationship of various design statements is clear to the photographer so that he can photograph a building from different points, yet make it possible for the reader to understand its composition.

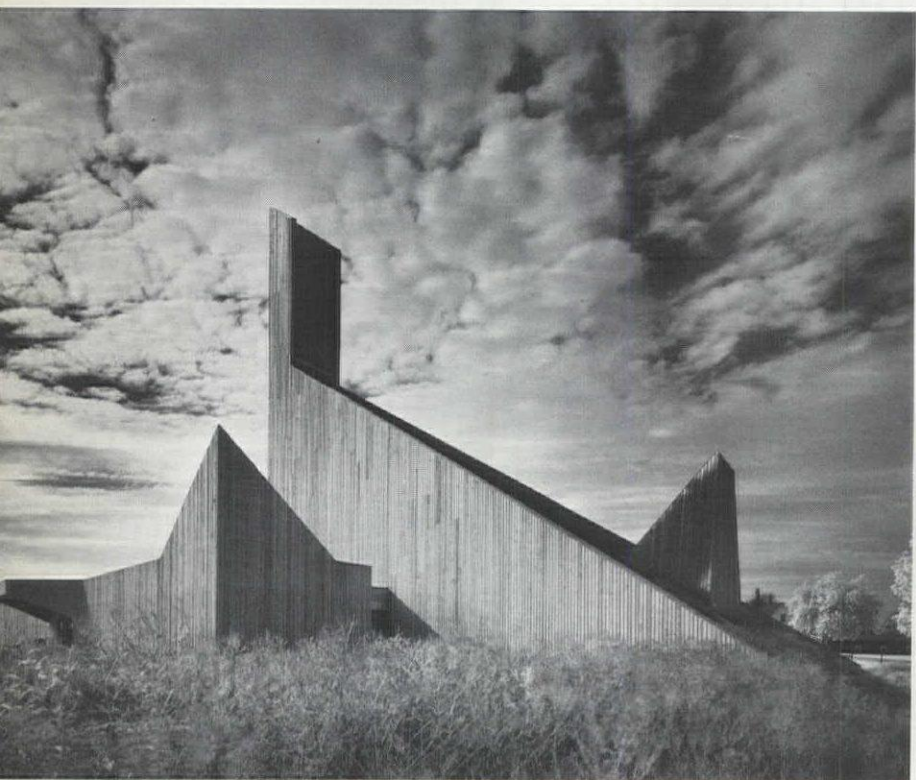
In an award presentation the camera positions, indoor and out, should be indicated on the plan so that each photograph may be identified directly to it, enabling the jury to see the plan/photograph relationship immediately.

In the following, I will illustrate why the angles and lenses and the photographer's forthright observation and understanding of the design elements—which dictate the positioning of the camera—are of such importance.

When approaching a new project, the photographer seldom knows or even anticipates what he will be working with. Personally, I do not like to have previous information or notes or even a plan of the structure, for coming upon it "cold" can be a most vivid and rewarding experience. This happened when I photographed the Covenant United Presbyterian Church (Crites & McConnell) in Danville, Illinois, shown with two other projects on the following pages.

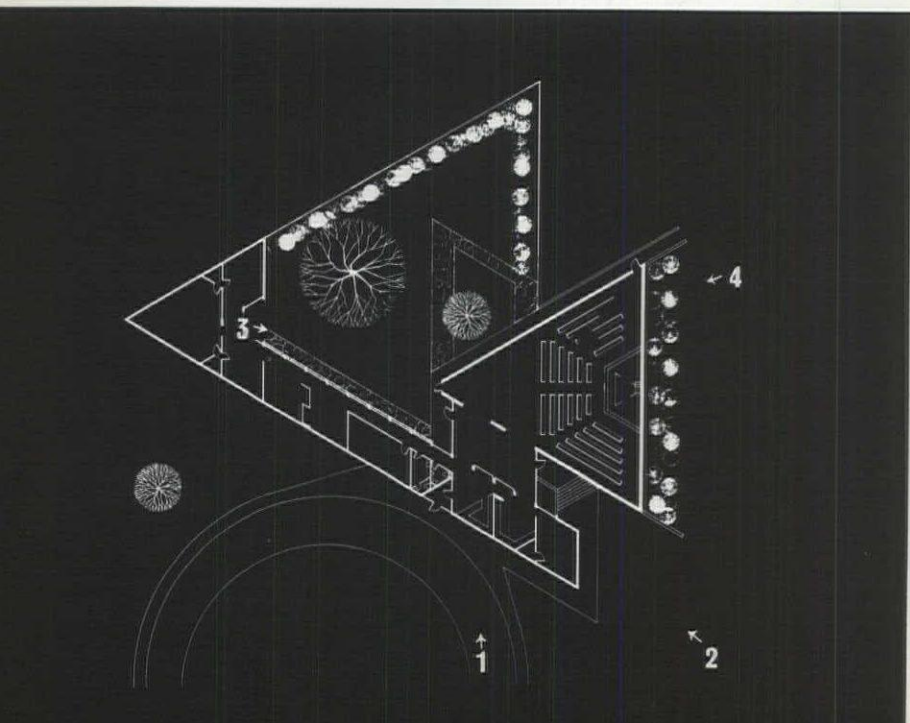


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The First Impact: An overall, wide angle scene of the Covenant United Presbyterian Church seemed almost imperative, for the relationship of the entrance, the tall cedar wall adjacent to it and the soaring diagonal roof line and towers would certainly depict what the church looked like. The second photograph was taken from a position closer in and farther to the right to show the profile of the major structure, its roof line, bell tower and the triangular skylight to the right. The same general elements are shown in these two photographs but are separated in an entirely readable fashion. Both pictures were taken with infrared film to cut through the haze and murk of the early morning.





3



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Opposite Views: The courtyard inside the wall was significant in illustrating the sanctuary structure. This can be read from the plan, for the third photograph was taken from the corner of the classroom wing (on the left of the main entrance in the first photograph). The fourth picture was taken from a position 180 degrees opposite of the third, interrelating the two and also showing how the grading of the ground is brought into a specific context with the sloping roof line.



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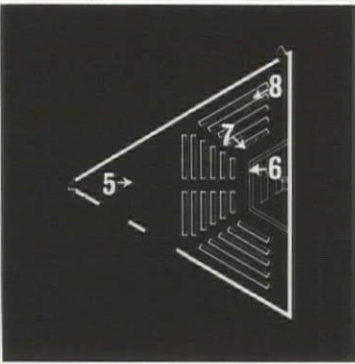
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One-Point Views: The altar with light pouring in through the skylight immediately establishes the camera position of the fifth photograph. The same holds true for the sixth exposure, taken from behind the altar and manifesting the relation of the bell tower with the interior. The lines of the pews, the ceiling and the altar were kept on a plane exactly parallel with the top and bottom of both photographs, making it possible to retain at least one dimension as a visual "anchor." Floodlights and spotlights emphasize primary design features without creating overpowering and pseudo-dramatic shadows.

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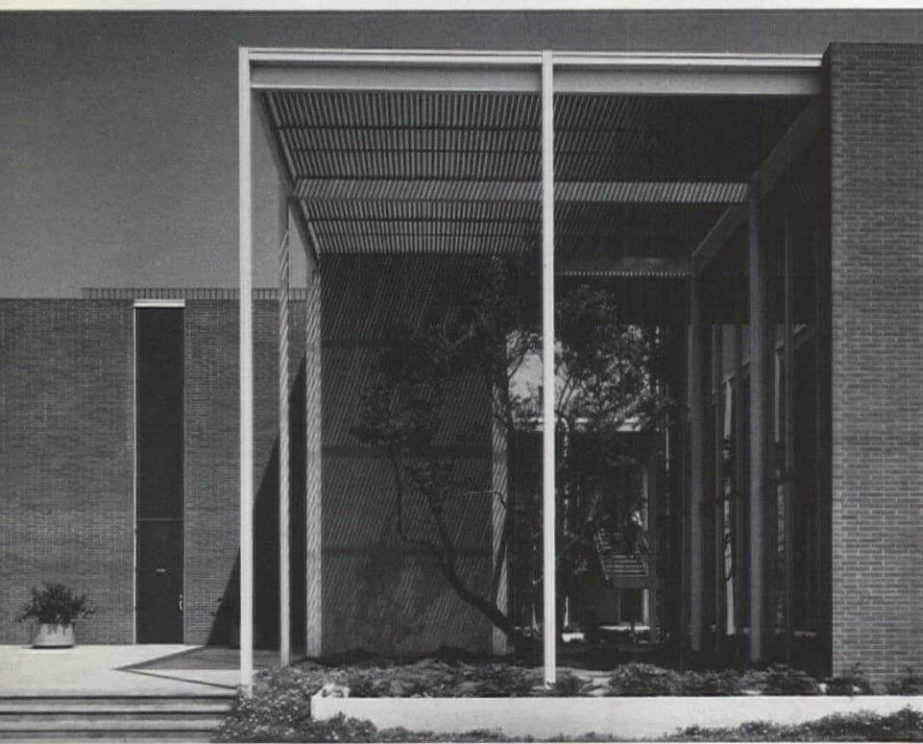
8



Angle Variations: Head-on nave compositions would not have been sufficient to show this unusual structure. Therefore, the seventh and eighth photographs, alternate side views of the two previous ones, were taken to show the slanting roof, the shape of the pew arrangement and the skylight opening. Note that the angle of the side aisle in the picture at lower right is such that it remains quite clearly related to the photograph at lower left, showing the top of the altar and the nave. A wider angle lens might have been used here to encompass more of the ceiling and walls of the lofty space. However, this would have caused a feeling of greater space than actually exists.

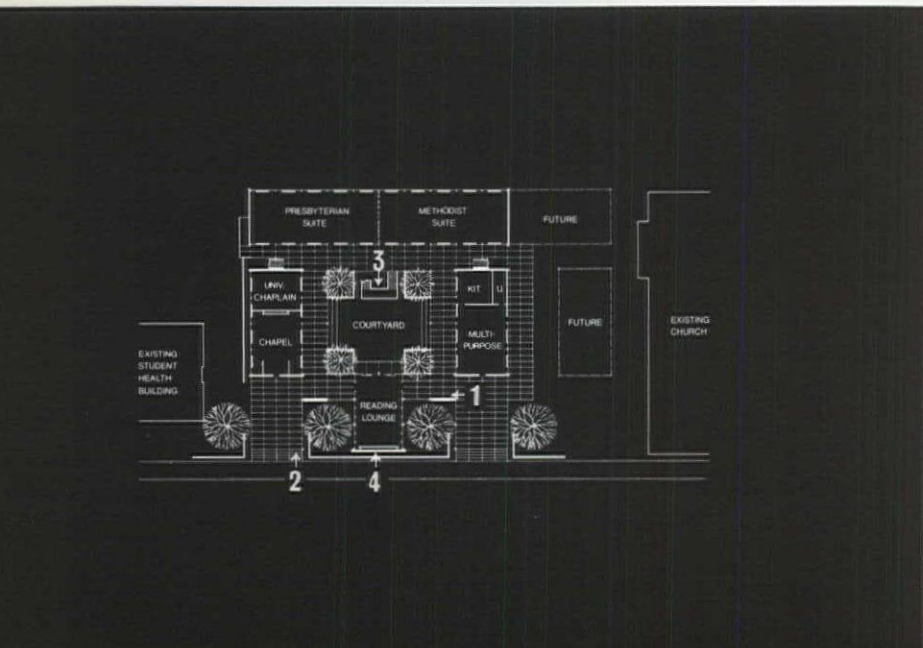


1



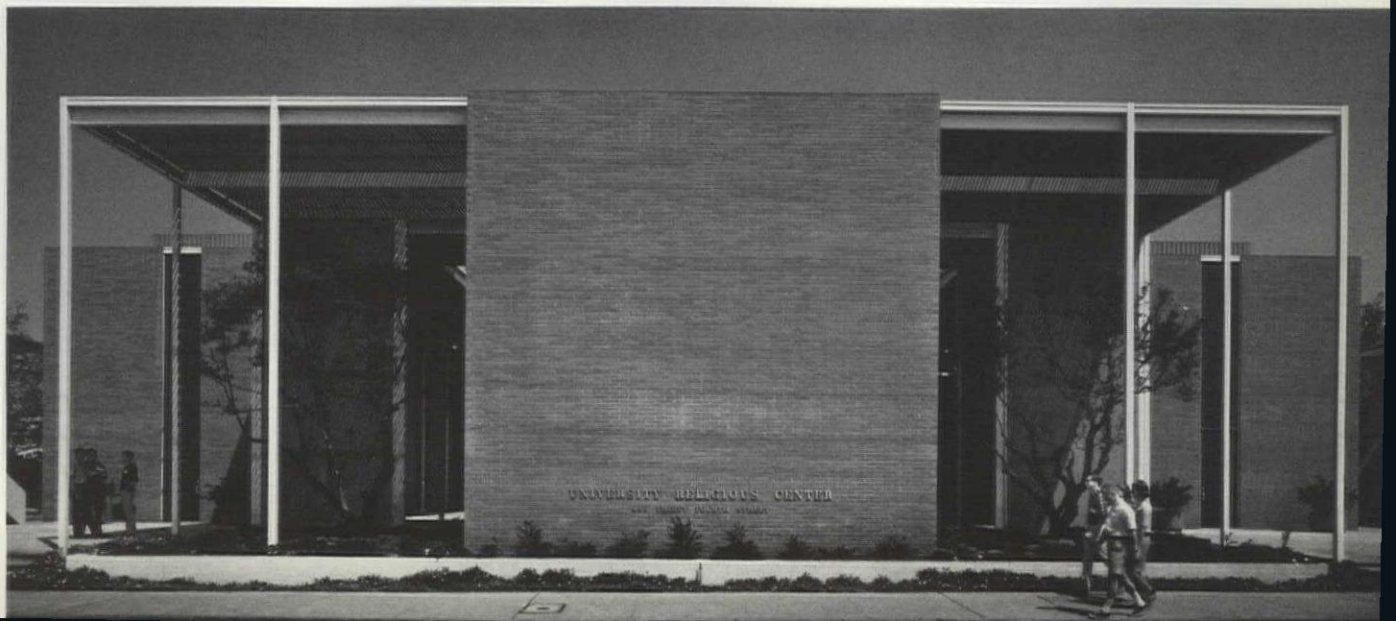
2

Relating to the Plan: A symmetrical structure like the University Religious Center, University of Southern California in Los Angeles (Killingsworth, Brady & Associates) readily lends itself to a plan-related series of photographs. All were taken with a lens almost of normal optical focal length. The first picture, taken parallel to the street, shows the reading lounge behind the facade and is in a 90-degree angle to the second one, which reveals a glimpse of the inner courtyard and its stairway. Note how the third view relates to the second one. Since the camera could not have been placed behind the column in the foreground of the third picture (the exact one-point perspective position), a more suitable view was achieved with the camera movement adjusted to recreate a head-on view. The fourth photograph, of the facade, is in direct 180-degree relationship to the one above. People in a scene give a sense of occupancy and a basis to judge the scale of a building. However, they must be carefully placed; if too close to the camera people can both distract and distort. It is wise to position the models along or in relationship to the axis or focal point of the photograph, for instance, along entrance areas or stairways on larger public or office buildings. Models should always be walking into the scene, as shown here, never away from it at the edge of the picture. Too many figures will clutter the image.

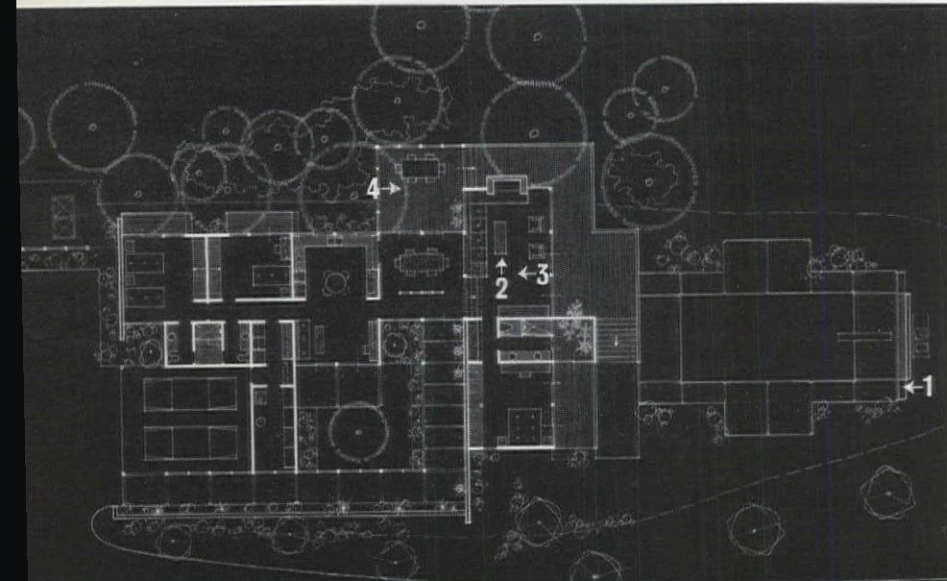
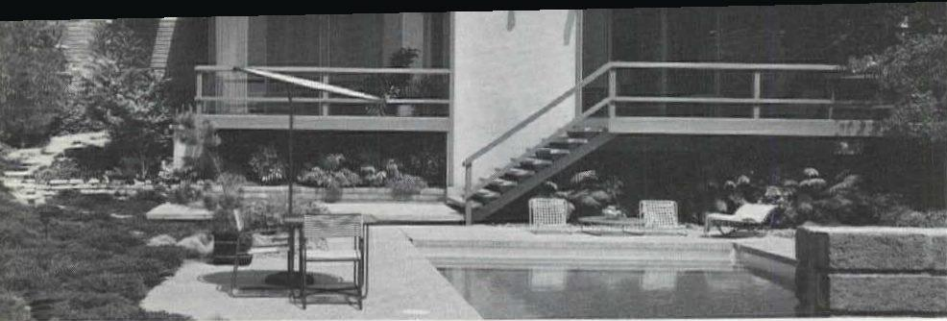




3



4



are equally represented, both in lighting and proportion. In the case of the M. C. Gill residence in Pasadena (Buff & Hensman), a straight-on exterior photograph represented a more powerful image of the siting and framing than would one showing two sides. The juxtaposition of the second and third photographs clearly relates to the plan, and the fourth demonstrates how the exterior "shell" wraps around the interior. Note how the deck and rail read in continuity. When there is a large glass area relating to specific outdoor features, sufficient flash lighting is necessary to bring the intensity of the interior values up so that they will photograph in balance with the exterior.

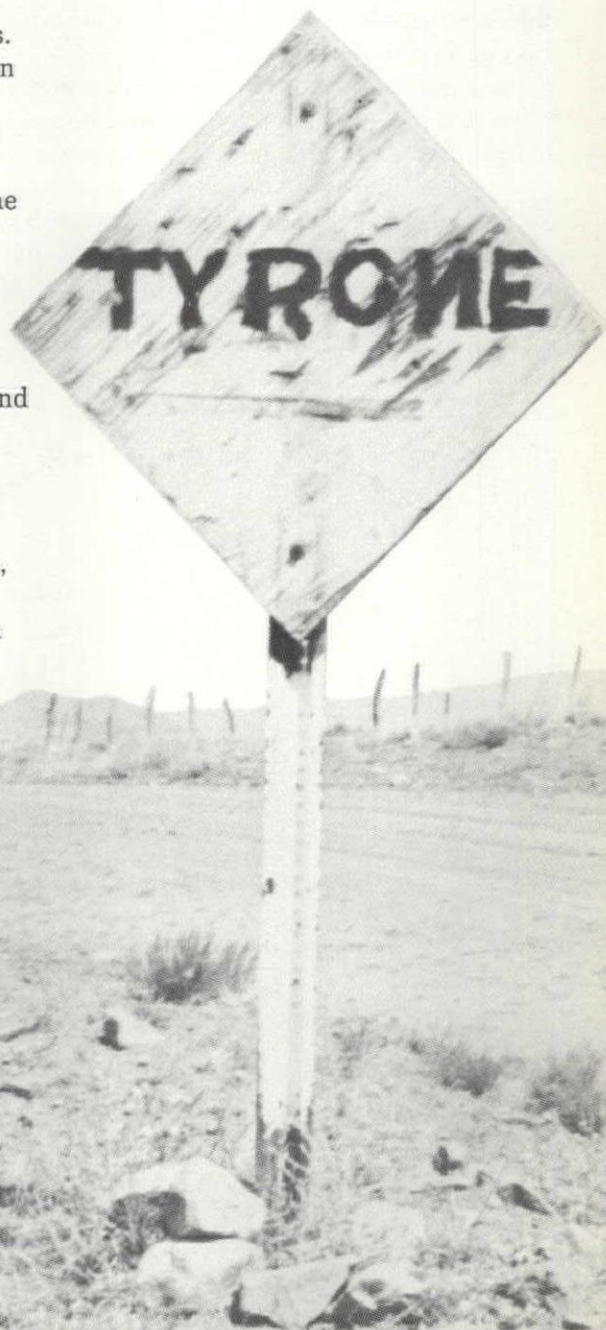
Gone Forever: Goodhue's Beaux Arts Ghost Town

BY ROBERT B. RILEY, AIA

Westerners take a strange pride in their ghost towns. Feature sections of the Sunday papers glamorize them; the tourist literature boasts of them. But Tyrone, in southwestern New Mexico, was, by any standard, very special. It had no legends of lonely prospectors, no bonanza strikes, no overnight fortunes. It witnessed neither the high living and hell raising romantically associated with mining towns nor the bitter labor troubles of so many company copper camps. It was not even very old. But for architectural sophistication and grandeur of conception, it was unequalled.

Tyrone lay cupped in the Burro Mountains, the region of the cruel Apache wars of the 1870s. The town was about 12 miles south of Silver City, traditional mining center of the area, where Billy the Kid supposedly killed his first man and where the only brothel in the United States said to be legally chartered by a city government still does business. Tyrone sat at an altitude of over 6,000 feet in a large and lonely landscape of juniper, piñon, live oak and scattered cacti. Copper was first discovered in the mountains at the end of the last century, and small-scale mining started at once. The Phelps-Dodge Company began to buy into local holdings in 1904 and 10 years later owned almost all of the interests in the area.

By 1915, the war in Europe was pushing copper prices up, and Phelps-Dodge began to plan large-scale operations. Tyrone, it was decided, was to be the model mining town in the world, and Bertram Goodhue, fresh from the Panama-



California Exhibition in San Diego, was hired to design both town and buildings. Why Tyrone should have been chosen for such ambitious development has always been a puzzle, but apparently the wives of at least two high company executives pushed the scheme. Some oldtimers believe that Goodhue's romantic activities were responsible for both his commission and the ambitiousness of the plan. Construction started in



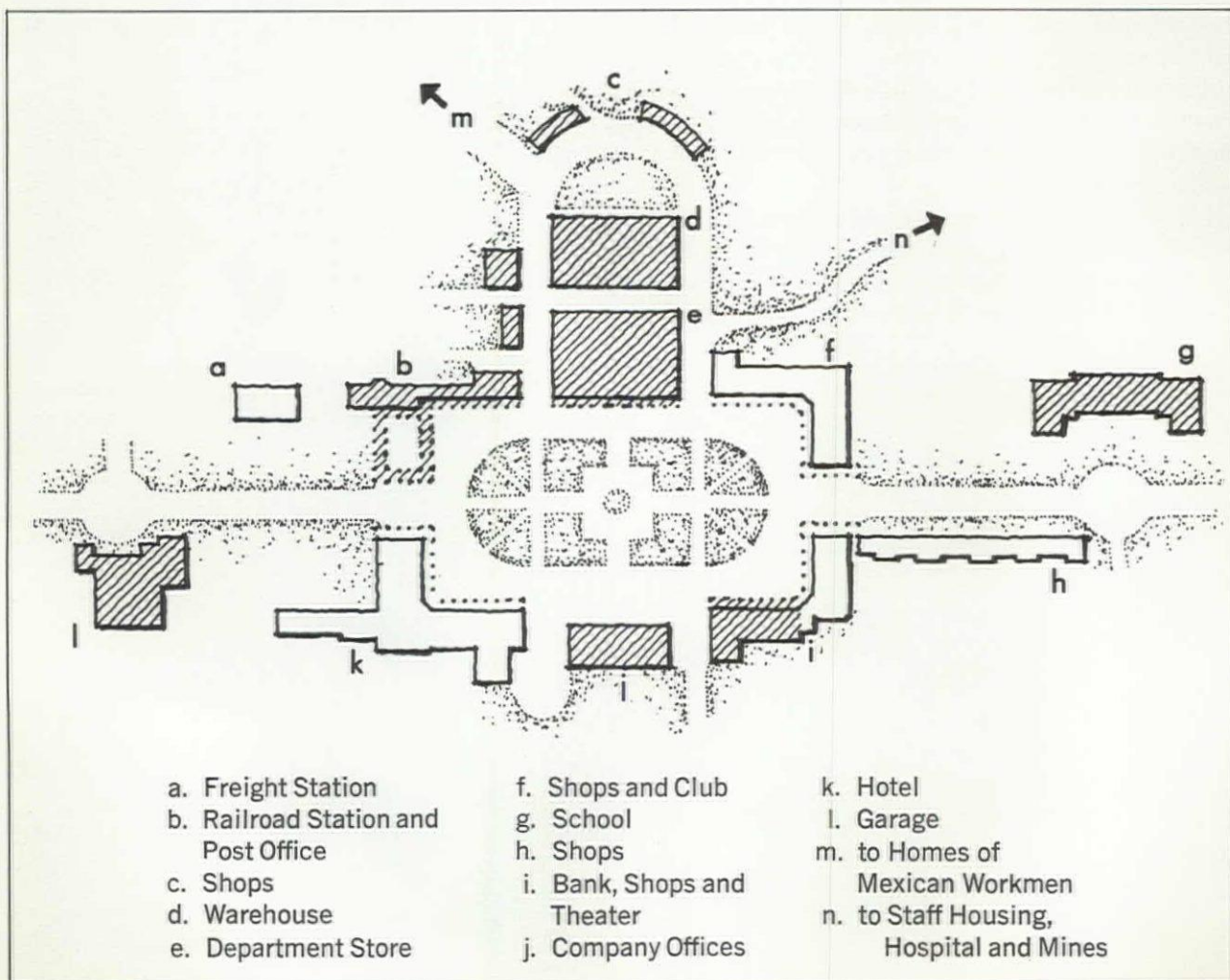
Town library was on second floor of this building.

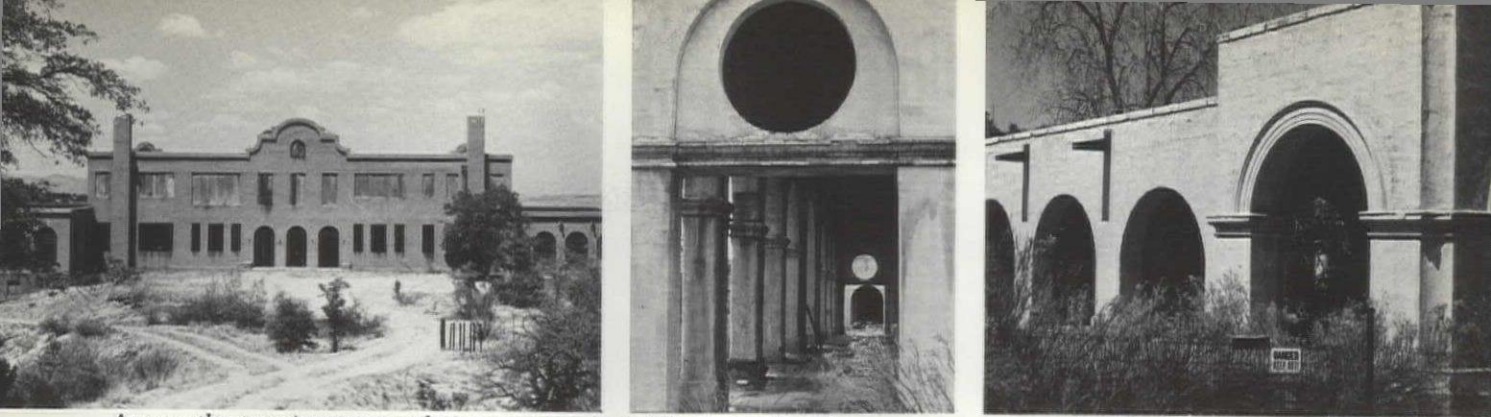
The author: Mr. Riley is a practicing architect, campus planner for the University of New Mexico and an editor of *Landscape* magazine. He is currently engaged in research on planning for isolated Spanish-speaking villages in the Southwest.

1915 but was not to last long. The war continued to push copper prices up and by 1917 had produced materials restrictions that ended construction at Tyrone for good.

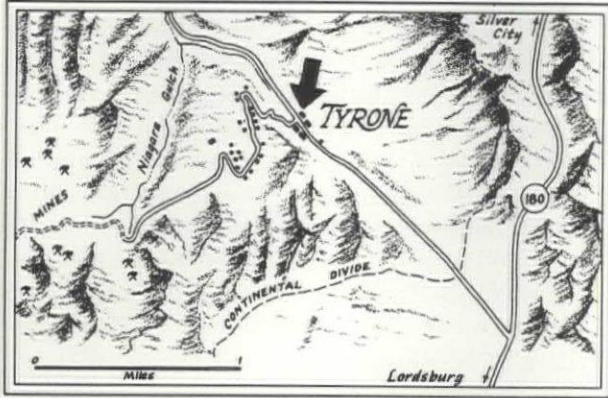
Goodhue's plan was comprehensive: staff housing on the heights to the southwest, a hospital just below the crest of the ridge, a town center grouped around a main east-west street parallel to the railroad and a district of workers' housing south of the town center. By the end of the brief

building period, the hospital was open and all housing well developed. In the town center the railroad station, company store and warehouse, company headquarters, the mercantile building and library and the school were up—enough of the major elements, along with planting, to form a fair semblance of Goodhue's projected plaza. The quality of construction was excellent; even incomplete, Tyrone provided enough amenities to make it the most comfortable and luxurious mining town in the West. The homes of Mexican workmen were incomparably better than any offered elsewhere, the staff homes sound enough that 30 years later they could be reoccu-





Among the town's accommodations were a hospital, an arcaded department store, a railroad station by the plaza.



Tyrone and surroundings in 1962, with arrow indicating the four buildings still left around original plaza.

pieced with only minor repair. The hospital, said to be the best equipped between Kansas City and San Francisco, featured two operating rooms with indirect lighting, private phones in every room and a number of sunken bathtubs. The railroad station had chandeliers, hand-carved benches, a marble drinking fountain and an arcaded outdoor waiting room. Trains were backed into the station, keeping the locomotive smoke out of the shed, and the dust-laden exhaust from the mines was ducted underground away from the town.

After the war, copper prices sank as rapidly as they had risen. The ore at Tyrone is low-grade,

The terraces at the open mine at Santa Riga, New Mexico, add a strange beauty and coloring to the landscape.



and the mines, producing an ore of 2 percent copper content, were competing with others turning out ore four to six times richer. Phelps-Dodge finally stopped operations in 1921, despite an offer by the workmen to take a 25 percent pay cut. A skeleton crew kept the mines open for a few years in hopes of an increase in prices, but by 1930 the workings had been abandoned completely. Some of the residents stayed on, and newcomers—artists, writers or commuters from Silver City—moved in and out sporadically over the next three decades.

In the '30s, a dude ranch operated for a while, and in 1941 a small amount of copper was taken out by leaching. Periodically, a story would appear in the Silver City papers speculating that the mines might again be opened, but nothing ever materialized. By 1966, about 20 families lived in the houses on the hill, and only the post office and a small company custodial office were still open on the plaza. Over the years, the workmen's homes, the warehouse and the school were torn down and the hospital, store and railroad station were fenced off behind barbed wire. Tourists were discouraged, and a prowling patrol car enforced the omnipresent "no trespassing" signs. Then, in the fall of 1966, Phelps-Dodge announced that it was indeed going to reopen the mines.

This time, however, mining operations were to be different; that difference meant the end of the town. All earlier mining had been done underground, with conventional shafts and tunnels. Now, it was decided, Tyrone could be operated profitably only through the use of open-pit mining. This is the simple process of digging down from the surface and stacking the overburden and waste to one side. It produces a hole of gargantuan dimensions: The pit at Tyrone will eventually reach a mile by three-quarters of a mile and perhaps 1,000 feet deep, and the dumpings will be equally large.

A similar pit exists at nearby Santa Rita, 20 miles to the northeast, the second largest copper pit in the country. The intricately sculptured terracing seen there and at the famous Bingham works outside Salt Lake City—terracing of a subtle and changing color—gives these pits a strange, impressive beauty all their own. Such sculpturing, however, is designed for minimum grade railroad removal of the ore and overburden. Since modern excavation is by truck and belt conveyor, such embankments are no longer necessary, and the pit at Tyrone is likely to look like nothing more than a disordered hole in the ground. Demolition started in early 1967 and is now complete. A new company residential development has been opened 5 miles closer to Silver City, and with the removal there of the

post office, still to be named Tyrone, the last evidences of the original town will be gone for good.

How successful Tyrone was in its prime is hard to say. Certainly, in the memory of its inhabitants, it was a happy town. The accommodations were comfortable and amenities were plentiful, even compared with established towns of its size in older parts of the country. The library held 5,000 volumes. The company store was a showplace—"the Wanamaker's of the desert"—and Phelps-Dodge was wise enough to rent well-furnished space to competing private merchants. The social life, too, must have been good: One of the most common reminiscences is the memory of music and dancing miners under Chinese lanterns hung in the plaza. As a piece of urban design, it may have been less successful, particularly since Goodhue's plan was never completed. No contemporary professional critiques exist (the mountains of southern New Mexico were a long way from any centers of architectural erudition), and the few photographs available give little clue to the quality of the plaza.

But if Tyrone's visual success as a living town is hard to evaluate, its success as a dying town was hard to beat. Its tiles were falling, its stucco peeling, its windows broken or boarded, but the pomp and luxury of its life were still plainly evident. Goodhue's bold forms and deep shadowed relief were designed to be read in the strong clear light of the Southwest, and suffered hardly at all in decay. The town was familiar enough to understand. It was built not by patricians of a long-gone culture but by executives of a still-thriving company; its architecture was not the board shanty construction of a Hollywood set but the solid, moneyed style of the civic center of any prosperous town.

Still, perhaps, Tyrone's biggest asset as a ghost town was its setting—that landscape of immense distance, loneliness and quiet. Grandeur gone to seed, the sight of ambitious architecture laid waste by nature and neglect, has always had a strong effect on the romantic mind. Kenneth Clark has pointed out that such a fascination with ruins was a major impetus to the Gothic revival.

... The Column grey with moss, the falling Bust,
The Time-shook Arch, the monumental Stone,
Impaired, effac'd, and hastening into Dust,
Unfaithful to their charge of flattering fame.
All is dread Silence here, and undisturb'd,
Save what the Wind sighs and the wailing Owl
Screams solitary to the mournful Moon ...

The wind blows almost constantly in that part of New Mexico, and if the owls are not particularly noisy, the coyotes are. The 18th century ruin-builders would have known how to appreciate Tyrone. Their patrons might even have raised the money to save it. □



The Gala Garage

A bright spot and a fun place, that's the new parking garage in Spokane, Washington. What's more, it caters to pedestrians as well as to drivers.

Covering half a block in the heart of town, Spokane's Parkade harbors in the rear a snug plaza with red brick paving, a splashing fountain, a sidewalk cafe, a bank, shops and kiosks.

The garage's ground floor provides a continuous row of stores sheltered against weather and sun by a second-story skyway encircling the building. The skyway is part of a system which leaves the sidewalk to pedestrians, for vehicular traffic enters and exits on the second level by ramps extending over the sidewalks.

Still further comfort is provided pedestrians by bridges spanning the streets from the skyway, bringing shops and businesses within easy reach. Colorful canvas awnings make use of the skyway and bridges pleasant in rain or shine.

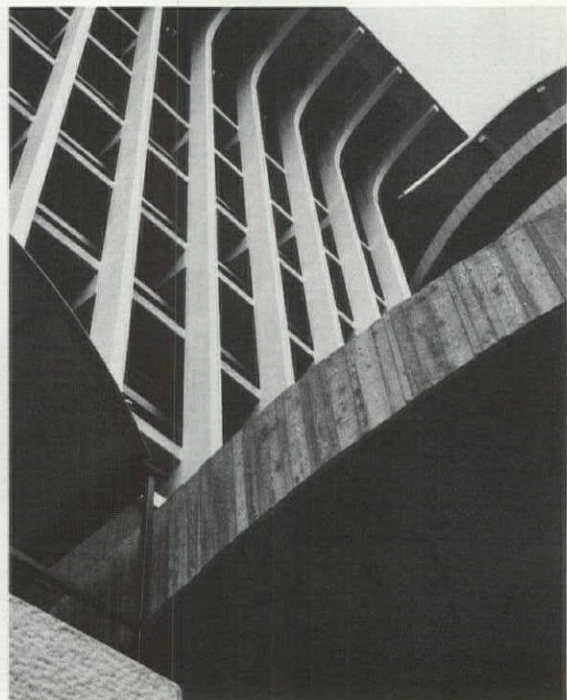
For drivers, Parkade has 800 transient car stalls, the basement holds another 100 stalls for permanent parking. Three elevators serve the parking public.

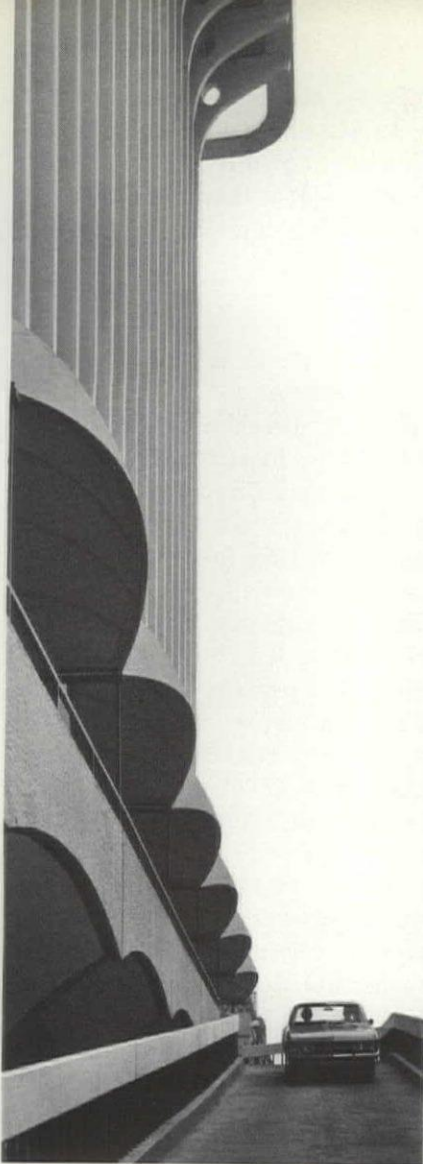
The entrance ramp projects into a one-way street with Parkade traffic flowing onto it from the right hand lane. A helical ramp makes for quick exit from the transient parking area with each ramp dropping two levels, serving every other floor. Four loops take a car down from the top level.

Exiting cars merge into another one-way street. The permanent parking entrance and exit are directly below the transient ones.

At night, soffits glow from upward shooting lights and the interior glitters from the pattern of bare light bulbs.

At once a private enterprise and an urban renewal project, the \$2.7-million Parkade was designed by





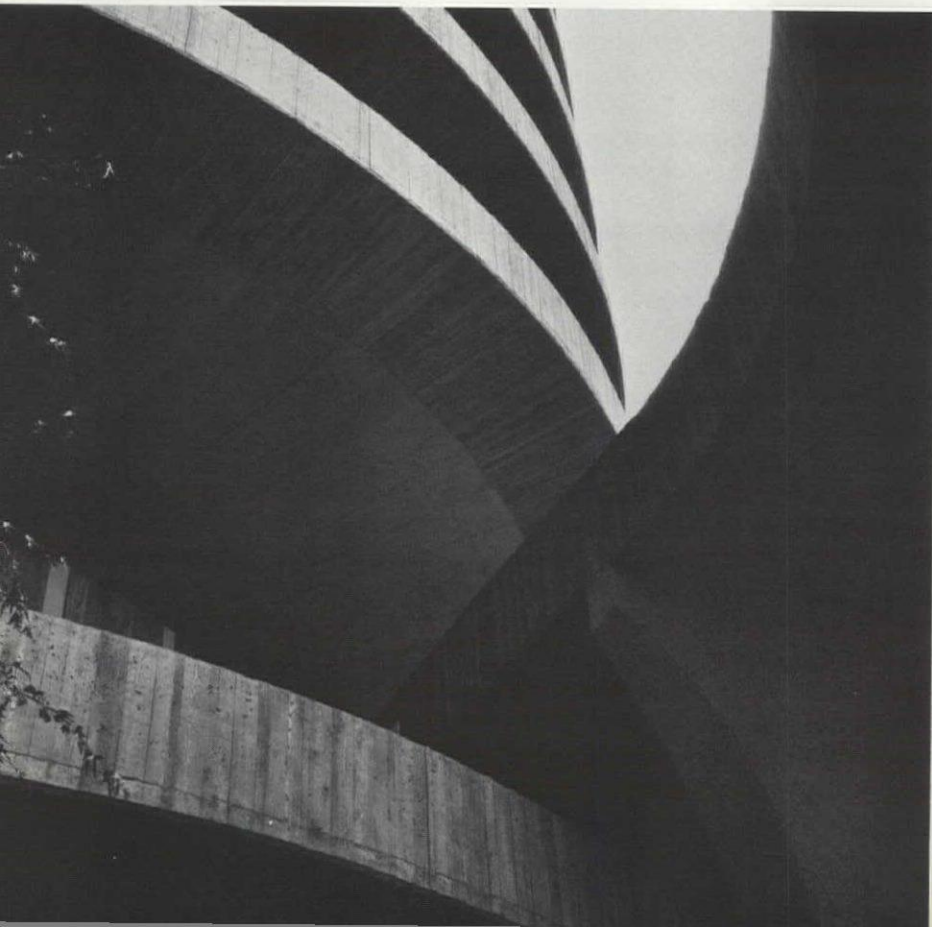
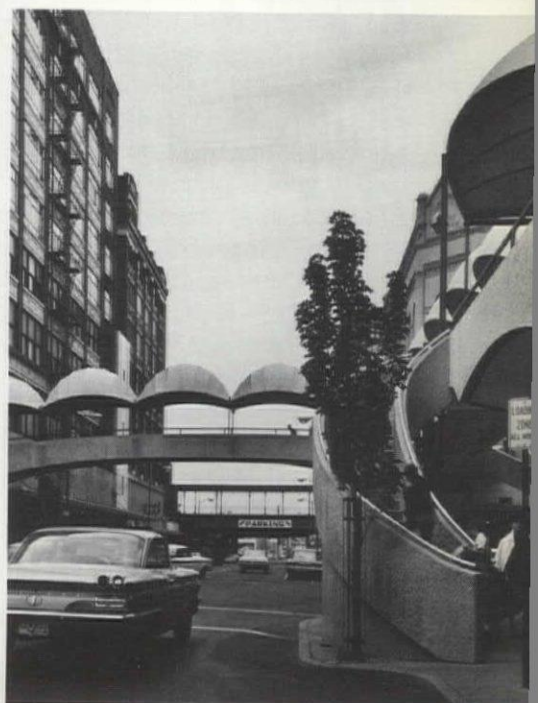
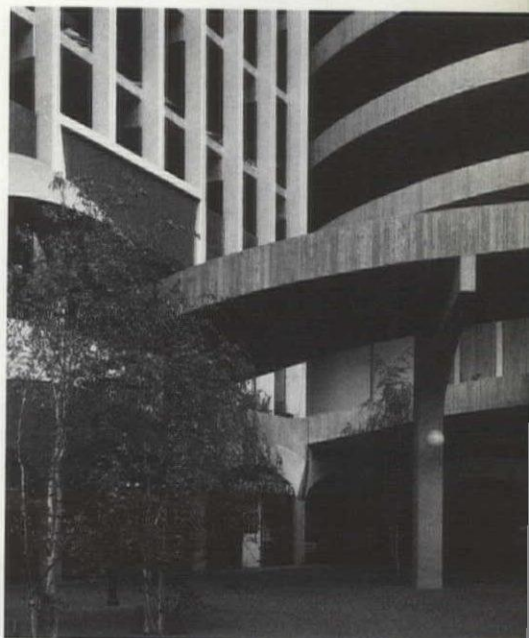
Warren Cummings Heylman & Associates for local businessmen who wanted not only to provide their patrons with convenient and economical parking but to upgrade the immediate vicinity as well.

The City of Spokane, only too happy to have private enterprise take care of urban renewal, did not charge for the air rights or tax the bridges. This \$134,000 project was undertaken by a department store and a property management company and is maintained by these two in conjunction with Parkade.

With the transformation of an abandoned alley into the plaza, a facelift for the surroundings followed as a matter of course. It was a natural thing also for the bank and the stores by the plaza to open entrances to this new center of activity.

Parkade's ground-level stores were built both as an attraction and to augment the revenue from parking. A roof on the garage was found to be another economical asset and it, too, with its bright orange color, adds to the garage's light atmosphere.

The tower is Parkade's focal point, serving as a homing beacon to guide and attract drivers. One who was attracted to it was photographer Gordon Peery who recorded these moods of Parkade—sort of a busman's holiday pedestrian style. □



BY PAUL B. FARRELL JR.

In order to knowledgeably discuss the financing of a project with his client and real estate consultant, the practitioner needs a general understanding of the discounted cash flow method of analysis. This method corrects the deficiencies of the traditional approach which leaves the investor with neither a clear measure of the real value of any one project nor a common criterion for comparing investment alternatives. Both methods are described here, along with a computer program developed to handle the extensive computations essential to a discounted cash flow analysis.

While meeting with a client sometime in the near future, the architect probably will hear the real estate consultant—an accountant, broker, banker or attorney—refer to the discounted cash flow (DCF) method of analyzing return on investment. A casual but quick remark could put the architect one up: “We certainly expect the project to generate a positive net present worth and a profitability index in excess of 1.00, assuming, of course, a reasonable discount rate.”

Professional jargon? Perhaps. Yet behind it all are some important concepts which, because of

The author: Mr. Farrell, an attorney with Smith, Hinchman & Grylls Associates, Detroit architects-engineers, also has a Bachelor of Architecture degree from Carnegie-Mellon University and a Master of Regional Planning from Cornell University. He wishes to acknowledge the work of Gilbert Spaman, systems analyst with the same firm, who developed a computer program based on the principles discussed here.

their growing acceptance within real estate financing circles, all architects should understand.

Recently, for example, departments of the federal government—the nation’s largest real estate investor—have required that all new construction proposals be accompanied by an economic analysis based on DCF principles. These government analyses are less complicated than our example which involves private taxable investments, but the principles are identical. The long-range complications inherent in private mortgage financing and the depreciation allowances on taxable real estate income strongly emphasize the importance of using the DCF analysis in testing investment opportunities.

To fully understand the DCF method it is essential first to review the traditional one. The worksheet on the next page is an excellent ex-

ample of the latter in a simplified form. It was selected in order to eliminate investment and operating considerations not directly related to the DCF analysis. Let’s look at the example more closely; then we’ll illustrate the DCF method by building on this same example.

The Client’s Project

Let’s assume that the client intends to construct a building at a cost of \$700,000 on land worth \$300,000; the total investment is \$1 million. The building will be leased to a national credit tenant such as a major department store chain for 30 years. The lease is a net lease, i.e., all operating expenses, including insurance, property taxes and maintenance will be assumed by the tenant. The client expects that a major insurance company will agree to lend him \$800,000 on a 30-year mortgage at 6.25 percent interest. Thus the client will have an equity investment of \$200,000 on a total investment of \$1 million.

A quick reference to a set of standard compound interest tables and some multiplication show us that this mortgage will require a constant debt service payment of \$59,112 per year for 30 years. The first-year interest on \$800,000 is \$50,000. The first-year amortization is the difference between the annual debt service and the first-year interest; and this \$9,112 amortization payment is that part of the first-year debt service which is applied to reduce the mortgage principal.

Traditional Analysis of Return

In reviewing this worksheet the client will see that there are five first-year measures of his return on an equity investment of \$200,000:

Pretax cash flow	\$15,888	(7.94%)
Equity increase	\$ 9,112	(4.56%)
Total return	\$25,000	(12.50%)
Total gain	\$29,000	(14.50%)
Spendable cash	\$19,888	(9.94%)

These financial criteria were developed as follows: The pretax cash flow of \$15,888 is the difference between the \$75,000 net annual income received under the lease and the \$59,112 constant debt service payment. (Gross and net income are equal because all operating expenses have been assumed by the tenant.) We then add to this pretax cash flow the \$9,112 first-year amortization which reduces the mortgage debt, and we see that he has a “total return” of \$25,000. However, the first-year amortization payment is an unrealized buildup of equity investment and not a real cash

Financial Analysis of

ESTIMATED PROJECTION WORKSHEET			
DUNCAN Korb & Trimble		REAL ESTATE INVESTMENTS	
103 E. 14th ST. OAKLAND 8, CALIF.		ADDRESS: NATIONAL-CREDIT TENANT	
TELEPHONE: 4-6230		TERM: 30-YEAR LEASE	
		DATE: 1966	
(EXAMPLE OF FIGURES RE: N-W-N INVESTMENT)			
THE FOLLOWING EXAMPLE IS BASED ON 1ST YEAR ANNUAL FIGURES			
1	EST. ALLOC. TO LAND	300,000	-
2	EST. ALLOC. TO BLDG	700,000	-
3	EST. ALLOC. TO PERS. PROP.	-	-
4	TOTAL COST		1,000,000 -
5	MONTHLY PAYMENT	4926 -	59,112 -
6	ANNUAL PAYMENT	59,112 -	6% %
7	ANNUAL INTEREST	50,000 -	9,112 -
8	ANNUAL PRINCIPAL	9,112 -	30
9	1st	800,000	-
10	2nd	-	-
11	3rd	-	-
12	Chattel	-	-
13	TOTALS	4926 -	59,112 -
14			
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the equity buildup of \$9,112 (the amortization), the traditional analyst will conclude that the client has a "total gain" of \$29,000 in the first year.

In addition to these first-year indices, we also know that 1) the gross income is constant at \$75,000 under a 30-year lease, 2) the tenant has assumed all operating expenses, so that net lease income is also constant at \$75,000 for 30 years and finally 3) debt service on the mortgage is also a constant \$59,112 annual payment for 30 years. Thus the client can expect to receive exactly \$15,888 (\$75,000 minus \$59,112) in pretax cash flows every year for 30 years.

After-Tax Cash Flows Unevenly

However, the annual after-tax cash flows and the increase in equity value resulting from annual amortization payments will not remain constant each year. During the first decade of ownership, after-tax cash flows will drop from \$19,888 to about \$12,000 in the 10th year. And the amortization part of the debt service will increase from \$9,112 to about \$16,000. Thus the total return in the 10th year will be approximately the same as in the first-year total return, while the annual after-tax cash flow will be declining prior to the year of sale. Moreover, if the client sells the project in the 10th year (at the initial investment cost), he will realize a large pretax return of \$307,000 in addition to the \$28,000 10th-year total return. And the tax on this return will differ considerably from the tax on his annual income.

The point here is that even with the fixed annual income under this net lease, no operating expenses and a fixed annual debt service, the investor's after-tax cash flow from this investment is quite uneven. The first year he will receive about \$20,000, in the ninth year he will receive about \$13,000 and (assuming a sale in the 10th year as in our example), he will receive a big \$237,000 after-tax cash flow in the 10th year. In the 10th year, then, it would appear that he will have a 124-percent return on investment.

As we can see from Tables 6 and 7 on page 79, the total after-tax cash flows returned to the client during this decade will be \$397,000 (total after-tax cash flows from operation of \$160,000 and an equity reversion of \$237,000 in the 10th year). The client initially invested \$200,000. Thus the \$197,000 profit he received during this 10-year period could be averaged to approximately 10 percent annually. We also know from the earlier discussion that the annual after-tax cash flows

flow (i.e., cash available for reinvestment in other projects after all of this project's obligations, including taxes, have been covered).

The client's after-tax cash flow depends on his income taxes. For this project he has elected an accelerated form of depreciation. Thus his first-year depreciation is \$35,000 which is tax deductible. His interest and depreciation deductions total \$85,000, or \$10,000 more than his net income under the lease. The client, therefore, has a \$10,000 tax "loss" even though he has a \$15,888 pretax cash flow.

This tax loss will offset income from other sources. And, since the client tells us that he is in a 40-percent tax bracket, he will have a tax "benefit" of \$4,000 cash which he would have paid to the federal treasury if he had not had this tax loss. This \$4,000 tax benefit and the \$15,888 pretax cash flows will give the client a first-year after-tax cash flow of \$19,888. If we add to this

range from 9.94 percent in the first year to 124 percent in the 10th year. And we have also seen several other first-year investment indices ranging from 4.56 to 14.5 percent of investment.

In brief then, the traditional method of analysis produces a confusing and incomplete array of financial criteria for a particular investment.

Since one of the principal purposes in using the DCF analysis is to properly account for the uneven cash flows, it is important to understand exactly why cash flows will almost always be returned unevenly during a period of real estate ownership. The six charts on page 77 should help to illustrate this fact in regard to the operating cash flows:

CHART 1

Our client's "net income before interest and depreciation" minus debt service payments equals his pretax cash flows. Each of these amounts is constant under a 30-year lease with the tenant and the 30-year mortgage.

CHART 2

The constant annual debt service payments include both an interest payment and an amortization payment. However, only the interest is deductible for income tax purposes. The interest is a percentage of the mortgage balance. The mortgage principal is reduced each year by the amount of the amortization payment. Thus in the first year 6.25 percent of \$800,000 is \$50,000, and in the 10th year when the unamortized principal balance is \$693,000, the interest is \$43,000. The debt service payment will still be \$59,112 in the 10th year, thus amortization will increase to \$16,000. The sum of the interest and amortization (i.e., the debt service) will remain constant every year and may be easily determined by preference to a set of standard compound interest tables (see "Suggested Readings").

CHART 3

Depreciation is a tax deductible allowance for recapture of certain investment costs. It is shown on this chart as an addition to the tax-deductible interest. The total amount of depreciation allowed over the economic or "useful" life of the project will be the same no matter what method of depreciation is chosen. However, with the accelerated depreciation methods allowed by the Internal Revenue Service, larger deductions may be taken in the early years of the project.

For example, under a "straight line" depreciation schedule, a \$700,000 building can be depreciated at 2.5 percent per year for 40 years (the

land cost is not depreciable). Thus the depreciation is a fixed annual deduction of \$17,500. Under a "double declining balance" schedule the investor may "write off" 5 percent of the balance of his investment each year. He will, therefore, have a depreciation of \$35,000 in the first year. The second year his depreciation deduction will be 5 percent of \$665,000 (i.e., 5 percent of \$700,000 minus the first year depreciation of \$35,000). By the 10th year, the depreciation will be \$22,000. As a result of taking accelerated depreciation, his total depreciation through the 10th year is \$280,000 instead of \$175,000 under the straight line method, making his annual taxable income \$105,000 less during this period.

The selection of the depreciation method (there are several common ones) will be critical to the investor's annual cash flow picture and may also affect the extent to which he may be denied capital gains tax treatment on a portion of his gain when the project is sold.

CHART 4

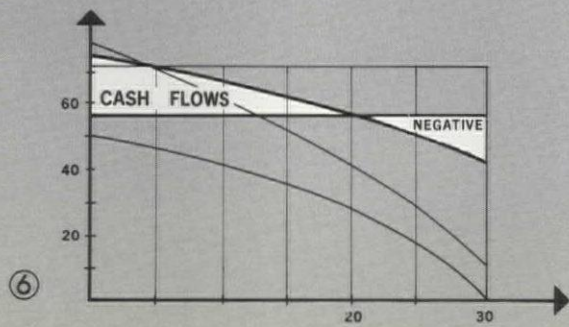
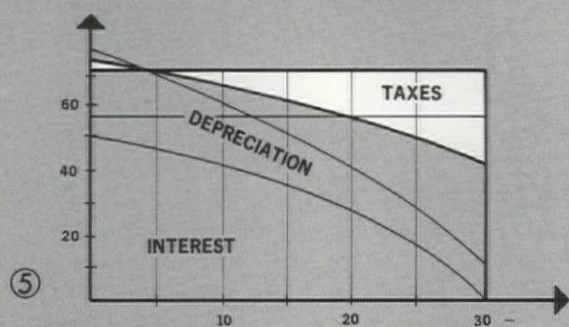
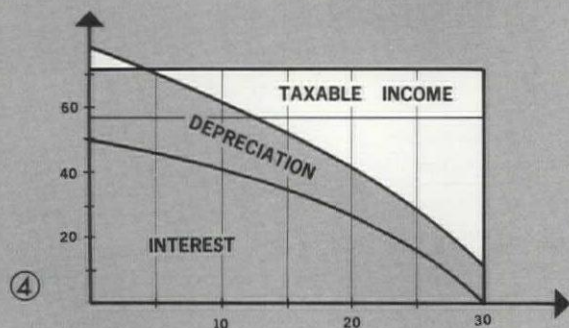
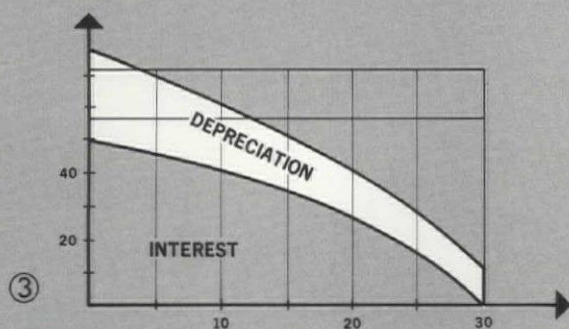
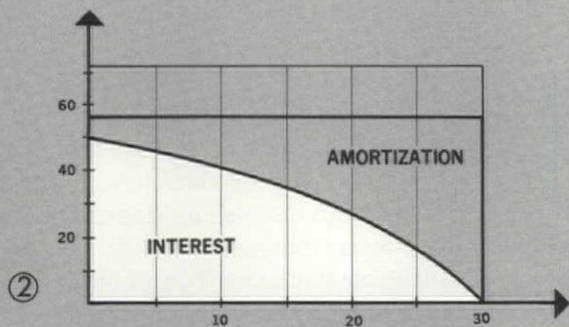
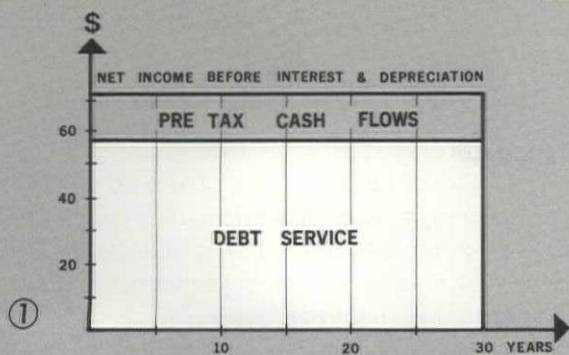
Taxable income is the difference of "net income before interest and depreciation" (NIBID) and the tax deductible items, principally interest and depreciation. During the first five years, a tax loss is generated by this project because the tax deductible interest and depreciation exceed NIBID. Loss is used to offset taxpayer's other income.

CHART 5

Income taxes are a percentage of taxable income. While it is unlikely that the tax rate of the investor would remain constant for the term of the mortgage, the rate is assumed to be constant for the earlier years prior to sale of the project. During the first five years of the project, the tax losses will offset other income of the investor and produce a negative tax or "tax benefit" in the amount of the tax which would have been paid on other income from salaries, dividends, interest, rents and so on.

CHART 6

Annual after-tax cash flows from operating this project will continually decline during the mortgage term. These cash flows are the difference between pretax cash flows (see Chart 1) and taxes (see Chart 5) shown on the following page. During the last decade of the mortgage term the after-tax cash flows would be negative, i.e., the investor would have to take money "out-of-pocket" to cover taxes and debt service. This situation, however, is unlikely to occur as most properties are either sold or refinanced in the first



decade of ownership. Refinancing would increase the tax-deductible interest and thus reduce taxable income. Refinancing may also permit the investor to recover cash value accrued through appreciation in the project's value and reduction of prior mortgage by annual amortization payments.

Deficiencies of Traditional Analyses

In summary then, the traditional method of analyzing real estate investment returns has three main shortcomings: 1) Such analyses usually examine only the first year of operations, thus avoiding the analysis of the uneven cash flows after the first year and the consideration of the time value of future cash flows; 2) the value of the equity reversion (cash left after selling the project and paying off the mortgage balance and taxes) is inadequately accounted for by looking at only the first year amortization; and 3) the use of several investment indices is confusing particularly where the investor may want a common basis for comparing this investment opportunity with several alternative opportunities such as other real estate or the purchase of fixed yield corporate bonds. **The DCF method of analysis tends to overcome these deficiencies by "devaluing" all future cash flows into one single present value which can then be compared to the original equity investment in order to develop one composite rate of return on investment.** Let's look more closely at the DCF method in the context of our example.

Applying the DCF Method

In order to adequately account for all cash flows, we have developed a generalized real estate investment model with eight basic subsystems. The first five subsystems build on the traditional methods illustrated in the accompanying worksheet. The latter three relate directly to the DCF method. These eight subsystems are illustrated in the diagram on pages 78 and 79.

1. Market Research: The use of our investment model requires an independent determination of such important inputs as land value, rents, construction costs and building size. These will be determined by the investor-developer and his market analyst.

2. NIBID: This acronym refers to "net income before interest and depreciation." This term was developed from appraisal language to distinguish it from the net income (after interest and depreciation) commonly noted on accounting statements. NIBID is calculated by estimating all future incomes from leases, parking, service to tenants, etc. and deducting from this vacancies and operating expenses assumed by the lessor.

3. Investment: Included here are all initial project costs including nondepreciable land and de-

preciable building costs. The building costs include not only the costs of demolition, utilities, site work and building construction but also professional fees and carrying costs such as insurance, taxes and interest during construction.

4. Long-term Financing: The three elements of this long-term financing subsystems are a) the principal amount of the mortgage, b) the constant annual debt service payment required to cover the mortgage and c) the amount of equity investment required. The mortgage principal is typically a percentage of the "project value." The project value is usually determined by the lender's appraiser based on the income-producing potential of the project. The total investment should be approximately equal to this project value which is a function of NIBID. While the determination of the project value is beyond the scope of this article, an appraiser, realtor or mortgage banker can be helpful here. Debt service is a function of the principal borrowed, the term of the mortgage, the interest rate and the number of debt service payments made annually. Any stand-

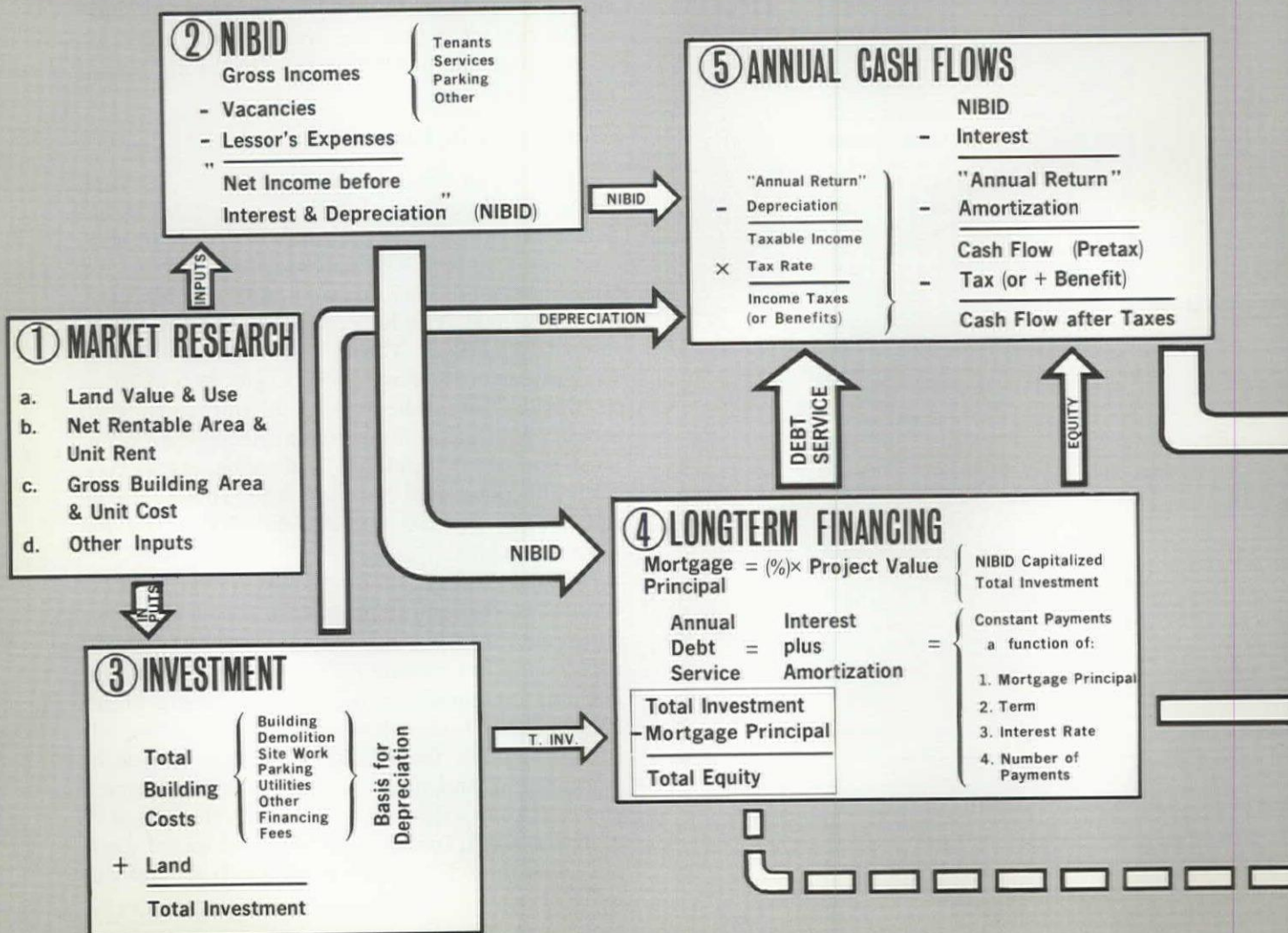
ard compound interest tables and a slide rule will provide the amount of constant debt service payment. Total equity equals total investment minus the mortgage principal.

5. Annual Cash Flows: The six charts on page 77 and the accompanying text adequately cover the method of computing annual after-tax cash flows—once NIBID, debt service, depreciation and the income tax rate are known. As we've seen on the worksheet shown earlier, the first-year cash flows can be determined with a few simple calculations once the basic data is assembled.

6. Long-term Cash Flows: The annual cash flows from operations vary each year. To determine the cash flow from the second year of sale, a series of involved calculations are needed in which we must account for a) the decreasing depreciation allowance and interest payment and b) the increasing amortization payment. The outstanding mortgage balance and the accumulated depreciation must be computed for each annual period.

7. Equity Reversion After Taxes: When the project is sold, the investor will probably have con-

REAL ESTATE INVESTMENT ANALYSIS



siderable cash remaining after he pays off the mortgage balance and his capital gains tax. This tax is presently 25 percent of the capital gain which is determined by subtracting the "adjusted basis" (total investment minus accumulated depreciation) from the selling price. In our example below, the selling price was assumed to equal the original investment. If the project appreciated in value 30 percent by the 10th year, the pretax reversion would be 100 percent greater than the example amount of \$307,000. (It should be noted parenthetically that a project sold earlier than the 10th year may involve special "recapture of depreciation" tax rules which may seriously affect after-tax cash flow; however, this subject is beyond the scope of this article).

8. Investment Indices: Once we have estimated all the cash flows from the operations and the ultimate sale of the project, we can compare them to the initial equity investment using the DCF analysis. Perhaps the simplest way to explain the financial concepts underlying this method is to define the six key terms commonly used by DCF

analysts. These definitions are cross referenced to the charts on this page.

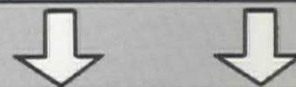
Present Value: The value of cash received at some future date can be determined by "devaluing" or "discounting" that future cash flow back to its "present value," thereby recognizing the fact that a dollar received tomorrow can be created by investing some lesser amount today. The discounting process simply requires that we know a) when the cash will be received and b) the current rate of interest at which we could have invested some lesser amount in order to realize that estimated future cash flow. Again, standard compound interest tables can be easily used to determine the present value of future cash flows at various interest or discount rates.

Thus, for example, our after-tax equity reversion of \$237,000 is multiplied by a discount factor of 0.54 to determine its 10th-year present value at a 6.25 percent discount rate. If we select a discount rate of 10 percent, then the discount factor for this 10th year reversion decreases from 0.54 to 0.39. In both cases, if the same equity reversion

EXAMPLE: TEN YEAR CASH FLOWS FROM OPERATIONS (\$000)								(9)	PRESENT VALUE OF CASH FLOWS AFTER TAXES			
YEAR	(1) NIBID	(2) DEBT SERVICE		(5) DDB DEPR.	(6) TAXABLE INCOME	(7) TAX (OR BENEFIT)	(8) PRETAX CASH FLOWS	CASH FLOWS AFTER TAXES (8) - (7)	6.25% DISCOUNT		10% DISCOUNT	
		INT.	(4) AMORT.						(10) DISCOUNT FACTOR	PRESENT VALUE (9) x (10)	(11) DISCOUNT FACTOR	PRESENT VALUE (9) x (11)
1969	75	50	9	35	(10)	(4)	16	20	.94	19	.91	18
1970	75	49	10	33	(8)	(3)	16	19	.88	17	.83	16
1971	75	49	10	32	(5)	(2)	16	18	.83	15	.75	14
1972	75	48	11	30	(3)	(1)	16	17	.78	13	.68	12
1973	75	47	12	29	(1)	-	16	16	.73	12	.62	10
1974	75	47	12	27	1	-	16	16	.69	11	.56	9
1975	75	46	13	26	3	1	16	15	.65	9	.51	7
1976	75	45	14	24	6	2	16	14	.61	8	.47	6
1977	75	44	15	23	8	3	16	13	.57	7	.42	6
1978	75	43	16	22	10	4	16	12	.54	6	.39	5
								totals: 160		117		103

6 LONGTERM CASH FLOWS

totals: 160



7 EQUITY REVERSION AFTER TAXES

Pretax Reversion		
Selling Price	1,000	
Mortgage Balance	- 693	
		307
Capital Gains Tax		
Selling Price	1,000	
Adjusted Basis	- 719	
Capital Gain	281	
Tax at 25%		70
Equity Reversion (Yr. Ten)		237
Present Value	6.25% Discount	126
	10.00% Discount	90

EQREV.

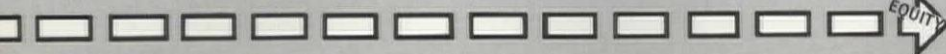
8 INVESTMENT INDICES

Discount Rate	6 1/2%	10%
Present Values		
1. Annual Cash Flows	117	103
2. Equity Reversion	126	90
Total	243	193
Original Equity	200	200
Net Present Value	43	- 7
Profitability Index	1.23	0.97
DCF Rate of Return	9.4%	

CASH FLOW AFTER TAXES

ORT. & BASIS

EQUITY



were received in an earlier year, the discount factor and present value of any future cash flow depends directly on the interest rate used in discounting that cash flow. The present value of the example project is the sum of the individual present values of each cash flow received during the 10-year period of ownership.

Discount Rate: In selecting the discount rates to be used in developing present values of future cash flows, the investor will likely choose rates of interest which he will apply to other investment alternatives in addition to the project under analysis since one of his main reasons for using the DCF analysis is to have a common basis for comparing many investment opportunities. Considerable experience and judgment is necessary in selecting rates appropriate for the realistic comparison of alternatives.

For example, the investor may select a minimum rate based on the alternative of investing his money in safe but low-yield mortgages or bonds. This may also be the interest rate which he must pay if he had to borrow the cash necessary for his proposed investment; obviously, in this case he will expect the project to earn a return at a rate at least as great as the borrowing rate. The investor may also select a higher discount rate if his experience with other opportunities suggests that his investments will typically generate cash at a rate greater than the minimum borrowing rate.

Economic Life: The period of time over which the investment will generate future cash flows may be critical. In the case of an investment with no equity reversion value (such as a machine with no resale value), the selection of a 10-year rather than five-year economic life will probably result in a noticeably higher present value of future cash flows since the present value of the investment equals the sum of the present values of all future cash flows during the economic life. Many buildings have a physical life in excess of 40 years. This physical life must be distinguished from the economic life of the investment in the hands of a particular owner. In our example we have selected a 10-year life, but there may be good reason for using five or 30 years.

Net Present Value: The difference between the present value of future cash flows and the original equity investment is the net present value. In our examples on pages 78 and 79, the net present value of the project is \$43,000 (\$243,000 minus \$200,000) discounted at 6.25 percent. The net present value of the same project is a minus \$7,000 (\$193,000 minus \$200,000) when discounted at 10 percent.

One word of caution is necessary here. As already noted, **one of the chief reasons for using the DCF method is to develop a single common**

criterion for comparing alternative investments of different cash flow characteristics and economic lives. Some care must be used when comparing two projects which vary much in the amount invested because the net present value will distort the value of a larger project.

Profitability Index: The ratio of the present value of future cash flows to the original equity investment is the profitability index. Thus in our example the profitability index is 1.23 at a 6.25 percent discount rate. And at 10 percent, the profitability index of the same project is 0.97. If two projects of different investment and cash flow schedules are compared, the profitability index (rather than the net present value) will provide a better basis for comparison. Thus, for example, if two investments have the same net present value, the smaller investment should be preferred.

DCF Rate of Return: When the present value of future cash flows equals the original investment, a) the net present value will be zero and b) the profitability index will be 1.00. The discount rate which will create this result is the "DCF rate of return." It can be determined by trial-and-error computations in which one discount rate is selected which produces a profitability index in excess of 1.00 and another discount rate is selected which produces a profitability index less than 1.00. The DCF rate of return is then computed by interpolation; and in our example it is 9.4 percent. This means, in summary, that over the 10-year period of ownership, our client will have returned to him his original investment plus after-tax cash flows, the composite long-term value of which is 9.4 percent of the investment.

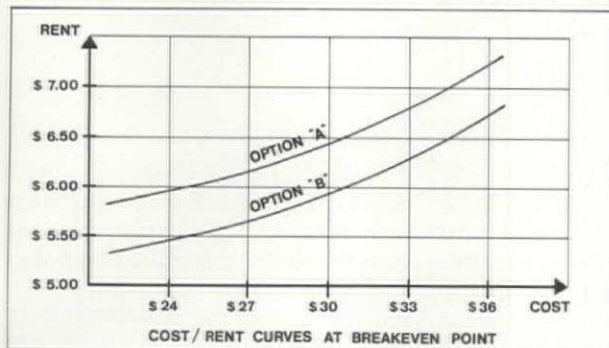
The Role of the Computer

The DCF method has not been widely used in real estate investment analysis for one major reason: It often takes thousands of separate calculations for one complete DCF analysis. The possibility of error is substantial and the time necessary is prohibitive. The supporting calculations for our example took an afternoon of manual effort with slide rule, desk calculator and longhand computations. We have avoided this problem by developing a computer program (REAP: Real Estate Analysis Program) which can handle over 50 complete sets of DCF analyses in less than 10 minutes of computer time, thus avoiding several weeks of accounting computations. The 50 sets of analyses provide us with reliable, error-free information about the proposed project. The program is designed to provide two major sets of information:

Profitability Guidelines—About 30 discreet analyses are run with all economic inputs being held constant except a) the unit cost of construction per gross square foot of building and b) the

TENANT RENTS COST OF CONSTRUCTION	LOW OPTION			TOWER OPTION		
	5.00	5.50	6.00	5.50	6.00	6.50
\$ 24	-5.0	-0.5	+3.9	-3.6	+0.6	+4.8 %
\$ 27	-6.7	-2.7	+1.4	-5.5	-1.7	+2.2 %
\$ 30	-8.2	-4.7	-0.8	-7.0	-3.5	+0.0 %
\$ 33	-9.4	-5.9	-2.5	-8.3	-5.1	-1.9 %
\$ 36	-10.4	-7.2	-4.1	-9.4	-6.5	-3.5 %

**RATE OF RETURN ON EQUITY
IN SECOND YEAR**



unit rent per net rentable area. Estimates of the most probable investment and operating expenses and incomes are judgments based on experience and each remains a constant input. Rents are then varied from \$4 to \$8 per square foot, for example, and construction costs from \$16 to \$36 per square foot. From this information, it is possible to develop curves showing the relationship of these three key variables: 1) tenant rental incomes, 2) building construction costs and 3) rate of return on investment.

Risk Simulation—Another 20 or so analyses are then run to test the effect of changes in other variables. The most probable unit rents and unit construction costs are first estimated as a basis for comparison. Then one or more variables such as operating expenses, construction period, mortgage term, interest, selling price or timing, depreciation schedules, tax rates and vacancies are varied and the effect of the change is compared to the investment return of the most probable rent-cost selection. Thus we are able to test assumptions and isolate major areas of uncertainty in a relatively short time and with a minimum risk of error in calculations.

As an example, we may be interested in knowing what effect the selling price will have on the investor's return. In our basic analysis we assume that the selling price equals original investment. In the risk simulation analysis we may assume that the selling price will be 0.90 of total investment to simulate a decline in value; we may also assume that the selling price is 1.25 of total investment to simulate an increase in value. If the selling price of the project did drop to 0.90 of the

original investment by the 10th year, the DCF rate of return of our example project would have dropped from 9.4 percent to 6.8 percent. However, an increase in the selling price to 1.25 of total investment would increase the DCF rate of return from 9.4 percent to 13.8 percent. These are the returns based on after-tax cash flows.

Without the computer we would probably prefer the traditional method of analysis, supported by our professional judgment. With the computer we can practically eliminate all calculations and still be assured that the 100,000 calculations performed are more reliable than the much less complicated traditional analysis through manual efforts. Moreover, in a few minutes the computer is capable of producing an extremely comprehensive and sophisticated analysis of a proposed investment. As financial analysts, our time can now be spent more productively in collecting relevant economic data, in testing the effect of available information and, in general, minimizing investor uncertainties.

The discounted cash flow method of analyzing real estate investment decisions is simple in concept, yet complex in application due to the large number of computations necessary for its execution. However, the DCF method is a superior analytical tool because it permits the investor to develop a realistic, comprehensive picture of his investment yield, particularly where cash flows will be generated unevenly over a long period. The computer not only eliminates the mathematical drudgery which naturally tends to make traditional analysts avoid the DCF method but also permits additional program sophistications which will give the investor a thorough understanding of the importance of particular income and investment variables. □

Suggested Readings

Perhaps the most useful desk reference on the subject is *Ellwood Tables for Real Estate Appraising and Financing* (American Institute of Appraisers, 1967). Once mastered, this standard reference and a slide rule could be a valuable substitute for present commercially available computer programs.

Three other publications are important to understanding the use of DCF analyses in many business settings:

1. Bierman & Smidt, *The Capital Budget Decision* (Macmillan, 1966).
2. *Financial Analysis of Capital Investment Decisions* (National Association of Accountants, 1967).
3. *Capital Investment Decisions* (Harvard Business Review Reprint Series, 1964).

For examples of traditional analyses, see the following:

1. Smith, "Relations of Architects with Real Estate Consultants and Owners," and
2. Lyles, "Principles of Economic Feasibility for Architectural Projects," both in *Comprehensive Architectural Services* (McGraw-Hill, 1965).
3. J. K. Lasser's *Successful Tax Planning for Real Estate* (American Research Council, 1965).
4. Kinnard, *Industrial Real Estate* (Society of Industrial Realtors, 1967).
5. Korb & Trimble, *Real Estate Sale-Leaseback* (Society of Industrial Realtors, 1966).



From the General to the Practitioner

BY GEORGE M. POLK JR., AIA

Today's complex society requires specialists with very special skills and training. Many professions recognize this fact, and practitioners with special practices have adopted special titles to indicate their field of special endeavor.

The medical profession is the most common example of a man

The author: Mr. Polk, before becoming an assistant professor—a professitect—in the department of architecture and building construction at Miami Dade Junior College, had his own practice. Sketches by Thomas Hutchens.

for every job and a name for every man. A sick person must decide what type of "ologist" he should consult.

As the architectural profession assumes a more diversified role in our times, it is only fitting that we know what type of a "tect" we are by the professional title.

The advantages of using a title that is self-explanatory should be obvious in today's busy society.

For example, a work of architecture that is particularly beautiful could be described as artitecture; this would be a one-word identification. Of course, the man who did it would be called an artitect. This may sound strange at first, but it would never be as mispronounced as arch-i-tect is now.

When a building's functional qualities outweigh its esthetic appeal, it may be called funcitecture as done by a funcitect, or formitect if you prefer, because form follows function.

Perhaps some day we will have a truly great leader in building matters. A man who combines the best qualities of the architect and engineer could be called an archineer or, if the building turns out badly, an engitect.

Groups of similar buildings without distinguishing features could be called dullitecture as a done by a duplitect.

For our future urban renewal projects we need an urbanitect to design cititecture. The urbanitect may be assisted in his work by such specialists as the sociotect and econotect.

Every large architectural office would have as principal a chiefitect or headtect to run a team composed of a designitect, specitect and several draftitects.

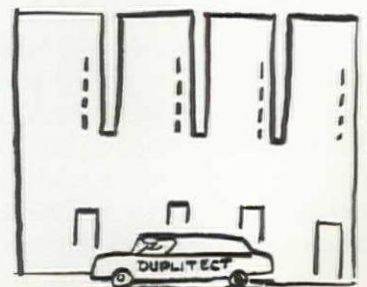
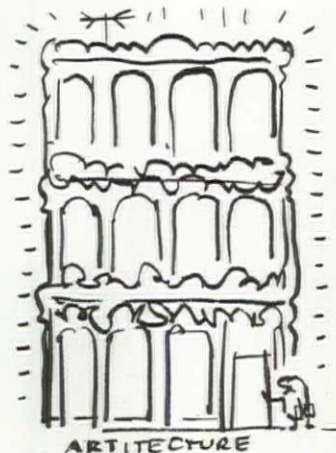
Bids would be accepted only from qualified constructitects.

Buildings erected in the country would be ruralitecture. If single-family homes, they would be designed by a resitect; if multi-family dwellings, by an apartitect.

Leaders in stylistic trends in architecture could be called Brutelects, Stonitects or even a Ruditect. The East Coast cult which emphasizes the techniques in structure could be called the technitects. Depending upon a practitioner's ability, he could be called a greater or lesser copitect.

Any of our present-day practitioners who say that their next building will be better could be called excusetect. The specialists in the profession who know all the answers could be called omnitects.

And last but not least, in our architectural schools we would have teachitects imparting wisdom to the studitects in a vast complex of scholitecture! □



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Permagard®: a thermoplastic polyester clear interior film finish designed to retain the natural color of wood or toned to enhance it. Highly abrasive and stain resistant. Excellent for cabinet doors, walls and flush doors. Easily cleaned with a damp cloth.

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Novoply® cores: a 3-ply particleboard panel of balanced sandwich construction. An excellent and versatile core material. Panel thicknesses: $\frac{3}{8}$ " , $\frac{7}{16}$ " , $\frac{1}{2}$ " , 1" , $1\frac{1}{8}$ " , $1\frac{1}{4}$ " , $1\frac{3}{4}$ " .

Veneer cores: panels with fir or hardwood veneer cores. Panel thicknesses: fir — $\frac{3}{8}$ " , $\frac{1}{2}$ " , $\frac{3}{4}$ " ; hardwood — $\frac{1}{4}$ " , $\frac{3}{4}$ " , 1" .

Basswood lumber cores: blocks of basswood lumber electronically edge-glued. Panel thicknesses: $\frac{1}{2}$ " to 3"

Mineral cores: have the lowest flame spreading rating (15 — if species density is 36.9 or less) of any wood-faced paneling. Panel thicknesses: $\frac{1}{4}$ " , $\frac{3}{4}$ " , 1" .

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We offer these standard machining details for $\frac{3}{4}$ " panels:

Miters: any degree, with or without spline. **Square edges:** cleanly machined edge, with or without spline or edge banding. **Edge rabbets:** any size. **Tongue and groove:** V at edge or elsewhere (Bevel). **Dado:** flat bottom or other. **Miter and shoulder.**

Other machine details and dimensions on special order.

Weldwood Doors — Algoma Grade

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A wide variety of cores is available, including lumber, mineral, Novoply.

We pre-engineer, premachine and prefinish doors with any wood species, colorful films, plastic laminate or resin fiber overlays for job-site painting. Also reinforcement of heavy duty hardware.

Finishes? U.S. Plywood factory applies three durable dry-film finishes in clear or opaque colors. For interior doors: Permagard and Permacolor. For interior and exterior doors: Vigilar. (See descriptions above for each of these finishes.)

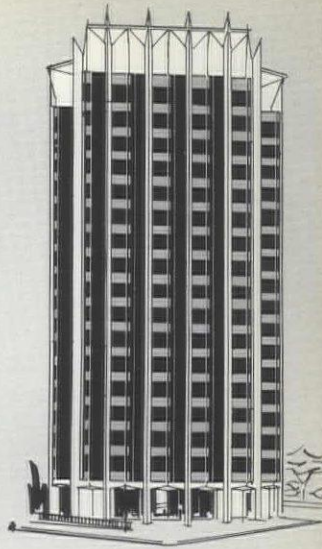
For most design requirements there is a Weldwood door combining function and long, dependable service.

Before final design and specification, consult with your Architects' Service Representative at your nearest branch office of U.S. Plywood. Since some constructions are better suited than others to particular applications, we can frequently suggest changes that lower costs or improve performance.



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Photo by Hedrich-Blessing

BUCKINGHAM-VIRGINIA SLATE CORPORATION

A Second Go in Seattle

The city's rapid transit system has won design awards but is still off to a slow start. Anne Hecker, who wrote on the wood tradition in the June AIA JOURNAL, tells why.

Ten years ago Seattle and its satellite cities faced up to a growing pollution problem, put together the Municipality of Metropolitan Seattle and set about to save the waters of Lake Washington and the shores of Puget Sound.

Metro's gigantic sewage construction program brought Seattle nationwide attention, an All-American City award and the reputation for solving its problems in the pre-crisis stage.

Today, facing the almost certain possibility of another metropolitan blight — wall-to-wall cars — civic planners have turned the momentum and foresightedness that created Metro and the Seattle World's Fair to developing a transportation system that already has won two national awards while still in the drawing board stage.

Two of nine merit awards handed out in February by the Department of Housing and Urban Development went to the Seattle transportation proposal for its excellence in system design for the comprehensive transit system concept and for excellence in transit station design.

The proposed \$1.15 billion system would incorporate 47 miles of rail rapid transit with express and local bus services and highway facilities into an integrated grid serving much of the same area as Metro and administered by the Metro Council. But it does much more than move people from here to there.

What the planners have come up with is a transportation system deliberately designed to shape the area's growth and mold it to human scale.

"Certain kinds of development naturally follow transit," points out Ed Devine, public affairs assistant to Seattle's Mayor J. D. Braman. "This kind of development can be controlled."

Seattle planners were particularly impressed by what was accom-

plished in Stockholm where two new cities—Farsta and Vallingby—were created along the transit lines. "These are completely planned communities, modern, charming and in human scale," Devine says.

"What we wanted to do was realize the sort of things that could naturally happen inside a city—to create a new town in town by using the power of transit," Devine explains. "So we want to know where this kind of line is most desirable and least desirable. Where it would tend to wipe out pockets of historic buildings or vistas. What sort of density, configuration do you create? Are we going to have blight growth at the stations along the line or plan ahead?"

Thus architectural, urban design and other consultants were involved from the very beginning of the studies and preliminary design planning by consulting engineers DeLeuw, Cather & Co. Handling the architectural aspects were Naramore, Bain, Brady & Johanson; environmental and urban design evaluations were conducted by Okamoto/Liskamm; socio-economic studies by Development Research Associates; market research by Joseph B. Ward & Associates and Jay Rocky Public Relations.

This team approach assured a balanced consideration of all aspects of the system and that the design of the system itself—the placement of transit corridors, location and design of transit stations—would help create the environment desired. Even the view from transit windows was taken into consideration. At one location at least, the route on Queen Anne Hill, the decision was made to go high rather than low, strictly on the basis of providing a better view.

At the same time the proposal envisions action by appropriate local planning and zoning officials to provide control of both public and private development around the stations.

Another highly important factor in the planning involved providing good transportation for the people in the central area, Seattle's low-income section. "Historically, transportation in low-income areas

is poor," Devine notes. Bus lines in Seattle presently radiate from the central area into the business district, severely restricting occupational opportunities for the people who live there.

Lines designed for rapid transit provide good access from the central area to educational institutions, to light industry areas, to the industrial complex in Duwamish Valley, putting the underprivileged no more than 15 minutes away from 90 percent of the Greater Seattle area's jobs.

How close does the Seattle plan come to the idea? Here's what the special board of consultants, Pietro Belluschi, FAIA, W. E. P. Duncan, consulting engineer from Toronto, and Henry Fagin, consulting planner of Laguna Beach, California, had to say about the proposal:

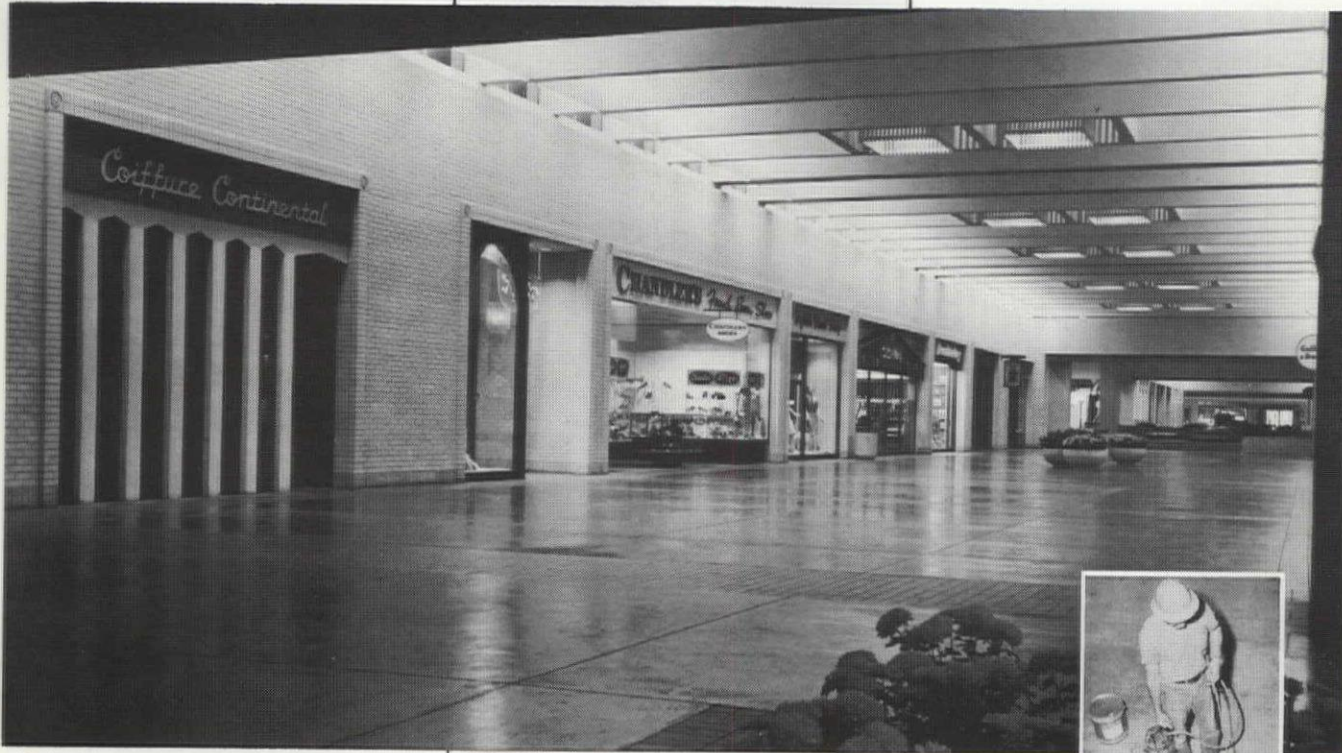
"Combined with other public measures, the proposed public transportation plan would help to bring about the forms of urban development envisioned by community leadership and appropriate to various parts of the area. Many other metropolitan areas have had similar opportunities in the history of their development but have passed them by. The resulting decline of urban vitality in many eastern cities has had serious social and economic effects now requiring extensive and costly remedies.

"The Seattle area has the opportunity now to benefit from unfortunate experience elsewhere and to create rather than remake a desirable urban environment. We consider that the urban values and environmental image which would be created by the proposed facilities would be appreciated and enjoyed by the citizens for many generations to come."

The transportation system was the keystone of a package of civil improvements presented to the voters in February as part of an overall program called Forward Thrust. Surprisingly, eight of the 13 Forward Thrust elements were approved, but not the \$385 million to start the transportation system. Slightly more than 50 percent of the voters bought the idea of build-

Continued on page 88

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ing a rapid transit system, not enough to validate a money issue in the state of Washington (60 percent approval required), but enough to give the planners hope of winning approval in another try next year.

Transit lost heavily in the so-called blue collar districts, going down resoundingly, strangely enough, in the Ballard District, the very area destined to get the first rapid transit leg.

At present the planners are evaluating the defeat in preparation for resubmission after the 1969 session of the state legislature where it is hoped to get some kind of assistance to make the financial package more attractive to the voters.

"We need a better job of public education," Devine says. "So people can see how rapid transit and the bus system benefit them. This didn't get across. The campaign wasn't localized enough." Many observers also believe transit just got lost amid the promotion for all the Forward Thrust measures.

Obviously, a real selling job needs to be done in the Ballard area, for instance, where there are many people with an income level

that makes them suspicious of and opposed to any new taxation and which has relatively good transportation now. It appears that the promoters jumped to the assumption that the Ballard section would not require special promotion efforts because it was to get the first rapid transit leg to be constructed—an assumption that proved disastrously false.

The planners admit that they were not prepared with adequate answers to some of the criticisms raised late in the campaign. Some of the remaining planning funds are now being channeled into cost and socio-economic studies of alternative possibilities, such as an all-bus system that Citizens for Sensible Transit demanded. The planners don't believe they will come up with a better proposal. But they will be better able to answer criticism in the next campaign.

Design studies were made under a rather complicated series of contracts financed by Seattle, Metro, the Puget Sound Governmental Conference—an area planning group—and HUD.

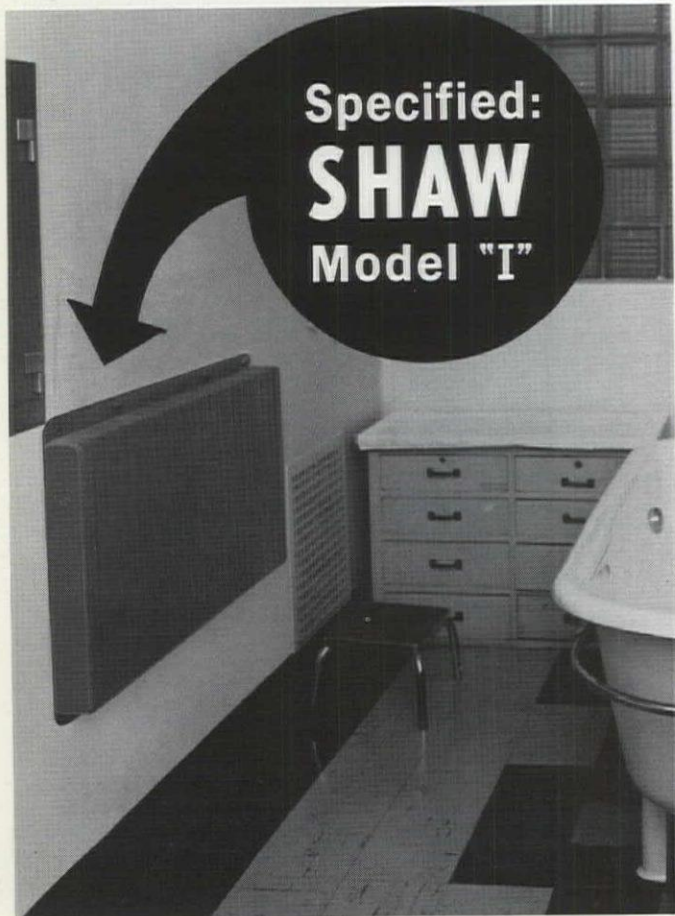
By 1990, population of the region is expected to have grown from 1.6 million to 3.1 million. The system

was designed to be implemented over a 17-year period to meet this population growth, including the purchase of land to be used later for rapid transit extension.

Already the new freeway that cuts a wide swath through Seattle is experiencing the peak capacity planned for 1975, according to a report released by the State Highway Department, unfortunately just shortly after the February vote. And Seattle, with its hourglass shape, can hardly afford another wide mass of concrete splitting it asunder.

Without rapid transit, "We will get a pattern of development completely unacceptable," Devine says. "We will foredoom the region to solid mass of subdivision, Sound to mountains. With rapid transit we can pose alternatives of creating nodes of development all through the region, keeping open spaces. Without rapid transit there will be no choice. We'll have more streets and highways than living spaces."

The planners believe that 65 to 75 percent of the people in the region, when properly informed, will be in favor of the transportation plan. They hope to prove it next spring. □



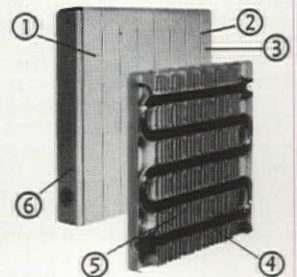
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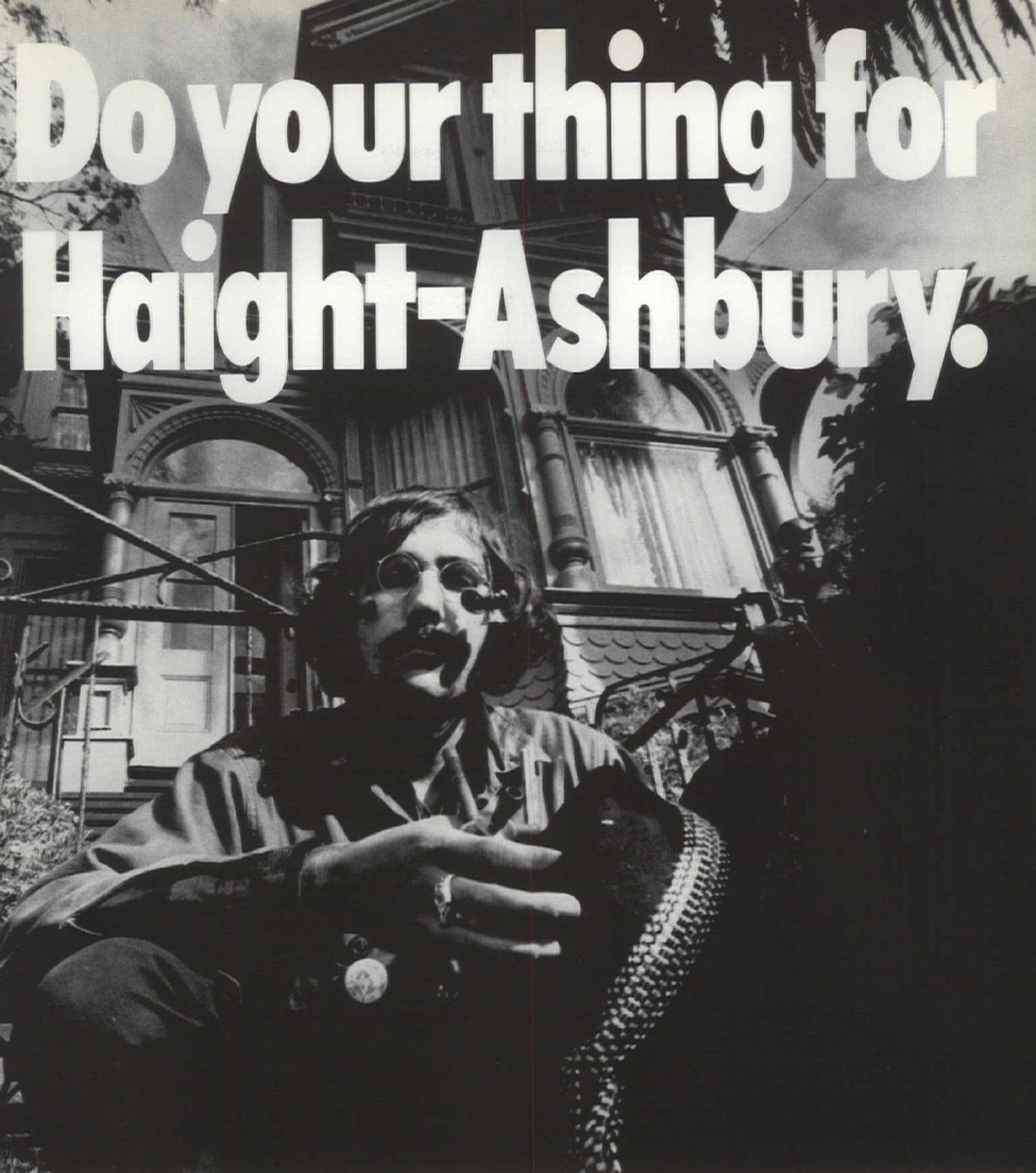
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Focusing on Research

Further information regarding these papers, presented at the annual Architect-Researcher's Conference in Gatlinburg, Tennessee, last year and abstracted here, may be obtained by contacting the authors. The next conference will be in Wisconsin Dells, Wisconsin, September 25-26.

Operational Gaming in Planning and Architecture. Allan G. Feldt, department of city and regional planning, Cornell University. 16 pp., no references or figures.

The usefulness of operational games is evaluated, drawing upon experience with the Community Land Use Game (CLUG). Operational games combine elements of role playing games and systematic games and have the following properties: They tend to be nonzero sum, not dependent on mathematical models for understanding or play; their potentiality is difficult to evaluate; the best games combine high proportion of strategy-based decision making with a small amount of chance; modifications introduced by players wishing to improve a particular aspect of reality can rarely be fitted into an existing game meaningfully; and all games condense time and space.

Potential uses: as a powerful teaching and communication technique; theory building; cross disciplinary communication; as an aid in understanding complex mathematical models (it may provide a better overview of a complex system than many years of actual operating experience); as a research procedure to explore effects of particular innovations in both administrative control and technological improvement; and for training in decision making.

Organizational Change and Its Effect on Management. Thomas J. Eyerman, Skidmore, Owings &

Merrill, Chicago. 5 pp., no references or figures.

Observations are given on the four components of architectural firm management stressing the interaction of leadership style, organization, monitoring and motivation. Two cases described show how understanding components' interaction can help overcome resistance to technical changes.

Recording Architectural Criticism. Sami Hassid, AIA, department of architecture, University of California, Berkeley. 4 pp., references, slides shown but no figures.

Praise, blame, acceptance and rejection are discussed as forms of evaluation of works of architecture. A series of studies were made recording criticism and classifying 46 significant areas by positive, negative and indifferent comments. A graphic method produces "profiles" of criticism for these classes. The effectiveness of the system is tested in six studies using a content analysis method. The method makes possible evaluation of relative weights of significant areas by categories of users, critics and designers with emphasis on building type, region, time, etc.

Simple Electrical Analogs of Continuous Beams. J. W. Fortey, New School of Architecture, University of Tennessee. 6 pp., three figures illustrated with working model.

Paper discusses the idealization and classification of structures as continuous or lumped systems. The continuous beam is considered a lumped parameter analog and a simple electrical resistance network gives direct solution to the governing slope deflection equations. One set of meters gives the support moments and another set records beams rotations. The extension of the present analog to rigid frames is considered, as is the

development of an alternative network for continuous parameter structures.

Expo Graphics. Paul Arthur, Arthur & Spencer Ltd., Toronto, and research professor, New School of Architecture, University of Tennessee. 18 pp., slides shown.

Expo 67 as a laboratory experiment for the development of better architectural graphics is discussed in terms of the systems approach. The author prefaces the study of the development of Expo graphics by general observations on the relatively poor standards achieved in architectural graphics generally and comments on reasons. Balance of paper deals with manner in which Expo graphics were developed: 1) the contents of the Grafton Report in terms of its recommendations re color, graphics generally, letter forms, signs and pictographs; 2) the execution of the on-site graphics in terms of the design and contents of the standard sign manual; 3) the concept and design of decorative and concessionaire graphics.

The Computer and the Building Design Process. N. W. Bryan, Computer Service, Inc., Jacksonville, Florida. 11 pp., no references or figures.

An architectural computer system, using modern small scale computers, was developed to ease the interaction and conflict within the design team during the design process. The original proposal included an information file, a mathematical building model and a subsystems (electrical, cost estimating, etc.) model. Due to unanticipated problems, the system was reduced to a limited building model, a material systems file and a cost estimating capability with additional subsystems to follow soon. The

Continued on page 104



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system, as it now operates, is of greatest value in cost estimating, giving a day-to-day cost picture.

Computer Modeling in Campus Design. Case Study at Duke University. Robert F. Mattox, AIA, Caudill Rowlett Scott, Houston. 12 pp., no references or figures.

In a pilot study conducted to provide better information for campus planning, computer programs were developed to analyze data collected from student diaries. Areas of concern included: 1) time spent in a specific activity, 2) traffic flow, 3) space utilization, 4) relationships between activities and related variables (costs, etc.) and 5) projection of future campus activity-space relationships and the resulting implications of various actions proposed by the planners. The goal was to get most benefits for least cost.

Housing Quality Measurement. Roger Montgomery, AIA, School of Architecture, Washington University. 21 pp., tables and bibliography.

This paper reports some preliminary findings and conclusions from a study of methods for identifying residential blight. It is limited to housing quality measurement problems in the urban planning process, particularly as revealed in urban renewal activities. It draws on community renewal program (CRP) materials from localities where work has been officially completed or where substantive work is complete and final reports are available. Topics discussed are 1) housing quality measurement, 2) approaches to housing quality measurement, 3) housing quality measurement methods in CRP(s), 4) the emerging monitoring function and 5) blight measurement related policy problems.

The Activity/Space, a Least Common Denominator for Architectural Programming. David S. Haviland, architect-in-residence, Rensselaer Polytechnic Institute. 15 pp., diagrams, tables and graphs.

Two interrelated problem areas of architectural programming are discussed: 1) "needs definition" and 2) "needs documentation and communication." Fundamental issues and work of the center for architectural research are presented. Issues are the failure to recognize how, when and in what form the needs will be used. Criteria formulation must be consid-

ered in terms of "origin to destination." An initial quantum is developed—"the activity/space"—and defined as an activity which takes up space and has a generally common set of facility implications. The "file cabinet" approach to programming, "commerce" and "physical affinity" are succeeding steps discussed along with possible computer implications.

Architectural Programming—State of the Art. Benjamin H. Evans, AIA, The American Institute of Architects. 17 pp., no references.

In response to a need for a more thorough and rigorous study and analysis process in environmental functions prior to the design of new buildings, a study was undertaken to identify the emerging techniques of architectural programming practice. The study included correspondence and review of periodicals, questionnaires and visitations and a workshop on programming. Topics mentioned were 1) problems of communication and responsibility, 2) sources of programs, 3) techniques used and 4) the development of specialists. Two examples are given of an architectural firm and a group of programming consultants. Other organizations and approaches are mentioned, suggestions for research and development indicated.

Decision-Making Theory Applied to Architectural Programming: Some Research Implications. Meg Green, department of sociology, Randolph-Macon Women's College. 6 pp., decision tables.

An exploration of some of the research problems suggested by applying decision-making theory to architectural programming is considered in this paper. The implications of delineating and determining the sequence of programming decisions are shown in the selection of building committee membership. The role relationships of client and architect are discussed in terms of decision-making function. Decision tables are described as aids in problem analysis. Other topics include information and creativity and the possible implications of greater emphasis on the concepts and tools of sociological research in architectural education.

Design: A Case History. Designer's Specifications for a Computer System. Richard Krauss, AIA, Ashley Myer & Associates, Cambridge. 8 pp., no references or figures.

The proposed format for putting

geometrical data about building design into a computer system is investigated in this study. The creation and manipulation of form is studied through reconstruction of the process involved in designing a six-classroom school building. Development is traced through notation of time-subject sequence. Major activity was found to be in the manipulation of space and form. Procedural analysis showed a constant process of decision making followed by feedback analysis and program re-evaluation.

Conclusions reached here were 1) determination of decision order is critical to the design process; 2) exposure to information retrieval is a valuable involvement factor for the designer; and 3) spatial hierarchy, when related to functional constraints, generates building form. It was concluded that a computer-aided system should recognize these characteristics and allow for close designer contact with evolving design form.

A Geometric Approach to School Modernization. Ben E. Graves, Educational Facilities Laboratories, New York City. 17 pp., no references or figures. The remarks of this paper are keyed to a slide presentation.

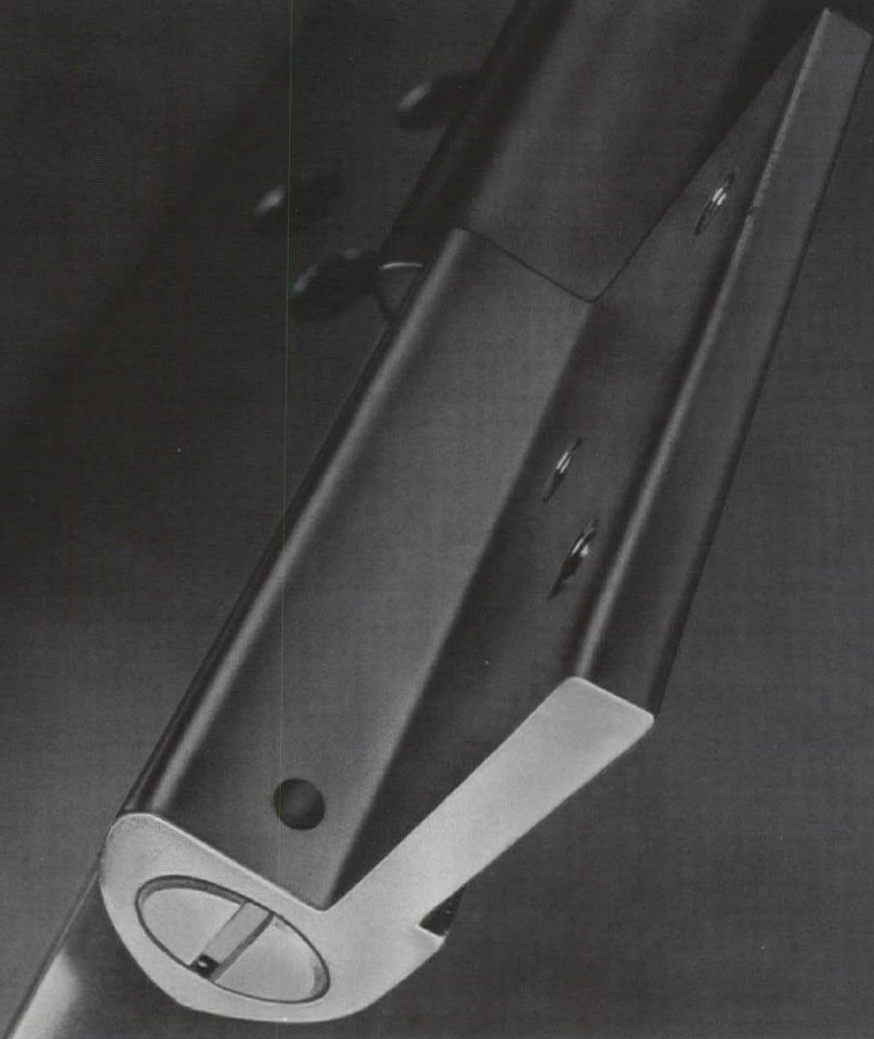
The problem of old and obsolete school facilities is acute, particularly in large cities. A maintenance or rehabilitation-oriented approach is not a realistic answer to continued facility usage. Guidelines show that if the cost of modernization for an additional life of 20-30 years approaches 50 percent of the estimated cost of replacement, project practicability should be questioned. Several examples of realistic modernization programs are shown in which emphasis on new functions and activity relationships is placed. The answer to the problem might be found in utilization of an advancing technology. Old buildings should be developed as supporting facilities for a flexible system of readily transportable learning environments. Current development of such a system is traced from the project's inception.

Building in the Deep Snow Country. Ian MacKinlay, AIA, Ian MacKinlay & Associates, Orinda, California. 12 pp., sketches.

Snow as a plastic material and its effect on building design are discussed, along with the problems of sun. Site development and major approaches to the design of struc-

Continued on page 106

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tures with emphasis on roof construction, orientation, sun angles, vents and chimneys and eave dripping are analyzed with sketches, and solutions are offered. Design style as a response to conditions of the environment is depicted.

Political and Spatial Characteristics of the Japanese Neighborhood. Richard Smith, associate professor of architecture, University of Oregon. 9 pp., references but no figures or diagrams.

This paper is a brief description of research conducted in Kanazawa, Japan. It concerns architectural observation and its potential as a research tool to overcome the architect's difficulty in separating a description of the built environment as it is from a recommendation about how it ought to be.

The study attempts to describe the Japanese street center neighborhood as it is and to develop a methodology so one observer can accept and build upon the observations of another. The accurate, intensive and extensive description of building and activities carried on within and around the buildings were geared toward an explanation of the neighborhood organization. The physical environment is used to illustrate the socio-political structure. The Japanese urban neighborhood is a play of heterogeneity and utilization of space against a constancy of scale, prefabrication, building materials and an informal social scheduling of community space.

Some Psychological Implications of Mental Health Center Architecture.

Mayer Spivack, director, environmental analysis and design section, Laboratory of Community Psychiatry, Harvard Medical School. 21 pp., no references or figures.

Analysis of the interface between man and his environment is an eclectic data collection process which is meaningless unless there is a conceptual framework to relate all the variables, and to reveal paradoxical environments which produce disorientation and anxiety. The author presents such a framework for exploration of the physical environment as a cultural and social artifact, a field for display of messages, a behavior setting, an influence on social and personal space and a sensory stimulus field.

The paper addresses the question: If our buildings are regarded as cultural and social artifacts

which relay messages to the users of these buildings, what do they say of our social attitudes about the purpose of the structure, the relative status of the patient, his expectations for recovery?

Also discussed are such factors as personal space, accurate perceptions of space, volume, distance, form, speed of movement and time-distance reality. The paper documents paradoxical and illusionary situations which simulate hallucinations. These disruptive influences are present in all environments and the designer needs to understand the social and behavioral significance of their buildings and what they should consider in their design and construction. Behavior research is considered in terms of the architectural designer.

A Computer-Based Cost Analysis and Design System and Its Implications for Future Practice. Arthur R. Cogswell, AIA, North Carolina Research Associates, Chapel Hill, N.C. 6 pp., 1 diagram, no references.

The Integrated Building System (IBIS) is a computer-based, cost analysis and design system which has been developed over the last two years for application to the design of low-income housing under grants from the North Carolina Fund and from the Department of Housing and Urban Development. Primary emphasis was on the development of a tool, based on existing conditions in the US construction industry, which could be used with a minimum of training by designers in the field. The primary objective was to develop a design tool that would provide an architect with rapid feedback cost estimates during the process of design.

The IBIS system is an integrated set of computer routines which are capable of accepting, storing and retrieving a three-dimensional description of a building, interior and exterior, and of automatically computing a quantity survey of labor and materials required to construct the building. The system then compares this quantity survey with a library of prestored construction cost data and produces a cost estimate for the project.

Applications to Architecture of the Science of Photogrammetry.

Perry E. Borchers, professor of architecture and research supervisor, Engineering Experiment Station, Ohio State University.

This paper discusses briefly the science of photographic measuring

and the architectural uses of photogrammetry, a precise science which requires substantial mathematical skills and sophisticated equipment. The results are impressive. For example, it is possible to record small flexures in a large modern building caused by thermal change.

The author discusses single and multicamera techniques and the kinds of data which they can produce. Through the use of a fully developed mathematical program, it is possible to reduce and determine the very small standard error in this data. The latter part of the paper deals with photogrammetric data and its application to the quantitative and qualitative perception of architecture.

Architectural Applications of Computer-Based Network Analysis Models.

Murray Milne, professor of architectural design, Yale University. 14 pp., graphs and diagrams.

This paper discusses the application of network analysis in the architectural design process. Background examples include: 1) CPM and PERT in project management and scheduling and 2) network analysis in planning the location of spaces based on their functional relationships. The major concern is with network analysis applied to the earlier phases of the design process where goals and goal interaction information are structured to lead toward a solution. The initial work by Alexander and Manheim is discussed, indicating the use of a series of computer programs, HIDE-2 and HIDE-3, to break down a large amount of goal information into subsets which might then be treated as small independent design problems. The discussion mentions why these programs might produce spurious results and outlines a new algorithm to avoid these pitfalls.

Design for the Visually Handicapped.

F. Cuthbert Salmon, AIA, professor of architecture, Oklahoma State University. 9 pp.

Blindness and its social position are statistically observed. The use and development of other senses in relation to building and environment and their influence on the blind person is evaluated. Integrity of design and the avoidance of architectural "isms" along with material usage are touched upon with a summation of observations in better understanding the needs and idiosyncrasies of the blind. □



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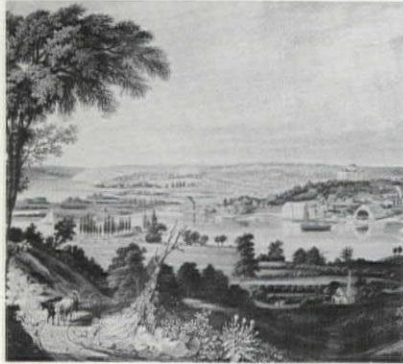
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Books

Monumental Washington: The Planning and Development of the Capital Center. John W. Reps. Princeton, N. J.: Princeton University Press, 1967. 221 pp. \$12.50.

There are countless books published on the subject of the national capital. These range from architecture to landscape design to planning. They span the full orbit from the political, the sociological, the philosophical to the actual. They are full of facts, suppositions, impressions, deductions and conjecture—of everything from the horrors of classical design and formalism to the vagaries of social implications.

Fortunately on occasion an author will sort things out with discrimination. The author of *Monu-*



mental Washington has done just that. He has developed a continuity that appears reasonable, without prejudice. His text is well prepared. It is direct and skillfully documented with a variety of plans and illustrations.

As an aside, it is interesting to note the continuous successes and conflicts with reference to the design of the capital. To quote excerpts from the text:

• The planning of Washington, D.C. was at once an act of faith, a political maneuver, a symbolic gesture and a remarkable achievement in city planning.

Certainly it was an act of faith in the future to adopt this plan (L'Enfant) so obviously beyond the resources that could immediately be mustered for its completion. . . . That long view has prevailed.

• The government also undertook a major building project—a huge structure . . . to house the State, War and Navy Departments. . . . Presumably many persons agreed with Grant, who . . . was said to observe “that the sight of it climaxed all the curious edifices he had seen in the course of his travels.”

• The recent proposals for the re-planning of Pennsylvania Avenue and for the refurbishing of the Mall are also hopeful signs, but these plans must be supported by other studies now in progress. . . . Needed as well is a new and comprehensive design plan for the entire city which would provide a firm basis for decisions on projects affecting the urban environment.

Monumental Washington is a treatise covering the range and development of the capital city and its federal establishment. If one wished to limit his library to a single source on the subject, he would make no mistake in obtaining this volume. It is an outstanding and comprehensive work.

PAUL THIRY, FAIA

Antonio Gaudi: A Reappraisal. E. Casanelles. Greenwich, Conn.: New York Graphic Society, 1968. 124 pp. \$10.

The Spanish edition of this book appeared in 1965. English-speaking admirers of this remarkable artist and architect will welcome this English version. Casanelles says it is time “for the old image of Gaudi, as a haphazard builder, constructing on impulse in a delirious baroque or surrealistic style, to be superseded by the truth.”

Casanelles views Gaudi as “highly organized” and a constructive architect who evokes an emotional response and provides a “communion” through his art and architecture “because his idiom is equally valid for East and West.”

This book traces the development of Gaudi's work and attempts a critical analysis of each of his structures. Included are extracts from Gaudi's diary for the years 1876-1879, these fragments revealing pathetically little about this creative genius. Half of the book is given over to illustration. The photographs provide a survey of Gaudi's surviving work.

A Short Dictionary of British Architects. Dora Ware. London: George Allen and Unwin, Ltd., 1967. 311 pp. 48 s.

This is a compilation of over 500 biographical sketches covering nine centuries. Although it includes some who have died in the present decade, it does not cover living persons. Sketches range from five lines to over a page in length, and portraits are included for some two dozen. It is a handy volume for quick information on the past leaders of the architectural profession in Great Britain.

How to Find out in Architecture and Building, A Guide to Sources of Information. D. L. Smith. New York: Pergamon Press, 1967. 232 pp. \$3.50.

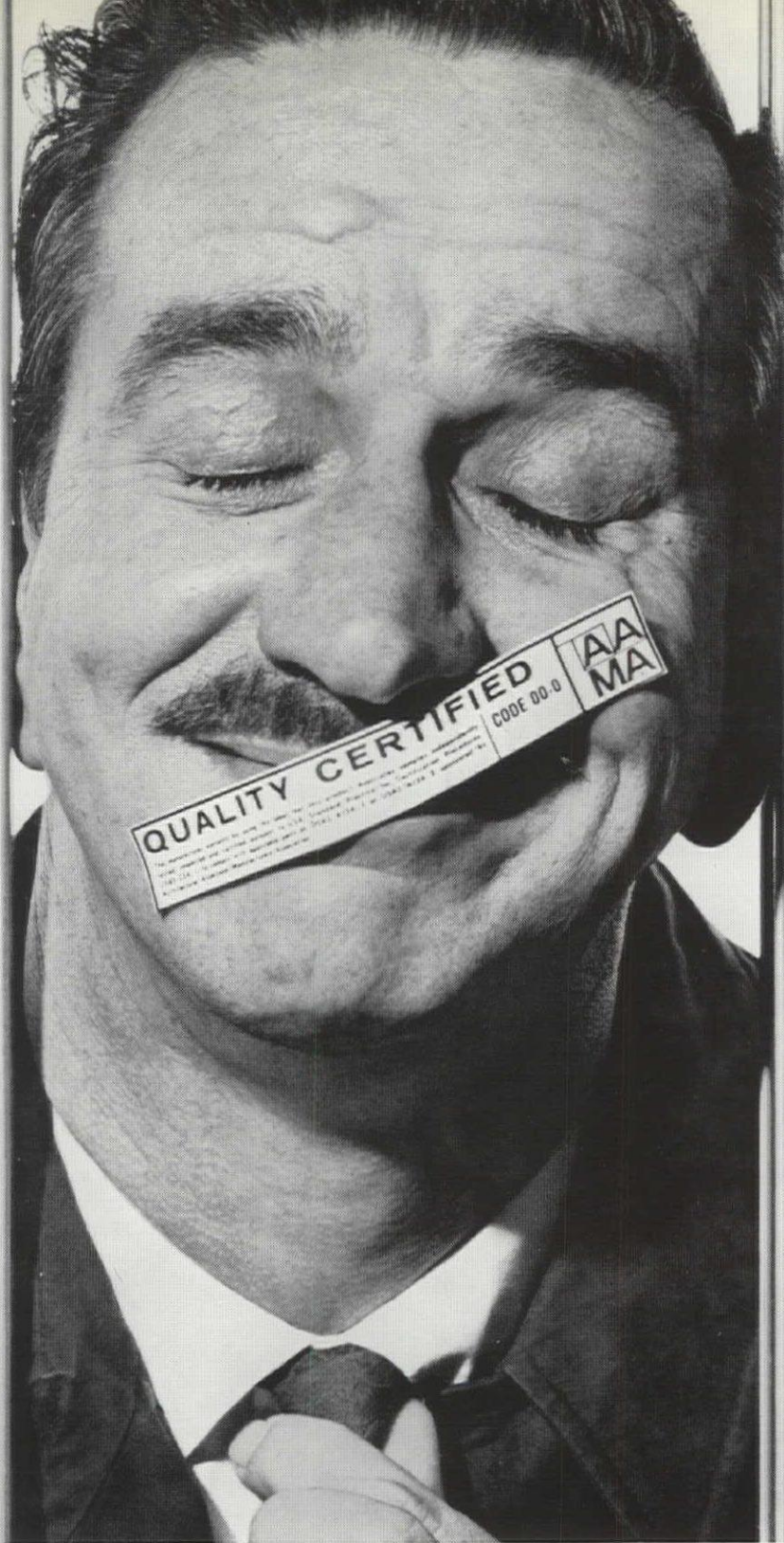
Librarian of the Oxford College of Technology, the author has prepared a guide to the literature and other sources of information in the fields of architecture, building and town planning. Emphasis is on the first of these, with material on the other two from the architect's viewpoint. Smith's typical reader is envisaged as a student of architecture, although the book should be useful to others as well.

The approach is definitely from a British viewpoint since in many sections there is no reference to American or other foreign literature. Its appeal in this country will mainly be to those who need to know about British literature and sources on these subjects.

Homes and Homebuilding, 1967. First Annual Index. Washington, D. C.: National Association of Home Builders, National Housing Center, 1968. 187 pp. \$10.

This is the first annual cumulation of the articles indexed in the *Library Bulletin* published by the library of the National Housing Center. Incorporating over 3,500 selected references from some 300 periodicals, it should prove a useful key to the significant literature on the subjects of homebuilding, home ownership and housing. Naturally, in view of its sponsorship, it is aimed at the homebuilder and the homebuilding industry, but it will be useful to others as well. The arrangement is alphabetical by subject. It would be helpful if cross references were introduced into the next edition to help the user find the heading used, e.g., “atrium homes” appearing under “court-garden homes,” and “street furniture” under “outdoor living.”

Continued on page 110



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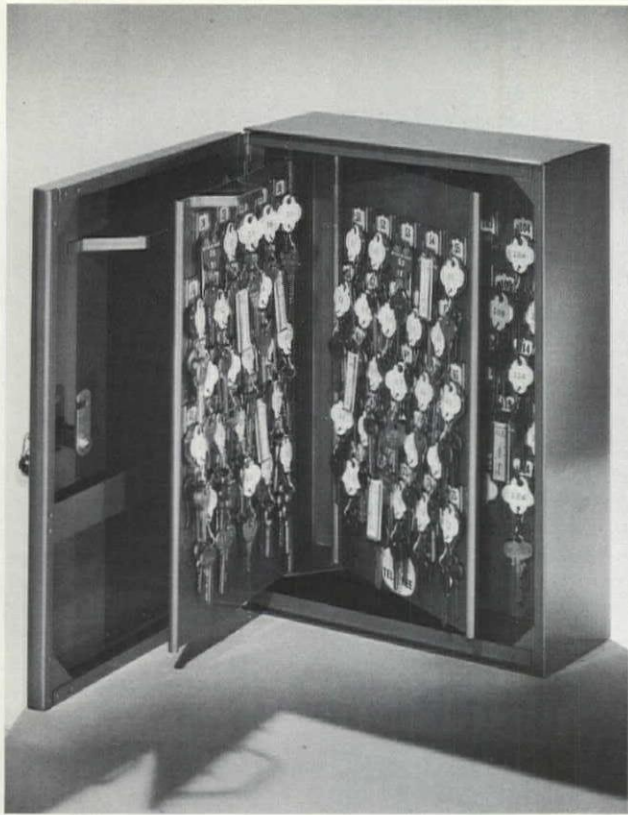
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Books from page 108

**Sunlight in Buildings: Proceedings of the C.I.E. Inter-
sessional Conference.** R. G. Hopkinson, Editor. Rotterdam: Bouwcentrum International, 1967. 391 pp. Dflns. 40.

Here are published the proceedings of an international conference held under the auspices of the Commission Internationale de l'Eclairage at the University of Newcastle-upon-Tyne in 1965. Thirty-eight scientists from all over the world participated in the conference and brought to it the latest research information. The aspects of solar radiation dealt with by the participants include psychophysics, human comfort, measures for control, thermal conditions in building and daylighting standards.

Industrial Real Estate. William N. Kinnard. Washington: Society of Industrial Realtors of the National Association of Real Estate Boards, 1967. 615 pp. \$12.50.

This work is a comprehensive source of information on all phases of industrial real estate principles and practices. Of particular interest to the architect are the sections on the development of planned industrial districts and parks. Among the topics covered are site selection, layout, site improvements, building construction and financing. Kinnard spent several years in the preparation of this book, which was commissioned by the Society of Industrial Realtors. He is associated with the Center for Real Estate and Urban Economic Studies at the University of Connecticut.

Manual of Precast Concrete Construction. Vol. 1: Principles, Roof and Floor Units, Wall Panels. Tihamér Koncz. Wiesbaden and Berlin: Bauverlag GmbH., 1968. 298 pp. \$17.50.

This is the first of a projected three-volume English edition of a work which has been highly successful in Europe. In addition to the German edition, Italian and Japanese translations have been published, and French and Spanish editions are in preparation.

The English edition of Volumes 2 and 3, to be published later, will cover industrial shed-type and low-rise buildings and multistory structures. Koncz is a Swiss structural engineer with considerable expertise in precast concrete construction.

Volume 1 has three major parts, the first one covering the principles and fundamentals of precast concrete construction. The second part deals with roof and floor units and the third with the external wall constructed of precast components. The manual has been highly praised by reviewers all over the world, many of whom declare the book to be without equivalent in the English technical literature and certainly a reference work of considerable value.

Torsion of Structural Concrete. Gordon P. Fisher, Symposium Editor. Detroit: American Concrete Institute, 1968. 505 pp. \$14; \$10 to ACI members.

Compiled under the sponsorship of ACI Committee 438 on Torsion, this volume consists of 18 papers by experts. The writers discuss the theory of torsion, torsion research and design of structures for torsion.

The purpose of the symposium, according to Fisher, "has been to bring the engineering profession up to date on developments in torsion of structural concrete, especially those which have taken place in the past half-dozen years." The value of the book, Fisher continues, will depend not only upon the extent to which it is read and used but also "the extent to which it engenders serious discussion by practicing engineers and researchers." □

Calendar

National

- Sept. 23-25:** National Bureau of Standards "Man and His Shelter" Conference, Gaithersburg, Md.
Sept. 24-27: Producers' Council Annual Meeting, Ambassador Hotel, Chicago
Sept. 25-26: Architect-Researcher's Conference, Wisconsin Dells, Wisconsin
Oct. 6-10: Prestressed Concrete Institute Annual Convention, Olympic Hotel, Seattle
Oct. 13-16: National Apartment Association Annual Convention, Flamingo, Dunes and Caesar's Palace Hotels, Las Vegas
Oct. 30-Nov. 1: Architectural Woodwork Institute Annual Convention, Sheraton-Boston Hotel, Boston

AIA Regional and State Conventions

- Sept. 4-6:** North Central States Region, Radisson Hotel, Minneapolis
Sept. 18-21: Western Mountain Region, Hotel Utah, Salt Lake City
Sept. 26-28: New Jersey Society, Chalfonte-Haddon Hall, Atlantic City
Oct. 3-5: Pennsylvania Region, Bellevue-Stratford, Philadelphia
Oct. 3-6: Northwest Region, Sun Valley Lodge, Sun Valley, Idaho
Oct. 7-9: California Council, Fairmont Hotel, San Francisco
Oct. 9-12: South Atlantic Region, Marriott Motor Hotel, Atlanta
Oct. 9-13: New York Region, Whiteface Inn, Lake Placid
Oct. 10-12: Central States Region, Tan-Tar-A Resort, Osage Beach, Mo.
Oct. 10-12: Louisiana Architects Association, Jung Hotel, New Orleans
Oct. 11-12: Alabama Council of Architects, Carriage Inn, Huntsville
Oct. 17-19: Ohio Region, Sheraton Biltmore, Dayton
Oct. 23-25: Indiana Society of Architects, Stouffers Indianapolis Inn, Indianapolis
Oct. 25-28: Florida Region, Daytona Plaza, Daytona Beach
Nov. 6-8: Texas Region, Driscoll Hotel, Corpus Christi
Nov. 7-10: New England Region, Park Plaza Hotel, New Haven, Conn.

International

- Aug. 26-30:** International Health Conference, Copenhagen
Sept. 9-14: Congress of the International Association for Bridge and Structural Engineering, New York Hilton Hotel, New York City
Oct. 14-16: Congress of International Council for Building Research Studies and Documentation, Willard Hotel, Washington, D. C., and Skyline Hotel, Ottawa (Oct. 9-11)

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Letters

Still Toasting Bendiner

EDITOR:

I enjoyed the colorful review by Nicholas Satterlee of the late Al Bendiner's *Translated from the Hungarian*, but one minor mistake—and I hope it is not in the book—appearing on page 136 of the June issue should be corrected.

It was Archduke Francis Ferdinand, not Archduke Otto, whose assassination signaled the start of World War I, as is probably known by the author's kinfolk living in the region of Sátoraljaújhely, or Máramarossziget, today occupied by the Soviets.

EUGENE PADANYI-GULYAS
Architect

Billings, Mont.

ED. NOTE: Reader Padanyi-Gulyas will be happy to learn that the Archduke is not identified by name in the book.

A Britisher on New Towns

EDITOR:

I recently returned from a short visit to your country and was impressed to find how great the interest was in the political and administrative machinery we have evolved in Britain to build our new towns. It was my reaction that the problems of urban renewal in the USA are going to become increasingly formidable, and I met many people who felt that something on the lines of the British new town movement might be required to deal with the problem comprehensively.

I believe that some similar machinery, obviously tailored to suit the American administrative background, could be of great help in overcoming the difficulties of land use, environmental improvement, transportation and the many human and social problems that arise when urban renewal takes place.

W. S. HOLLEY
General Manager
Washington Development Corp.
Washington, County Durham,
England

Third Graders Speak

EDITOR:

Enclosed are copies of letters I received from some third graders in Sudbury, Massachusetts (sample shown), following a little talk about architecture. The children are astonishingly bright and eager to learn. I am convinced that more of this should be done, and at this

level, in order to create an awareness of the meaning of the profession and the role of the architect in our society.

EDWIN G. JOHNSON, AIA
Cambridge, Mass.

ED. NOTE: Six letters sent to another architect under similar circumstances were printed in the AIA JOURNAL for November 1967.



Triad Theory Rebuked

EDITOR:

William Caudill's article "The Triad Theory: One Approach" in February deals with an issue of great importance to both architects and architectural students; it therefore merits thoughtful and critical analysis. Any serious contribution is to be doubly welcomed because the subject has suffered from relative neglect.

It is clear that Mr. Caudill's intent is to be taken seriously. His exposition treats us to a parade of famous names from Wright through Mies to Horatio Greenough, Francis Bacon, Socrates, Peirce, Edwin Muir, Matisse, Beethoven, Tolstoy, Joyce Cary, Ingres, Saarin, Ernst Fisher, Leonard Bernstein, Louis Kahn, Louis Sullivan, Hogarth, Pericles, Jerry Soltan, Rembrandt and Lincoln in joyful but often dubiously relevant profusion.

Unfortunately, the author's argument is based on a very crude scientism. Scientism is characterized by the belief that by adopting a few of the more obvious techniques of "pure" scientific theory (in this case, the notion of measurement by relative magnitude) we can convert an unscientific discipline into a "scientific" one. Mr. Caudill believes that by attaching measurable magnitudes to the intuitive value judgments of individual jurors, he has transformed the jury system into an instrument of greater precision. This conclusion is entirely unjustified.

Let us examine Mr. Caudill's argument in greater detail. He starts

from the assumption that we need to evaluate architecture in the light of three major factors. As an assumption it is no better and no worse than any other—after all, writers on architecture from Vitruvius to Norberg-Schultz have opted for some kind of triadic model. But why we should choose this particular triad is not at all self-evident. On reflection, we may be able to come up with any number of equally plausible triads (for example: user "fit/client" "fit"/social "fit").

Suppose we admit, however, that any intellectual system must, on final analysis, rest on arbitrary basic assumptions. The first step, then, would be to call for a clear definition of those basic assumptions. So we are entitled to ask for definitions of "function," "form" and "economy" which are at least sufficiently unambiguous to enable us to place evaluations in the appropriate categories. What, for instance, does the author mean when he uses the word "economy"? He defines it by saying, "Both kinds of economy (monetary restraints and visual restraints) concern the principle of maximum effect with minimum means." His concept of "economy" apparently refers to both form and function. If the boundaries between terms are blurred to this extent, where shall we place our evaluations?

Next, Mr. Caudill asks us to accept the notion that his three items must be dealt with equally: "to seek an equilibrium which will bring about a union of function, form and economy." This statement is based on the fallacy that only equal partners can achieve union, an assumption which is even less self-evident than the triadic point of departure. We could more reasonably argue that every architectural problem requires a unique compound of function, form and economy; and that this compound depends very much on context.

Lastly, we are asked to attach numerical magnitudes to each term and then to sum these magnitudes by means of a particular geometry. I will return to the question of how we attach numerical magnitudes and what effect this has on the validity of the whole process. Note for the moment the particular geometry offered us. This leads to the astonishing conclusion that a solution which contains terms only marginally greater than another is actually deemed to be quantitatively very much greater (compare, for example, the areas of 5-5-5 and

6-6-6 triangles). Further, in order to circumvent the shortcomings of his model, Mr. Caudill has to argue that there is no such thing as bad architecture; presumably, if it is bad, we simply call it something else!

To return to the fundamental problem posed by Mr. Caudill's system of measurement: This system requires that we attach numbers to value judgments. How we do this is apparently a matter of personal taste. Now, the sum of several value judgments is not logically better or more precise than one single value judgment. A whole army of subjective evaluations, when assembled together, does not by some magical sleight of hand take on an "objective" character. In a word, we can spare ourselves the trouble of these rather tedious calculations because the result cannot have any greater significance than the initial guess.

Quantitative evaluations can only be achieved by summing truly quantitative measures. To lump quantitative and qualitative "measures" together willy-nilly seems to me to be singularly pointless. Mr. Caudill says "Experience is a dynamic synthesis of facts and value. Can a physical experience be separated from the emotions?"—and he implies that the answer is always no. Experimentally, this may be true in many circumstances. However, it does not follow that experiences cannot be analyzed in terms of "facts and values." If, for example, we are trying to evaluate an environmental control system, we can make a reasonable distinction between physiological comfort/discomfort, which can be measured, and associated emotional states, which currently we cannot measure.

It is of course true that the present "state of the art" in quantitative measurement of the environment is underdeveloped. But this is a circumstance which seems to me to call for efforts to extend this art on a piecemeal, empirical basis. Alternatively, one could argue that because many phenomena remain stubbornly unmeasurable, we should, for the time being, continue to use intuitive value judgments. Both positions are intellectually tenable. To equate precise numbers with imprecise concepts is intellectually untenable.

CLAUS SELIGMANN

Associate Professor, College of Architecture and Urban Planning
University of Washington
Seattle, Wash.

Unfinished Business from page 40

A remaining inequity in the Keogh Act is that the self-employed person who elects a lump sum at distribution has to pay tax according to an income-averaging formula that results in a levy almost as severe as if the distribution were treated as earned income—about \$50,000 on the \$169,190 accumulated in the foregoing illustration.

For this reason, it is generally best to elect an annuity or a withdrawal option at retirement, thus spreading the tax over time and reducing the \$50,000 bite to about \$30,000 in the example shown.

Employees, who incidentally can take a lump sum under capital gains tax provisions, may not be required to contribute toward their retirement but can make voluntary contributions up to 10 percent of their pay. In the latter case the employer may make additional contributions up to 10 percent of his net income, thus increasing the tax-free amount set aside.

Table 2 shows three situations with varying incomes and numbers of employees, situations probably not untypical of self-employed architects.

The net tax gain or loss is contingent on the relationship between

the income tax bracket, the amount contributed and the deduction. Any number of variations of this type of example is possible.

In this example, the amount contributed for employees is assumed to be a loss, while in fact it might have offsetting benefits.

Column IV of this table, which makes no attempt to illustrate the value of tax-free accumulation, shows "given year" savings or costs, but this is not a final figure. Because of the tax deferral aspect of the Keogh Act, final costs of member participation can be ascertained only after adjusting the tax savings of pre-retirement years by the amount of taxes paid upon distribution.

The American Institute of Architects has established its Tax-Qualified Retirement Program for the use of members who may find the Keogh Act advantageous. The Institute's program has been approved by the Internal Revenue Service as Qualified Master Plan #PGH-POL-64-15.

Members wishing further information are requested to write to: The American Institute of Architects, c/o Continental Illinois National Bank & Trust Company, Lock Box H, Chicago 90, Illinois—Corporate Securities Division. □

TABLE 2
Illustration of Effect of Deductions on Tax in 1968 and Subsequent Years

	(I) Net Taxable Income from the Practice Before Keogh Plan Deductions	(II) RETIREMENT FUND	(III) Deductions (100% of Retirement Fund)	(IV) Actual (Cost) or Savings for a Given Year **
EX. 1	M \$10,000 (22%*) E None	\$1,000 (10%) None	\$1,000 None	\$ 220 (22% of \$1,000) None
EX. 2	M \$14,000 (25%*) E \$5,000	\$1,400 (10%) \$ 500 (10%)	\$1,400 \$ 500	\$ 350 (25% of \$1,400) \$ 375 (75% of \$ 500) (<u>\$25.00</u>)
EX. 3	M \$36,000 (42%*) E \$5,000 E \$5,000	\$2,500 (7%) \$ 350 (7%) \$ 350 (7%)	\$2,500 \$ 350 \$ 350	\$1,050 (42% of \$2,500) \$ 203 (58% of \$ 350) \$ 203 (58% of \$ 350) <u>\$ 644</u>

* Income Tax Bracket (Assuming Joint Return)

** (Incurred by reason of participation in a Keogh Act Program)

M Self-Employed Member
E Employee

The actual savings or cost of participation (see Column IV) is arrived at by deducting from the net tax savings for the current year the cost of employee contributions adjusted for the tax savings generated by deductions. Note that in Example 2 the member is able to deduct the full amount of his contribution to the employee's fund. At his tax bracket, the savings is \$125. Accordingly, the out-of-pocket cost is \$375 for an actual \$500 employee contribution. However, the member also was eligible for a \$350 tax saving by reason of the deduction allowed for the contribution to his personal fund. The net result is a Keogh Act Program for both member and employee at a cost to the member of \$25.00. Examples 1 and 3 show net savings figures.

Asides

Next Month: The 100th AIA convention is now history, and from where we sit, it should go down as one of the most significant in the annals of Institute history. For the tone of the Portland/Honolulu meeting—a profession seeking greater involvement with social concerns—was established at the very outset by Whitney M. Young Jr., whose provocative address will be presented in its entirety.

The Purves Memorial Lecture was brilliantly delivered by Barbara Ward. Her thoughts on urbanization drew high praise, as did the session on "Nature," led by the nation's First Lady. Both will be covered in the September Convention Report issue.

It was a meeting that saw the exhibit area—perhaps the most handsome ever to grace an AIA convention—become a gathering place for the close to 3,000 participants who were housed in a half dozen hotels some distance from the Portland Coliseum.

And despite the sense of urgency that permeated the professional program, the overall atmosphere was one of relaxation.

Practicing What They Preach: Those who discussed the natural environment in Portland would surely applaud Salishan, the residential/recreational development on the central Oregon coast, which a number of convention-goers made it a point to visit before leaving the state. It also will be featured next month as a portfolio.

UD the Home Study Way: Paul Spreiregen, AIA, who is well known to AIA JOURNAL readers through his series of articles "Urban Design: The Architecture of Towns and Cities," later published in book form by McGraw-Hill, has authored a two-part text. The former Institute staffer's *Urban Planning* is now included in all architectural courses offered by International Correspondence Schools. Part 1 deals with basic problems, starting with the earliest city patterns; Part 2 concentrates on the United States. R.E.K.

PHOTO & ART CREDITS: P. 38—Berko Studio; 50—Richard Sadler; 52, 54, 55—Henk Snoek; 56—A. Rapp, courtesy German Tourist Information Office; 58—Cecil W. Stoughton, National Park Service; 67, 68, 69, top—Robert B. Riley, AIA; 69, bottom—Barnes & Caplin.

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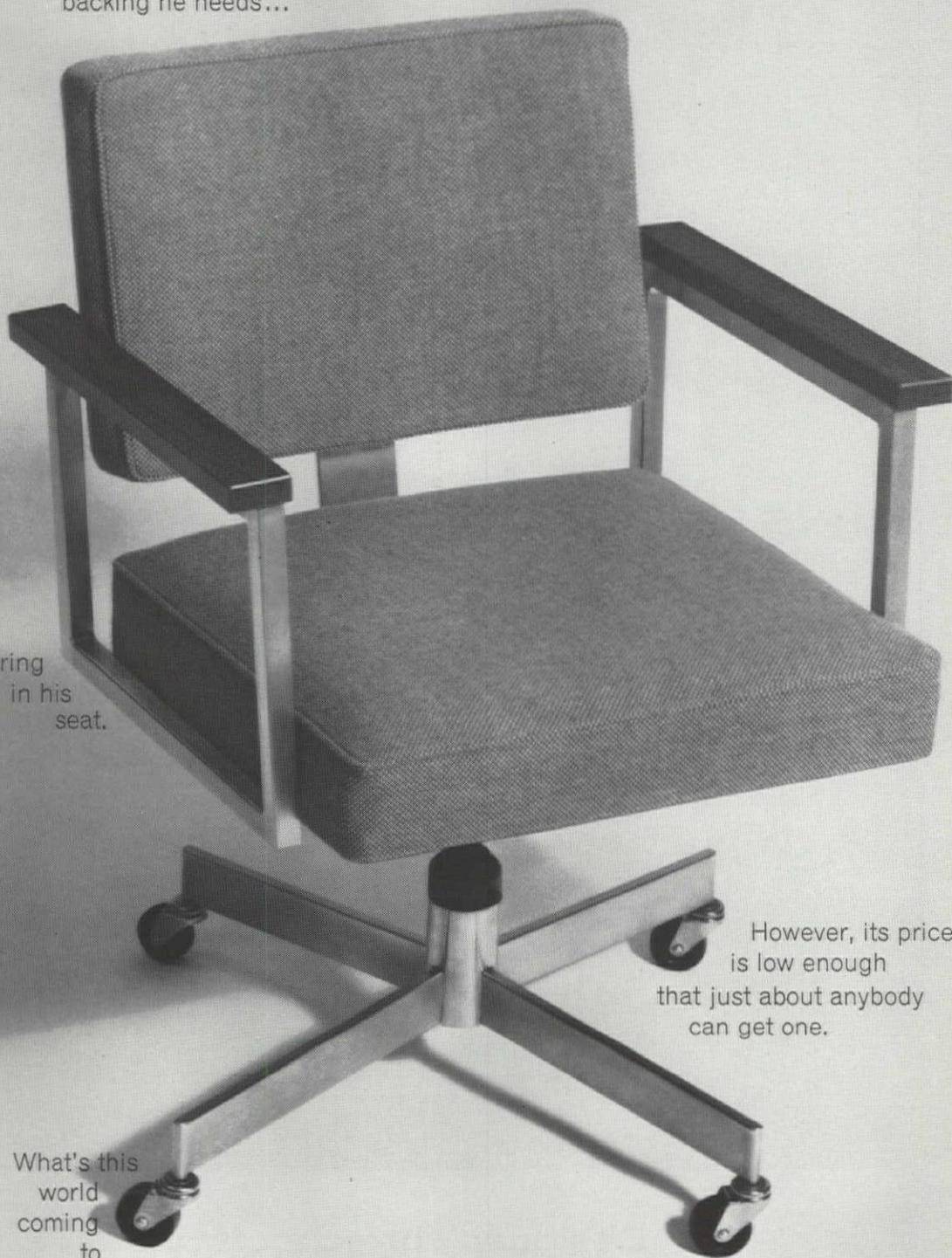
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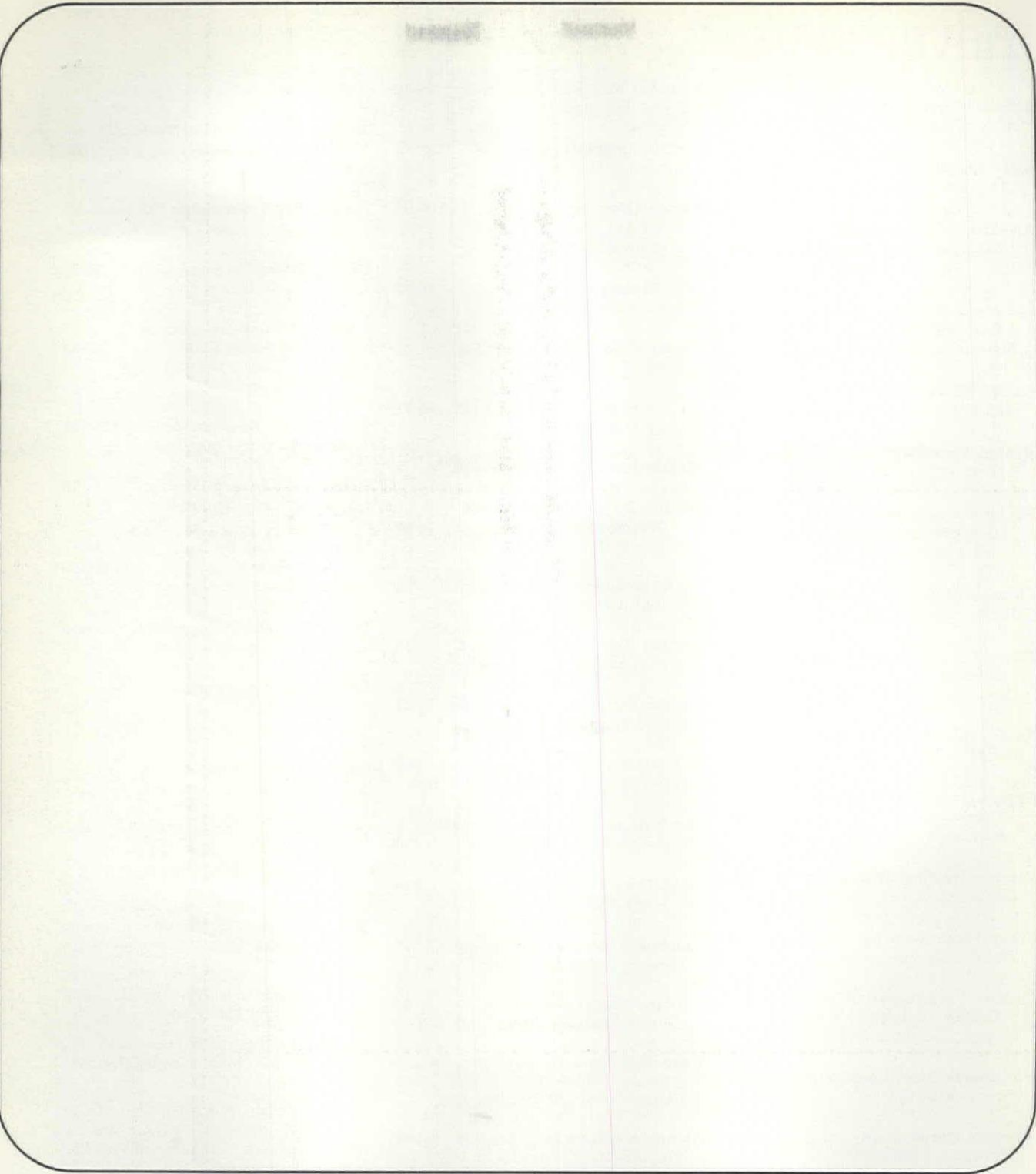
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