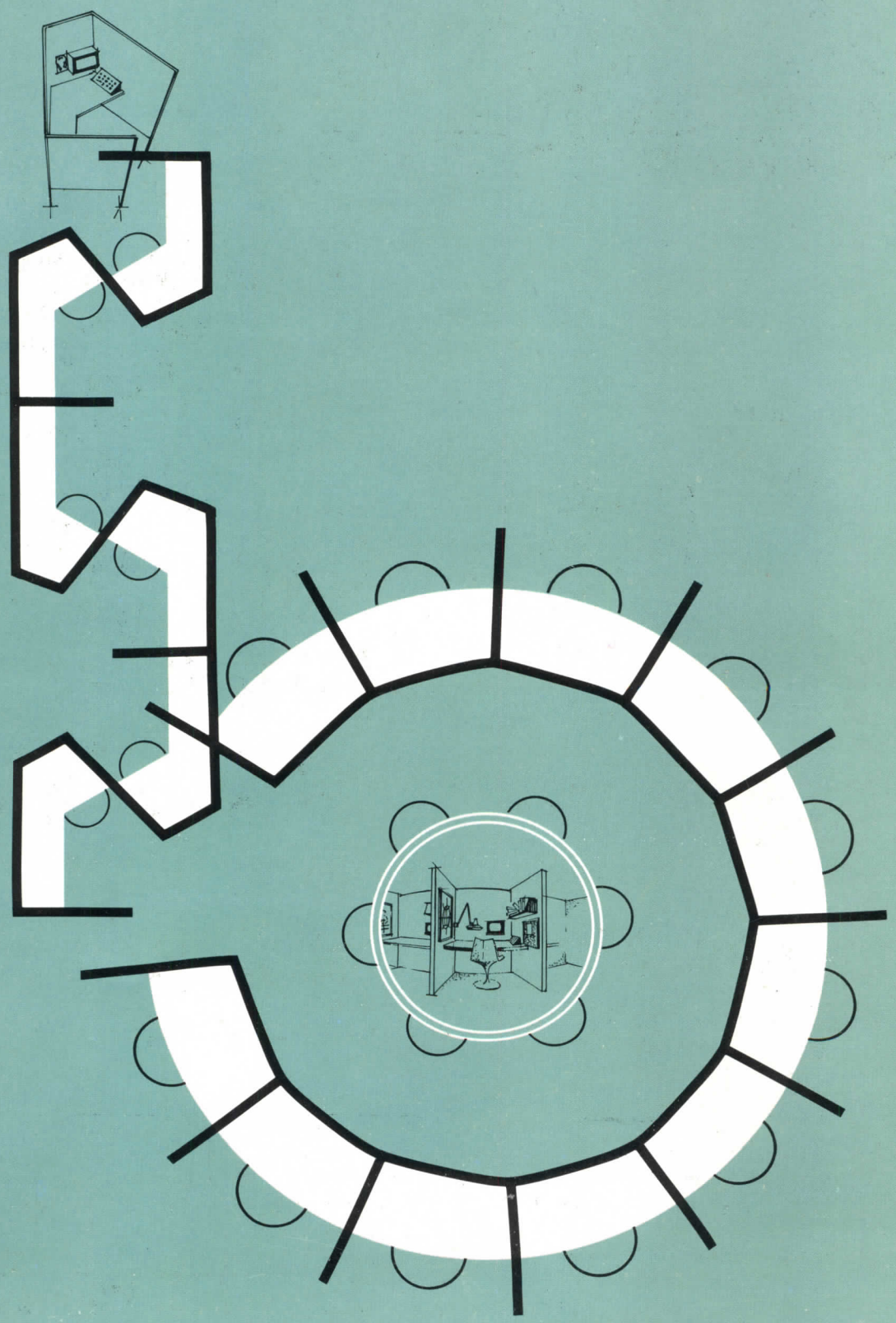
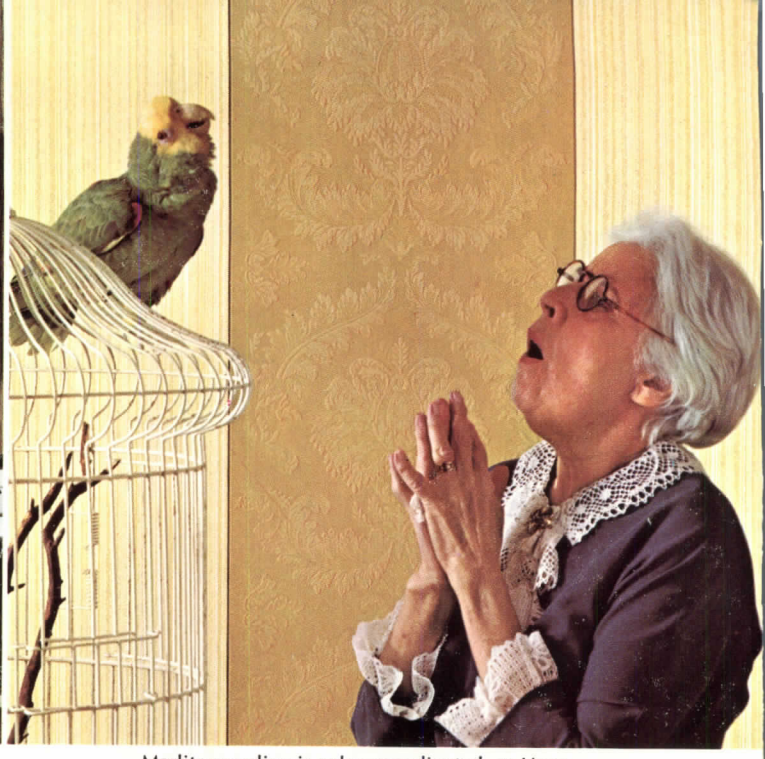
AIA JOURNAL

OCTOBER 1970



Mossy Pecan Marlite has the beauty of rare hardwood, but is priced to fit anyone's budget.



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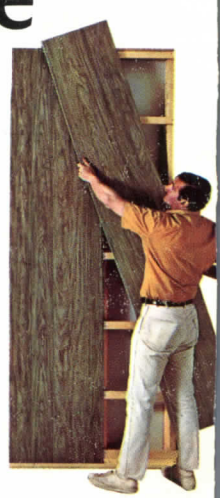

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s drinking fountains were specified because they look better. . . and they last.)

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tenance-saving materials—redwood
g, copper flashings and downspouts,
concrete shakes on the mansard roof
ong wear and fire resistance.

o-date facilities are embodied within
me-like atmosphere. The 2½-acre
ous in Lafayette, California, includes
buildings on different site levels,
h harmonize with the country setting.

First impressions are important. As you approach Las Trampas the feeling is one of welcome, of progress and happiness.

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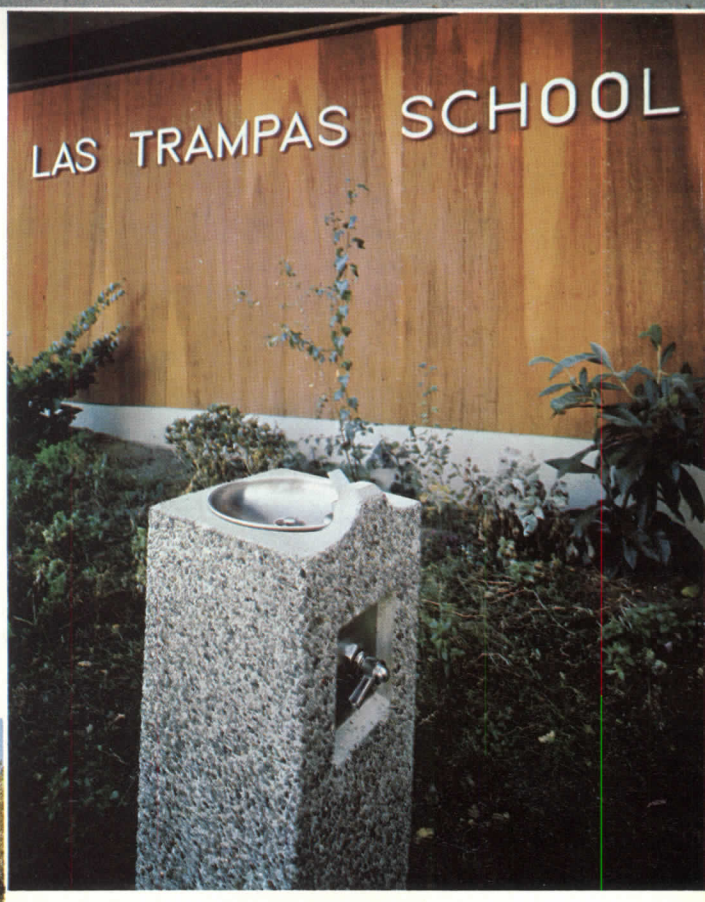

Architects:
Perata and Sylvester A.I.A., Lafayette, California

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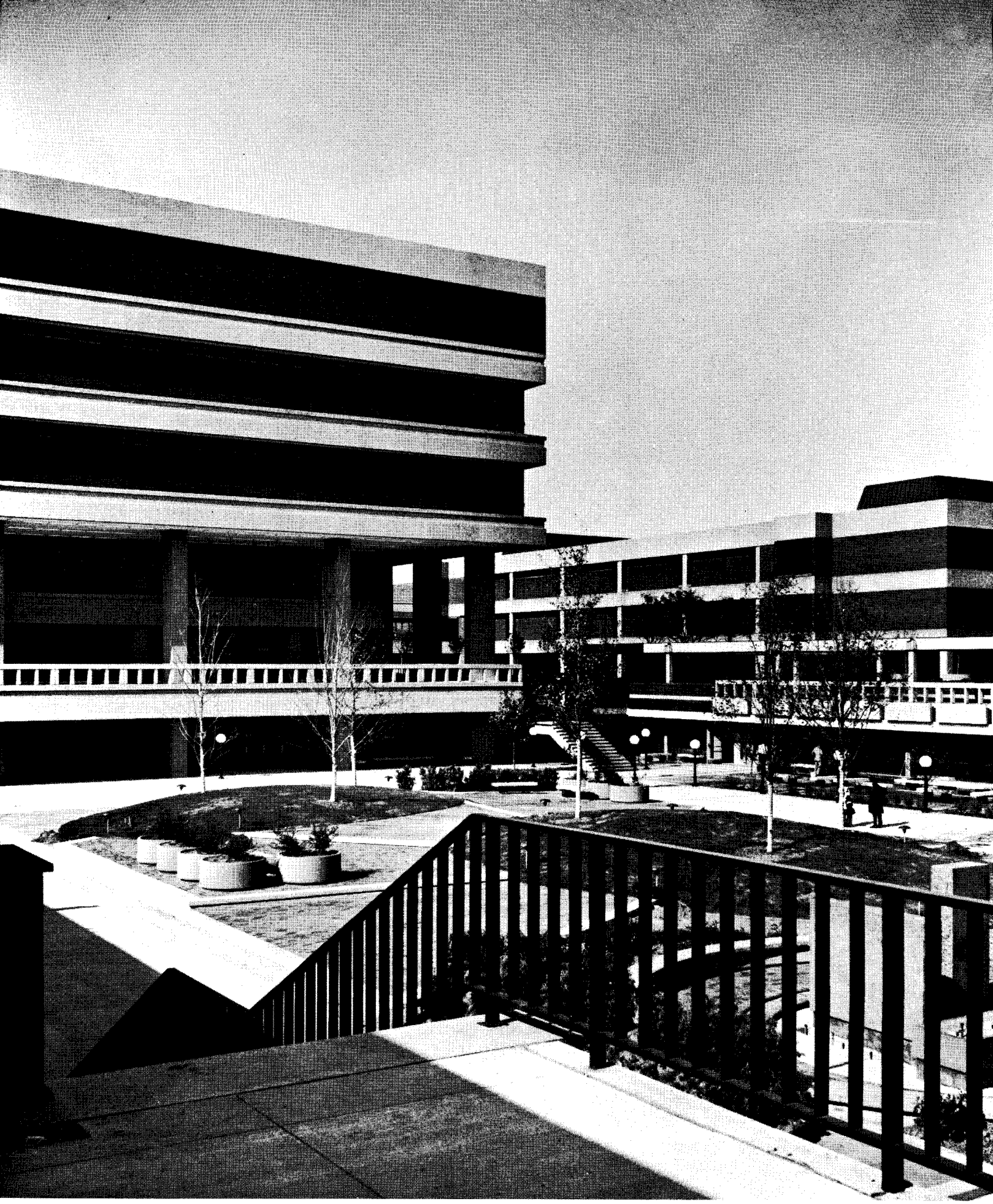

CUYAHOGA COMMUNITY COLLEGE, Cleveland, Ohio. Honor award winner in the 1970 Community and Junior College Design program. The complex was honored for "outstanding handling of a very limited site in an urban renewal area of the highly industrialized city of Cleveland." Architects: Outcalt-Rode-Kaplan-Curtis. General Contractor: Turner Construction Co. Twelve Dover Oildraulic and Electric elevators installed in seven buildings on the campus by Dover Elevator Co.

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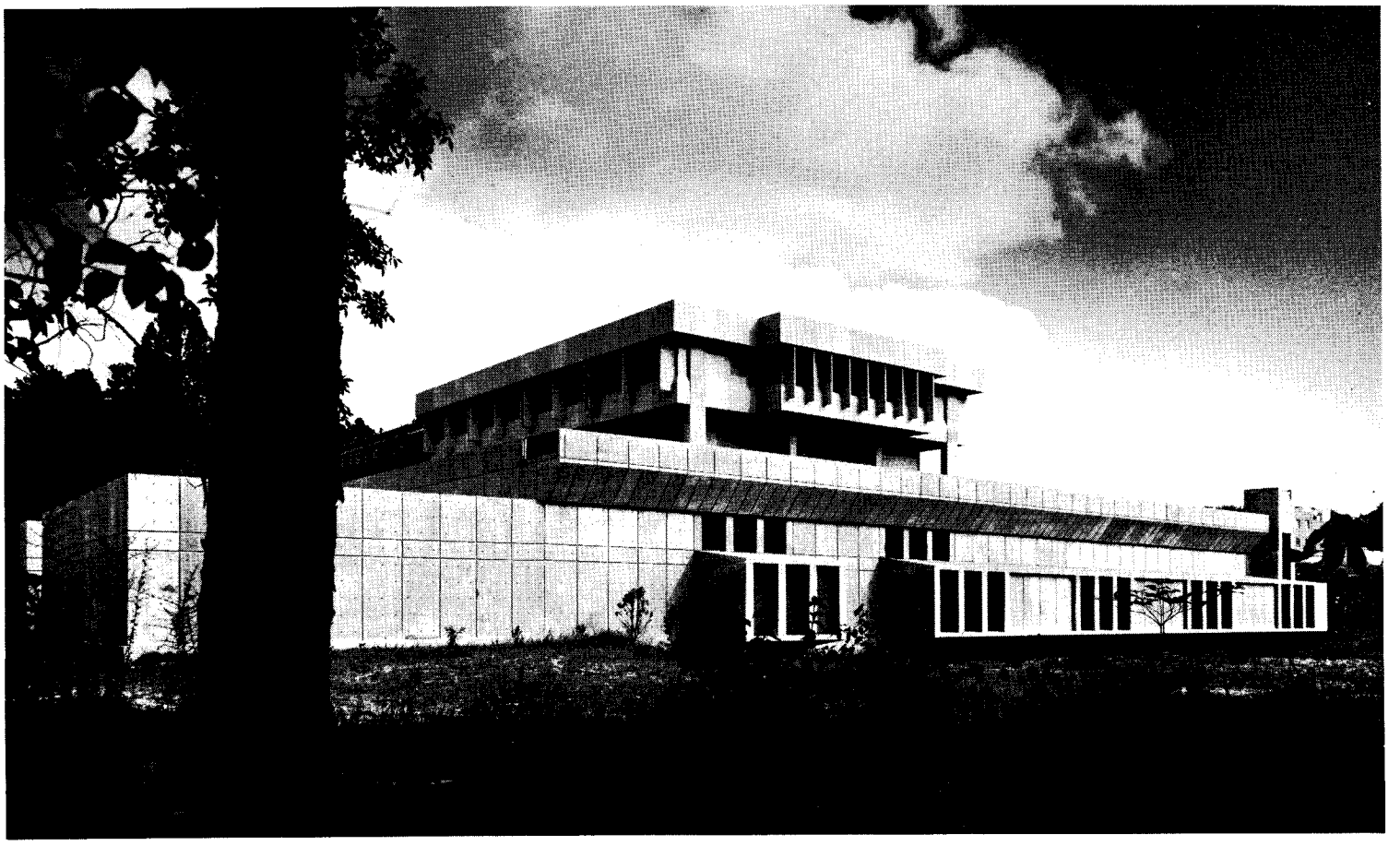

DUKE NUCLEAR LABORATORY, Duke University, Durham, N. C. Cited as one of 16 outstanding examples of campus design for the 1970s by College & University Business magazine. The massive solidity of its design evokes a feeling of security appropriate to its function. Architect: A. G. Odell Jr. & Associates. General Contractor: F. N. Thompson, Inc. Dover Oildraulic elevator installed by Dover Elevator Co.

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AIA JOURNAL

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COVER

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VOL. 54, NO. 4

comment and opinion

NOT IN THE PUBLIC INTEREST: It is not surprising that six national architectural and engineering societies, among them The American Institute of Architects, have advised Assistant Secretary of Defense Barry J. Shillito, through the joint Committee on Federal Procurement of A/E Services, of their unequivocal opposition to a "test" of a radically new system of architect/engineer procurement by the military agencies. Under the one-year experiment, announced by Pentagon officials on August 24, the proposals for A/E services are solicited on a two-envelope basis. The first contains the technical proposals of interested firms; the second includes a price estimate. After evaluating the technical proposals, a selection board for the military will rank the firms in order of preference by qualification. Following a review of the price proposals, the board may re-rank the firms to reflect price considerations. The test, conducted by the US Army Engineer District, Sacramento, and the Southern Division, Naval Facilities Engineering Command, Charleston, South Carolina, apply to all A/E contract awards of $10,000 or more.

Elmer K. Timby, chairman of the professional societies' joint Committee on Federal Procurement of A/E Services, told Shillito that the experiment cannot have validity because it does not provide a method of permitting totally objective evaluation of results, nor does it provide stringently controlled conditions with established norms over a period sufficient to provide conclusive findings. "Present procedure recognizes that emphasis upon qualifications and competence in the relatively inexpensive design stage is essential to insure economy in the much more costly construction and operation stages," Timby said. The "arbitrary manner in which the 'test' has been conceived and is, apparently, proceeding precludes any possibility of even minimal endorsement or approval by any of the six societies," he added.

The AIA holds that to require architects and engineers to submit design solutions in order to be considered for federal work is an unfair burden on the design professional and contrary to the interests of the public. A design concept is an integral part of the total building solution and is arrived at only after careful study, programming and analysis. To require sketches of proposed design solutions from architects and engineers before a detailed program is agreed upon by the client and the design professional is to ask for solutions based upon insufficient information.

To require price competition for A/E services, the AIA maintains, will result invariably in the cost of these services becoming the dominant factor in the selection process. Because lower price comes from lower levels of service, the client, in this case the federal government representing the public, will be the ultimate loser. In addition, the preparation of a technical proposal with a price estimate of the cost of design services will result in increases in the total cost of professional services.

In spite of these trenchant arguments, the Department of Defense has initiated its first project under the new procedure: an Air Force facility in Louisiana. The firms selected to submit priced technical design proposals, however, declined to do so on the grounds that the DOD's selection procedure is not in the public interest.

Timby points out that the experiment disregards the intent of Congress, as stated in a House-Senate Conference Report on the 1969 Military Appropriations Bill, that the inclusion of price data in negotiated procurement was not intended to modify the traditional method of obtaining A/E services on a professional negotiation basis by selecting the best qualified firm for negotiation of the contract. The A/E societies are willing to reconsider their position, he said, if the DOD will release its committee study which preceded the action of the experiment and will cooperatively enlist the aid of the professions in an orderly and objective approach to implementation of its recommendations.

ROBERT E. KOEHLER

ACKNOWLEDGEMENTS

10—left, Official Photograph, the White House
12—Stone & Steccati
76—Drawings from *Instructional Hardware/A Guide to Architectural Requirements.* Courtesy of Educational Facilities Laboratories

NEXT MONTH

During the last few years the idea of building new towns has been thoroughly examined in the United States and we now have a wealth of published material on the subject—pro and con. A British architect/planner, deeply involved with new towns abroad and with three here in this country, joins the discussion. Going a step further, he suggests a possible strategy for the US to follow if there really is a will among Americans to create improved environments for millions of people. How one new town—Nun's Island in the Montreal area—was planned, financed and designed and how it functions is discussed in another article.

Also in November: a Practice Profile on a small California firm that is engaged in housing—and prefabricated, at that; an abbreviated version of the AIA convention address by Ian L. McHarg in which he shows the architect how the world really works; a portfolio of Mediterranean villages with accompanying text as seen by a practitioner who spent seven years in studying, photographing and assembling his material; and another article in the Practice Aids series, this one devoted to approaches to the predesign phase.

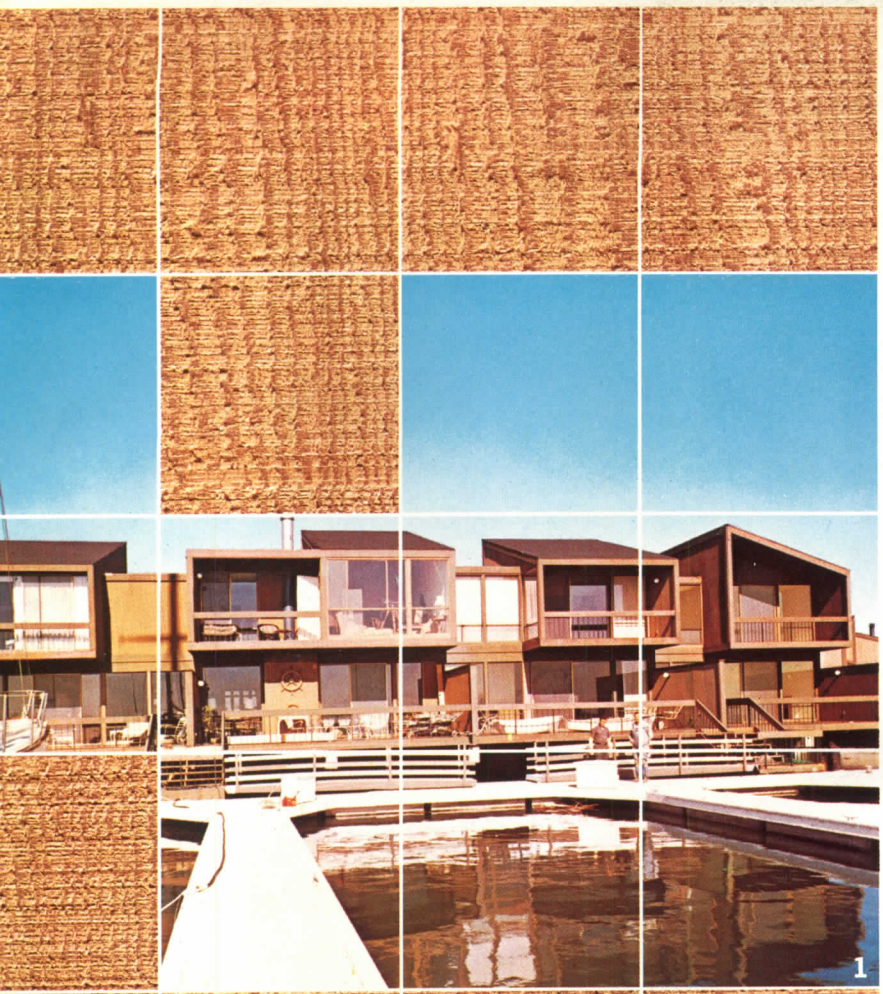
ASIDES

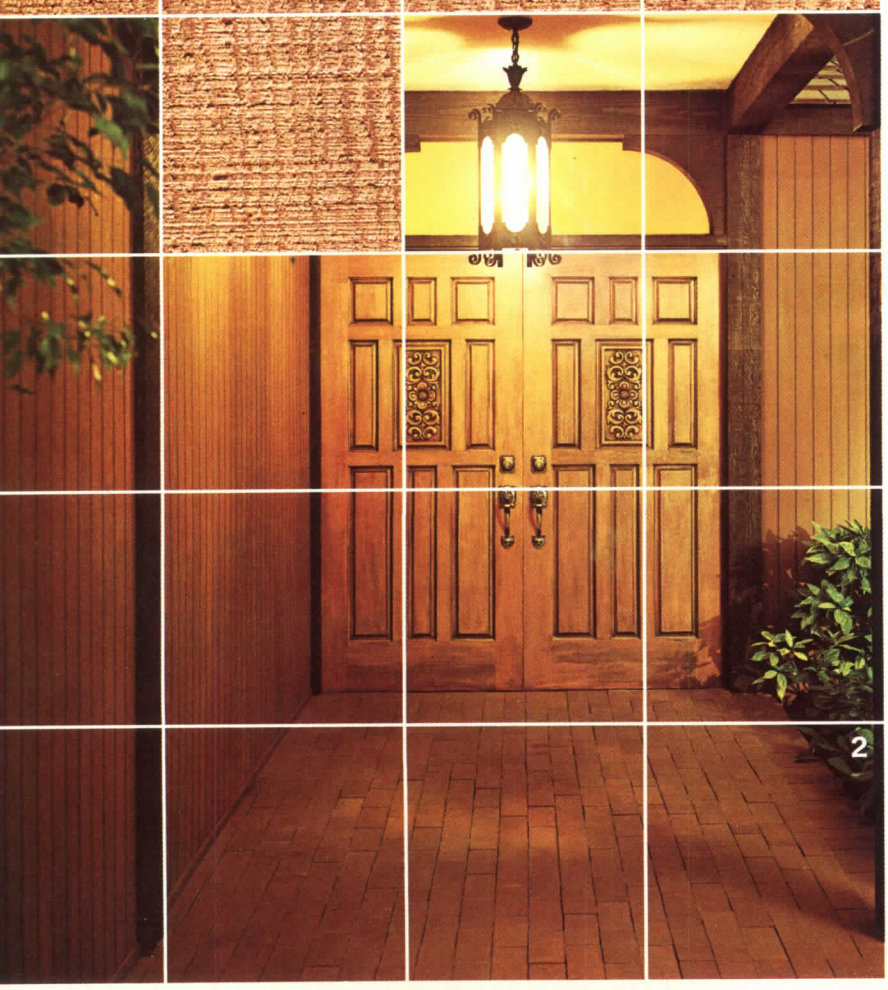
The Institute Page this month is devoted to an analysis of two documents: the revised A201 and the new A701. This brings to mind a statement of principles agreed upon a few years back by the AIA and the American Bar Association, a review of which seems to be timely now. It deals with the "areas which jointly involve the professional knowledge of both" and attempts "to clarify the areas of responsibility of both groups." Particularly pertinent is the following:

"II. The architects shall timely advise the client to consult a lawyer on legal matters, and the lawyer shall timely advise the client to consult an architect on architectural matters. It is recognized that what constitutes the practice of architecture is a question which rests with the legislatures and the courts, and that what constitutes the practice of law is a question which rests finally with the courts.

"III. A. For many years, The American Institute of Architects has worked effectively to promote uniformity in contract forms for use in connection with the construction of buildings or other structures and has prepared printed forms designed to promote that objective. In future printings, the owner-contractor agreements, the General Conditions of the Contract for Construction and the contractor-subcontractor agreements shall carry a statement in substantially the following form: 'This document has important legal consequences; consultation with an attorney is encouraged with respect to its completion or modification.'

B. The architect is cautioned not to furnish legal advice and not to appear in a representative capacity as an advocate before a quasijudicial or administrative agency when substantial questions of law or legal procedure are involved." □





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MODULAR.

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1. Ballena Bay Apartments, Alameda, California
Architect: Fisher-Friedman Associates, A.I.A.
Builder: Pan Pacific Development Co.
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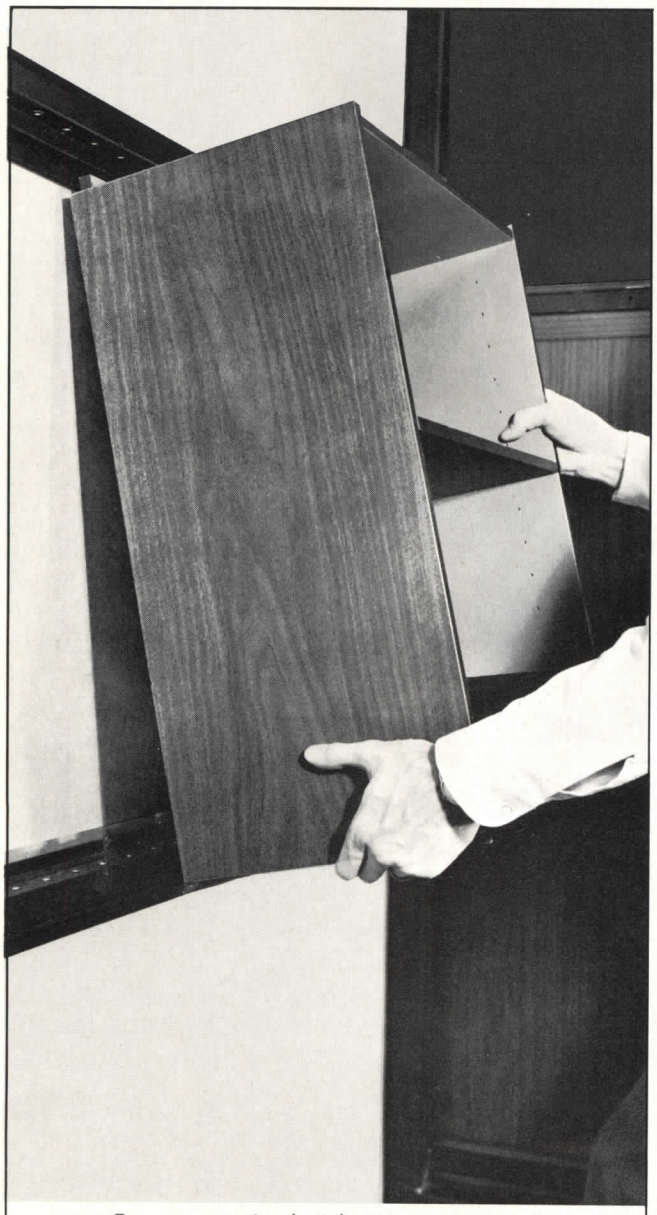
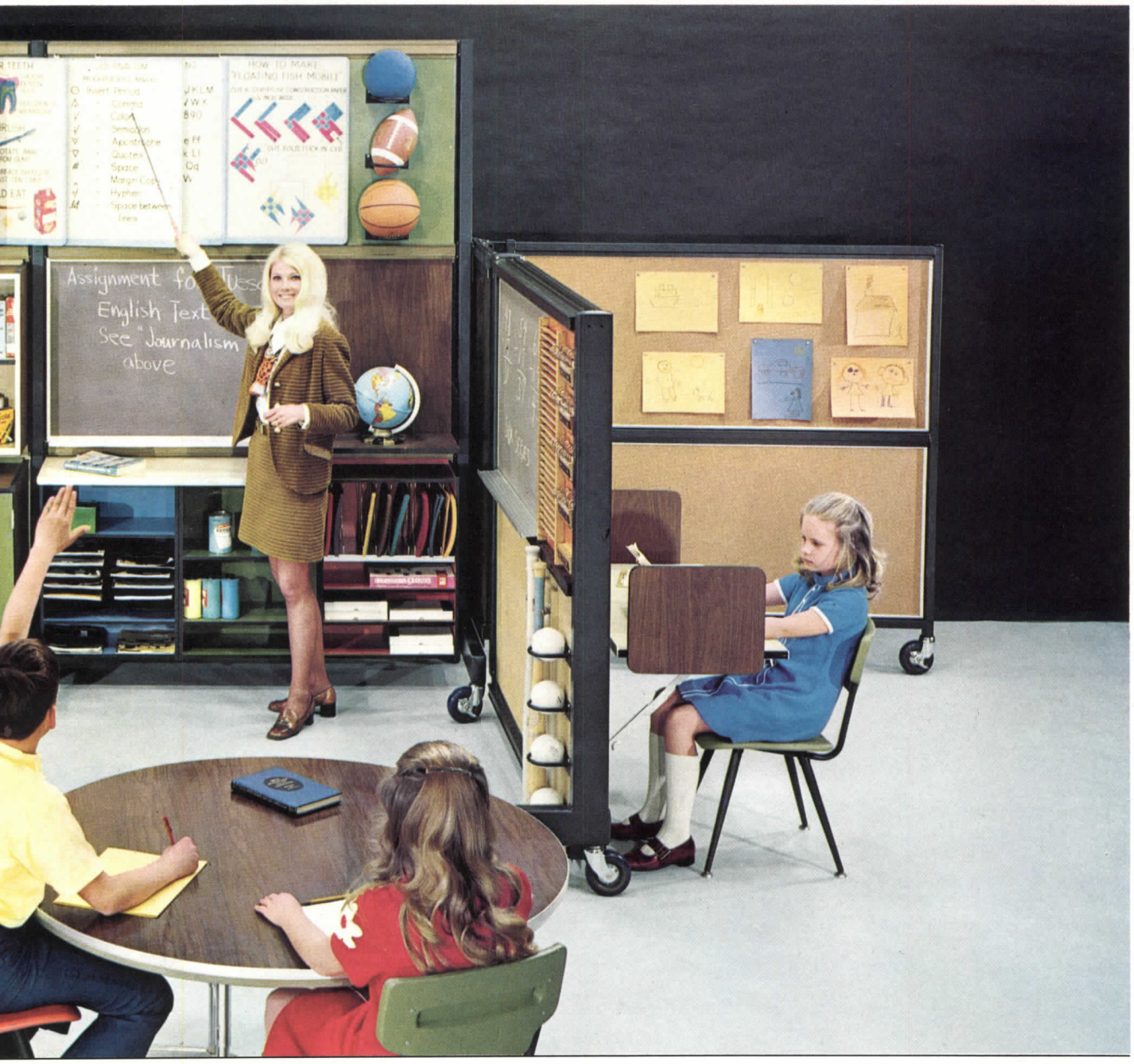


Components simply "plug" into support rail.

Introducing VUE . . . the most flexible low-cost learning wall system ever devised.



Visual **U**nified **E**nvironment system . . . for an architect it solves the problem of what to do about walls in an open school. For, VUE combines the flexibility of a room divider system with the multiple advantages of a structural wall.

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outlook

White House Fellows Have an Architect in Their Midst Assigned to Interior

Among the 17 White House Fellows who began their duties last month is an architect, the second of his profession to be so appointed. He is Captain Rodney A. Coleman of Rosemont, Pennsylvania, a project architect with the US Air Force Civil Engineering Corps.

Rodney, like his predecessor, Jack McGinty, now a practitioner in Houston, has been assigned as an aide to the Secretary of the Interior and is representing the department on a working group of the Domestic Council, a White House Advisory Group.

President greets Coleman as Hudson Drake, director of White House Fellows, looks on.

The captain is a 1963 graduate of Howard University where he was a member of the varsity basketball and baseball teams and was active in the Air Force ROTC program, being the recipient of many awards and distinctions.

Since Coleman's commissioning in 1963, his work has included the design and construction supervision for numerous renovation projects on Air Force facilities.

Coleman was selected by a Presidential Commission which made its choices from among 31 national finalists, recommended by 11 regional panels, after a weekend of conversations at Virginia's Airlie House.

This year there were about 1,200 applicants for the program, designed to provide rising young leaders from business, the universities and a variety of professions a first-hand exposure to the top level of the federal government. During their year in the nation's capital the fellows receive a salary of up to $24,500, based on previous education, experience and earnings.

Persons between the ages of 23 and 36 who are interested in the program should send their inquiries to the Director, Commission on White House Fellows, the White House, Washington, D. C. 20500. Deadline for applications is December 1.

Apprentices to Benefit from $5,000 Prize Given Franzen by Building Trades Union

Ulrich Franzen's "ability to organize space to serve contemporary human needs and his talent for using materials and forms to bridge old and new eras of architecture have put him in the forefront of architecture."

So stated President Thomas F. Murphy of the Bricklayers, Masons & Plasterers International Union in presenting the initial Thomas Jefferson Award for Architecture to the New Yorker during its biennial convention in Washington, D.C.

Franzen, in turn, announced that he would donate the $5,000 prize which accompanied the award to the A. Philip Randolph Institute for use in its "Outreach" project to help place young minority group members in apprentice training programs.

The award will be given every other year to an architect whose environmental design contributions are "in keeping with the ideals of statesman-architect Thomas Jefferson."

In his address to the convention, Franzen, an AIA Fellow, said, "The job potential of construction in the next 30 years is staggering, but it can never be realized if we are a nation half poor and half rich; it cannot be realized if we are so protectionist that we fail to attract those young people who are willing to lend a hand."

Civil rights leader Bayard Rustin accepted the donation as executive secretary of the Randolph Institute and called for a coalition of trade unions and minority groups to solve the problems of poverty, race and Vietnam.

AIA Headquarters Project Moves Ahead

Bids will be let in mid-December to pave the way for a new $7.4 million AIA Headquarters Building, with groundbreaking scheduled for around January 1. Institute plans call for movement to a temporary headquarters for the two years allocated for construction of the project, designed by Norman C. Fletcher, FAIA, and John C. Harkness, FAIA, of The Architects Collaborative of Cambridge, Massachusetts.

At the Boston convention, delegates voted to establish a separate business corporation which will be able to assume mortgage financing commitments to erect the new building. A nonprofit professional organization, such as the AIA, cannot assume mortgage obligations at current market rates under District of Columbia tax laws, according to Max O. Urbahn, FAIA, of New York, chairman of the Committee on Institute Headquarters.

Sandstone pillars frame chancel and rich, dark pews of church destroyed by fire.

Requiem for St. Thomas: A Building Burns But Its Spirit Thrives in Inner City

Standing against a backdrop of charred ruins, the sign proclaims: "St. Thomas Parish LIVES at 1772 Church Street." The address is that of the rectory around the corner of what used to be the main entrance to the Episcopalian church, just east of Dupont Circle in the nation's capital.

It was best known as the place where Franklin D. Roosevelt worshipped, but the edifice also was regarded as a fine example of Gothic architecture in the English perpendicular vernacular. Designed by Theophilus P. Chandler, FAIA, of Philadelphia, the 58-year-old structure with its gray granite walls and 100-foot tower went up in smoke early the morning of August 24, the victim of what officials called "suspicious ignition."

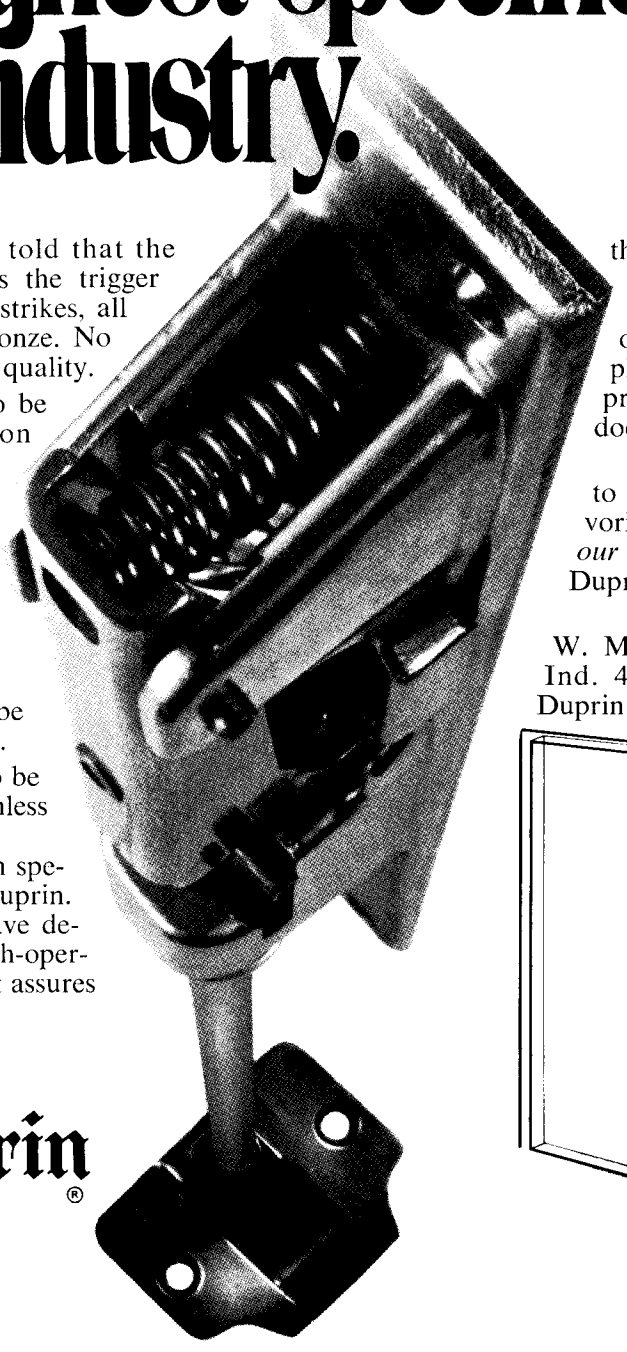
Destroyed, too, were the 22 stained glass windows, the work of London's Henry Holiday, one of the leaders of his craft at the turn of the century.

The 850-seat church gave a sense of scale to a residential area which finds itself in a period of transition. About one-half of the congregation lives in the Maryland and Virginia suburbs, but its rector, the Rev. Henry H. Bruel, was "bringing in the neighborhood" through work with the Dupont Circle hippies and a VISTA program.

The first Sunday following the fire the parishioners returned to pray amid the rubble. Wearing a brightly colored vestment made especially for the service, Father Bruel said, "It symbolizes the Resurrection." The worshipers, in turn, seemed to be caught up in this spirit of hope and optimism, even while realizing it would be unfeasible to re-create a Gothic structure.

This led one newspaper reporter to write, "Maybe the building doesn't matter, after all." The pedestrians who passed St. Thomas every day — as did this writer — surely cannot agree, for a sanctuary has been lost that can never be replaced. *continued on page 12*

It took time, but we have now designed an automatic flush bolt to the toughest specifications in the industry.



How tough? Well, we were told that the actuator body and face, plus the trigger bolt, as well as sill and soffit strikes, all had to be of drop forged bronze. No other device has this built-in quality.

The latch bolt had to be extruded bronze with a nylon coating to minimize friction and assure long wear. No other device has that, either.

In addition, the latch bolt guide, the latch bolt safety trip, and the ratchet all had to be cadmium-plated, case-hardened steel.

The dead lock had to be channel-shaped stainless steel.

And all springs had to be compression type, also stainless steel.

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That should be enough to make Von Duprin *your* favorite line. So we'll close with *our* favorite line: Think of Von Duprin devices first. They last!

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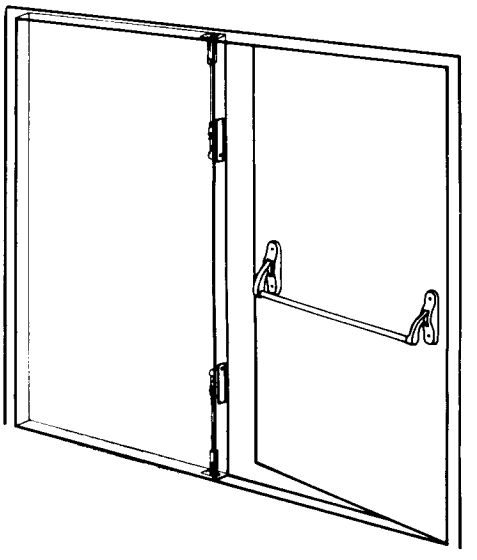

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outlook *from page 10*

Cincinnati AIA Will Celebrate Centennial With a Party and an Office of Its Own

Commemorating the 100th anniversary of its founding this year, the Cincinnati Chapter AIA will host the annual meeting of the Architects Society of Ohio, October 29-31. By that time, the chapter will have, for the first time in its history, an office headquarters at the new Contemporary Arts Center in the heart of town within sight of the rebuilt Fountain Square, half a block away. A centennial celebration party at the center will wind up the meeting.

The chapter's centennial committee has prepared a commemorative brochure to be offered to those attending the ASO sessions. It will contain sketches of Cincinnati landmarks by local artist Clinton Orlemann, with one 11x15-inch print suitable for framing. In addition, a display of drawings and sketches executed by local artists during the past century will be on exhibit.

It's 75 Years for Albert Kahn Associates, With a Firm Award and Exhibition to Boot

When the Newcomen Society in North America met in Detroit on September 24, it heard, for the first time since its founding in 1923, an architect give the annual address. It was fitting that Sol King, FAIA, should do so, for he is president of Albert Kahn Associates which, during its 75th anniversary, was being honored by the society.

Like its British counterpart, the American Newcomen, as it is commonly called, perpetuates the life and work of Thomas Newcomen (1663-1729) whose inventions paved the way for the Industrial Revolution. In addition to the Newcomen Award, the society maintains a Memorial Library in Business History near Philadelphia, which is open to the public for research.

In his address, King, who has been affiliated with the architectural/engineering firm for 35 years, chronicled its history. He pointed out that a pivotal point in Albert Kahn's career occurred in 1903 when he was commissioned by Packard to design a 40-acre plant in Detroit. The parallel growth of Kahn and the motor car industry is now legend.

Today, King heads a 300-man organization whose projects include industrial complexes, newspaper plants, educational buildings, hospitals, parking structures and office buildings.

What has happened in those 75 years has been documented by an exhibition, "The Legacy of Albert Kahn," which will continue at the Detroit Institute of Arts through November 1. The accompanying catalog features an essay by W. Hawkins Ferry, who also compiled the illustrations. In the epilogue, King writes about Kahn: "His creative responsiveness to the needs of his time remains as perhaps his greatest legacy."

Construction Industry Conference Set

The National Construction Industry Arbitration Committee will conduct conferences in the following five cities this month: Minneapolis, Sheraton Motor Inn, the 14th; Cleveland, Pick-Carter Hotel, 15th; Los Angeles, Century Plaza Hotel, 19th; Seattle, Washington Plaza Hotel, 23rd; Boston, Boston Marriott Motor Hotel, 31st. For further details, contact E. Robert Cregar, Conference Coordinator, American Arbitration, 140 W. 51st St., New York, N.Y., 10020.

Deaths

PETER J. COLLINS
Norwalk, Conn.
JORGEN ELMER
Berkeley, Calif.
LYTLE P. LINDEBERG
Seattle
LOUIS PIROLA
Chicago
JOHN LINN SCOTT
Austin, Tex.

Members Emeriti

EDWARD G. CONRAD
Lakewood, Ohio
LOUIS P. JOSSERAND
Houston
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Lancaster, Pa.
ROMER SHAWHAN
Pasadena, Calif.
JOSHUA H. VOGEL
Issaquah, Wash.
LEONARD WILLEKE
Grosse Pointe, Mich.

NIAE Remembers Miss Rother Who Lived Simply But with Untold Dedication

"As simply as she has lived, with modesty but with concerned awareness, so has she died — simply, but indeed leaving a great legacy of a dedicated job well done and long remembered." So wrote Arnold A. Arbeit, AIA, chairman of the board of the National Institute for Architectural Education, in tribute to Cecylja B. Rother, executive secretary.

In accordance with Miss Rother's specific wishes, no services were arranged to mark her passing and her body was cremated. She had donated her eyes to the New York Eye Bank. And so on November 10 there will be "a simple memorial meeting" at NIAE headquarters at 20 W. 40th Street in New York City.

"Miss Rother diligently devoted herself to the organization, originating from the parent group, then the Society of Beaux-Arts Architects, to the Beaux-Arts Institute of Design and finally the NIAE," Arbeit stated. "She dedicated all her energies and talents for over 50 years to the education of young students of architecture, sculpture and mural painting. Because of her efforts and assistance to many of the now famous young men and women, they, in turn, later contributed to the organization, not only by devoting their time but also by contributions and legacies which continued the educational function of the institution."

Miss Rother, who died at the age of 73 on August 8 after a prolonged illness, emigrated to this country with her parents in 1904, and studied ballet but was forced to give it up because of family objections. A graduate of New York University in 1921, she later joined the Beaux Arts Institute as assistant to Dean Edmund S. Campbell.

Leaving no family, Miss Rother had maintained contact with leading architects, students and institutions of architectural education throughout the world.

German Chancery Becomes American Legacy for Eiermann, Its Architect

Residents of Washington, D. C., and all the city's many visitors who appreciate handsome and efficient architecture are in debt to the Federal Republic of Germany for the "exercise in diplomatic grace" of that country's chancery located on residential Reservoir Road. At the time of its dedication in 1964, Germany's President, Heinrich Luebke, called the chancery "a diplomatic workshop of creative design." It was acclaimed in the architectural press as "not only the best of the handful of modern chanceries in Washington, but quite probably the city's best new office building as well."

Egon Eiermann was chosen as architect because of the skill he demonstrated in the German Pavilion at the Brussels World Fair in 1958. Faced with two major problems in the design of the structure — the placement of a large office building in a single-family residential area and the relationship of it to a steep and sloping hill — Eiermann turned problems into assets.

Eiermann, professor at the Technische Hochschule in Karlsruhe and a member of the Akademie der Künste in Berlin, died July 19 at the age of 66. In addition to many industrial buildings and churches, including the Kaiser Wilhelm Bedächtniskirche in Berlin, he also designed furniture.

Worldly Known Lloyd Morgan Is Praised As Architect-Teacher-Humanitarian

Lloyd Morgan's influence as an architect went well beyond the borders of the United States. In France, he was in charge of "Region Devaste," a civic planning project for reconstruction of devastated areas, including site planning, housing, hospitals and public buildings. He was honored by the French Government.

A Fellow of the Institute, Morgan designed the Waldorf-Astoria Hotel, the Barbizon Plaza, the Sherry-Netherlands Hotel and the Hotel Pierre, all in New York City; the Miami-Biltmore Hotel and the Roney Plaza Hotel in Miami Beach; and Parklabrea and Parmerced, two massive housing projects built for the Metropolitan Life Insurance Company in Los Angeles and San Francisco.

But Morgan, 78, who died of a heart attack in Tarrytown, New York, on July 18, was equally known as a teacher. He taught at Yale and New York Universities, the Ecole des Beaux Arts and the Fontainbleau School in France. For six years he conducted his own atelier in this country for students who could not afford architectural school. He was trustee of the National Institute for Architectural Education. □

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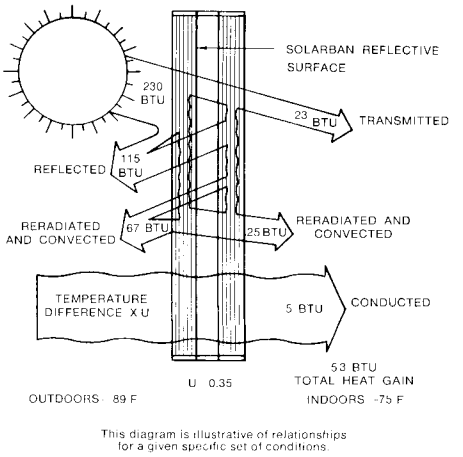

This diagram is illustrative of relationships for a given specific set of conditions.

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Conwed CORPORATION

Front Page Photo

PRODUCT: 7000 Series partitions combined with Five Plus Five Ceiling System.

Left

PROJECT: East Lansing State Bank, East Lansing, Mich.
PRODUCT: Conwed 5+5, bays of 60"x60" regressed splays (perforated) 3'x3' fixtures.
ACOUSTICAL CONTRACTOR: Larry Brooks & Associates

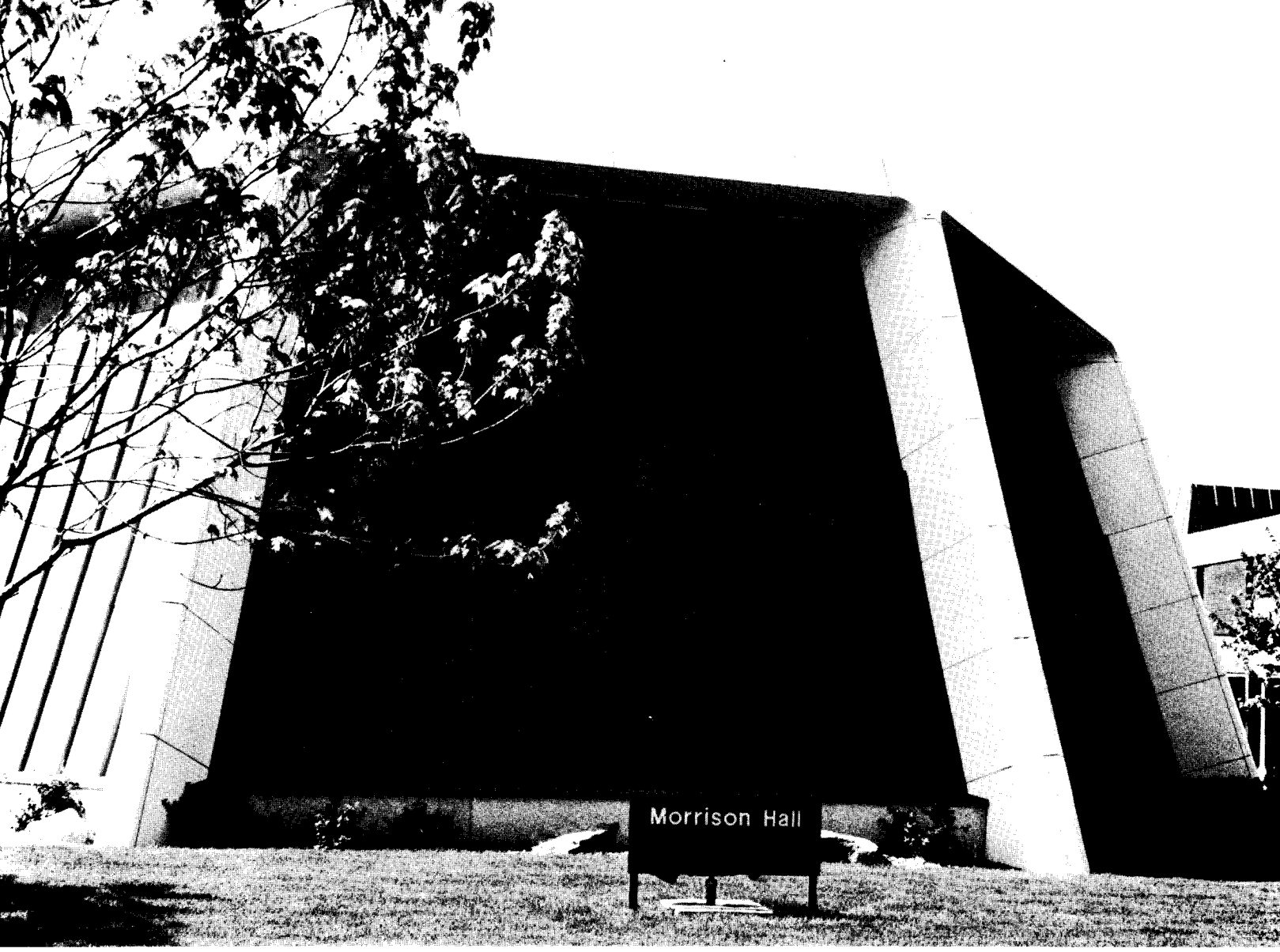
Top Right

PROJECT: Western State Bank, St. Paul, Minnesota
PRODUCTS: Conwed 5+5, 30"x60" vaulted fixtures, ventilating grid and semi-concealed lay-in panels.
ACOUSTICAL CONTRACTOR: Hauenstein Burmeister

Bottom Right

PROJECT: Barber-Colman Corp., Rockford, Illinois
PRODUCT: Conwed 5+5, 30"x60" air delivery fixtures, low profile air fittings, 30"x60" fissura panels.
ACOUSTICAL CONTRACTOR: Continental of Rockford

Circle 145 on Information Card.



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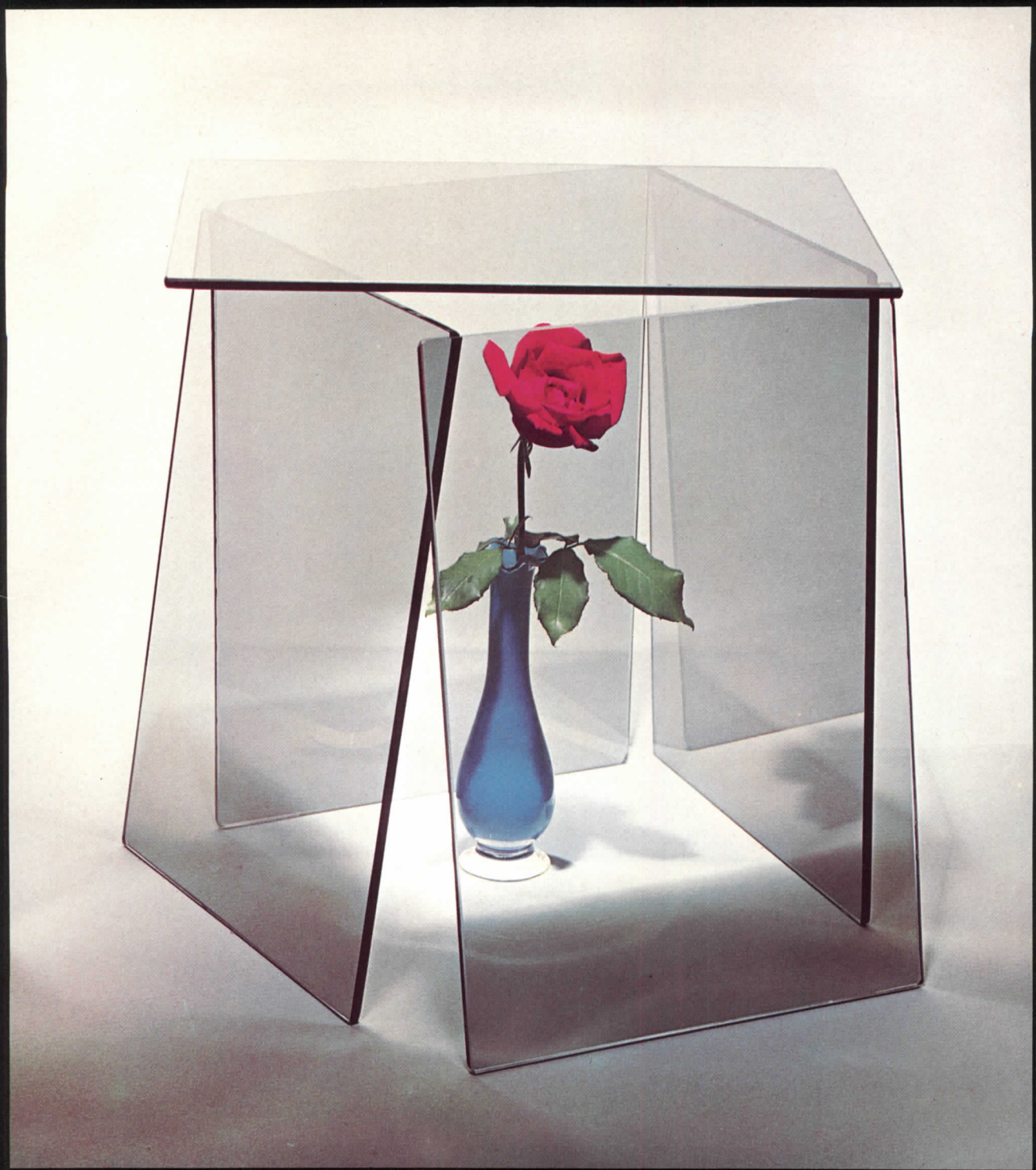

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A Look at Two Documents

by ARTHUR T. KORNBLUT, AIA
Administrator
Department of Professional Services

As part of its continuing program to provide practitioners with current practice documents, the AIA has published the 12th edition of its General Conditions of the Contract for Construction (A201). Although changes in the new edition may be described as minor when compared with the reorganization that occurred four years ago, there are improvements in several important areas which detail the rights and responsibilities of the owner and contractor more precisely and which better define the architect's role during construction. To maintain a consistent relationship among related documents, the changes in the General Conditions with regard to the architect's responsibilities as the owner's agent during construction have been paralleled in the 1970 edition of the Owner-Architect Agreements (B131, B231, B331).

The major innovation in the 12th edition of the General Conditions is the debut of a new document called Instructions to Bidders (A701). Although the General Conditions is a contract document, it contained requirements that the contractor had to meet *prior* to his signing the contract. The AIA had been aware of this situation, but declined to remove portions historically contained in the General Conditions until such provisions could be accomplished satisfactorily elsewhere. These requirements are more properly stated as conditions of bidding. The new document, Instructions to Bidders, was written to contain them. Thus an improvement is afforded the General Conditions. The two areas affected involved subcontractor approval and the requirements for furnishing a Performance Bond and Labor and Material Payment Bond. Furthermore, Instructions to Bidders contains other standard provisions related to bidding which should demand a minimum of modification when used in conjunction with a properly prepared notice to bidders or advertisement for bids.

A major factor in the development of both documents was the cooperation between the National Documents Review Committees of the AIA and the Associated General Contractors of America. Many of the improvements in the 12th edition of the General Conditions resulted from discussions between these two committees based on experience in using the 11th edition. The AGC has approved both the 12th edition of the General Conditions and Instructions to Bidders for use by its members. This represents a major achievement in the use of standard contract language and should result in fewer costs arising from unforeseen contractual contingencies.

Documents A701 and A201 have complementary provisions and are intended for joint use in the Project Manual. The following items were included in the previous editions of the General Conditions but are now in Instruction to Bidders:

- Certain provisions relating to the submission of information regarding subcontractors (Ref. A701, paragraph 8.1; and A201, paragraph 5.2).
- Provisions relating to the Performance Bond and Labor and Material Payment Bond (Ref. A701, paragraph 9.1; and A201, paragraph 7.5).

If General Conditions is used with instruction to bidders other than document A701, such instructions should contain adequate provision for those items.

One of the more substantive changes in the new edition of the General Conditions is in Article 2: Architect. The provision which enabled the architect to stop the work has been deleted. The architect has the right to reject work which does not conform to the requirements of the contract documents and to demand any testing or inspection in accordance with subparagraph 7.8.2. By deleting the "stop the work" provision, potential liability has been avoided in those circumstances in which the architect could be found negligent for failing to exercise his right to stop the work. By retaining the right to reject work, the architect can properly perform his duties as the owner's agent.

There are other revisions which may be characterized as minor, such as a revised provision for the procedure to be followed if a subcontractor is rejected.

The development of Instructions to Bidders, the continuing effort to maintain high quality contract documents and the constant effort to evaluate the effects of judicial decisions relating to such items as the "stop the work" phrase all point up the value of the 12th edition of General Conditions of the Contract for Construction. □

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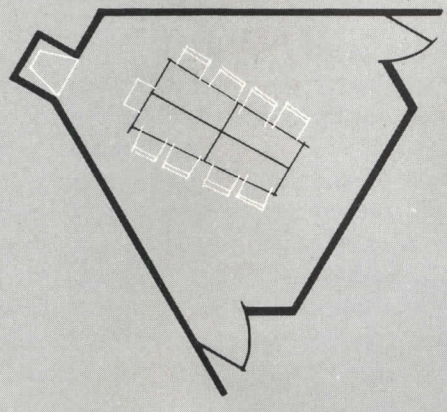
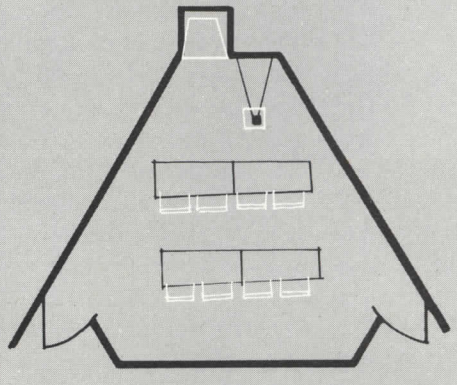
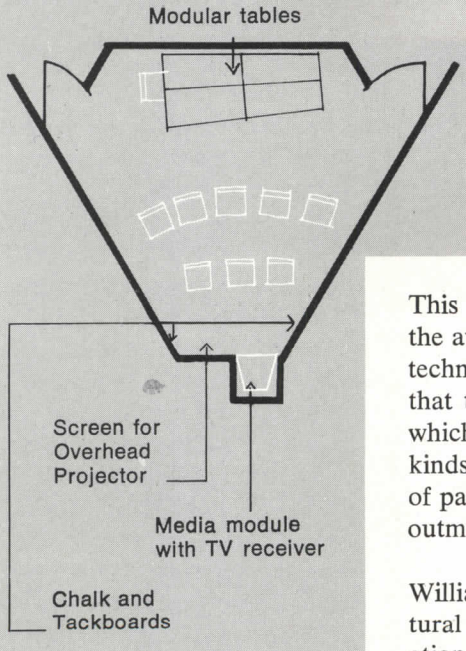
Designing for Educational Technology



ALTERNATE SEATING ARRANGEMENTS





This article has been prepared to guide the architect through the available resources on planning and designing for educational technology. Although not a how-to-design-it manual, it is hoped that the data will provide the architect with a foundation upon which to base his quest for facilities that will truly enhance the kinds of learning the new technology provides. Such is the change of pace in education today that some of the information may be outmoded already.

The material was developed by David S. Haviland and William F. Winslow, staff members of the Center for Architectural Research, Rensselaer Polytechnic Institute, with the cooperation of The American Institute of Architects Committee on Architecture for Education, and adapted for publication by Betty J. Ritter, AIA.

A bibliography is appended that is purposely noncomprehensive, noting only a few sources for the architect's use. Throughout the article, numbers in parenthesis following a publication title refer to the bibliography listing.

One of the most pervasive changes in education in recent years has been brought about by the development of a potent educational "technology." Where the educator once depended upon words and chalk to communicate, educational technology now provides him with a vast array of resources with which to do the job. Projectors, recorders, television, teaching machines, audio labs, dial-access systems and computers are being utilized to communicate new experiences to both individual and group learners in the contemporary school and university.

Buildings and spaces for education must respond. If we believe that the physical environment can help or hinder what transpires within it, and if we believe that communication is at the very heart of education, then we must provide facilities that will permit — indeed, enhance — effective communication. This is no simple task. Many developments in educational technology are relatively recent and new potentials are seen nearly every day.

Ideally, educational planning for the technology should be largely completed and documented before the architect undertakes schematics. More often, however, it is not, and the architect may find himself in the precarious position of making educational decisions. To avoid undue burdens during the early design stages, an educational specification and media plan should be developed long before pencils are put to paper.

Educational Specifications: Wise educators recognize the value of developing an educational specification before proceeding with any commitment to facilities. Beginning with a statement of the institution's educational philosophy, the spec details the kinds of learning situations the school provides its students.

A good educational spec looks at each learning situation carefully: How can the goal be best accomplished? How should the learners be grouped? What kinds of experiences should be included? What teaching techniques will be used? How much time is needed? What kinds of instructional resources are required? What personnel is anticipated?

One learning situation may rely on didactic lecture, another on a field trip and still another on the use of educational technology to bring a variety of experiences to the student. In some cases, the instructor may wish to pace the class carefully through a lecture and in others let the individuals pace themselves through programmed instruction. In some situations, the information can be presented verbally; in others, drawings, films or models may be required. Simply put, the learning systems idea asks: For any learning situation, what is the best *combination* of techniques and resources to do the job?

Why are the learning systems so important to the architect? Because it says that there is no *one* best way to handle all learning situations. Television is no more the final answer than is large-group instruction. The educational institution that adopts the new learning systems may have many different kinds of communication going on under its roof, and the environment must be designed to accommodate them all.

The architect, of course, does not write the educational spec. Because he is the ultimate interpreter, however, he should work with the educator to see that he is provided with the required information. So far as educational technology is concerned, the architect should 1) get involved early; 2) impress upon the educator that the choice of instructional resources has direct physical implications for the school facility; and 3) encourage the educator to develop a media plan.

Media Plan: The media plan describes the kinds of instructional resources that will be used and how they will be used in various educational situations within the proposed building. As the building program takes shape, the media plan should, for each space in the proposed facility, provide answers to such questions as the following:

- What kinds of learning situations will take place there?
- What kinds of instructional resources will be used at the outset — and as far into the future as the educator dares to predict?
- When will the various resources be used — all the time or just once in a while? For long or short periods?
- Which resources must be built into the space and which can be brought in as needed?
- Where will equipment and materials come from? Who will bring them, load materials and operate equipment?
- What kinds of resources (if any) will be distributed to the space via cable or other distribution network?
- What kinds of controls must be provided?

Every educational institution will approach the utilization and support of instructional resources in a different way. One may set up a program that is heavily decentralized with a full complement of equipment and resources in every learning area; another will place emphasis on central provision of equipment, software and professional support. But no matter what the approach, it should be detailed in the media plan *before* the architect begins work on schematics.

The various spaces in which media may be used include:

- large-group presentation spaces, such as lecture halls, auditoriums and communication centers
- small- and medium-group presentation spaces, such as classrooms, seminar rooms, conference areas and meeting rooms
- individual learning spaces, including independent study areas and carrels
- special purpose spaces, such as audio laboratories, science rooms, shops and other occupational areas
- flexible and open-plan areas
- resource centers
- media support areas.

Each of these space types has distinctive characteristics, requiring individual consideration during educational planning, programming, schematics, design development and production of construction documents.

Media in Large-Group Spaces

Designing the large-group teaching space is one of the most complex tasks facing the designer of educational facilities. The threefold need to communicate effectively to large groups, to use many forms of media in the communicative act and to accomplish this in a pleasant and comfortable environment serves to complicate the issue. Because many students are involved, and because the financial commitment to large-group space is often high, there is very little margin for error.

Planning: Fortunately, much research has been done on the large-group teaching space. Planning and design guidance is available and, backing this up, dozens of large-group rooms have been built. What works and what doesn't is known; the architect's task in designing these spaces is to interpret and apply the experience in a meaningful way.

As group sizes increase to 40 or 50 people, the character of the communication begins to change; as the size approaches 80, 100 or more people, the changes become definite. More emphasis is placed on the presentation of information, less on the presentation-and-discussion format. To make presentation as effective as possible, the large-group teacher often employs a wide range of visual and audio-visual media such as:

- projected images (often using several to make points, form

comparisons, etc., and coming from slides, films, film clips, lantern slides or opaque materials)
- projected blackboard, such as that provided by the overhead projector (conventional chalkboard loses its effectiveness in large-group spaces)
- television (on monitors or projected on screens)
- models or other three-dimensional devices
- audio materials, either off the air or from tapes or records.

The very nature of large-group instruction suggests that the instructor may be using several of these techniques during a single lecture, often employing them simultaneously. To assure that the facilities will respond to these patterns of use, the architect should make sure the media plan spells out:
- which media will be used and which may be used simultaneously in the educational experience
- which media will be built-in and which will not
- whether front, rear or a combination of both projection approaches are desired
- who will actually control the media used
- which types of technical support will be provided for each learning space.

Each of these issues can have major design implications and they should be faced during the development of the media plan.

The use of media is crucial to large-group instruction. Even where educators claim that current use is minimal, history proves that introduction of media into large-group situations is inevitable. While specific decisions about choice of media rightfully belong to the client, the architect can usually assume that most large-group teaching spaces will, if not immediately, be media oriented. This assumption by the architect will insure that he will not "design out" the future use of media.

Programming: Basic issues in programming a large-group space are how much space should be provided and whether it should be shared with other uses — dramatics, speeches, forums, motion pictures.

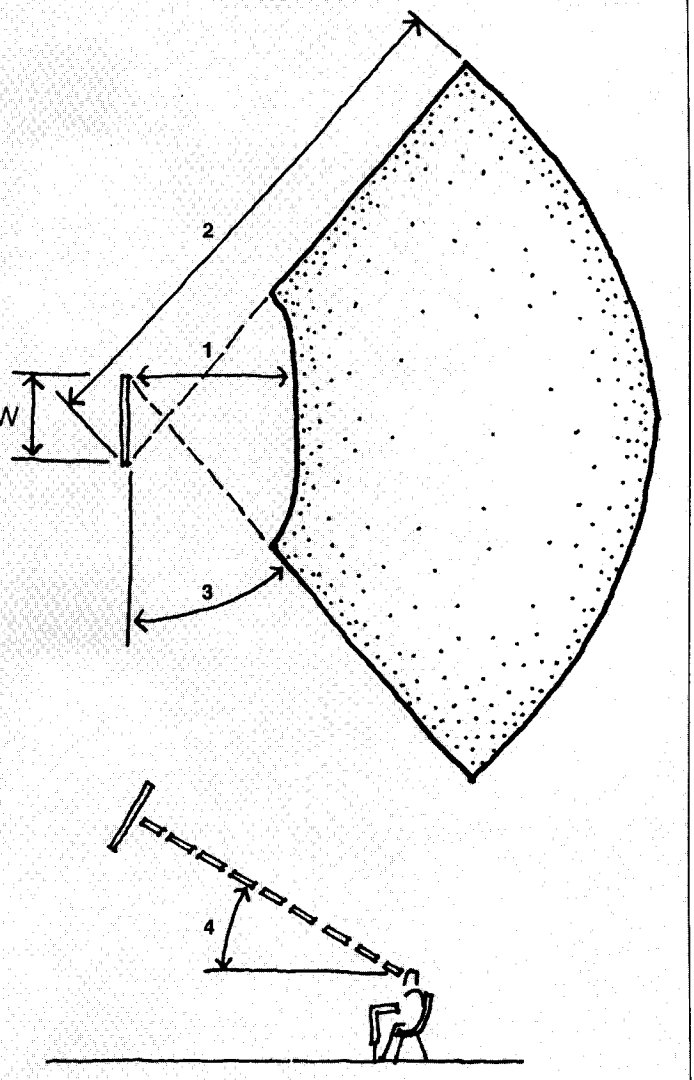
Other concerns during programming include:
- size (media-oriented spaces are rarely larger or smaller than their nonmedia counterparts)
- supporting spaces (the kinds of supporting spaces result from educational and administrative decisions on how media are to be used; these decisions should be reflected in the media plan)
- interrelationships (interrelationships of the supporting spaces also evolve from the media plan).

One of the functions that the architect often assumes during programming and schematic design stages is that of advising the client about media possibilities; to assist this function (*see* the bibliography for several summary publications, specifically 10, 12, 17, 24, 28, 37, 61).

Schematics: Basic issues include:
- Shape: The real determinant of the shape of large-group rooms is the sightline. To enable the designer to create a space in which every viewer can see the images presented, data has been developed about the optimum viewing area (OVA). The OVA relates to projected images so they are not too close, too far away nor too far off to one side. Figure 1 summarizes information about the OVA and how it is determined by rule of thumb. For additional technical information, the designer may consult the bibliography (36, 37, 65 and 69). Other influences on room shape will be wall and ceiling configurations for acoustic purposes.
- Display surfaces: Where a number of display surfaces will be used, the front of the room should be laid out tentatively during schematics. Display surfaces should be arranged for best viewing and maximum flexibility of use. The long "throw distance" of

Figure 1

OPTIMUM VIEWING AREA (OVA)



Minimum Viewing Distance — 1
This is largely influenced by problems with eye scanning when viewers sit too close to images. If "W" is the width of the image, a "2W" rule of thumb is usually used.

Maximum Viewing Distance — 2
This is influenced by the type and legibility of the image, its contrast, the presence of motion and other factors. Some of these are characteristics of the medium used; others relate to the projection system (projector, optics, screens, lighting) used. Usual beginning rules of thumb:
Overhead and opaque projector — 3W to 6W
Motion pictures — 6W to 8W
Other projection — 6W
Projection systems can be chosen which alter these figures.

Edge Angle — 3
An edge of 40° is about the minimum for distortion. Not all screens are effective at 40°, however. Special narrow-angle (i.e., large-edge angle) screens may provide certain advantages (such as more light in the room or a less powerful projection system), but they also decrease the viewing angle.

Vertical Viewing Angle — 4
This angle should not exceed 30°.

the overhead projector (Fig. 2) often poses special problems that should be resolved at this point.

• Location: Probably the most important aspect of large-group rooms because of the sheer volume of traffic they receive. Internal room circulation, access (preferably from the rear) and flow of students from lounge and toilet areas should all be considered. Windows are generally a liability in media-oriented large-group rooms, and most authorities recommend that they be avoided whenever possible.

• Adjunct facilities: The rear projection area requires the most careful consideration during schematics (Fig. 3); too often it is simply leftover space. The architect must tentatively lay out the required projectors and make sure that their projection beams can get to the screen. There are many ways to avoid the "straight throw" situation, but these may have certain disadvantages. The media coordinator or audio-visual dealer should be contacted at this point for information about specific equipment.

Design Development and Construction Documents: Even though many of the significant decisions are made during schematics, the large-group room still demands much from the architect during design development and the production of construction documents.

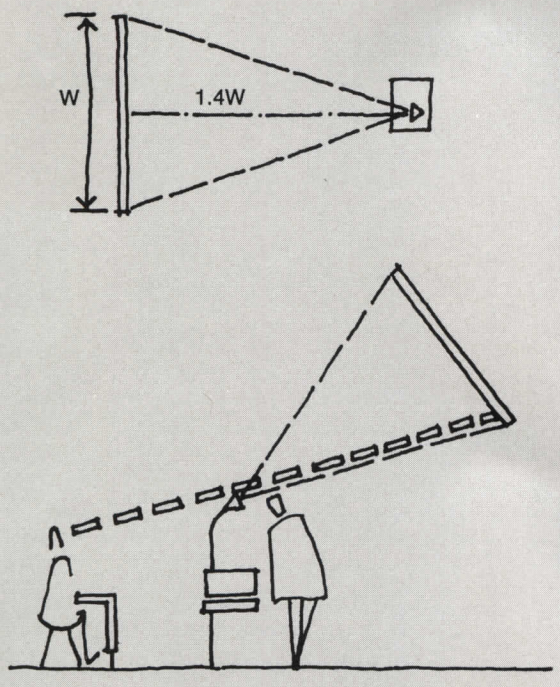
• Lighting: Must be carefully designed to allow good viewing. When media are rear-projected, light can be left on in the room, but a second, lower lighting level should be considered (Fig. 4). Stray light on the screen must be minimized and special spotlighting of some areas of the room may be in order.

• Seating: Allow each viewer good sight lines to the various display surfaces. As many seats as possible should be placed in the OVA; check code restrictions, however.

• Acoustics: Sound systems must be carefully selected and related to the acoustic design (acoustical errors in large-group rooms are compounded by many listeners).

Figure 2

OVERHEAD PROJECTOR



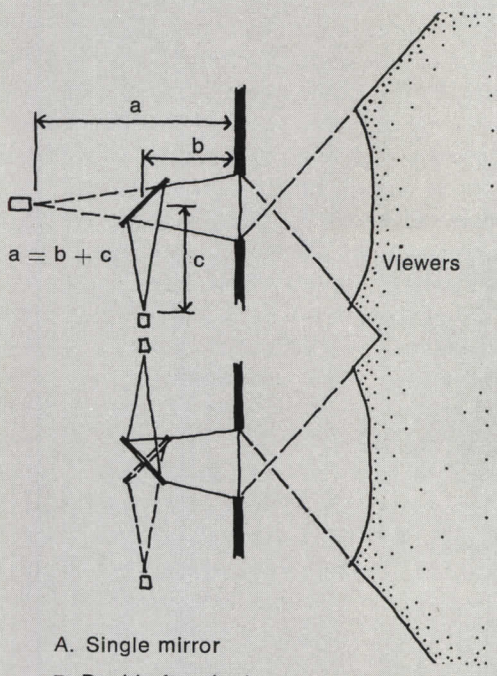
The most common overhead projectors have a 10" x 10" aperture and a standard 14" lens. This often means that the projector must be located very close to the first row of seats:

5′ screen	7.0′ throw distance
6′ screen	8.4′ throw distance
7′ screen	9.8′ throw distance
8′ screen	11.2′ throw distance
9′ screen	12.6′ throw distance
10′ screen	14.0′ throw distance

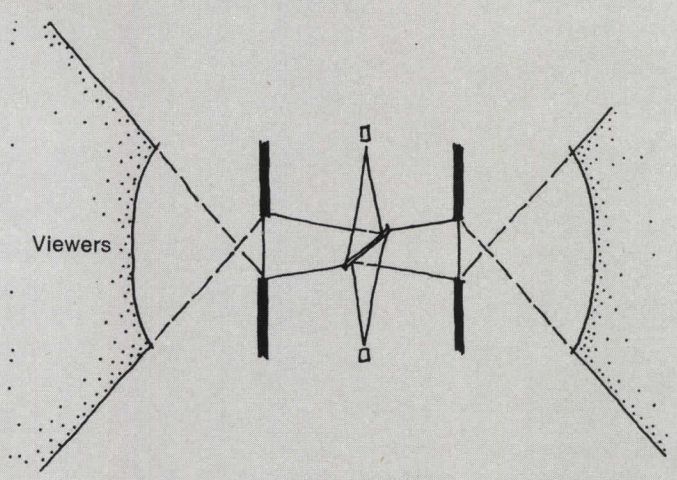
One solution which allows those in the front rows to see is to raise the screen vertically. But as this happens, it must be tilted, or the image will be distorted. In any case, the screen must not be raised too high. Remember the maximum vertical viewing angle.

Figure 3

REAR PROJECTION LAYOUTS



A. Single mirror
B. Double-faced mirror
C. Rotating mirror



• Front-of-room layouts: Should be developed in detail, with locations of all projection components (projectors, screens and projection "beams") laid out to scale.
• Control systems: What controls will be provided, how will they work and where will they be located?
• Climate control: Always important.
• Projection area: Layouts should be finalized, including any required minor adjustments in wall locations.
• Wiring and conduit requirements: Locations, quantities and sizes will pose a problem if several media are to be controlled remotely or if a student-response system is to be installed. Selection of specific media components should be made at this point so that power and wiring requirements can be determined.

Many of the listed references provide specific guidance on these issues. Figure 4 points up some of the design concerns.

While it is not necessary to build a new structure to provide a large-group room, the complicated nature of this kind of space suggests that if renovation is chosen, it must be carried out with extreme care. *Educational Facilities with New Media* (24) presents some case studies in renovation; *The High School Auditorium: 6 Designs for Renewal* (31) explores specific renovation proposals (*see* also 2, 48, 57 and 71).

Many educational institutions are forced into creating multi-use and divisible large-group rooms and auditoriums. The ins and outs of this approach, along with 17 examples of existing installations, are presented in EFL's *Divisible Auditoriums* (17).

An emerging facility type, often called the "communications center" or "lecture hall center," combines several large-group rooms and the required technical support facilities into a single structure. Particularly adaptable to colleges and universities that use large-group instruction, communications centers are presently being built at many institutions. *New Building on Campus: Six Designs for a College Communications Center* (49), an EFL publication, explores the thinking behind the communications center and presents six proposals for such a center submitted in an architectural competition. Since that time, the State University of New York has developed *A Bulletin Outlining Planning and Design Criteria for the Communication and Lecture Hall Centers as Planned for SUNY* (23). Based on the design guidance developed in the *Bulletin,* SUNY is now operating or con-

Figure 4

MEDIA AND ROOM CHARACTERISTICS

Front of the room: Where a number of display surfaces will be used, the front of the room should be tentatively laid out during schematics. Display surfaces should be arranged for best viewing and maximum flexibility of use. The long "throw distance" of the overhead projector (Fig. 3) often poses some special problems which should be considered at this point.

Location: Probably the most important aspect of locating large group rooms is the sheer volume of traffic they receive. Internal room circulation, access (preferably at the rear) and flow of students from lounge and toilet areas should be considered. Windows are generally a liability in media-oriented large group rooms, and most authorities recommend that they be avoided whenever possible.

Adjunct facilities: The adjunct facility requiring the most careful consideration during schematics is the rear projection area: Too often it is simply a piece of leftover space.
The media complement in a rear projection area determines its size and shape. The architect must tentatively lay out the required projectors and make sure that their projection beams can get to the screen. There are many ways to avoid "straight throw" situations, but these may have certain disadvantages. The media coordinator or audio-visual dealer should now be contacted.

Interrelationships: If these are carefully spelled out in the program, they should raise no design problems. The probable flow of materials and equipment among these spaces, however, requires that they be carefully considered.

Media type	Projection characteristics	Room lighting	OVA characteristics
Overhead projection	Front only; throw distance usually 1.4W; efforts should be made to prevent keystoning.	Full room lighting; stray light on screen to a minimum.	Minimum distance = 2W; maximum distance = 3W (or 4W - 6W if typewritten material can be avoided); edge angle = 40° minimum.
2" x 2" slide projection Film projection Filmstrip projection	Front or rear; remote control possible; usual throw distance is 2W, but can be shorter if special optics are used, or much longer to provide for front projection from the rear of the audience.	Reduce to intermediate level during rear projection; may have to nearly darken during front projection unless special screen is used; keep stray light on screen to a minimum.	Minimum distance = 2W; maximum distance = 6W (can be increased to 8W where motion is present); edge angle = 40° minimum.
3¼" x 4" projection	Front or rear, but remote control is expensive; throw distance about 2W.		
Television projection	Front or rear; remote control distance may be limited; throw distance about 2W.	Depending on brightness of image, may have to darken room during rear projection.	
Opaque projection	Front only; no remote control.	Will have to darken room.	
Television receivers		Can be used in fully lighted room if there is no glare on tube face from fixtures.	Minimum distance = 4W; maximum distance = 12W.

structing five of these centers, each containing media-oriented lecture rooms seating from 60 to 480 people (*see* also 5, 24, 27, 28, 47 and 57).

There are a number of well designed large-group rooms in existence. The following list is hardly exhaustive, but it does suggest some that are worth a personal visit:

- The Lecture Hall Centers of the State University of New York (15 centers, many of them exemplary; contact the State University Construction Fund, Albany, for details)
- Lawson Hall, Southern Illinois University, Carbondale
- Newhouse Communications Center, Syracuse University
- Sir George Williams University, Montreal
- Scarborough College, Scarborough, Canada
- Miami-Dade Junior College, South Campus, Miami
- Orange Coast College, Costa Mesa, California
- Rensselaer Polytechnic Institute, Troy, New York (particularly Sage Building, rooms 138 and 139).

Media in Small- and Medium-Group Spaces

For many years, the "medium" group of 25 to 35 learners was the mainstay of American education. Although many programs now provide for variable groups and individual learning, the medium group is still a potent force. However, the self-contained classroom that always housed the medium group is seen less and less; if used, it is usually conceived of as a space in which many kinds of experiences take place.

Many of these experiences involve educational technology, both old and new. The teacher may use overhead, slide, filmstrip and film projectors, as well as television and other group media. Individuals and small groups within the medium group may use programmed learning devices, portable projectors and portable audio apparatus.

Similarly, many educators are adding small groups, seminars, conferences and team project sessions to their programs. Media use in these situations usually parallels that of the medium group practice.

Perhaps the most distinguishing characteristic of media use in all of these situations is its casualness. Bringing in a projector to show a film is no longer a special occasion that disrupts the group; the use of a wide range of equipment is becoming a common and continuing experience.

Architecture must respond to this trend. It is difficult for any teacher to use instructional media casually if it requires a major environmental adjustment — moving seats, setting up equipment, stringing together extension cords, etc. In a nutshell, the medium- or small-group space should allow the teacher to use the media as quickly and simply as possible.

If small and medium groups are to be housed in discrete spaces, there are two general approaches. First, design the space specifically for media, particularly presentation media (projection and television). Here the display surfaces are built in and rear projection may be used. These kinds of spaces are often created for formal education, training and conference uses. Second, design the space for temporary and casual use of the media. In this case, equipment is stored and set up when needed. Using lightweight portable equipment, this kind of arrangement is seen more frequently at the school rather than the college level, but trends indicate more general applications.

Where the first approach is taken, the planning, programming and design guidance parallels that for large-group media rooms. While most of the literature in the field does not emphasize the medium- or small-group space, the precepts developed for the larger rooms can be used.

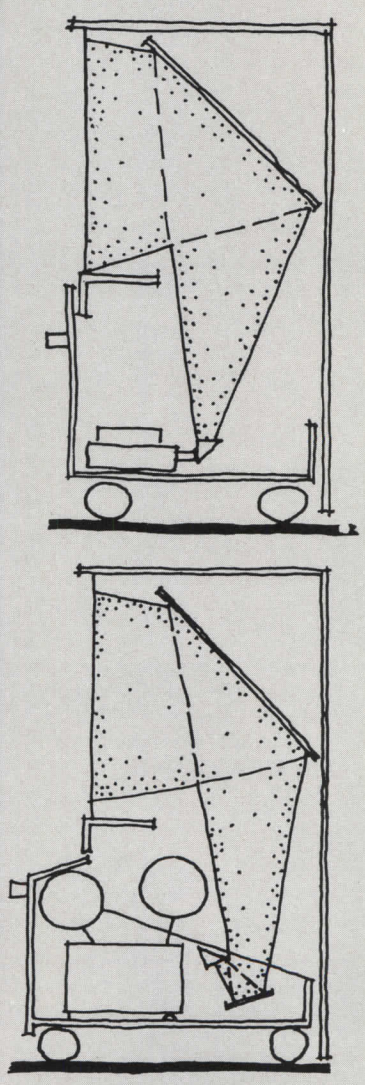
Where the second approach is chosen, the architect must consider how each of the media may, indeed, be used. If media are not "designed in" to the space, the architect must make sure that they are not "designed out."

Planning and Programming: Because small- and medium-group spaces are often not designed as true audio-visual spaces, media implications are sometimes disregarded during planning programming. Three questions about the use of media in these spaces should be answered in the media plan and appropriately interpreted in the facility program:

- Permanence: Will there be permanent built-in media installations, or will a temporary or semi-permanent solution be chosen? If the latter, careful thought must be given to how media will actually be set up and used. One approach that seems to work for small and medium groups is the use of a self-contained cabinet (or "media module") that provides projector, mirror system and rear projection screen. There are many commercial versions available. The publication *Educational Facilities with New Media* (24) details one that can be built in the school (Fig. 5).

Figure 5

SELF-CONTAINED MEDIA UNIT



A self-contained media unit can be built in the school if help is available. The media module here is adapted from *Educational Facilities with New Media* by Alan C. Green et al.

• Circulation: Where media will be built in, the program should include necessary provisions for front or rear projection space. If media are not to be built in, the program should provide for any implications that the distribution and use system may place on the facility: Will there be a central place for storage (and other support) functions? How will equipment and materials be distributed (by hand, mail, carts)? What routes will be most heavily traveled (possibly calling for few or no changes in floor levels along the route)? If media cabinets are to be used and shared, which spaces will share them? In other words, the flow of media through the facility will have significant effects and should be carefully documented in the program.
• Distribution: If TV, dial-access or other kinds of media distribution are to be used, there may well be important implications for organization of the building. The last section of this article on "Media Support Facilities" discusses these problems in greater detail, providing more specific information.

Schematics: As mentioned under programming, the architect creating small- and medium-group spaces should be guided by the general principles of large-group room design. Some specific considerations include:
• Optimum viewing area: important in the smaller room as well as in the large-group space — students must be able to see.
• Because the group is smaller, the problem of shaping the space to fit the OVA is usually not so critical as it is in larger rooms. If the size of the screen becomes an issue, placing it in a corner of a square room to better accommodate the fan-shaped OVA may be the answer.
• The small- or medium-group room rarely offers the opportunities for display that can be designed into larger rooms; consequently, front-of-room design is less critical. If several media are to be used, however, display surfaces should be considered.
• If media are to be constantly used, large windows remain a liability.
• The size of the group usually precludes the need for stepped or sloped floors.

Design Development and Construction Documents: Once again, it is suggested that the design team use the large-group room design considerations as a checklist. Many of the problems, such as the need for airconditioning, may disappear; and others, such as acoustic design, may become less crucial. They all should be considered, however.

Again, a word of caution about lighting because experience shows that this aspect of design development is continually underemphasized in media rooms. If it is desirable to have the room lighted during presentations, an intermediate lighting level should be provided. The problem of light and glare on screens, television monitors and other display surfaces demands careful attention.

Because we have more classrooms than any other kind of space in our schools, it stands to reason that many of these rooms will be renovated rather than replaced. When renovating for media, the architect should ask such questions as:
• Will the renovated space allow good viewing? Will existing structural members get in the way?
• Can light be adequately controlled?
• If distributed media are to be accommodated, can cabling be run without too much trouble?
• If an elaborate media complement is envisioned, what power supply changes may have to be made?

Awareness of these issues comes from common sense and a feeling for the kinds of demands that the new technology makes. The educator can be of considerable help to the architect.

Media and Independent Study

Everywhere one turns there is talk of "individualization." Recognizing the value of individual pacing and the worth of the Socratic dialogue, many educators are attempting to implement various approaches to the individualization of instruction.

At one time, this took the form of limited special groupings and individualized schedules for exceptional students. Now, as educators find ways of handling individual differences of students, the character of many programs is changing.

While it is generally accepted as a worthwhile goal, the implementation of individualized curricula is a slow process, one which does not happen overnight. It can, and probably will, happen over a number of years, however, and any institution moving in this direction would be advised to consider the implications for facility planning and design.

Most approaches to individualization have some common aspects:
• As often as possible, the student is encouraged to work at his own rate. In the primary years, this is likely to involve "packages" of instruction put together either commercially or by the teacher, or a combination of the two; in the older grades, much of the student's work is of his own choosing.
• No matter how individualized a program is, students do not accomplish all of their work alone. Seminar, medium- and large-group meetings are a fundamental part of the program. Most educators feel that their students should be presented with a wide range of learning experiences.
• Media play an important role in individualized programs. The teacher cannot directly participate with every student at each moment of the day, but the student can make use of a variety of resources and informational tools.

Planning and Programming: As the institution departs from more traditional approaches, its educational specification becomes more and more important. As will be seen, the issue of individualized learning is one that shapes the architecture of a school and should be faced squarely before the architect begins to draw. Accordingly, the educational spec and the accompanying media plan should answer these questions:
• Which learning situations will be geared to individual rates and capacities? Will they take the form of simple enrichment or remedial work, actual units of independent progress or an entirely nongraded approach?
• What types of student, student teacher or student visitor groupings will accompany individualization? What will be the role of the seminar, the conference, the medium group, the large group?
• What types of resources will the student utilize: books and other hard-copy materials, programmed texts, portable projection or audio equipment, special kits and miniature apparatus, television, dial-access audio or video and computer-assisted instruction?
• What will be the use-patterns for these resources? When will they be used? How often? In what way? By whom?
• Where will these activities take place? In individual spaces? In group spaces? In complete privacy? With access to small-group areas? To resource areas? To teacher areas?

The last group of questions is especially cogent for the architect. As schools move toward individualized learning, the independent study activity begins to replace the medium group as the focal point of the student's learning experiences. This is more than a matter of semantics. In the traditional school, the 25- to 35-student classroom is the basic building block of the school. It is the "home base" with which the student identifies and to

which most learning activities are related. When the student begins to work independently, the individual study station necessarily replaces the classroom (*see* 9, 13, 14, 26, 38, 48, 51, 63 and 76 for general planning).

Schematics: To physically accommodate independent study, the designer should be aware of two important issues:

- The role of independent study in the student's daily life. This includes a determination of physical focal points in the school and of what is needed to support these, followed by appropriate translation into design.
- Student comfort in the independent study situation. When the student is left alone, he develops a heightened awareness of his surroundings; the architect must design accordingly.

Study rooms, cubicles and carrels may be located in special rooms, in pockets of space or scattered throughout the school plant. Broadly speaking, there are four types of independent study stations:

- The traditional "dry" station with no electrical outlet and no provision for any electronic resources.
- The "wet" carrel containing either a built-in piece of equipment (projector, tape recorder, etc.) or a convenience outlet.
- The "wet" carrel connected to a schoolwide audio, audio-video or computer distribution network. (This includes stations for dial-access and computer-assisted instruction. Sometimes a number of these stations are packaged together into a self-contained distribution network). For further details, see the following section, "Media in Special-Purpose Areas."
- Special-purpose carrels that may also provide air, gas, water and waste service.

The first two types of stations present few problems during schematics. If, however, students will be asked to bring resources and equipment to these stations, the architect must consider where the equipment will be stored, how the student will check it out for use and bring it to the station.

The third type of station poses a particular problem during schematics. If the station is to be wired into a central distribution system, long and complicated wiring runs can be avoided by clustering this type of station and allowing uncomplicated wiring access to origination spaces.

Design Development and Construction Documents: Once the broad decisions have been made, the designer can begin to create study environments and/or select them from commercial literature. Cubicles or spaces may be built into the building, or self-contained study stations or carrels may be utilized. The latter choice is probably the most frequent.

Carrels can be provided in all shapes, sizes and dispositions. They may be assigned to one student or they may be shared; they may be dedicated to a particular learning activity (dial-access of missed lectures, for example) or they may accommodate a number of divergent functions; they may be purchased or "homemade." Most of these decisions evolve from the educational spec and the media plan. Once they are made, there are a number of studies and design proposals for carrel types that may be used by the architect. Ralph E. Ellsworth and Hobart D. Wagener have co-authored a book, *The School Library: Facilities for Independent Study in the Secondary School* (20), in which they discuss the library as a teaching laboratory and the kinds of carrels that may be included. Several prototype carrel designs are presented on pages 53-69 and carrel arrangements are illustrated. A bibliography is included. *Study Carrels: Designs for Independent Study Space* (7) explores carrel design criteria and presents 11 prototype solutions.

Figure 6

PORTABLE MEDIA AND THEIR USES

Media	Use patterns	Broad implications and sources of information
Portable projectors and teaching machines	Student brings both the material to be used and the device for showing it with him to the station.	Most portable equipment is lightweight, relatively noiseless and does not require reductions in lighting level. Equipment range can be seen in NAVA Directory; manufacturer material should be consulted. Station must be designed to accommodate both the equipment and work space while using the equipment. Relation of use spaces and storage spaces (where students pick up materials and equipment) is important.
Portable audio equipment	Student brings both the material to be used and the device for listening (or recording) with him.	Same requirements as above, unless users will be speaking (recording). In this case, acoustical isolation becomes a real factor.
Kits and miniaturized apparatus for science, electronics, etc.	Student brings kits of material with him. Sets up and operates apparatus as required.	Depends on kinds of apparatus used. Most place no demand on station (except possibly a convenience outlet). Science kits may require water and waste (miniature laboratory). Consult manufacturer materials.
Desktop computers	Machines usually already at the station. Student brings work or programming problems to the machine.	Adequate work area (in addition to the space consumed by the machine) is important. Acoustical isolation may be necessary.

An understanding of planned-use patterns coupled with a familiarity with the media to be used will provide the architect with a good base for designing facilities for independent study. Figures 6 and 7 offer some general direction by examining the two broad categories of media use for independent study: built-in or portable equipment.

Media in Special-Purpose Areas

In addition to areas for general learning activities for groups and individuals, schools may use a wide range of media in special-purpose learning situations. These include development of language, speech and other audio skills such as transcription; taping and replay of practice teaching, dramatic events and other evaluative efforts (several seminaries use video tapes to evaluate "practice preaching"); taping and replaying of athletic events; magnification of events and processes for science and vocational courses; development of manual skills, such as use of office machines; and observation and evaluation of students and teachers in a variety of situations.

In short, educators are finding that almost any kind of learning activity may have a "media potential." Where this is recognized and incorporated into the media plan, it follows that many kinds of spaces also may have media potential. This notion of media potential gives added importance to the media plan.

Because the roles of media are so diverse, it is hard to uncover specific planning and design guidance for special-purpose spaces. We therefore offer here a brief overview of three of the most frequently encountered media-oriented special-purpose learning spaces: audio laboratories, shop and laboratory areas and areas used for observation and evaluation.

Audio Laboratories: Traditionally referred to as the "language lab" and often oriented to the development of language skills, the audio lab is also used for instruction in speech, dramatics, transcription and other verbally related skills. In addition, the audio lab can be used to dispense audio instruction in any discipline.

Audio labs come in a variety of shapes and sizes, with any number of special features. They may be audio-passive (listen only), audio-active (listen and respond) or audio-comparative (listen, respond and compare responses). Most labs contain a series of student stations and one or more program sources. More elaborate setups also include a variety of instructor-operated controls.

The selection of the lab type should be made by the educator because different types of labs meet different educational objectives. The media plan should note the desired lab type:

- A wired installation with student stations, program sources and possibly an instructor console wired together. The program sources may be at the console, at the student station or in a central repository.
- A wireless installation where audio information is carried on an audio loop and picked up by wireless headphones (sometimes used for instruction of children with hearing problems).
- A wireless installation where portable audio equipment is placed in student stations, or where students check out equipment and tapes from a central storage place.

Another issue which the media plan should clarify is the relationship between the audio lab and other audio-visual components. If the school will be using television, distributed audio or dial-access systems, the media plan should note if the lab will be tied into the network. Even though this is an educational or administrative decision, it may have architectural implications.

A significant consideration during planning and programming of audio labs is the need for adjunct or supporting areas. Where labs have instructor consoles, there are sometimes advantages to placing them in a separate control room. The questions of who makes the master tapes, where they are made and stored and where other lab materials are stored should be answered in the media plan and the necessary adjunct spaces included in the program.

Suggested layouts of packaged labs can be obtained from manufacturers; these layouts usually place few restrictions on schematic design. The literature, however, emphasizes the audio aspects of the lab. If the educator wishes to use the lab situation for lectures and visual presentations, the design criteria for medium- and large-group rooms should be superimposed on the manufacturer's requirements. The architect, placing the lab stations in an OVA, may find it necessary to place the stations on stepped floors or to add a secondary lighting level, as discussed previously. *Educational Facilities with News Media* (24) presents a case study solution for such a lecture-laboratory (*see* also 8, 12, 25, 32 and 52).

Shop and Lab Areas: Educational technology, particularly television and video tape recorders, is used to magnify demonstrations and experiments so that a large number of students may watch, to allow viewers to observe dangerous situations or to observe situations where their presence may be disturbing and for recording material for later reuse. The activities originate from areas as diverse as chemistry labs, auto mechanics shops, home economics labs, data processing centers, office practice areas, gymnasiums and auditoriums.

The primary medium is usually television. An internal system which picks up and transmits images from one space may be used, or several spaces may be part of a larger origination-distribution system.

In any case, the architect should understand from the media plan the possible roles of media; establish locations for cameras, recorders and receivers, keeping in mind the tenets of good viewing; and see that the proper electrical components are included in the construction documents.

Areas for Observation and Evaluation: Activities observed may run the gamut from athletic and dramatic presentations to speech classes, practice teaching and observation of students or teacher behavior. The latter is a common occurrence in schools for children with physical or learning disabilities.

The media plan should provide information about who or what will be observed, which media will be used, whether the observers are to be concealed or remote and how and where the recorded information will be played back and evaluated.

One issue in programming is whether special space is required for observers and observation equipment. If a camera (with no recorder or with a remote recorder) is all that is required, can it be set up in the same room or will it require an adjacent space? If an adjacent space is necessary, must it accommodate people as well as equipment? How many? Will they require separate access? Will they talk, discuss, take notes? Will there be a technician to see that the scene is recorded, or will others monitor the observation, perhaps discussing the events among themselves?

Depending on the mode of observation, design may hinge on either of two points: how best to conceal the camera or how best to provide the necessary adjunct area. The publication *Facilities for Education in VA Hospitals* (25) presents schematic design solutions to the latter problem.

The architect must be careful to include in the construction documents the service to camera, recorder and monitor locations,

Figure 7

BUILT-IN MEDIA AND THEIR USES

Media type	Use patterns	Broad implications and sources of information
Projection equipment	Student will most likely bring material to be viewed with him.	Location of equipment (to provide good viewing, gain ample work surfaces, prevent glare, etc.) is most important since users will not have the opportunity to move it.
Audio equipment	Student will most likely bring material to be listened to (or recorded on) with him. Audio may, however, be distributed via an audio loop, broadcast band, etc.	Acoustical isolation becomes important if user is to speak and record.
Television equipment	May simply be a TV receiver (for receiving broadcast instruction), or may also include a video tape recorder for playback of video materials brought by the student.	Location of equipment and display surfaces are most important unless there is some flexibility in changing them. Glare a particularly significant problem. TV distribution systems may impose some restrictions of location, clustering, etc.
Dial-access audio or audio-video	Student comes to the station and calls up a ready-stored audio or video tape program by dialing a pre-established number. Headphones used for audio and a TV receiver for video.	Same general problems in designing the study station for audio and TV equipment. Additional space will be required for central location of tape decks, materials storage and switching equipment. Distribution system may impose some restrictions on location, clustering, etc.
Computer input/output equipment	Student may use a printer typewriter or a CRT typewriter device for developing, debugging and running computer programs.	Computer terminal equipment does not require the precisely designed environment that the central processing equipment does, but manufacturer recommendations should be studied. Acoustics will be a problem with some terminal hardware.

as well as access to the schoolwide TV origination-distribution system, if there is one. If the activity being observed is greatly detailed, then lighting should be given special consideration so viewers can see the details clearly. The principles of studio lighting may be applicable here.

Media in Flexible and Open-Plan Spaces

Emphasis on educational technology and a desire for flexible or open planning are far from incompatible objectives. In fact, they often spring from a common educational objective to provide learners with maximum possibilities. Because media do have strong implications for design, the media plan, as always, should spell out the when, the what, the where and the how of media use.

When media are to be used in flexible or open-plan spaces, the best design approach is to make sure that the opportunity for setting up projection apparatus or using self-contained cabinets is not designed out by changes in floor levels or other architectural features. As suggested for other space types, it is best to lay out typical media setups during schematic design.

Media in flexible or loft-type spaces present some thorny, but hardly insoluble, problems:

- Lighting: If the selected projection media cannot be used in a fully lighted space, it will be necessary to include a lighting system that can be adjusted to relocated partitions (in the flexible plan) or that can be controlled in modular units (in the open plan). In the latter case, however, it will rarely be possible to provide a completely darkened area.
- Acoustics: This is, of course, a general problem in open planning. The greatest problem with media use is in distributed audio. Ceiling canister speakers that direct the sound downward may be used to partially contain sound in one area (carpet the floor where this is done). For smaller groups, headsets or several low-volume speakers can be used; these solutions greatly multiply the number of cords, however.
- Storage: There should be some place to store equipment and materials when not in use. Some storage should be out in the open space area, in cabinets, for example, for handy access.
- Power: Since most media require electricity, 120V, AC power should be available everywhere in an open plan.

Resource Facilities

Probably no educational facility is being innovated more than the good old library, now called variously the instructional materials center, instructional resource center, perception core and a hundred other names.

Several developments in education are focusing attention on the resource center. There are new kinds of resources and the ever-multiplying store of information and the new technology being developed to provide access to it; there is individualized learning, with its greater dependence on resources, and the growing emphasis on the library as *use* rather than *storage* space.

Perhaps more than any other educational space, resource facilities reflect the educational philosophy behind them. The library may be a single room or may be dispersed throughout the school. It may orient its services only to the school or may serve the community as well. While these decisions are made by the educator, they do have architectural implications. The architect should, therefore, turn to the media plan for answers to the following kinds of questions before he begins to design:

- What kinds of media will be involved? Built-in or portable?
- Who will use them and how will they obtain them? Are provisions needed for small-group viewing and listening?
- Which media will be restored in the center?
- Will resources be produced or maintained in the center?

Probably the most difficult part of integrating the new communications technology into the resource center is the electrical requirement: outlets, power, special voltages and distribution systems. The media manufacturer's representative is a good source for this information.

Where educators anticipate the development of media distribution systems, initial provision for the necessary conduit should be considered. If an extensive system is planned, cable trays or wiring baskets should be incorporated into the initial solution, since they are difficult to add later.

The impact of computerized information retrieval systems on resource center planning appears to be taking two forms: storage and retrieval of bits and pieces of information and reduction of entire resources (books, catalogs and other printed material) to microforms — microfilm with attendant microfiche equipment, aperture cards, etc.). At this time, it appears that computerized storage and retrieval of *complete* resources will neither be feasible nor entirely desirable. For this reason, we can expect that future educational resources will probably be dealing as much with resources as they will with computerized storage of information about those resources. It is safe to say, however, that many of those resources will be in miniaturized form.

The greatest potential of library automation stems from the separation of the user from the actual collection. The user will be able to have access to automated card catalogs and indices from points outside of the collection; this will not only permit decentralization, but it will affect the circulation within the library. Placing more and more archival information on microforms will, of course, also decrease the amount of storage space needed (*see* publications 27, 33, 35, 45, 46 and 60).

Media Support Facilities

To use the new technology most effectively, a school must provide also certain kinds of support activities. Depending on its educational program, a school may need to provide any or all of these activities:

- production of graphic materials, overhead transparencies, slides and photographs
- film processing
- still photography
- motion picture photography and production
- relaying or taping off-the-air radio or television broadcasts
- origination of radio or television programming (from studio, remote location, recorder)
- taping of various activities and events
- distribution of radio and television throughout the school
- dial-access of audio, or audio-video, information
- overall media administration and coordination
- professional consultation services
- in-service media education
- preview or audition of materials and equipment by teachers
- equipment maintenance and repair
- central storage of equipment and materials
- central computer.

Media support can be accomplished in many ways. Some schools rely on a centralized approach where talent and materials are closely grouped for efficient interaction. Others prefer to decentralize their support activities, placing them out where the teachers and students are. In any case, educators who rely heavily on media are finding that they must develop systematic support. It often starts with the hiring of a media coordinator and may grow into an elaborate combination of professional and technical staffs, with a wide variety of production, origination and distribution capabilities.

There may be also several *levels* of support:

- a production unit, within the teacher's department, for overhead transparencies, drawings and other simple graphics
- an equipment repository for several departments
- a schoolwide center for the production of more elaborate graphics as well as some photographic and slide work (this center may include a professional A-V staff)
- a districtwide television network with origination and taping facilities in a center that serves several schools
- a regional media center for the collection and distribution of materials, special equipment and literature relating to A-V use (may provide professional consultants and conduct in-service training in media)
- a superregional media research, development and evaluation center.

Because support patterns are so varied, it is difficult to find reference materials devoted to their planning and design. There is guidance available for planning some of the more specific space types, such as studios, TV origination areas and control rooms, but even these are general in scope. After all, there is no ideal studio or control room — these grow out of a client's specific needs. And these spaces cannot be put together into the ideal unit until the support program has been detailed carefully.

For the purposes of our discussion, the many varieties of supportive services can be grouped into several broad categories: photography and graphics production, motion picture production, TV production, dial-access programming, computer operation, A-V operation and maintenance and, finally, administration and coordination.

Photography and Graphics Production: The amount of graphic and photographic materials that is produced "in-house" varies from school to school. Some institutions rely heavily on commercially prepared visuals, charts, displays, models, slides and photographs. Others feel that the convenience of in-house production areas encourages the teacher to develop more useful material. Using the in-house production areas, the teacher can draw, ink and letter large visuals, dry-mount and paste materials,

prepare overhead transparencies and make use of a primary (large character) typewriter.

Some schools prefer to consolidate several in-house production areas into a schoolwide facility that provides some professional help, relieving teachers of some of the production tasks.

Motion Picture Production: Only a few educational institutions get into motion picture production on any real scale. Where they do, they should seek advice and resources in the field of filmmaking; few documents in the educational facilities field devote much attention to it. *Motion Picture Production Facilities of Selected Colleges and Universities,* by Don G. Williams and Luella V. Snyder (70), presents a status report of who was doing what in the early 1960s. Although it deals with programs rather than physical facilities, it could help both educator and architect by supplying leads to other programs and facilities.

Television Production: Because TV is, by nature, a distribution system, it follows that schools using TV will require some system of spaces — spaces for origination, distribution, control and reception. The kind and arrangement of space, however, depends on the scope of TV use envisioned. Some schools limit TV use to a few sets that receive standard commercial or educational station broadcasts. Others use internal systems, with a camera that transmits directly to receiver or recorder. Still others plan, produce, distribute and record their own programs. Required spaces may include studios, control areas, set production areas, dressing rooms, staff offices, maintenance areas and storage for equipment and video tape.

The media plan should give specific answers to the following kinds of questions:

- Where will programs originate: off the air, live from studio, live from remote locations, from prerecorded tapes?
- How sophisticated will the central engineering and control system be? How complicated?
- Is expansion predicted?
- If the school will originate its own material, what support will be required: technical help, graphics, professional consultation?

The design of television spaces is an exacting science. Problems of viewing, acoustics, lighting, power cabling, access, climate, to suggest just a few, require that the designer approach his work with extreme care. A number of television and lighting manufacturers publish guidance material on layouts of studios and technical areas. There are also some general reference sources that can provide a starting point; but once he reaches the design stage, the architect should seek competent advice.

Another concern of the architect designing the TV facility is the need for flexibility: how best to design a building that will permit a truly flexible arrangement of cabling, to allow new origination and distribution points in the future? This is a complex issue and one that does not appear to be handled well in most reference sources. Most consultants today do not recommend the "empty conduit" approach if the conduit is firmly fixed in place — as it usually is. A method that is finding more acceptance is that of providing trays or wiring baskets in major circulation or chase areas; when new sets or cameras are added, it becomes merely a matter of going through a wall (perhaps through a predesigned sleeve) and running any necessary surface cable. In any event, a qualified TV professional should be consulted if the architect has not faced this problem before.

Dial-Access Programming: The central support area for dial-access systems accommodates the program sources (audio tape decks and/or video tape decks), the processing unit that accepts requests for programs and the switching apparatus that sends programs to the requesting stations. Because the installation of such a system represents a large-scale commitment, most educators select manufacturer and system early in the planning process. Once the general specifications for the system are set (number of stations, program sources, etc.), the manufacturer can quickly provide an equipment layout as well as environmental requirements for the central support area.

The primary input to a dial-access system is the tape deck. More elaborate systems may include film, slide and filmstrip chains for converting these media to television. They may include also (or at least have access to) audio and video recording facilities for creating new programs on tape. Dial-access systems require support activities by a technician, so he must be accommodated, too.

Because dial-access is a distribution system, it presents heavy demands for cabling which should be investigated early in design because they may suggest more economical ways of arranging learning spaces. For additional information on dial-access systems, see 3, 14 and 76.

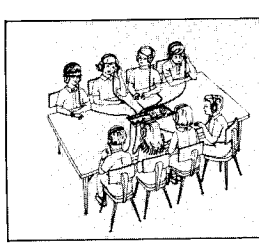
Because there are few systems installed, there is probably no substitute for personal contact with those who are operating them. One of the more ambitious programs is in the West Hartford (Conn.) Public School. Under the leadership of Dr. Ira Singer, West Hartford developed a system in renovated space that has been incorporated into newly built space.

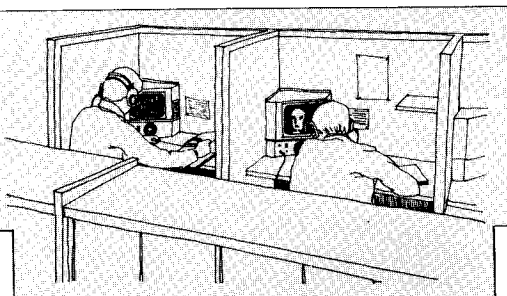
Computer Operation: As schools develop systems of computer-assisted instruction and allow students use of computers for various learning tasks, educators are beginning to consider the need for remote terminals throughout the building. Whether these terminals are supported by an in-house computer is, of course, up to the school administration. One approach is to provide the in-house computer and use coaxial cable to connect it to terminals up to 2,000 feet away. A second approach is to time-share a larger computer remote from the school; in this case, a telephone-distribution network is all that is needed. If the computer is provided in-house, then the necessary support areas (administration, programming, dispatching, off-line operations and storage) should not be overlooked.

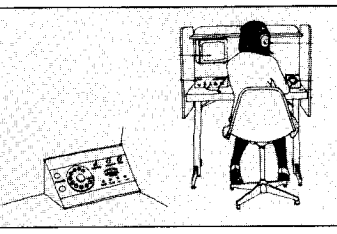
A-V Operation and Maintenance: The number and location of maintenance areas will depend upon the requirements of the media plan. Obviously, where classrooms (particularly large-group rooms) are designed for frequent media use, it may be desirable to locate a technician area within easy reach. Here, the technician can assist in setting up materials, load machines and generally help out when needed in addition to performing everyday maintenance. One common misconception must be pointed out: that these areas can be shared with rear projection regions. This is *never* satisfactory because of lighting and sound conflicts.

Administration and Coordination: The basic problem here is not the planning and design of these spaces but seeing that they are included in the program in the first place. For example, when a school plans to originate its own television programs, the need for studio and control space is evident from the start. And if the school is to produce its own graphic materials, any programmer will be sure to include some production space. What is often neglected is space for administration and general support. Depending on the media plan, space may be required for reception and secretarial services, administration and staff work, consultation with individuals and groups, media preview and audition, visiting lecturer preparation and the reception of materials and equipment.

To make the overall media system work, this kind of space must be planned from the start. There is a limit to what can be accomplished in hallways and converted classrooms! □







Designing for Educational Technology

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Mel Gooch received a measure of fame when he dared battle city hall. He wrote about his experience in a letter to the *Los Angeles Times*. It received front page coverage. As Gooch reports, "The aftermath was more interesting than the math itself." In addition to receiving many letters and telephone calls, he was invited to appear on three television shows and to give one radio interview. The story was picked up by the Associated Press and went everywhere "except some remote areas in the bottom of the Grand Canyon." His boss, Victor Gruen, FAIA, even read the story in a European paper.

After such heady success as a tongue-in-cheek writer, Gooch reports that he has learned the following lessons: "1) Everyone in southern California reads the *Los Angeles Times*, which should provide comfort to the Chandler family since every nickel helps. 2) The 'David and Goliath' syndrome is as much alive today as it always was. The little guy who contends against the big guy — and wins — is ever the hero. 3) There is reaffirmation for me that government (in Los Angeles anyway) is constructed in such a way that a small property owner with a small complaint can, by virtue of his right as a citizen, appear before the highest authority in one of the largest cities on earth and be heard. If his cause is just, there is good chance he will be given satisfaction. My store of Molotov cocktails now repose on the shelf in the garage, defused, until that right has been taken from us."

In case you live in the bottom of the Grand Canyon, here is Gooch's letter to the *Times*.

How to Cement Relations with City Hall by Mel Gooch, AIA

My name is Mel Gooch. I live in Woodland Hills, commute every day to my office, cut the grass on Saturdays and vote the Democratic ticket whenever possible. No one in Woodland Hills ever protests anything. No reason to. Until recently . . .

That's all changed now. I have protested. I have protested to the City of Los Angeles, one of the great cities of the world, and what's more, I won.

Neighbors now speak to me — as far away as three or four houses up the block. They talk of the "Gooch Resolution" and how it will affect people's lives for generations to come. The story is more fascinating each time I tell it.

About eight or nine years ago, the telephone company installed a trunk conduit in the parkway along my side yard. A small section of the sidewalk was cracked and eventually fell away. It measured about 5 square feet.

Some months ago, I received notice from the Department of Public Works that the broken sidewalk needed repair. Not 5 square feet but 50 square feet. And I was given two choices: A) repair it myself, to city specifications, or B) the department would make the repair and I would be charged for the expense.

Old-fashioned arithmetic compelled me to accept alternate B. I didn't agree that modern technology had progressed to the point where it was necessary to remove 45 square feet of perfectly sound concrete in order to repair five, but I still couldn't beat the arithmetic. How much could it amount to? The going rate is 50 cents per foot, maybe 60 cents, for a total of $25 or $30. I can drop that much taking time off to arrange a permit.

In due time, the crew arrived. They chopped out the 50 square feet, the forms and . . .

That's when it all started. They poured the fresh cement on the afternoon of October 31, 1969! Halloween!

The combination of hundreds of mischievous goblins and 50 square feet of fresh cement produced the inevitable result. By 10 p.m. the slab was a shambles. I spent the next two hours with wire brushes and cold chisels attempting to scratch out names, epithets, footprints, tic-tac-toe games and assorted passages from the Book of Isaiah.

And then I got the bill. $90! Which works out at a whopping $1.80 per foot. Or, if one considers the original 5 square feet which really needed repairing — I'd rather not. The bill also stated that if I wished to contest anything I could attend a hearing at room such-and-such, Los Angeles City Hall.

Our family council voted 7-0 that I should attend the hearing no matter what the cost in lost work time. An important principle was at stake and, it is our right and privilege to protest what we consider to be a poor product at an outrageous price.

A lady met me at the door of room such-and-such and discussed my case with me. It would do me little good, she explained, to appear at the hearing for this is a routine practice. The department's costs are established, no changes are ever granted and, after all, it was only a matter of $90.

But to back down now was impossible. I was delegated by six others—my wife and five children—and I had only one vote.

It was only then that I found out that room such-and-such was the Los Angeles City Council chambers, and I would have to speak to the council itself: to all those famous people I have heard so much about.

My turn finally came, and I stood before that august assemblage. I told my story just as it had happened. When I mentioned Halloween, I thought those august gentlemen would fall from their chairs. And the audience laughed even louder.

When it was over, Councilman Bradley stated that he was in full sympathy with my cause. He proposed that hereafter the Department of Public Works cease all sidewalk repairs on all October 31sts. It was immediately voted upon — and it passed!

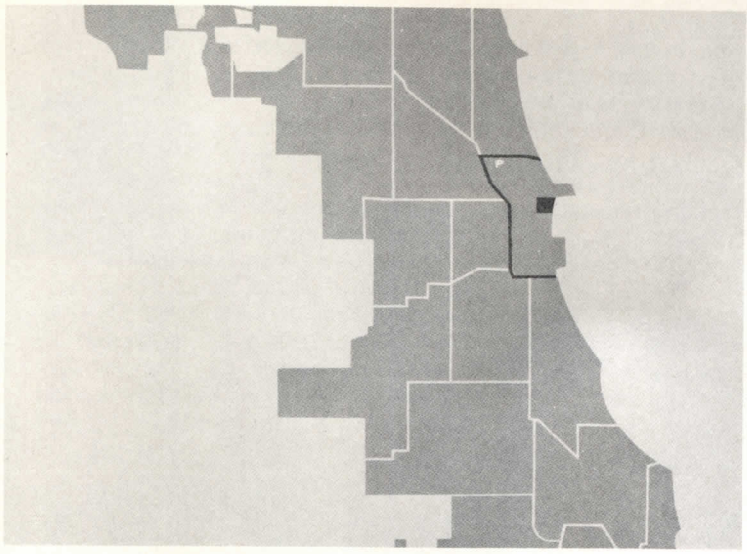
I was told that the department would replace the damaged sidewalk, but I would still be required to pay the $90.

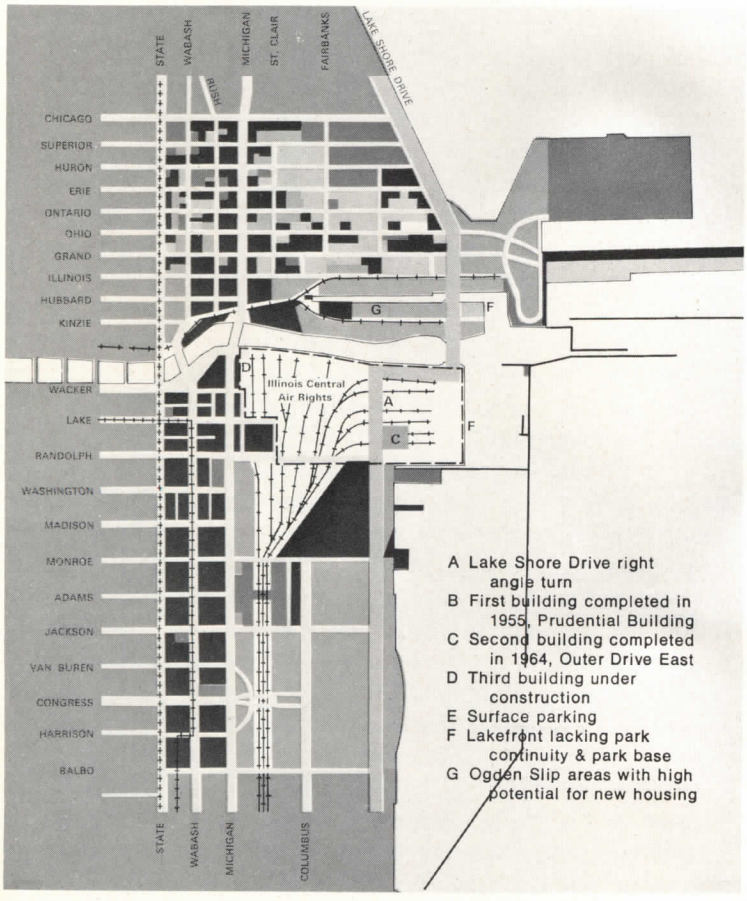
So what's $90? I had spoken to the City Council of Los Angeles, one of the great cities of the world. I had exercised a citizen's privilege of stating my views before the governing authorities of the land. I had witnessed the lawmaking process and had seen a real resolution passed on my account. It was an exhilarating experience, one that every citizen should have. At home the vote was 7-0 that I had done well indeed. It was worth $90.

A week or so later, a kindly gentleman from the Department of Public Works called my wife to ask if Mr. Gooch would consider an adjustment in price, rather than replacement of the slab. A quick vote was taken — 7-0 in favor. The man said he would call back in a few days and tell us the reduced price.

He called. The bookkeeping procedure at the department is too complicated, he said. The system is computerized and somehow associated with the property tax statements and there is no physical way my $90 bill can be reduced — except to strike it completely from the books and make no charge at all.

Would Mr. Gooch consider just forgetting the whole thing and try to get along with the sidewalk as is? The vote: 7-0 in favor. The sidewalk is not really that bad. So you see, it pays to be a good citizen. □





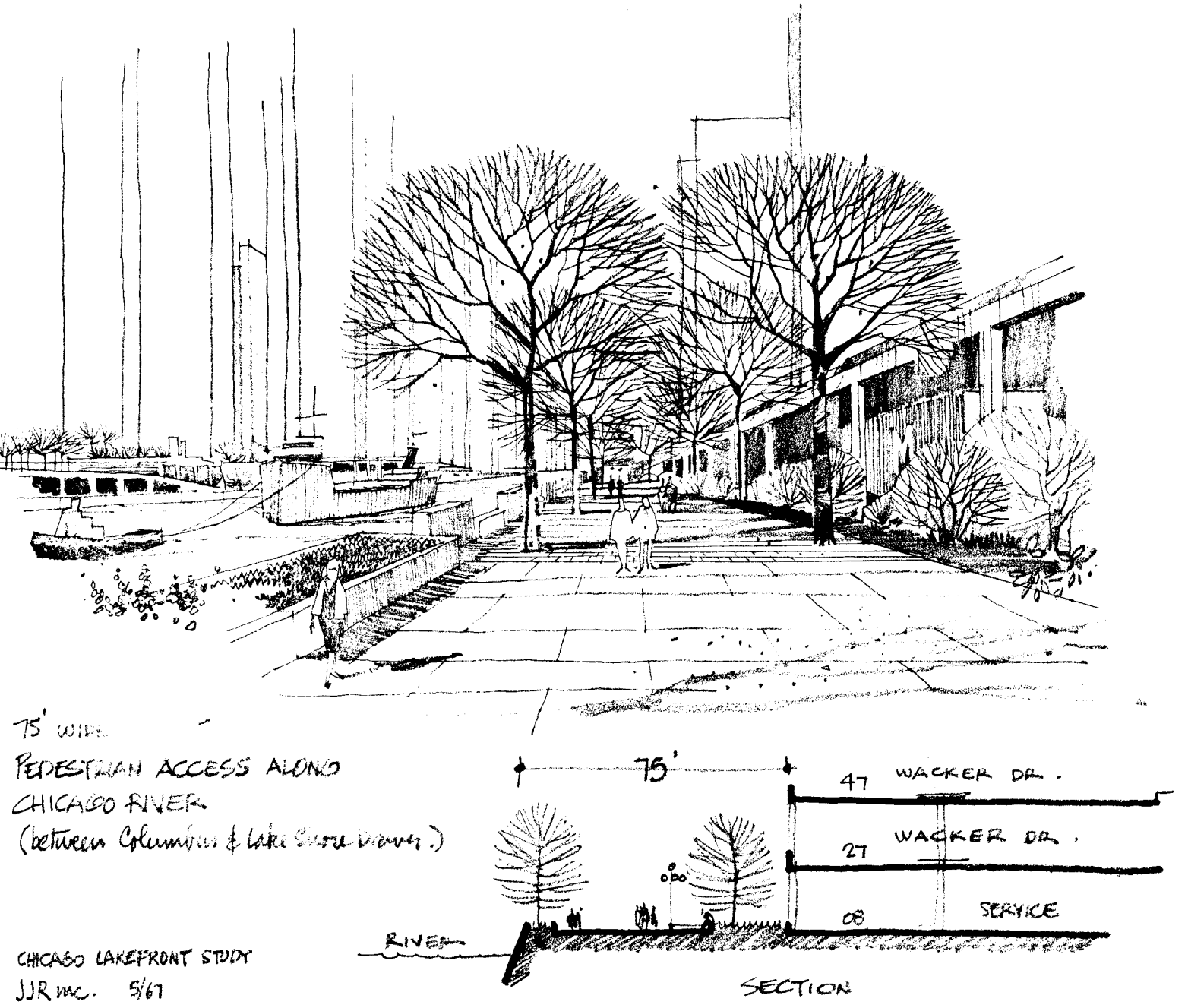
Is a Graphic Master Plan Really Necessary?

by JOHN KEWELL, AIA

Here the intriguing question is raised as to whether the definitive master plan can be replaced by more flexible guidelines of quality that are enforced by ordinance. The author, a member of the AIA Committee on Design, shares an idea which was generated following a meeting in Chicago when attention was directed to the so-called air rights over the 50-acre Illinois Central sorting yards. The final report of the committee will be reviewed this month and will be ready for publication shortly thereafter.

The question of whether a master plan is an obsolete concept was raised by the presentations made at the meeting of The American Institute of Architects Committee on Design, producing some food for thought. (Although conclusions of the committee must be submitted to the board for approval before they are published, if at all, as an official position of the Institute, this is in no sense a minority report but simply an idea stimulated by some nonsecret information without pretext at anything as lofty as AIA policy.)

For the third year now, the committee, among its other work, examined a design issue of national significance. In 1968, it was Copley Square in Boston; in 1969, the 64-story thing proposed on top of Grand Central Station in New York. The committee's chairman in 1969 was Jean Paul Carlihan, AIA, who made such a magnificent presentation to the New York Landmarks Commission that its president credited the Institute with having made the major single contribution which enabled the commission to stand up to the tremendous pressures it faced and decline permission to build "the thing." In 1970, it's the development of what is still referred to as the "air rights" over the 50-acre Illinois Central sorting yards on a site which is the heart of Chicago: a rectangle measuring six blocks from the lakefront on the east to Michigan Avenue on the west, and from the Chicago River on the north to Randolph Street on the south.



This site is just north and east of the Loop, which has the same problems as downtown Los Angeles and for the same reasons, and just south, across the river, from the part of Michigan Avenue onto which the elegant stores have moved in the past three decades since I did my graduate work in Chicago under Moholy-Nagy. An appropriate development of this site could create, in addition to a fine environment for working and living on the site, not only cohesion between the parts of Chicago north and south of the river, but also an influence on the trend of major business development. As such an opportunity is rare and the scale is impressive, a good solution could set a pattern. The issue, therefore, was felt to be of national importance.

The chairman of the Committee on Design, Ralph P. Youngren, AIA, of Chicago, had really done his homework. He had distributed copies of a handsome and detailed booklet describing the proposed project to his committee a week before the meeting. He had provided a meeting room on the 27th floor of a building adjoining and overlooking the site. He had arranged for presentations by everybody who is anybody, and by nightfall we had received more information about the air rights project than most people in Chicago.

Mr. Kewell is the principal in the Los Angeles architectural/engineering firm of John Kewell Associates.

The stories unfolded by knowledgeable men piece together and condense to this: The air rights project was conceived some years ago for the space over the Illinois Central sorting yards. The rails are now mostly gone and the projects under actual development stand on fee simple; so "air rights" is becoming a misnomer.

Much study culminated in the booklet mentioned. Entitled "Illinois Central Air Rights Development: Guidelines for Development of the Randolph Terminal Properties," it was prepared for the Department of Development and Planning, City of Chicago. It contains guidelines, the core of which is a list of detailed requirements for "Quality of Development." The guidelines envision about 9 million square feet of office space, 1.25 million of retail area and 19.5 million square feet of housing for 35,000 residents with a "maximum number for families with children." Detailed in the booklet are 12 commendable items, such as "building placement and platform development must relate to and complement existing structures" and "landscape elements . . . must provide a sense of unity."

The guidelines also provide for a three-level podium: service on the bottom, through-traffic street tie-in on the intermediate and local traffic on the upper level. A pedestrian walkway, hung below the upper level, "must physically link the Lakefront Park, Michigan Avenue, the Chicago River and Grant Park (to the

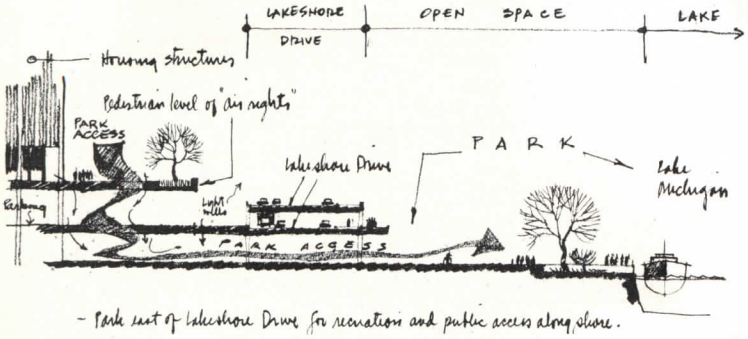
south) for direct and easy pedestrian access." The rapid transit system is to be extended to a station at bottom podium level, linked to the pedestrian walkway.

Under the "Standards of Chicago's Comprehensive Plan," 140 acres of park are required for the 35,000 residents. Six of these acres are in a park in the middle of the hoped-for residential area and most of the rest on a fill in the lake, to be made.

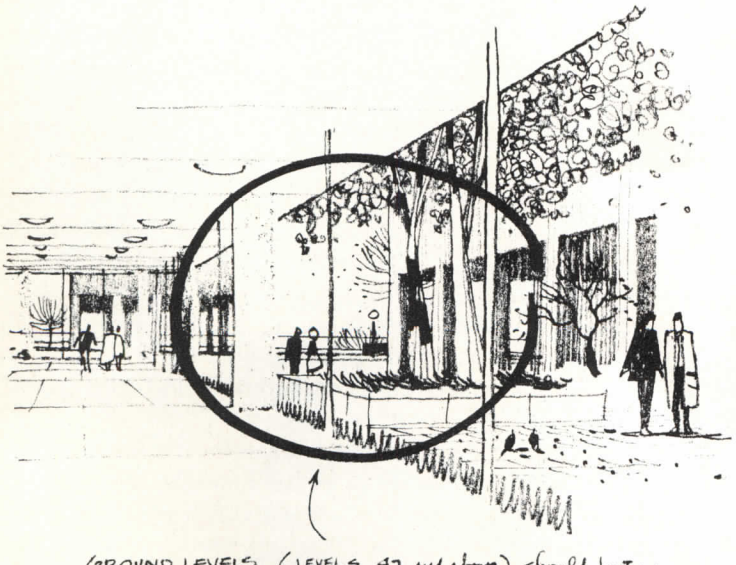
So far, so good. A noble vision of civilized quality environment. If you are troubled by the density, think of the $200 per square foot — yes, foot — of land.

Critics are doubtful that the quality requirements are being met, especially in such areas as the view of the development presented by three-level roadways facing north, south and east, or in the preservation of view from all structures. And the provision of the park-on-fill is uncertain. The pedestrian walkway is required but not located. It is to be provided to fit the project as it develops and will hopefully pass enough sunken plazas so as not to be a tunnel. The street pattern is approximate, building sites are not determined and the zoning is "predominantly residential" on the lake side. The only thing that is really certain is the three-level podium and the six-acre park.

- Areas east of Lake Shore Drive to be predominantly open space/recreation
- Automobile - glimpses of lake 10-30 seconds in time length each minute's drive.
- Undulating median - w/ park quality at intervals - enhances roadway scene.



- Park east of Lakeshore Drive for recreation and public access along shore.



GROUND LEVELS (LEVELS 47 and above) should feature some open views to Lake Michigan without obstruction.

The extent to which the quality requirements will be enforced is the $64 question because there is, in short, no "master plan and beautiful birdseye," and there is not likely to be any. The architects of the developers have, more or less on their own, made some studies which look like the kind of master plan that is so pretty in the magazines. These studies are, however, quite unofficial, and the couple we saw had been "superseded."

Our past leads our first reaction to be: There ought to be a graphic master plan. An unkindly critic could say that whenever a customer shows up, they cut off a hunk for him. Maybe so. But implications of callousness do not fit this picture. All parties involved are making a genuine demonstrated effort toward the good. The city went to much trouble to develop the guidelines, and the developers must be commended for accepting them. The architects are doing their best to meet the "quality" characteristics of the guidelines which require them to try to anticipate surrounding development. But they patiently explained that when a client for whom you are doing a couple of million-square-foot buildings will not commit himself to a total site master plan which defines streets and building sites, you can't ram one down his throat.

However, as 70 percent of the funds for the podium and work other than the actual buildings will come from various levels of government, this leverage is expected to assist in obtaining the desired quality; for example, making the pedestrian walkway what the guidelines intend it to be. Even if some of the criticism of this particular case may prove valid, such as the claim that letting the first three buildings use up half the office allowance will make it impossible to abide by the allowance, the question is inescapable whether the type of approach to this project, rather than lacking something, is not, instead, actually a step in the right direction.

After all, the realty and construction industries have tacitly admitted for some time that the beautiful birdseyes may be needed to sell major developments, but they are actually eyewash. Ten or 20 years later, when it is finally completed, no development resembles the birdseye.

The semirigidity of what we are used to seeing in a graphic master plan with definite streets and "possible" buildings is a crutch. It is a convenient system of almost physically existing fences which, if followed, will hopefully insure the quality originally intended. It is mighty tough, however, for the business community to commit itself to such fences a decade in advance. Perhaps the kind of master plan which is more realistic as the scale becomes ever larger is, instead, a set of guidelines of quality spelled out and really enforced by ordinance. And the problem of achieving continuing quality without the crutch of the semirigid master plan would be the architect's coming challenge.

If the definitive master plan is compared to the "how-to-do-it" type of specifications, then master planning by quality requirements describing what the accomplishment must be like compares to the "performance" type specifications. To replace the definitive master plan with standards of quality would call for a very high level of design and great capability on the part of the architect to create a good environment, even while mixing land uses and modifying circulation patterns to fit the needs of the situation as the future presents it. Life may get tougher — but even more interesting! □

Here Is Masterspec

by JOHN H. SCHRUBEN, AIA

A year has passed since The American Institute of Architects established Production Systems for Architects and Engineers (PSAE). Here is a review of what has been accomplished with its first production system, MASTERSPEC, and an evaluation of the services PSAE offers architectural/engineering firms.

The purpose of PSAE is to provide production services, with the advantage of automation and on a national level, to A/E firms. Higher quality systems can be developed by this method than any individual office could possibly prepare and maintain. Furthermore, cost advantages can also be achieved; these are seen to be significant for the individual office which might otherwise attempt to develop and operate its own systems of similar nature.

PSAE's first system, MASTERSPEC, has been funded by the Institute. The area of specifications was chosen, after careful consideration, as the one of greatest need. Also, this area was recognized as the best basis from which other coordinated systems could be developed. Chicago was chosen as the base for operations because it offered technical capability and expediency. A staff of specifiers with experience in automation of specifications was engaged to launch the system; preparation has been underway since August 1969.

CLM/Systems, Inc., computer consultants with specification automation experience, was engaged to provide the computer program. Simplicity and economy of operation have been key goals in the selection of automation techniques.

Following the initial efforts required to design the system, the PSAE staff has concentrated on preparation of masters. The highest priority sections in the principal architectural and structural divisions were developed first (divisions 3 through 10 of the Uniform System). The coverage has now spread to division 2 and will soon include sections in divisions 11 through 14. Next year will find progress in mechanical and electrical sections, divisions 15 and 16.

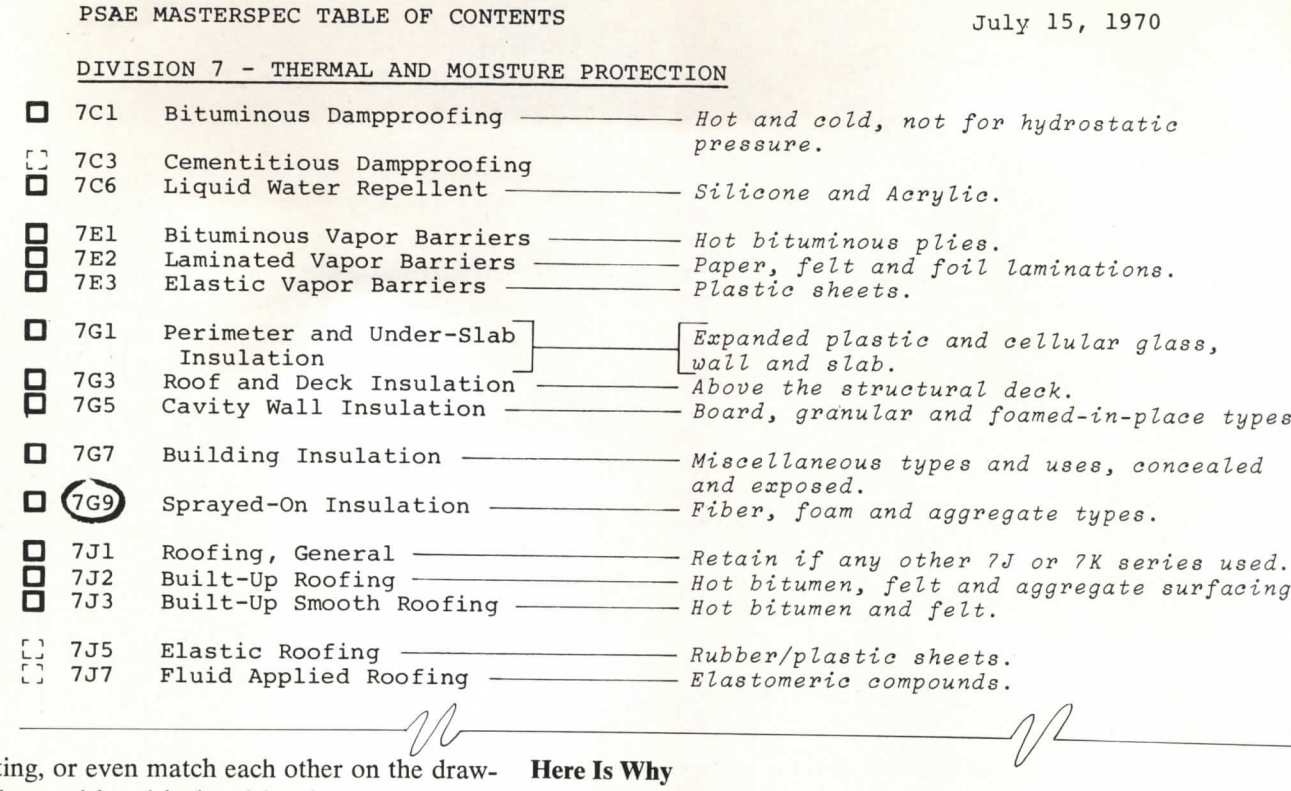
The present coverage for architectural, structural and civil sections is approximately 72 percent for normal projects (left). Although only one-fourth of the total indexed sections is written, it supplies almost three-fourths of the normal book content. This is simply because they are the sections used most frequently on the majority of projects. It should be noted that this percentage of coverage only creeps up slowly as the writing of new sections progresses beyond this point. This is the nature of master specifications; 100 percent coverage is never achieved. There is always the likelihood that a small percentage of the spec book on any major project will need to be manually prepared.

There is no reason to believe that the merger of automated and manually prepared text is in any way objectionable. Even if the formats and type fonts are not exactly the same, the job of conveying the requirements to the construction industry is not hindered. It is unlikely that the notes on the drawings will match

Sections Written	Date Available	Percent Coverage
465	Never	100
300	Jan. '72	95
220	July '71	91
170	Jan. '71	85
105	June '70	72
89	April '70	65
60	Feb. '70	50
0	Aug. '69	0

MASTERSPEC system percent coverage for architectural, structural and civil specifications sections at actual and projected stages of development.

Mr. Schruben is president of Production Systems for Architects and Engineers, Inc. Further information regarding subscription, etc., is available from PSAE, 343 S. Dearborn St., Room 1709, Chicago, Ill. 60604.



PSAE MASTERSPEC TABLE OF CONTENTS July 15, 1970

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

☐	7C1	Bituminous Dampproofing	*Hot and cold, not for hydrostatic pressure.*
☐	7C3	Cementitious Dampproofing	
☐	7C6	Liquid Water Repellent	*Silicone and Acrylic.*
☐	7E1	Bituminous Vapor Barriers	*Hot bituminous plies.*
☐	7E2	Laminated Vapor Barriers	*Paper, felt and foil laminations.*
☐	7E3	Elastic Vapor Barriers	*Plastic sheets.*
☐	7G1	Perimeter and Under-Slab Insulation	*Expanded plastic and cellular glass, wall and slab.*
☐	7G3	Roof and Deck Insulation	*Above the structural deck.*
☐	7G5	Cavity Wall Insulation	*Board, granular and foamed-in-place types*
☐	7G7	Building Insulation	*Miscellaneous types and uses, concealed and exposed.*
☐	7G9	Sprayed-On Insulation	*Fiber, foam and aggregate types.*
☐	7J1	Roofing, General	*Retain if any other 7J or 7K series used.*
☐	7J2	Built-Up Roofing	*Hot bitumen, felt and aggregate surfacing*
☐	7J3	Built-Up Smooth Roofing	*Hot bitumen and felt.*
☐	7J5	Elastic Roofing	*Rubber/plastic sheets.*
☐	7J7	Fluid Applied Roofing	*Elastomeric compounds.*

The Table of Contents of the PSAE system is used as an order form (right). Each section required is marked up by the user (next page, above), who deletes, adds and revises as necessary and forwards it to the nearest data processing center. This in turn sends completed printout back to the user (next page, below).

the specification printing, or even match each other on the drawings. Yet both must be read hand in hand by the same person. Furthermore, very few persons concern themselves with the entire book at one time. Typically, a reader is concerned with only one section or related group of sections at a time.

Here Is How

When an office enters into a yearly subscription agreement with PSAE, it receives a bound set of completed MASTERSPEC sections, or "Reference Catalog," as well as instructions and other information. The fee is nominal, related to office size.

PSAE maintains the master content, which is operational on computers at a number of franchised data processing centers across the country, as well as a stock of up-to-date copies of every operational MASTERSPEC section. The latter are sent to the user for editing as needed; a minimum fee is charged on each project for this paper handling. The Table of Contents of the system (part of which is shown above) is used as the order form for copies of sections. This is the first step in editing the system for a project.

The user marks up each section to match his project requirements, deleting unwanted choices, revising text as necessary and inserting new requirements not contained in the master (across page, above).

After completion of the markup process, including review, this project specification draft is sent to the nearest franchised data processing center. This center codes and keypunches machine readable input, makes the computer run, gets the project specification printout from a high-speed line printer and returns it directly to the user (across page, below). The user pays a fee for this data processing, based on the number of pages printed out for the project.

At the user's office — after inserts have been checked for accuracy — reproduction and distribution proceeds in the normal manner. The project master from the data processing center is a hard copy on white paper (for photo offset, Xerox or similar reproduction). With a build-up in volume of processing, a direct offset paper plate will be offered as an optional form of printout from the computer.

Here Is Why

Of all the major features and goals of the MASTERSPEC system, the most frequently misunderstood — and sometimes criticized — point has been the automation. This is understandable since few offices have had any experience with automation of specifications beyond the automatic typewriter stage. Automation does require a special effort on the part of many users in adjusting office procedures in order to benefit fully from the system. Furthermore, the transition period to MASTERSPEC cannot be instantaneous. To expect this would be like planning a trip to the moon without having experienced outer space.

The most basic advantage for virtually every user results from the speed of converting compiled decisions into a printout of final project specifications. Many of the traditional delay problems are overcome. As an example, it is not necessary in this day and age to tell a client: "Your project will be delayed about two weeks in bidding because we have only three spec typists — and one is sick, another on vacation." Or to say to the typists: "We are going onto a 12-hour day for the next eight days; don't worry about proofreading, we will issue an addendum to correct typographic errors." Or to say to a government agency: "We cannot improve the completion schedule of this project's documents by three weeks since we have another project already committed for completion at that time, and all our spec typists are busy."

The point is, it doesn't make sense to have the complete output of a firm's effort revolve around the productivity of a few spec typists. In most localities, it is unlikely that a large pool of experienced spec typists will be available through an agency, particularly not at a cost better than that of automation. Likewise, it is obvious that there is no cost advantage in maintaining three times the average number of spec typists required for continuous work just to avoid crises at peak load periods. With labor costs of all kinds rising faster than other costs, the outlook for a continuation of manual specification typing is not encouraging.

Automatic typing represents, at best, "half a loaf" of advantages over manual typing. The cost of buying or renting equipment is substantial, particularly if used only for spec typing. Practically no degree of sophistication beyond manual typing is

Protect other surfaces and equipment from being damaged by the application, overspray, fall-out and dusting-off of sprayed-on insulation. Remove excess and spillage promptly.

Apply insulation full thickness over entire substrate as shown. Exercise care to spray material completely into inverted corners, and to build up work to full thickness at projecting corners. Cover substrate in a monolithic blanket of uniform density and texture.

INSERT C RETAIN ABOVE, OR MODIFY AS REQUIRED.

~~Apply expanded plastic insulation by manufacturer's recommended procedures to minimize hazardous conditions in handling the materials, and to avoid excessive dimpling or depressions in the completed surfaces.~~

DELETE ABOVE IF NO PLASTIC.

THE EDITING (MARK-UP) OF THIS SECTION HAS BEEN INTERRUPTED AT THIS POINT TO SHOW THE FOLLOWING EXAMPLE OF A PREPARED INSERT.

SEC. 7G 9

INSERT C

Do not cover electrical box cover plates with insulation. Also, install temporary bolts projecting 4" from threaded inserts to be used for support of adjustable hanging "Clouds" and special light fixtures, which will be installed after installation of sprayed-on insulation.

PERFORMING ARTS CENTER - AJAX UNIV - BKM 3791 7/27/70

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feasible with automatic typewriters. However, the most serious problem is that each office must be equipped with its own master tapes — a very ineffective and unresponsive mode of automation for voluminous material. Even simple routines, such as automatic deletion of notes to the specifier, are difficult to achieve.

The desire to hold back the entire printout of decisions until the last minute, so to speak, can only be realized with experience. With automation, even the complete review process can be concluded, with corrections made, before printout of any portion. This more nearly parallels the drawing process and makes coordination easier.

Although spec writers and typists have performed their tedious tasks admirably in the past, two factors of change have been on collision course for several years. First, with shorter work weeks and different attitudes toward overtime and sweatshop routines, there is less flexibility for adjustment of manpower to schedule requirements. Second, the content of contract documents continues to become more voluminous and intricate. Also, clients have become accustomed to computerized performance for other similar services and cannot help but wonder what's wrong with the architectural profession.

With MASTERSPEC, help is never a problem. Should one processing center have an equipment failure or a backlog of work, a project may be sent to any of several other centers.

Perhaps second to the speed of performance advantages is the basic error-free performance that can be expected from a software/hardware system, as opposed to the cutting/pasting/typing proofreading/correcting routines of traditional processing. The system provides "flags" at locations where the master content has been changed or supplemented to meet project requirements. This permits the specifier to proofread only his unique input, relying on the equipment and system to produce error-free text directly from the master, when unchanged.

Although of less importance, the consistent format of machine printout is worthwhile. It is efficient in paper usage and provides many nominal refinements, such as project name and date on every page, right margin justification and line numbers.

Aside from the project-use advantage of automation, the basic automation is essential for the ease of building and updating the master. In general, offices have not been very successful in maintaining a master without some form of automation. It is needed to ease the process of correcting initial input — which never ends — and of updating this at reasonably frequent intervals. If this isn't done, the contents take on the nature of "canned specs" and soon fall into disuse.

Here Is How Much

The major potential for savings in most offices through the use of MASTERSPEC is not found in a comparison of manual typing costs with data processing costs. Technical labor is the actual source of real economic gain, and a major item is a reduction in the need for conversation between team members. The consensus of offices which use their own systems is that a 50 percent reduction of specification-oriented technical labor is feasible with an "optimum" master specification system. However, no one has yet been able to achieve this margin because an optimum master system has not been made due to the cost.

Here is how the potential for savings on technical labor exists: Let us assume that a medium-sized firm has 10 projects a year, averaging $2 million, that will be processed by MASTERSPEC. These will each generate a fee of $120,000, of which $50,000 is required for all technical labor.

Traditional specification-oriented technical labor would be 5 to 8 percent of $50,000, or $2,500 to $4,000. With MASTERSPEC, it is recognized that the amount of spec-oriented technical labor can be reduced to 2.5 to 3.5 percent, or $1,250 to $1,750. Savings on technical labor would then be $1,250 to $2,250.

MASTERSPEC edited copy plus data processing may cost up to $0.50 per page more than traditional cut-and-paste procedures for writing, typing, proofreading and correcting. The extra cost in this case would be $250, which leaves a net savings per project of $1,000 to $2,000. For the medium sized firm this would amount to $10,000 to $20,000 yearly.

The above savings are related to specifications costs alone but do not account for better overall office efficiency, increased proficiency, improvement of production schedules, decreases in errors and omissions and similar benefits.

Current subscription cost for MASTERSPEC (40 persons) is $350. For the individual firm which wants to develop and maintain its own system at a similar level of operating proficiency, the yearly subscription fee for MASTERSPEC should be compared to an in-house overhead cost of $100,000 to $250,000 per year, depending on the scope of A/E services provided and the range of project types prepared for.

The major economic point of the entire venture forces us to recognize that the average office cannot individually afford to develop and maintain a worthwhile master system. Even the very largest office will have to stop somewhat short of the optimum development in order to break even on investment versus savings. However, through a coalition of hundreds of offices, a system can be developed to the highest feasible level of proficiency so that all users will optimize their savings. The figures available from many offices indicate categories something like this:

- A 15-man office, in order to improve its performance and save something like 20 percent on spec-oriented tech labor (which would amount to approximately $4,000) might spend $5,000 per year to prepare and maintain certain crucial master specification sections (a net loss of $1,000 per year).
- A 150-man office might break even in a similar but expanded endeavor by spending $65,000 yearly on masters to save $65,000 yearly on project spec-oriented tech labor (representing a labor reduction of 35 percent for project specifications).
- A coalition of 100 offices (1,500 tech persons) might be able to spend $250,000 per year on an automated master specification system ($2,500 per office) and reduce each office's project spec-oriented tech labor by 45 percent ($9,000 average per office), totaling $900,000 reduction. This amounts to a net saving of $650,000 ($6,500 average per office).
- The MASTERSPEC system, projected with 1,000 subscribers (15,000 tech persons), will be able to spend $500,000 per year on development and maintenance of the system ($500 per office) to produce a 50 percent reduction in project spec-oriented technical labor ($10,000 average per office) totaling $10 million reduction of costs in the construction industry. This amounts to a net saving of $9,500,000 ($9,500 average per office).

Questions that spring up related to these four examples are: Why should the medium and small offices have to suffer economic losses in order to gain the advantages of an automated master specification system? Why should each large office struggle on alone, just breaking even? Why should numerous coalitions spring up on a nonuniform basis, competing with each other and settling for "half a loaf" of economic gain? Why isn't one uniform master system, sponsored by the profession itself, the logical solution to maximum proficiency, maximum strengthening of the profession and maximum economic gain for all?

In the above figures, for the 15-man office, there is a sub-

stantial difference between spending $5,000 to save $4,000 and spending $500 to save $10,000.

Here Is the Future

In addition to economic savings and the direct improvement of office practices through automation, a number of other substantial advantages can be gained from a national specification system controlled by the profession.

There is an obvious improvement realized in the project specification book when working from a carefully maintained master in lieu of cutting and pasting from an earlier project. The specifier is forced to consider all reasonable choices, including newly available materials and systems. From this base he is certain to make technically superior decisions, give closer attention to construction costs and coordinate the entire range of materials and systems for the project more carefully. He is also equipped to do out-of-town projects far better than possible through any other process.

The national system, through its representation of a large dollar-volume of work, is able to implement the profession's interests vastly better than any single office has been able to by itself. The Institute, without this system, has been limited in its involvement with certain other interests in the construction industry. In particular, national manufacturers and trade associations can now be communicated with directly on an equal basis.

Last summer, the Institute and the Construction Specifications Institute reached an agreement regarding MASTERSPEC. The system will be submitted to CSI for distribution to appropriate existing committees working on the subject for their information, evaluation and comment. These comments will be submitted to PSAE.

The Automated Open End Specification System (COMSPEC) now being prepared by Stanford Research Institute for the CSI Research Foundation will be made available for PSAE review together with CSI staff.

When its program is firmly established, PSAE will consider a composite directorate representing the AIA, CSI, Consulting Engineers Council and other organizations interested in the quality and nationwide uniformity of construction specifications.

Over and above the initial advantages automation offers at present, there are additional long-range ones which will be implemented from time to time. One is the automatic printout of project information such as a listing of required shop drawings, the table of contents for the specification book, a list of all major materials required, a keyword alphabetic index and similar items.

Through the use of new equipment, it may become feasible for individual offices to prepare their own machine-readable input. This would enable them to maintain their own unique additions or revisions to the universal PSAE master.

Of utmost importance is that automation provides a basic means of integrating the master specifying system with other master production systems to be developed by AIA/PSAE. These are projected to include construction cost estimating, automated implementation of standard details and routines for scheduling requirements such as doors, frames, hardware, room finishes and mechanical equipment performances. The combination of all these will provide the basis for possible development of other systems spreading into the design and construction phases. This ultimate capability will place the architect in a renewed position of strength in the building industry.

Even in the areas of format and the manner of producing printout, there is much room for improvement through automation as hardware/software systems keep pace with the growth of MASTERSPEC. As an example, an option could be provided whereby the printout would be returned to the user in double-column format on 10x13 pages, ready for reduction to 8½x11 during reproduction. The reduction in paper requirements is obvious, along with improved readability. The output of the computer might also be transmitted directly to the architect's office via telephone. There, it will be captured on microfilm from a high-speed video tube telephone device, then reproduced directly from the microfilm.

In the speculation of what is possible and economically feasible in the years to come, only one thing is certain: We will never realize the benefits of future developments unless we proceed through intermediate levels. Again, we simply cannot get to the moon in one giant step.

Considering all the ramifications of MASTERSPEC, it is clear that the success and timetable now rest primarily with the AIA membership and others in the building construction profession. The Institute has established ambitious goals, including the need to learn how to make progress through actual use of the systems.

Approximately 300 firms are now subscribers, varying in size from small firms and one-man spec consultants to the very largest A/E firms. At this time, the average subscriber has 17 technical persons on his staff. The total technical manpower with access to MASTERSPEC is already over 5,000. Projections indicate that this is about 15 percent of five-year growth; or 5 percent of the available market.

About 25 percent of the subscribers have advanced from level 1 use (reference document) to level 2. This is the stage of receiving sections from PSAE stock for actual project editing, with or without use of automation. Ten per cent of the user firms have also sent one or more projects through data processing (level 3 automation). These early users of the complete system have made an invaluable contribution to its development, allowing both PSAE and its automation consultant to determine needed adjustments and proceed with plans for the future. Most of them will continue with full use of the system.

It would have been possible, but not necessarily advantageous, for the Institute to have funded and staffed the project at several times the present level. However, a deliberate and sure-footed development of the project was chosen, allowing ample time for the natural evolution of progress, yet minimizing the total investment required to produce a self-supporting enterprise.

The possibility of looking outside the profession for support of the venture during its development and implementation has been repeatedly turned aside. The thought has been that complete control must be maintained by the profession. Furthermore, outside costs such as for data processing are being held to a minimum by maintaining good competition in the franchises for such work.

The funds loaned PSAE by the Institute will soon be needed for other purposes. The money will be returned as soon as the volume of MASTERSPEC use has reached a level which permits repayment.

In addition to the relationship between finances and early use of the system, there is a much-needed relationship between user feedback and early use of the system. Everyone agrees that the venture should progress no further than necessary before the results of feedback from users begin to have a direct effect on every aspect of the system. This is felt to be the most desirable way, as well as the most economical, to serve the interest of the profession. The need to use feedback as a means of improving the system will diminish as it becomes larger and more completely established. □

Is the Roof About to Fall In?

by BERNARD J. GRAD, FAIA

Concerned with "runaway" inflation, a veteran practitioner sounds a warning to US architects everywhere.

Most responsible architects are currently concerning themselves with the many problems that accompany the challenge of building for our exploding population. The most frustrating issue we face, however, is the impact that runaway inflation is having on construction costs.

The big picture is simply this: The demands of the nation are so great that there is too much to be built with too tight money with too little skilled labor and too few contractors who want to compete in a market that is so filled with the specter of disaster that the very foundations of the construction industry are on quicksand.

All of us affiliated with the industry are coping with the paradoxical dilemma of responding to the challenge of the future by using tools of the past. With few exceptions, we are still building the same way that we did centuries ago. One major reason is the stranglehold that the craft unions have on the industry to the degree that their policies and jurisdictions are restraints to innovation. Moreover, government, management and labor are engaged in a hand-in-glove arrangement for the convenience of each to the detriment of our society.

In the spring of 1969, labor succeeded in negotiating a three-year contract on a nationwide basis which resulted in an hourly wage for the various skills of better than $10 an hour. This will mean that, instead of previous yearly cost escalations of about 5 percent, the cost of construction will rise at the rate of about 1 percent per month for the next three years.

To further complicate the labor cost picture, efforts are now being made to open the unions to outsiders, the black minority in particular. Even if this goal is reached by union acceptance, the cost of apprenticeship and on- or off-job training plans have yet to be defined, let alone worked out, so that the impact on job costs can be known. Only now are these forces coming into focus, and architects are therefore faced with so many intangibles that their responsibilities to their clients in establishing and controlling costs are in jeopardy.

Let it be stated here that architects have always considered the ability to determine and control costs as one of their prime responsibilities. The reputations of many firms have been built on their sensitivity to the many factors in the marketplace which bear on costing, and nothing provides more satisfaction to both clients and architects than good buildings which have been designed and constructed within the budgets.

There has been no special trick which would make it possible for architects to accomplish these basic services for their clients. By experience they know within reasonable ranges the cost of the types of buildings they were accustomed to designing. They kept current with the costs of materials and labor and were aware of what was going on in the marketplace. The free competitive process was in action. There were sufficient contractors, subcontractors, manufacturers, vendors, suppliers, mechanics, skilled and unskilled, to meet the demands of the country. Maybe there were tight spots, but generally the knots loosened, and the wise clients and exeprienced architects were on the lookout, scheduling work to avoid those bad times.

For those of us whose careers have embraced the past four decades, we have run the gamut of economic ups and downs. We had a taste of the joy ride to the dizzy heights of the late '20s. Then we struggled and managed to survive the economic decimation that took place during the Depression of the early and middle '30s. After a brief recovery, we went through the years of World War II. Through the late '40s and even during the Korean War, we were keeping pace with the job of controlling the costs of our designs. The following 15 years of steady uphill economic growth further increased our problems in the area of costs. Nevertheless, we could still design buildings within our clients' budgets and meet the requirements of a sound pro forma statement wherein capital produced a reasonable return for the investor, be he an entrepreneur in the office building field or a university expanding its facilities for educational purposes. So much for the past and our capabilities to scientifically control costs when the components were known.

Today, we have the same task of responding to our clients, and the numbers we are coming up with should be the concern of all. In recent months, the press has reported project after project which has exceeded its budget, some by as much as 100 percent. These escalations have literally shocked public officials as well as those responsible for the original cost estimates. What is more distressing is that private investors in all segments of our economy are being faced with the same runaway inflationary costs.

What should be of the greatest concern to all of us who make up the construction industry is that we are on the inevitable road to economic unfeasibility if the present trend continues. How far can the client be pushed in swallowing continuous inflationary costs before he reaches the elastic limit of feasible investment? Office buildings which in the recent past could be built for between $18 and $26 per square foot, depending upon size and quality, are now budgeted between $25 and $40. Hospitals now cost between $55 and $60, and so it goes in all categories. How many tenants are there like those in New York City who can pay up to $20 per square foot for office space?

The danger signals have already appeared in the offices of many architects throughout the country. We find ourselves being whipsawed between commitment and reality. But what is happening to architects is relatively unimportant compared to the resistance now being evidenced by our clients. They are fast reaching the day when they will not be able to afford the cost of erecting new buildings.

In the cold light of reality, it is time to act — not talk — about costs. These comments are not intended to be an indictment against a particular sector of our industry but a signal of what is happening in the daily lives of architects throughout the land. What a calamity it would be that with all of our knowledge and ability, we would be contributing to an entirely unnecessary economic collapse of our basic industry because of default. □

Mr. Grad, a partner in the firm of Frank Grad & Sons, Newark architects, is author of *Adventure into Architecture.*

Architectural Education

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Learning — While Teaching the Community

by JAMES HALL III

This study of the housing situation in Huntersville, a neighborhood in Norfolk, Virginia, was undertaken by third-year architectural students at Hampton Institute. Their solutions to the area's dire housing needs were developed over a period of a semester with a series of reviews with the Huntersville Neighborhood Housing Committee and the Norfolk Department of City Planning. It marks the third consecutive year of such studies by Hampton students in conjunction with these community organizations.

Undoubtedly, one of the most pressing problems facing American cities today is inadequate housing. The national housing needs of 26 million units within a decade were established in 1968. This figure does not in itself differentiate between quantitative needs and the degree of poor housing conditions.

Furthermore, the figure does not begin to describe the dismal character and atmosphere that follow such poor housing when highly concentrated, or the accompanying social conditions. Nor does it reveal the direct correlation between shortage of housing, bad housing and low income.

The Huntersville neighborhood falls within the boundaries of the Norfolk Model Cities program. From the data compiled by the Norfolk Department of City Planning, the nature and extent of physical and social problems is quite explicit. Of the 90 neighborhoods or planning districts of the city, Huntersville ranks third by prevalence of physical, ninth by prevalence of social problems. From the specific housing standpoint, 1940 dwelling units out of a total of 3,616 within the neighborhood, or 53 percent, are substandard. More than 50 percent of these are concentrated within the area of this study.

The above conditions are further reinforced by the fact that 82 percent of the neighborhood's total dwelling units were built prior to 1939. Thus the substandard housing can be eliminated and the trend abated only by 1) new housing and 2) a program of rehabilitation to prevent other older housing from becoming substandard.

From the social standpoint, 1,081 families out of 2,214, or 48 percent, have incomes under $3,000. The unemployment rate is 6½ percent. Over 50 percent of all individuals of age 25 and over have less than eighth grade educations. In the neighborhood as a whole, 2,215 dwelling units, or 73 percent, are renter occupied. Within the area of this study the renter occupancy rate is even higher. The correlation between bad housing and complementary adverse social conditions can be readily seen.

One element that is awkward to document, if not impossible, is the existing rent price factor versus the quality of housing gained in return. This relationship, buttressed by the high percentage of rental categories and shortages of sound housing, is indicative of the housing plight of the lower income resident. Some 90 percent of the property in the study area is owned by private landlords. This percentage can be equally applied to the remaining areas of the neighborhood zoned medium and high density. The opposite applies to the area of the neighborhood zoned low density, where the same percentage would reflect homeownership. It is also in the low density area that sound housing is found. Thus the relationship between homeownership and sound housing can be deduced.

The 1960 census showed the population of Huntersville to be 10,800, which at present can be considered the minimum number. This number becomes meaningful only when related to the neighborhood density. Of the 90 neighborhoods or planning districts of Norfolk, Huntersville has the second highest density with 31 dwelling units per net residential acre. The density of the neighborhood is three times that of 67 other city neighborhoods and five times that of 36. The average density of the city is 7.3 dwelling units per net residential acre. Therefore, any increase in the density of the Huntersville neighborhood has to be carefully considered in terms of the balance relative to the remainder of the city.

Community services — the supporting element of a neighborhood — are as lacking as the housing situation. Indoor neighborhood recreation space is nonexistent. Outdoor recreation space is basically lacking. Several tot lots or vest-pocket parks have been built recently within the neighborhood. The concept of opening up the interior of a residential block for recreational purposes has proved to be sound and successful in a number of cities. The purpose is to allow small children direct access to play space without the interference of vehicular traffic. However, to be effective, each residential block with dwellings without private yards should have such a play space if the thesis of adjacent play space is to be gained. Also, since the play space is relatively small, additional recreational space must be provided for older children.

The extent of social services, as now exemplified by a temporary neighborhood center, is primarily nil due to the limited scope, resources and facilities of the center. The center, as presently constituted, cannot begin to treat the social ills or problems of the neighborhood as outlined above.

At present, two elementary schools exist in the neighborhood, both located at its extremities. A major city arterial has to be crossed to reach one of them. Each of the two is old and the accompanying recreational facilities are basically inadequate.

Prior to the beginning of this study, an attempt to develop an attack on these prob-

lems was in its formative stages. This effort, General Development Planning, was being spearheaded primarily by the Norfolk Department of City Planning in conjunction with the Huntersville Neighborhood Housing Committee. It had produced 1) an analysis of the problems, 2) neighborhood objectives, 3)a designated GDP project area and 4) a proposed land use plan, accepted by the neighborhood. It was at this point that this study began.

The GDP project area comprises 30 acres with 540 existing dwelling units and involving approximately 2,000 people. The area of this study includes the GDP project area and the high density area adjacent and directly south, or an additional 11 acres with 355 dwelling units and about 1,300 people. The total area of this study, then, is 41 acres involving 895 dwelling units and about 3,300 people.

In many instances, the development of an area has resulted in the exclusion of previously existing residents due to the cost of the new housing versus the income of the previous residents. This has caused destruction of old neighborhoods with new residents replacing the old.

This study will attempt to alleviate this condition by emphasizing low cost and homeownership by 1) utilizing to the greatest extent prefabricated major components and 2) employing factory produced housing units. These two avenues of approach could also provide possible means of "sweat equity" toward purchase of the dwelling unit as well as on-the-job training for the unemployed.

The use of factory produced housing units in low density zoned areas is an accepted fact. Studies and proposals have also been made whereby these units are used in medium density zoned areas by stacking one unit on the other; the lower unit supporting the next upper unit. Another possible means will be investigated in which these units will be employed as townhouses in the area zoned medium density but with a more pronounced individual unit effect. This effect will extend the individual homeownership atmosphere of the low density area of the neighborhood.

In addition to the factor of lowered cost, these units would provide an answer to the relocation problem always associated with unit development of relatively large areas. With proper planning, no disruptions of family life would occur; only a move from a blighted dwelling to a new one.

The second approach, use of prefabricated major components (floor systems, wall systems, combinations), is the minimum step that can be taken toward lowering the cost of housing. Mass production of component parts in a central location provides a savings in construction time and materials. Both approaches are in keeping with the thinking of Operation Breakthrough. Of the three teams participating in the study, one will concentrate on the use of factory produced units, two on prefabricated major components.

The study will, in general, proceed within the established GDP framework but will propose modifications where needed. Though emphasizing low cost housing, the overall goal will be to create an environment for living — for the aged, for families with and without children and for single individuals. Inherent to this goal will be to maximize choice between homeownership and rental categories.

As an attempt to attack the social as well as physical problems, 12 acres have initially been designated as a Neighborhood Center Complex with a neighborhood center facility, elementary school and recreation space. This complex will serve the entire neighborhood. One of three shopping areas is proposed in the general vicinity of the complex. The acreage used for these needed community facilities will decrease residential land use originally available for housing. This loss of approximately 200 dwelling units will be considered during the study.

The elementary school is proposed to replace the two existing schools. For a neighborhood of this magnitude, 10,800 people, several schools dispersed conveniently throughout would be the proper solution. However, due to the pattern and location of decay and the land most readily available, the feasibility of the proposed location becomes more apparent. This study will concur with this proposal as basically sound. However, another solution, equally plausible, is to provide two schools, constructing a new one and upgrading one of the existing ones while eliminating the other adjacent to and across the arterial. A third possibility, though somewhat more difficult, is to provide land for another school on a brewery site — an industrial island in residential water.

Existing major arterials and public transportation to and from the neighborhood are essentially adequate and will be recognized as remaining. However, a segment of an additional arterial dissecting the neighborhood is planned adjacent to the proposed elementary school and neighborhood recreation space. This would duplicate the condition faced by children attending the existing school. This study will not recognize the proposed arterial.

Existing residential streets in the study area require major improvements and the majority are without sidewalks. As in most old neighborhoods, many more streets exist than are necessary for ample and convenient movement. This excessive vehicular pavement decreases available community space and hampers, unnecessarily, proper planning for housing.

New vehicular circulation patterns will be studied in conjunction with the planned unit development. Utility services are available from the city.

The overall goal is to provide an environment for living. Therefore, the concept evolves from the following objectives:

- Total community living: facilities for the aged, families with and without children and single individuals.
- Assuring that all or the bulk of existing residents can continue to reside in the area.
- Maintaining, if possible, the existing relative density.
- Maximizing choice of housing — homeownership and rentals, individual townhouse units, garden apartments, high rise, condominium or cooperative housing.
- Recognizing the need of community facilities and using this space to serve as a central point for the Huntersville neighborhood.

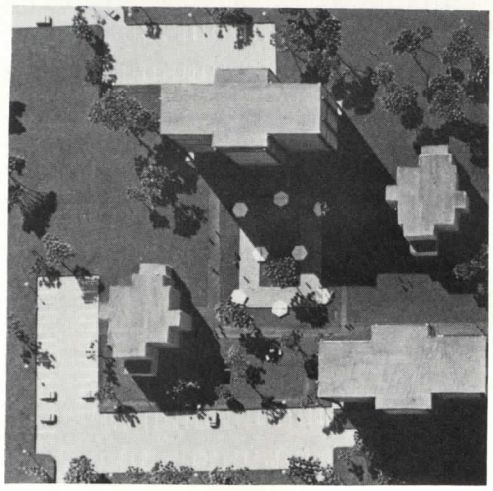
Mr. Hall, assistant professor with the Division of Architecture, Hampton Institute, Virginia, was class design professor of this study. Students at Hampton elected Mr. Hall as the outstanding architectural teacher of the year, and he was subsequently presented with a $500 prize by the Virginia Chapter AIA.

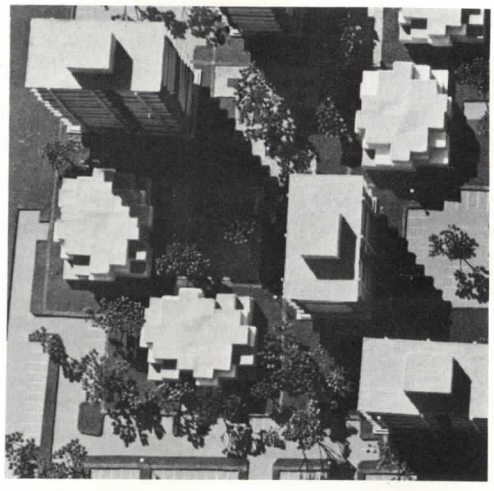
• Relating the scale of proposed new construction to the existing which is to remain, maintaining an optical order throughout the neighborhood.
• Allowing for needed community space and savings in development cost with clusters of multiple housing.
• Recognizing existing principal arterials and nodes but planning for a separation of pedestrian and vehicular movement.
• Negating the "project imagery" associated with low cost housing developments and producing an "imageable" urban environment or neighborhood.

Such sessions, with the Huntersville Neighborhood Housing Committee and the staff of the Norfolk Department of City Planning, were held at periodic intervals during the study. As preliminary proposals were made, feedback and reactions were received and taken into consideration. These sessions led eventually to the proposed solutions.

In addition to providing an opportunity for meaningful exchange, the review sessions became a reciprocal learning experience between the students and the staff of the planning department. The Huntersville housing committee gained and learned by being directly involved in and exposed to the many factors surrounding housing and observing several possible means of solving the same problem, and also by witnessing extensive studies — so extensive that most city agencies and professional consulting firms cannot normally provide anything similar.

No study such as this can provide all the





TEAM 1: Sidney Chachere, Calvin Nelson, David Swan

MEDIUM DENSITY AREA — 18 ACRES

Existing units — 540; 19 units per acre
Proposed units — 216; 12.7 units per acre

Prefabricated townhouses
2-story, stacked units

Number by type	*Square feet per unit*	*Approximate cost per unit*
44 4-bedroom units	1,250	$9,500-10,000
30 3-bedroom units	1,250	$9,000-9,500
14 2-bedroom units	1,000	$8,000-8,500

Garden apartments, 4-story buildings.
(prefabricated major components)

Number by type	*Square feet per unit*	*Approximate cost per unit*
32 3-bedroom units	1,225	$4,500-5,000
32 2-bedroom units	860	$4,000-4,500
64 1-bedroom units	705	$2,800-3,300

HIGH DENSITY AREA — 11 ACRES

Existing units — 355; 32.2 units per acre
Proposed units — 502; 45.6 units per acre

Highrise buildings, 7 and 10 stories
(factory produced, modular stacking)

Number by type	*Square feet per unit*	*Approximate cost per unit*
162 3-bedroom units	1,250	$9,500-10,000
44 2-bedroom units	1,250	$9,000-9,500
176 1-bedroom units	625	$5,000-5,500

Garden apartments, 6-story buildings,
(prefabricated major components)

Number by type	*Square feet per unit*	*Approximate cost per unit*
40 3-bedroom units	1,225	$4,500-5,000
60 2-bedroom units	860	$4,000-4,500
20 1-bedroom units	705	$2,800-3,300

Existing composite density of study area—21.8 units per acre; proposed—29.1 units per acre

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TEAM 2: Arthur Jackson, Donald Lane, Maurice Unthank

MEDIUM DENSITY AREA — 18 ACRES

Existing units — 540; 19 units per acre
Proposed units — 239; 14 units per acre

Townhouses, 2-story attached units
(prefabricated major components)

Number by type	*Square feet per unit*	*Approximate cost per unit*
42 4-bedroom units	1,600	$13,700-14,200
32 3-bedroom units	1,400	$12,700-13,200
21 2-bedroom units	910	$8,500-9,000

Garden apartments, 4-story buildings,
(prefabricated major components)

Number by type	*Square feet per unit*	*Approximate cost per unit*
72 3-bedroom units		
36 2-bedroom units		
36 1-bedroom units		

HIGH DENSITY AREA — 11 ACRES

Existing units — 355; 32.2 per acre
Proposed units — 664; 60.3 per acre

Highrise buildings, 8 and 12 stories,
(prefabricated major components)

Number by type	*Square feet per unit*	*Approximate cost per unit*
260 2-bedroom units	995	$6,000-6,500
260 1-bedroom units	480	$3,200-3,700

Garden apartments, 4-story buildings,
(prefabricated major components)

Number by type	*Square feet per unit*	*Approximate cost per unit*
72 3-bedroom units		
36 2-bedroom units		
36 1-bedroom units		

Existing composite density of study area—21.8 units per acre; proposed—37.15 units per acre

TEAM 3: Alexis Felix, Nancy James

MEDIUM DENSITY AREA — 18 ACRES

Existing units — 540; 19 units per acre
Proposed units — 249; 14.6 units per acre

Townhouses, 2-story,
(prefabricated major components)

Number by type	Square feet per unit	Approximate cost per unit
42 4-bedroom units	1,500	$13,000-13,500
35 3-bedroom units	1,320	$12,000-12,500
28 2-bedroom units	890	$8,500-9,000

Garden apartments
144 units

HIGH DENSITY AREA — 11 ACRES

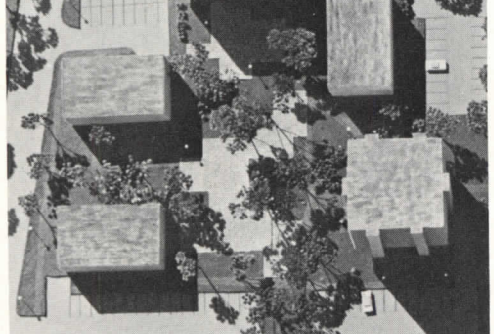
Existing units — 355; 32.2 per acre
Proposed units — 432; 39.2 per acre

Highrise buildings, 8 and 12 stories,
(prefabricated major components)

Number by type	Square feet per unit	Approximate cost per unit
104 3-bedroom units	1,040	$6,500-7,000
104 2-bedroom units	936	$6,000-6,500
104 1-bedroom units	598	$4,000-4,500

Garden apartments
120 units

Existing composite density of study area—21.8 units per acre; proposed—26.9 units per acre



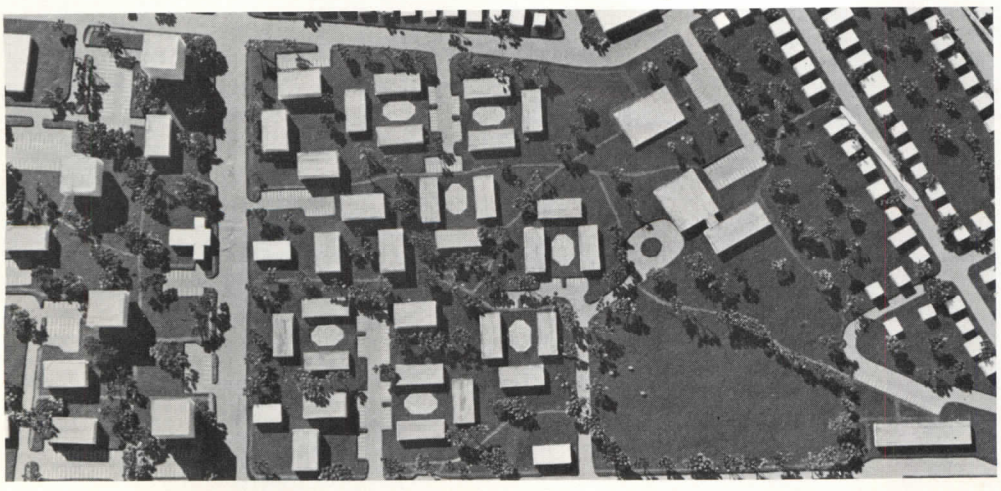
answers to all the housing and environmental problems existing within a neighborhood. This study proposes several concepts which can be applied in Huntersville, each indicating, besides the overall goal already mentioned, not only provisions for housing but also for adequate surrounding community space — the difference between living versus pleasurable living.

The efforts to alleviate the adverse conditions in the Huntersville neighborhood began with the GDP effort initiated by the Norfolk Department of City Planning, the first stage. This study represents the second stage.* The third and final stage rests with the City of Norfolk on the one hand and the Huntersville neighborhood on the other. The city must be responsive to the needs of the neighborhood; the neighborhood must be, in itself, a responsible entity. These two complementary ingredients can provide the impetus and means for change. A varied number of tools exist under the Federal Housing Act for attacking the problems of a neighborhood; though inadequately funded, they do exist.

People, as a group and as private citizens, influence the status of their neighborhood and may make this sharply felt when fully aware of bad versus good environments and the quality of well planned neighborhoods versus those normally seen and those normally planned.

The behavioral scientists state that two factors shape the human during his development: heredity and environment. Of these two, environment is the most influential. The home and its immediate surroundings encompass the greatest share of the individual's environment, physically and socially. It is here that the individual is shaped, positively or negatively. It is also here that human worth is either inflated or deflated. Individual dignity cannot be legislated or veneered; it can be only allowed to grow. A sound living environment can provide that tillage. □

* Subsequent to the completion of this study, the third-year design class undertook a detailed investigation and analysis and prepared a program for the development of a Neighborhood Center (social services and recreational facility) for the Huntersville neighborhood. This program was used by the Norfolk Model Cities Agency for preparing an application for a multimillion dollar grant to develop a series of neighborhood centers throughout the City of Norfolk, including the Huntersville neighborhood. Last May, the Department of Housing and Urban Development appropriated $2 million for the Huntersville center.



Emergence of a New Professional

by JOHN P. EBERHARD, AIA

A Master in Architecture in Building Systems Design is now available, with a curriculum that encompasses analysis of man's physiological, psychological and social needs.

It is frequently remarked that architecture is no longer playing a valid role in our society, that it has become effete, that it is no longer leading technology but being led by it.

Architecture, at least in the abstract, is the total body of practice which unites art, science and technology in the realization of those artifacts which in our culture are called buildings. Architecture cannot be invalid, but it can be badly practiced in the sense that society has badly matched its potential — either artistically, scientifically or technologically — to its needs and aspirations.

Architects today are effectively related to only a small portion of the buildings that we build; they are seldom involved in the primary decisions which affect our built environment such as the deliberation of government bodies, the formation of building codes and regulations and the management of the corporations which manufacture the materials and products that are eventually assembled into buildings.

Our new School of Architecture and Environmental Design at the State University of New York at Buffalo is a result of our conviction that the designers of the future will include a new professional, trained in the systems approach to design problems.

The graduate program of our school will therefore go beyond normal architectural curriculum. The school's graduate program will offer a Master of Architecture in Building Systems Design.

Building systems design represents a new approach to the design and production of the constructed environment and is now emerging as a significant direction for professional development. Unlike more traditional design professions, this approach encompasses all the interrelated processes that a society or organization uses to produce its entire constructed environment, rather than limiting its scope to the design of individual buildings or building complexes.

The hallmark of building systems design is the systematic analysis of man's physiological, psychological and social needs and the development of mechanisms to enable us to meet these needs through the physical environment. The body of knowledge presently available for meeting these needs will be examined and expanded by the program.

The core of the two-year academic program is the practicum, a flexibly structured laboratory course organized around the analysis and development of real problems accepted from outside sponsors. This is designed to be a continuum of responsibility. Initially, students work as team members under experienced faculty leadership, progress-

ing to individual project responsibility. During the final semester, each student will lead a research team of undergraduates from our own school as well as from other parts of the university and will present a report of this research project as his master's thesis.

In the course of the practicum, outside consultants are asked to help project teams resolve issues and to describe the current state of the art in their professions. Candidates learn to determine when outside consultants are needed, where such consultants may be found and how much of the project budget it is wise to expend for their services.

Additional courses are offered in qualitative and quantitative measurement techniques like those used in operations research, linear programming, systems engineering, behavioral science concepts and management concepts.

The graduate program represents the primary thrust of our school, but we also have two undergraduate programs underway. One program is a major in Environmental Design. This major is not aimed at any single existing professional route. Hopefully, people who participate in the major will become psychologists, sociologists, lawyers, architects and a whole new set of professionals not yet institutionalized with names. This program, leading to a Bachelor of Arts in Environmental Design, is intended to represent a major, but not a professional degree.

This introduction to environmental design will provide a systematic survey of our environment including man's place in and relationship to it, as well as the processes of control and monitoring employed by man in his quest for enrichment. The stressed point of view is ecological, wherein man is perceived as subject to the same balance-seeking laws which control the environment in which he lives. The goal is an understanding of urban ecosystems, so that purposive problem-solving efforts may be designed and implemented.

The second program is an evening program given through our Millard Fillmore College which will make it possible for people working in professional firms to receive a Bachelor of Architecture degree.

The intent of this program is to provide an education which will equip graduates to handle the numerous and complex facets of contemporary architectural practice. There are three principal "tracks" of studies, passing through three phases. The tracks are architectural technology, architectural design and architectural humanities. The phases are introduction, integration and specialization.

Architectural technology refers to the "hard" sciences and disciplines utilized in architecture, such as engineering. Architectural humanities refers to the "soft" sciences and disciplines utilized in architecture, such as history, sociology, economics and law. Architectural design is defined as the bringing together of architectural technology and architectural humanities to solve a given problem. The period of introduction provides a broad survey of those three areas, providing a basis for further study. The period of integration emphasizes the bringing together of the three areas as a working process. The period of specialization offers the student the opportunity to develop his particular interests in any or all of the three tracks, through the choosing of electives.

We have also begun to organize continuing education seminars for those professionals who received their formal education some time ago. These seminars, in the form of summer institutes of various lengths, will center on the theme of building systems design. We would hope in this way to contribute to the development of new skills for environmental design professionals not just in their formative years but in the total spectrum of their lives as well. □

Mr. Eberhard is dean, School of Architecture and Environmental Design, State University of New York at Buffalo.

All About Student Foreign Exchange Programs

Although the advantages of such programs are quite apparent as far as the students are concerned, it is perhaps less obvious that a range of benefits extend to participating architectural firms as well. Here is how.

In the past several years, a number of firms in the United States have become actively involved in exchange programs and have welcomed foreign students into their offices for three to 12 months of practical training — American style. These experiences have been described by many happy architects. Their most enthusiastic comments are usually about the favorable impact on office morale and spirit which results from these experiences, particularly evident in young members of the firms. The architects also mention success in providing the foreign visitors with opportunities to observe and become involved in the various responsibilities of office practice, as well as many facets of American life after office hours.

How do architectural offices in the US link up with interested foreign students, and how do architectural students in our universities link up with receptive foreign architectural firms? With the help of IAESTE — the International Association for the Exchange of Students for Technical Experience.

IAESTE is a European phenomenon, created in 1948 by universities and industries of nine countries to build international ties after World War II. Today, it boasts component organizations in 41 countries throughout the world, including IAESTE/US, a nonprofit educational corporation.*

Aims of the association are 1) to train advanced students of architecture/engineering and the sciences in the professional practice methods and industrial techniques of other countries; and 2) to build a foundation for international understanding and goodwill among these potential leaders and the host firms, companies and institutions. Technical experience in the sense of the aims of the association refers to experience through on-the-job training to supplement college and university education.

How does the exchange program function? Each member country collects offers of training positions from professional firms and industrial and other organizations, along with expressions of interest from students who have the desire and ability to participate in the program. Each firm indicates its specific needs while each student indicates a choice of three foreign countries and his related language abilities.

At the IAESTE annual conference, which is held in January, representatives of the 41 participating countries gather, armed with training position offers and data on qualified trainee applicants. At this time IAESTE performs its most difficult task: exchanging the offers and matching them with the qualifications of applicants. Subsequently, background information on each "matched" student is sent to the appropriate receiving firm for review. The firm retains the final decision to accept or reject the nominated foreign trainee. On the rare occasion of an unacceptable match, IAESTE is usually prepared to nominate another applicant.

In the receiving countries, IAESTE also arranges for necessary permits, lodging and, in many cases, for social and cultural programs during or after the period of training. In the sending countries, the association insures the traveling students against illness and accidents.

Offering firms are expected to pay each trainee enough to cover the cost of living during the actual training period. In addition, it pays a small administrative fee to IAESTE for its services. Student trainees pay their own transportation but can take advantage of special travel facilities arranged by IAESTE in the sending country.

IAESTE/US has exchanged a number of architectural students in each of the past several years. In 1969, for example, there were 16 placements in US architectural firms out of a worldwide total of 266. Until this year,

"Our experience with IAESTE trainees has been most productive. We took our first trainee on a basis of being willing to cooperate in an attractive sounding but — for us — untried procedure. Very soon we discovered that the gains from this program exceeded our expectations. Our young foreign employees were most conscientious and eager; they were communicative and friendly and they had ability. They subtly increased our own grasp of the educational and professional resources of their nations, while at the same time they learned something of ours. When they left, it was apparent that both they and our firm had benefited; we continue to remain friends and, in a sense, associates, as their professional lives mature and gain scope and experience in their native lands and international endeavors."

KAMLAH L. JOHNSON, AIA
Curtis & Davis
New York/New Orleans

* IAESTE/US, 866 United Nations Plaza, New York, N. Y. 10017; R. M. Sprinkle, executive director.

however, there has never been a cooperative arrangement between IAESTE/US and The American Institute of Architects or ACSA.

Actually, ACSA administered an independent exchange program beginning in the early 1960s and operating through the summer of 1968. It was then committed to the development of a workable and active program for the betterment and cultural broadening of architectural students and a few highly dedicated ACSA committeemen donated a vast amount of time and effort in administering the program. The primary problem encountered was the lack of a broad base of operation in various countries; as a result it was essentially an exchange of students from US schools with students from the Architectural Association School of Architecture in London. For this reason, it was decided late in 1969 that a link with IAESTE/US should be developed. Under this arrangement, ACSA will promote the program in its member schools, the AIA will promote it in its component organizations and in architectural firms; IAESTE will be administrator.

Although a few students and firms participated in the IAESTE/US program last year as a direct result of this new cooperative arrangement, the program announcement came too late to have much effect. The program for summer 1971 will serve as the first real indication of the project's potential in architecture. Interested firms and students must be identified no later than December 15, 1970, for the 1971 program.

Given the fact that there is rarely a time when IAESTE/US has encountered a shortage of willing student applicants, the most serious problem facing the organization is a consistent deficiency in the number of participating US architectural firms with a resulting shortage in the number of available training slots. In all probability, this is partially due to a lack of knowledge or understanding of the program. But there is also a prevailing lack of interest among US architectural firms and an unwillingness to try the untried. In past years, several heads of ACSA schools have sought support from local architectural firms but only a handful have been successful.

IAESTE statistics for 1969 present the situation clearly. The total number of architectural placements in the US requested by foreign countries was 62; IAESTE/US was able to provide only 11 actual openings, whereas a total of 28 US architectural students were placed in other countries. It is most fortunate that IAESTE/US was able to complete arrangements on such a lopsided basis, but a similar situation cannot be guaranteed every year. According to Robert M. Sprinkle, IAESTE/US executive director, his organization must maintain a close balance between students received and students sent in order to remain credible on the IAESTE exchange market.

Therefore, the IAESTE exchange program is essentially reciprocal in nature. The number of US students fortunate enough to be placed in a foreign country is largely dependent on the number of offers available from US firms.

The track record is very poor indeed. In order that we may provide chance-of-a-lifetime foreign experience opportunities for more of our most promising architectural students, more architectural firms will have to become involved.

So now you're informed of the program and its benefits to firms and students alike. The rest is up to you. JAMES E. ELLISON

> "Twice in the last four years, we have participated in the IAESTE program. In both cases, it has been a successful venture for the firm; we have benefited from the students' contributions to the spirit of the office, and each of the students has been capable of productive, meaningful work. We hope that they have benefited as well, through being exposed to a different kind of work experience than that available in their own countries, due basically to the different professional procedures. We have encouraged travel as an added experience and at times instigated group trips that have been most enjoyable for all concerned. Through IAESTE, we are provided the vehicle for bringing young people into the office with a variety of backgrounds; it also allows us to participate in providing opportunities both for national and foreign professional students to gain invaluable experience that will undoubtedly affect their future careers."
>
> W. H. BARNETT
> *Vice President*
> *Stevens & Wilkinson, Inc.*
> *Atlanta*

What's Happening in Architectural Education

Campus Notes. Princeton University's new program, leading to the degree of Master in Public Affairs and Urban Planning, is a cooperative venture of the Woodrow Wilson School of Public and International Affairs and the Princeton School of Architecture and Urban Planning. Dr. Paul N. Ylvisaker, former New Jersey Commissioner of Community Affairs, will serve as professor of Public Affairs and Urban Planning and will play a prominent role in the advanced-degree program, which is aimed at preparing students for key positions in public and private careers involving the formulation of plans and policies in urban areas.

æ Sidney L. Katz, FAIA, is appointed acting dean of the School of Architecture at Pratt Institute. For more than 20 years, Katz has been on Pratt's visiting faculty.

æ Martin D. Gehner, AIA, heads the Department of Architecture at Iowa State University. Gehner, who was on the faculty of the University of Connecticut from 1967, succeeds Raymond D. Reed, AIA, who asked to be relieved of administrative duties in order to devote more time to teaching.

æ The University of California at Los Angeles' School of Architecture and Urban Planning now offers a three-year Master of Architecture program for bachelor-degree holders desiring a professional degree in architecture or urban design; a two-year Master of Arts program for those interested in developing research programs in architecture or urban design; and a Master of Arts and Ph.D. in planning.

æ Bertram M. Berenson, AIA, is director of the University of Nebraska School of Architecture. Formerly professor and director of the Division of Architecture at Hampton Institute, Virginia, Berenson replaces Professor Homer L. Puderbaugh, who has returned to teaching.

æ DeVon M. Carlson, AIA, will remain on the University of Colorado faculty as a professor of architecture at the end of this school year after retiring as dean of the School of Architecture — now the College of Environmental Design. Carlson has been with the university for 27 years.

Three university faculty members are directors of the new curriculum in environmental design: Robert W. Kindig, AIA; Dwayne C. Nuzum; and John M. Prosser. The College of Environmental Design will gradually replace the present five-year undergraduate program with a four-year undergraduate and two-year graduate program. The graduate offerings will include an option in urban design. As funds and space become available, graduate programs in landscape architecture, urban and regional planning and interior design will also be available.

æ A combined degree program leading to a Master of Architecture and a Master of Business Administration is now available at the School of Architecture, Washington University, St. Louis.

æ The University of California Extension, Berkeley, has re-established its certificate program in city planning, designed to provide educational opportunities for persons whose professional development can be enhanced by specialized continuing education. The program, open to qualified students throughout the US, is a combination of correspondence instruction, tape recorded lectures and seminars. The courses: the Growth of Cities and the Development of City Planning; the Planning Function in Local Government; Research Methods and Plan Making; Planning Implementation and Programming.

A major Ph.D. program specializing in architectural research has also been established.

Eleven students, mostly with professional experience, are working toward the new degree in the Department of Architecture.

æ The studies in architecture and urban design, formerly in the School of Humanities and Sciences, Stanford University, California, have merged with the environmental engineering program of the Department of Civil Engineering to form a new undergraduate and graduate level program in environmental engineering and design. Courses are offered in environmental planning, urban and regional design, pollution control, water resources and transportation systems.

æ Southern Illinois University, Carbondale, now offers bachelor's and master's degree programs in the Faculty of Technical and Industrial Education, aimed at preparing technical teachers for secondary and vocation schools and for associate of technology or science degree programs.

æ The Department of Architecture in the School of Design, North Carolina State University, Raleigh, and the Department of City and Regional Planning, University of North Carolina at Chapel Hill, have developed a joint program in urban design. This will fit into existing programs in both departments and also into the developing graduate programs in landscape architecture and product design at the School of Design. The program will lead to the proposed degree of Master of Urban Design for graduate students in the School of Design at NCSU and will be available to graduate students pursuing degrees in City and Regional Planning at UNC-CH with an area of specialization in urban design.

In general, applicants with academic distinction in almost any field and with capability and desire to enter the program will be considered. For further information, write Peter Batchelor, Director, Urban Design Program, North Carolina State University, Raleigh, N. C. 27607.

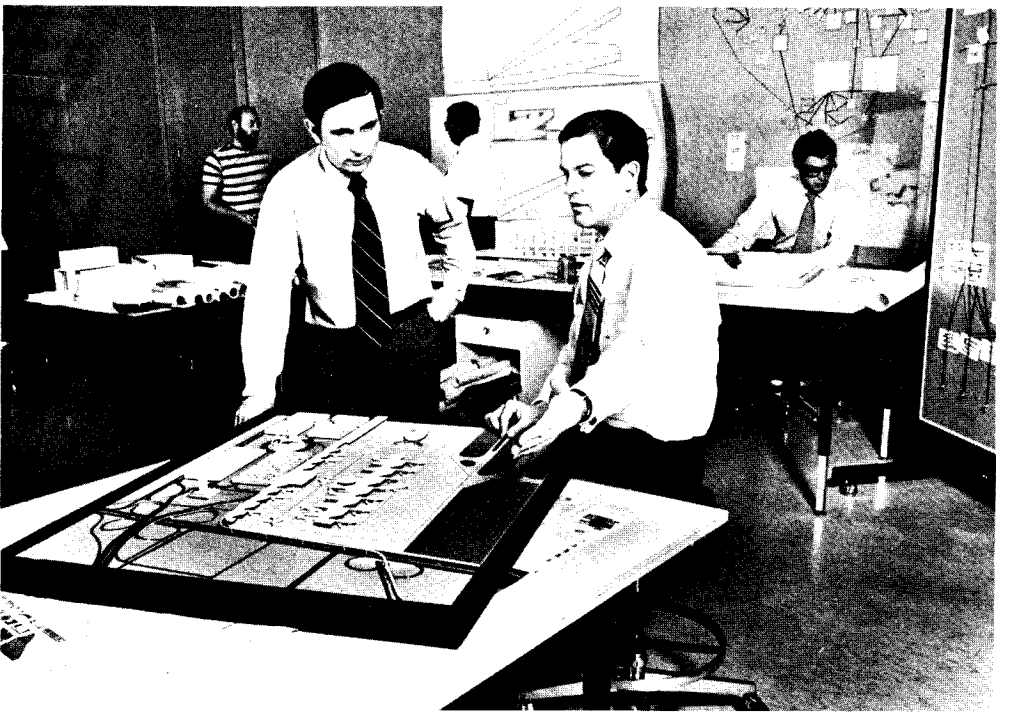
Off-Campus Notes. An Architectural and Environmental Research Center, developed with the guidance of the Environmental Design Workshop of the School of Architecture and Urban Planning at the University of California at Los Angeles, has been launched by the architectural firm of Welton Becket & Associates. Dr. Harvey Perloff, dean of the School of Architecture and Urban Planning at UCLA, is coordinating that school's participation in the center, which has quarters adjacent to the Becket firm's West Los Angeles offices, while Louis Naidorf, AIA, vice president of Welton Becket & Associates, is its director.

Objective of the center, in addition to providing a more complete service to clients, is also to share findings and data with the architectural profession at large, according to MacDonald Becket, AIA, president of the Becket firm. The five major goals of the program are:

1. to create a mechanism for testing potentially useful alternatives to current professional methods and information handling techniques
2. to act as a forum for the exchange of ideas, for the discussion of new directions for the Becket firm and for the profession
3. to evaluate the actual performance of completed projects in comparison with the design objectives
4. to study emerging architectural problems to be better prepared for the future
5. to establish an information center with the means to correlate and disseminate the data resulting from the center's studies.

Basic research projects for the Becket firm will include environmental simulation studies, urban design studies, urban systems analysis, behavioral studies and futures studies. Studies currently underway are new directions for architecture as a profession; emerging building types and forms; and impact of societal and technological changes on the construction industries.

Gaming, the technique of dealing with problem solving processes in graphic displays, and systems analysis with the aid of computers are among the many techniques the research teams will employ.



The Welton Becket Research Center, Los Angeles. MacDonald Becket (right) and Louis Naidorf.

æ Bernard J. Grad, FAIA, is appointed chairman of a State of New Jersey advisory committee which will study the possibility of establishing a school of architecture in that state. Grad is also chairman of a similar committee sponsored by the New Jersey Society of Architects, which has been striving to establish such a school in the state for several years.

Continuing Education. An AIA-sponsored, New York State Association of Architects-hosted PDP seminar on Building Systems will be held in New York City on November 14. Albert Dietz, professor of Building Engineering at MIT, will present his analysis of systems available in Europe and the US. Write AIA Headquarters or NYS/AIA, 441 Lexington Ave., New York, N. Y. 10017.

æ An architectural refresher course is offered November 5-7 by the University of Wisconsin. Intended especially for persons preparing for the state board architectural examination, the sessions will focus on material related to all seven examination sections. Write Raymond C. Matulionis, program director, University Extension, 432 N. Lake St., Madison, Wis. 53706.

æ The 11th Acoustical Training School, conducted by Michael J. Kodaras and Robert Lindahl, will be held November 9-10 at the Dearborn Inn, Dearborn, Michigan. Sessions will be devoted to general principles of architectural acoustics; sound transmission loss, acoustical correction of rooms; industrial noise; and noise control of air conditioning, heating and ventilating equipment. Write Kodaras, 75-02 51st Ave., Elmhurst, N. Y. 11373; or Lindahl, 2261 Winthrop Road, Trenton, Mich. 48183.

æ The Transportation Research Institute of Carnegie-Mellon University, Pittsburgh, is initiating a professional program in urban transportation systems. The six-week course, directed toward professionals in transportation and related fields, begins October 5 and continues through November 13. Following a four-week lecture series at Carnegie-Mellon, participants will go on a two-week study trip of transportation facilities in Canada and Europe. Contact William W. Ellis, director of Special Education, Transportation Research Institute, Carnegie-Mellon University, Pittsburgh, Pa. 15213.

æ "System Building: A Technique of Analysis and a Method of Construction" is a course offered by the Real Estate Institute of New York University's School of Continuing Education. The course, directed at architects, engineers, builders and those interested in construction, examines definitions of the systems concept; the progress of systems

Architectural Education

building abroad is contrasted with US developments; and activities of government agencies. Write the university's School of Continuing Education and Extension Services, Division of Business and Management, 1 Fifth Ave., Suite 2K, New York, N. Y. 10003.

Environmental Education. "America: A New Synthesis," the 1970 Slide Show Competition winner of The American Institute of Architects, examines physical, social and psychological problems in our environment. Billed as an education tool, the presentation is used for private and group showings. Contact David I. Grist, Fenton G. Keyes Associates, 321 S. Main St., Providence, R. I. 02903; or Philip Francis, Box 1041, Providence, R. I. 02901.

Thomas A. Norton, AIA, of Norton & Hume, Stamford, Connecticut, is doing what too many people are just thinking about doing: speaking before elementary and high school students about environmental planning. Making his time available to as many schools as possible, Norton feels that a sensitivity to our environment must be communicated to the young if we can ever hope for improvement.

Fellowships, Awards, Grants. The 1971 AIA/AIA Foundation Scholarship Program has been announced. Undergraduate and graduate students should apply through accredited schools of architecture; interns, practitioners and educators should apply directly to the AIA. Deadline is December 15. Awards, to be announced in March 1971, range from $300 to $3,000. For details, write AIA Headquarters.

Twenty to 25 AIA/Ford Foundation scholarships are again available for disadvantaged students who have demonstrated an aptitude and interest in the study of architecture or related disciplines, who can obtain admission to a college or university for such study and who do not have the necessary financial resources to enter school. Potential applicants must be nominated by an AIA member or chapter, a CDC, a school head or professor, or by such community groups as the Urban or Neighborhood Service Centers, etc. Deadlines are: nominations — November 15, 1970; final applications — February 15, 1971. For complete details, write AIA/Ford Scholarships, AIA Headquarters.

The Institute of International Education is recruiting candidates for US Government Awards under the Fulbright-Hays Act and for grants offered by foreign governments, universities and private donors. Candidates must have a bachelor's degree or equivalent before the grant's beginning date and, in most cases, be proficient in the language of the host country. Those enrolled at a college or university may get application forms from their Fulbright Program adviser; others should write IEE, 809 United Nations Plaza, New York, N.Y. 10017, or its nearest regional office. Such are located in Chicago, Denver, Atlanta, Los Angeles, Houston, Washington, D.C., and San Francisco.

Michael A. Goodman, FAIA, professor of Architecture at the University of California, Berkeley, has received the Berkeley Citation for distinguished achievement and notable service to the university.

The Architectural League of New York has named John M. Bailey Jr. winner of the Arnold W. Brunner Scholarship for his proposal to study and prepare for publication a historical and critical evaluation of advocacy planning and an assessment of the effective future roles and responsibilities of the design professions in the processes of urban and environmental design. Bailey, director of the Community Design Center at the University of California Extension, is cofounder of ARCH and was its assistant director from 1965-68.

Incentive grants of $100 to $1,000 for projects which enhance our man-made surroundings, preserve unique natural or historic areas or develop innovative solutions to specific environmental problems are offered by America the Beautiful Fund, a nonprofit conservation organization. Projects with sustaining community or university support, with a potential to become prototypes and with commitments beyond the planning and design stages have the greatest chance for support. Individuals with training or capability in planning, architecture, landscape architecture, design, natural resources or ecology may obtain further information from or send an outline of their projects to America the Beautiful Fund, 219 Shoreham Building, Washington, D. C. 20005.

Jose R. Bernardo, AIA, of New York City has recently been awarded one of the 10 Cintas Fellowships for the year 1970-71. The fellowships are given to young creative artists of Cuban citizenship or lineage in the fields of painting, sculpture, literature and architecture. Administered by the Institute of International Education on behalf of Cintas Foundation, Inc., the awards carry a $3,000 stipend. The fellowships were established by funds from the estate of the late Oscar B. Cintas, former Cuban Ambassador to the United States.

The National Trust for Historic Preservation has awarded one-year fellowships to a specialist in 19th century Colonial Revival architecture, Louis S. Wall, and to a student of urban planning, Myra F. Harrison. The fellowships, which carry stipends of $7,000 each, are open to students who have completed at least one year of accredited graduate work in history, architecture, archeology, city planning, American civilization and culture, or environmental studies, including landscape architecture. For information, write Frederick Haupt or Sabin Robbins, NTHP, 748 Jackson Place N.W., Washington, D. C. 20006.

Publications. *The 1970 Directory of Engineering College Research and Graduate Study,* published by the American Society for Engineering Education, is a guide to research and graduate programs at 190 major engineering school in the United States, Canada and Puerto Rico. The directory details $258 million in engineering college research for 14,706 projects, tabulates faculty and students engaged in engineering research, areas of research, and research expenditures. A separate breakdown of engineering-related research by other university departments is also given. Copies at $7 each, $3.50 to students, are available from ASEE, Publications Sales, Suite 400, 1 Dupont Circle, Washington, D. C. 20036.

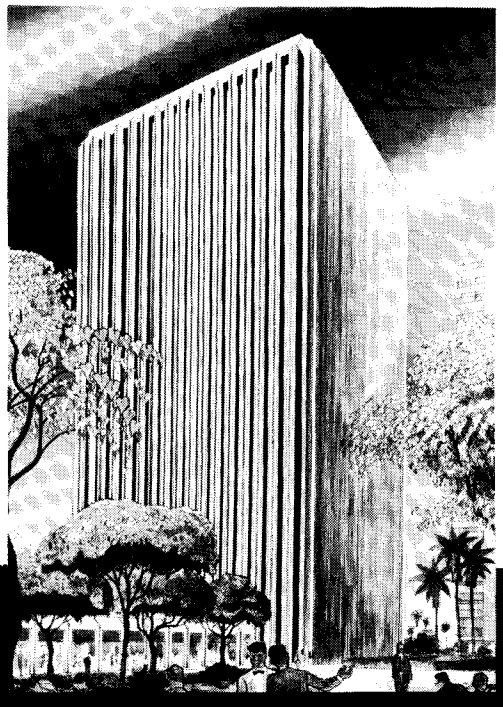
Also from ASEE and worth noting is the March 1970 "Effective Teaching" issue of *Engineering Education.* Advocating audiotutorial, programmed, computer aided self-paced and individualized instruction, the Effective Teaching issue, though written primarily for engineering educators, can be used by all college educators interested in improving their teaching. Copies are $1.25 each, see address above.

A Directory of University Urban Research Centers, published by the Urban Institute, provides information on university urban research centers' past and current projects, staff size, relationship to their universities, sources of support, fields of research and publications. Organized alphabetically by university and with indexes for location of information by states, by centers and by directors of the centers, the directory is available at $3.50 each from the Urban Institute, 2100 M St., N.W., Washington, D. C. 20037.

The *Construction Education Directory* lists 40 schools that offer four-year BS degree programs in construction or in a construction option of civil engineering, as well as architectural and engineering programs for which there is some opportunity to elect construction courses. Designed as an aid for secondary school guidance counselors, the directory is $1.25 a copy from the Associated General Contractors of America, 1957 E St. N.W., Washington, D. C. 20006.

Current Index to Journals in Education, a monthly, features bibliographic citations and annotations for articles concerned with the field of education. Write for sample copy or information to CCM Information Corporation, 909 Third Ave., New York, N. Y. 10022. Subscription is $34 a year.

The program in real estate and urban development planning at the American University has reissued a brochure describing the range of 18 individual course offerings, information on faculty, ways of financial assistance, etc. Copies are available from Dr. Maury Seldin, director of the program, at the American University, Washington, D. C. 20016.



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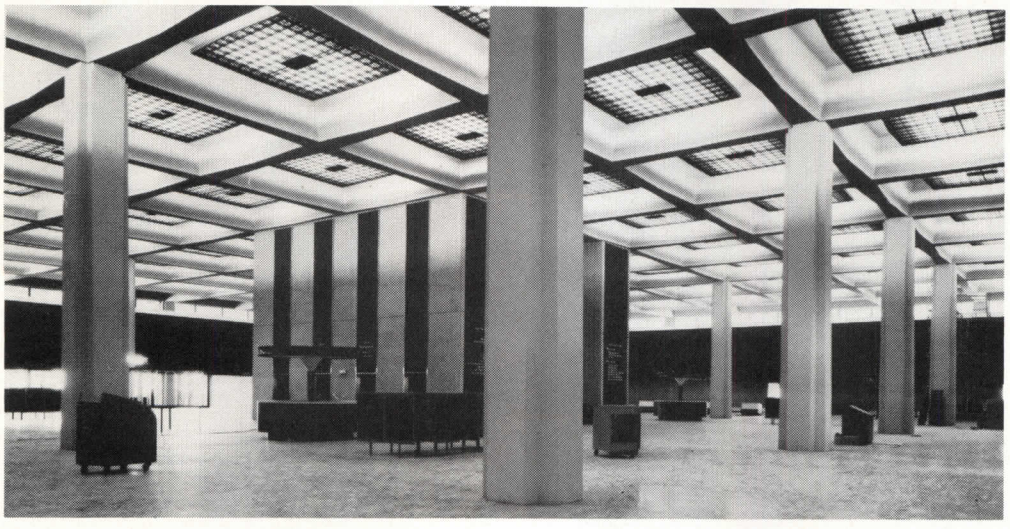

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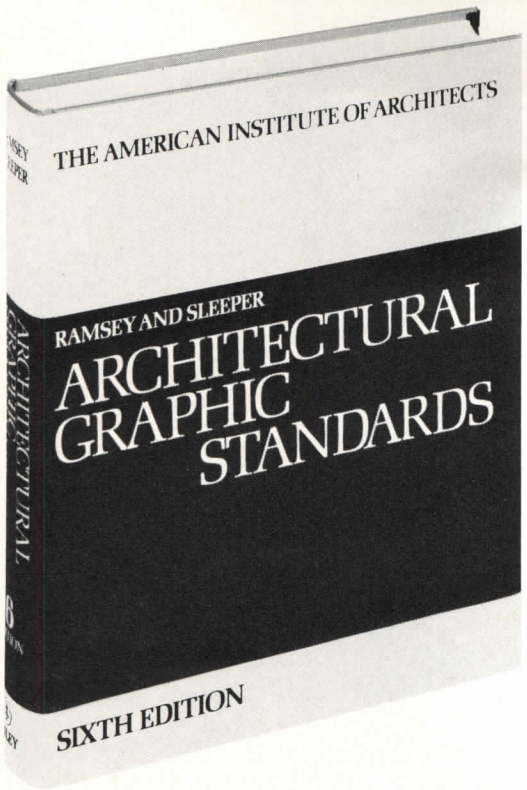

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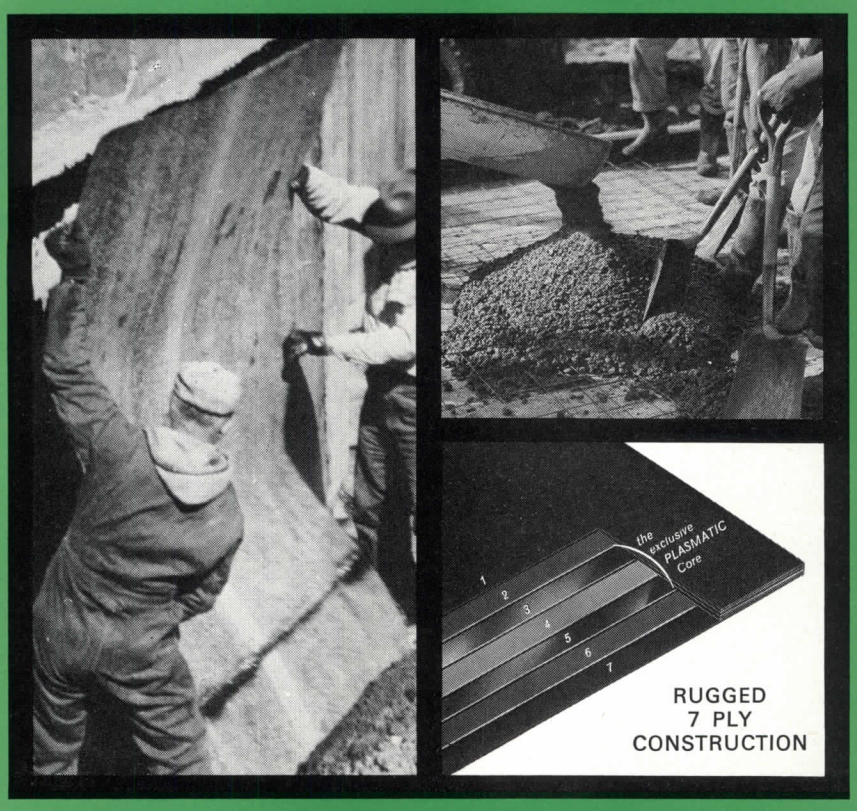

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First 6 Months 1970

APARTMENTS / TOWNHOUSES

Renovation of Townhouses, Washington, D.C., Harbridge House, Inc.	8 Units
Arlene, Washington, D.C., FHA, Arnold Schlein, *McDonald, Williams & Marshall, AIA*	9 Units
Denis Apartments Renovations, Washington, D.C. FHA Project 000-44085, Saul Denis, *McDonald, Williams & Marshall, AIA*	22 Units
Elderly Housing, St. Louis Housing Authority, Turnkey MO 1-22, *R. Elkington, AIA*	32 Units
Staffordboro Townhouses, Stafford, Virginia, *Virginia Mortgage Banking Co.*	45 Units
Keene Mill Station, Fairfax, Virginia, *Fleisher Development Corp./Barber & Ross*	49 Units
Kimberly Gardens, Sec. II, Laurel, Md., Jacobs/Brown/Gildenhorn, Turnkey MD 15-4, Prince George's County Housing Authority, *Armstrong & Salomonsky, AIA*	50 Units
Patrician Towers, Rehoboth Beach, Delaware, Charles Fairchild & Co., *Florance & Cohalan, AIA*	52 Units
Elderly High Rise, Winooski (Vt.) Housing Authority, Turnkey, VT 6-2, *Harper-Drake, AIA*	52 Units
D.C. Frontier Housing Development Townhouses, Washington, D.C., Charles Bresler, *Bryant & Bryant, AIA*	55 Units
Sousa Square, Washington, D.C., FHA, Horning Bros., *Duane, Duane & Cahill, AIA*	109 Units
Elderly/Family Housing, Presque Isles (Me.) Housing Authority, Turnkey, ME 4-1, *Anderson Nichols, AIA*	110 Units
Langston Lane Apts., Washington, D.C., Dormic Constr. Co., *Edmund Dryfuss, AIA*	118 Units
Family/Elderly Housing, Alamogordo (N. Mexico) Housing Authority, Turnkey NM 4-2 John Cornell, *Burran Assoc., AIA*	150 Units
Family Housing, Petersburg (Va.) Housing Authority, Turnkey VA 20-3, *Spigel, Carter, Zinkl & Herman, AIA*	150 Units
Elderly Housing, Prince George's County, Md. FHA Project SH-MD-14 D.C. Church Homes, Inc./Savage, Fogarty, Brinker Constr. Corp., *Robt. A. Willgoos, AIA*	192 Units
Meade Village, Anne Arundel County (Md.) Housing Authority, Turnkey MD 18-2, Tilman Rosenblatt, *Lawrence A. Mennefee, Jr., AIA*	200 Units
Burwood Village, Anne Arundel County (Md.) Housing Authority, Turnkey MD 18-1, Tilman Rosenblatt, *Lawrence A. Mennefee, Jr., AIA*	200 Units
University House, St. Louis (Mo.) Housing Authority, Turnkey MO 1-20, *Schwartz & Henmi, AIA*	201 Units
Elderly High Rise, Lowell (Mass.) Housing Authority, Turnkey MASS 1-6, Peabody Constr. Co., Inc., *Geo. Earl Ross, AIA*	208 Units
Elderly Apartments, Brockton (Mass.) Housing Authority, Turnkey MASS 24-7, Housing Development Co., *Damon, Worley, Cady & Kirk, AIA*	318 Units
Edgewood Terrace, Washington, D.C. NCHA, Turnkey, DC 1-46, Mid-City Developers, *Bucher-Meyers, AIA*	334 Units
Parkview, St. Louis (Mo.) Housing Authority, Turnkey MO 1-19, *Jack H. Tyrer, AIA*	397 Units
Elderly High Rise, Brockton (Mass.) Housing Authority, Turnkey, MASS 24-6, Alco Universal, Inc., *DeVries Assoc., AIA*	400 Units
Modular Housing Concepts, Washington, D.C., *Urban Systems Development Corporation, Div. of Westinghouse*	450 Units
Rolling Brook Townhouses, Woodbridge, Va., Charles Fairchild & Co., *Bucher-Meyers, AIA*	450 Units
Germantown Park, Germantown, Md. Mid-City Developers, *Rogers, Taliaferro, Kostritsky & Lamb, AIA*	675 Units

GOVERNMENTS—FEDERAL / STATE / LOCAL / FOREIGN

Subway Substation, Washington, D.C. Metropolitan Area Transit Authority, Norair Engr. Corp., *DeLeuw, Cather & Co./Harry Weese, AIA*	$ 23,000
Monocacy Pine Cliff Park, Frederick County, Md., *Joseph B. Nelson, AIA*	75,000
Miscellaneous Improvements, Central Intelligence Agency, McLean, Va., *Saunders & Pearson, AIA*	100,000
NASA-ERTS Tracking Facility, Goddard Space Flight Center, Greenbelt, Md., *Bryant & Bryant, AIA*	220,000
Marumsco Creek Park Community Center, Prince William County, Va., Johnson Page Construction Inc., *Spector, Peake & Howell, AIA*	250,000
White House Alterations, Washington, D.C., *Saunders & Pearson, AIA*	400,000
New Firehouse, Baltimore, Md., *Constantine Courpas/The Associated Architects & Planners*	1,400,000
Fourth District Police Station House, Washington, D.C., *McGaughan & Johnson, AIA*	1,500,000
Parking Garage & Power Plant, State Circle Complex, Annapolis, Md., *Albert Gipe Assoc./Wrenn Lewis & Jenks, AIA/Henry Powell Hopkins, FAIA*	2,000,000
Brazilian Embassy Chancery, Washington, D.C., Humphreys & Harding Constr. Co., *Leo Daly & Co., AIA*	2,500,000
Water Supply Improvement Project, Government of Guyana, South America, Harold T. Smith, Inc., *Jas. M. Montgomery, Inc., Engineers*	3,500,000

CHURCHES

Education Wing, Church of the Redeemer, Bowie, Md., *Charles A. Richards, AIA*	50,000
Park Road Community Church, Washington, D.C., *Bryant & Bryant, AIA*	220,000
Simmons Memorial Baptist Church School & Addition, Baltimore, Md., *Sutton & Campbell, AIA*	300,000
Christ Lutheran Church, Replacement Cost, Washington, D.C.	600,000

HOSPITALS / NURSING FACILITIES / LABORATORIES

Medical Service Building, Howard University, Washington, D.C., Johnson Page Construction Co., *Robert J. Nash, AIA*	$ 250,000
D.C. General Hospital Warehouse Addition, Washington, D.C., *Edmund Dreyfuss, AIA*	800,000
Anne Arundel Health Department, Parole (Annapolis), Md., *Gaudreau, Inc., AIA*	1,200,000
Pott Spring/Cinder Road Nursing Facility, Towson, Md., *Rogers, Taliaferro, Kostritsky & Lamb, AIA*	2,000,000
Kimbrough Army Hospital, Ft. Meade, Md., *Marcellus Wright & Partners, AIA*	3,100,000
Medical Education Building Addition, Medical College of Virginia, Richmond, *Lee, King & Poole, AIA*	7,500,000
Basic Science Expansion & Medical Center Library, Change Orders, Georgetown University, Washington, D.C. *Mariani & Assoc./Thos. F. Ellerbe, FAIA*	NFP

ARMED FORCES

Service Station, USN Hospital, Bethesda, Md., *Holle & Graff, AIA*	100,000
Physical Security Lab. Additions & Alterations, Ft. Belvoir, Va., *Cross & Adreon, AIA*	175,000
Officers' Club Alterations, Andrews AFB, Camp Springs, Md., *Robert Calhoun Smith, AIA*	1,000,000
Prefabricated Family Housing, Vint Hills Farms Station, Va., *Chapman & Miller, AIA*	2,500,000
Computer Room Modifications, Naval Reconnaissance & Technical Support Center, Suitland, Md. *Walton, Madden, Cooper & Auerbach, AIA*	NFP

SCHOOLS / COLLEGES / UNIVERSITIES

Thomas Elementary Addition, Washington, D.C., *Thomas J. Stohlman, AIA*	200,000
Green Acres Private School Addition, Rockville, Md., *Harold Esten, AIA*	275,000
Ross Elementary School Alterations, Washington, D.C., *Holle & Graff, AIA*	300,000
Student Union, Phase I, George Mason College (University of Virginia), Fairfax County, Va., *George M. Ewing Co., Arch.-Engrs./John Carl Warnecke, FAIA*	1,100,000
Webb Elementary School Addition, Washington, D.C., *Bryant & Bryant, AIA*	1,100,000
Carver Elementary School, Washington, D.C., *Gray, West & Wilson, Architects*	1,275,000
Rock Creek Center School for Trainable Mentally Retarded, Frederick, Md., *Bushey & Burrey, AIA*	1,500,000
Langdon Elementary School Additions & Alterations, Washington, D.C., *Chapman & Miller, AIA*	1,850,000
Education Building, Morgan State College, Baltimore, Md., *Frey & Welch, AIA*	2,000,000
Natatorium, Auditorium & Theater, Anne Arundel (Co., Md.) Community College, *Wheeler, Bonn & Shockey/ Wm. Harder/Rogers, Taliaferro, Kostritsky & Lamb, AIA*	2,100,000
Brookland Elementary School, Washington, D.C., *Carl A. Ruppert, AIA*	2,400,000
Expanded Gymnasium Facility, Morgan State College, Baltimore, Md., *Cassell & Gray, AIA*	2,500,000
Library-Learning Resources Complex, Montgomery Community College, Rockville, Md., *McLeod, Ferrara & Ensign, AIA*	2,750,000
Alabama Avenue Elementary School, Washington, D.C., *Leroy J. H. Brown, AIA*	2,800,000
Careers Center Bldg., Anne Arundel (Co., Md.) Community College, *Rogers, Taliaferro, Kostritsky & Lamb, AIA*	3,300,000

MISCEL. — COMMERCIAL / INDUSTRIAL / FOUNDATIONS / ASSOCIATIONS

Car Wash, Greenbelt, Md., Scharf Enterprises, *McGaughan & Johnson, AIA*	50,000
Clinton Bank Addn., Clinton, Md., Meyer Shapiro, *Walton, Madden, Cooper & Auerbach, AIA*	100,000
A & P Supermarket, Springfield, Va., Hechinger Enterprises, *Robert S. McMillan, AIA*	100,000
Warehouse, Washington, D.C., Jean Carr Co., Inc./Thos. J. Owen & Son—Real Estate Appraisers, *Gitlin & Cantor, AIA*	150,000
American Car Wash, Richmond, Va., *L. R. Hodges, Jr., AIA*	175,000
Peoples Nat. Bank of Maryland, Greenbelt Branch, *Neil R. Greene, AIA*	200,000
Indoor Tennis Courts, Potomac, Md., *Brown, Wright & Mano, AIA*	350,000
Pott Spring/Cinder Rd. Commercial Development, Towson, Md., *Rogers, Taliaferro, Kostritsky & Lamb, AIA*	1,500,000
Nineteen-Ninety M St. Office Bldg., Washington, D.C., Robert E. Morrison Co., *Robert Calhoun Smith, AIA*	2,500,000
The Beach Club, Hilton Head Is., South Carolina, Sea Pines Plantation, Inc., *Rogers, Taliaferro, Kostritsky & Lamb, AIA*	4,500,000
Components Div. Fac., Phases I-III, Manassas, Va., International Business Machines, *Rogers, Taliaferro, Kostritsky & Lamb, AIA*	25,500,000
GEM Office Bldg. Change Orders, Bethesda, Md., International Business Machines, *Keyes, Lethbridge & Condon, AIA*	NFP
Headquarters Building, The American Institute of Architects, Washington, D.C., *The Architects Collaborative*	NFP

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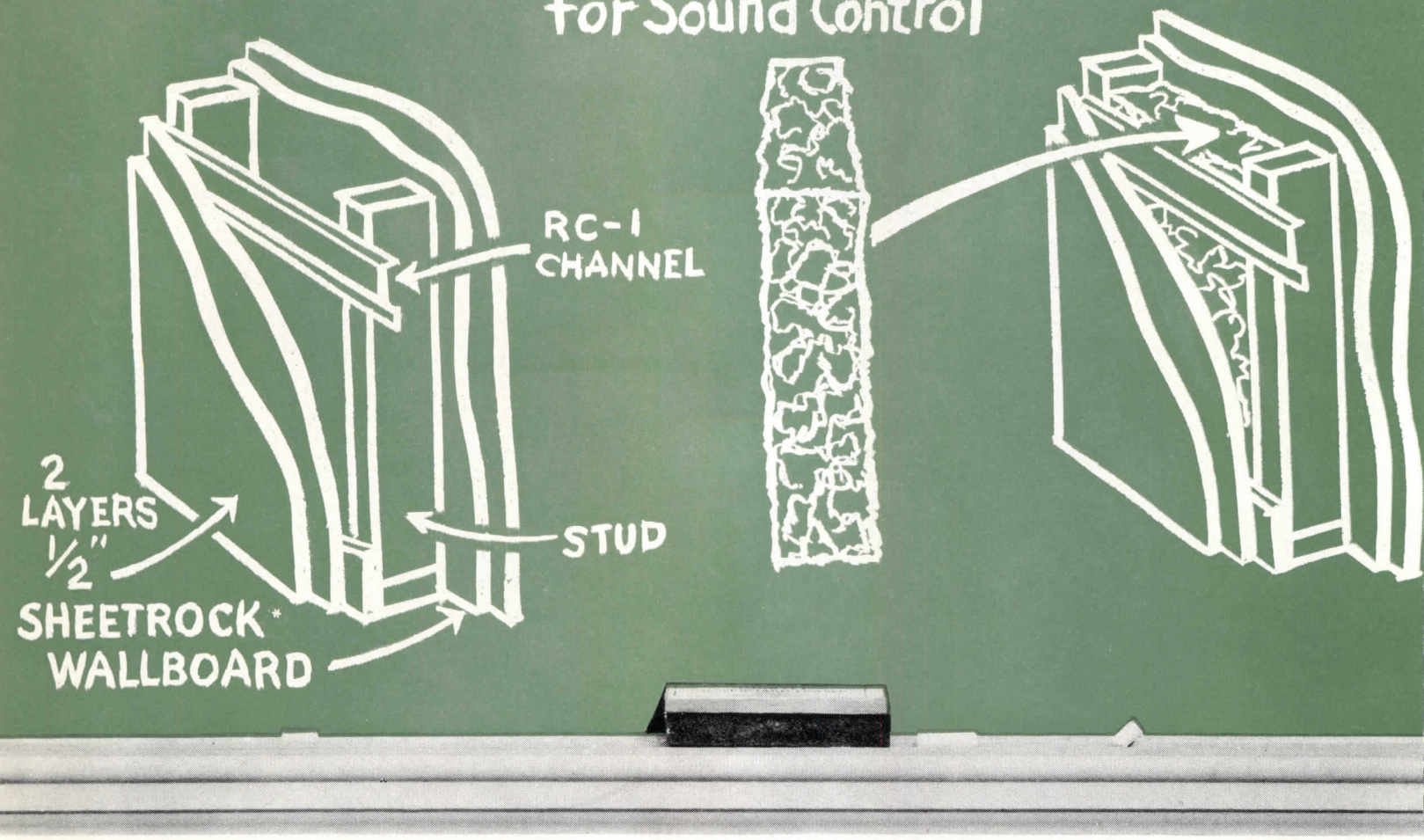

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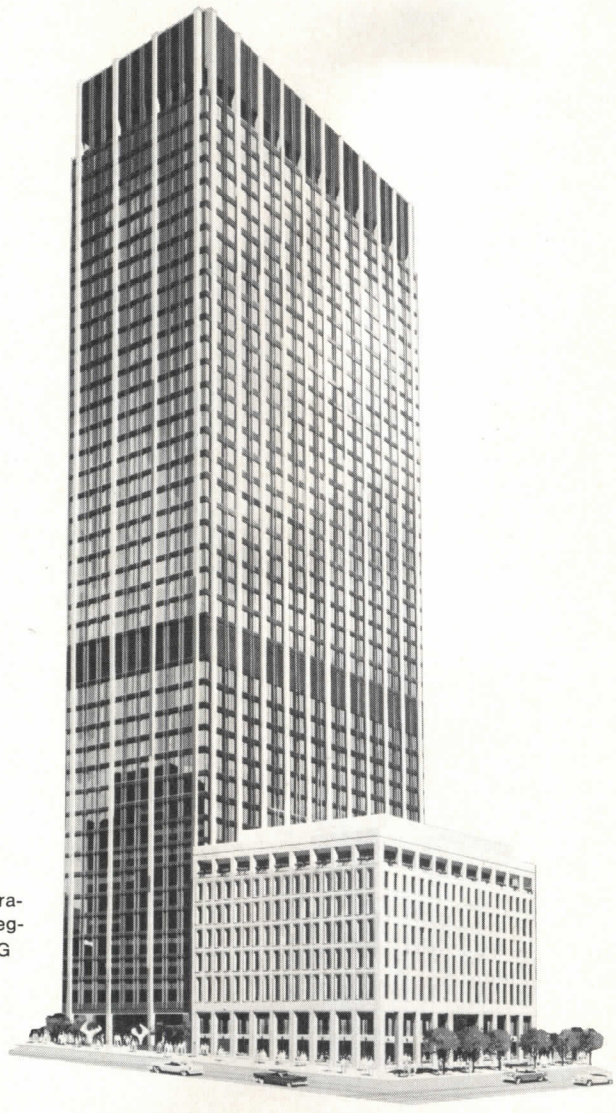

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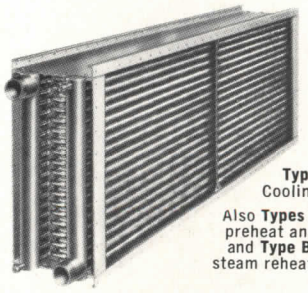

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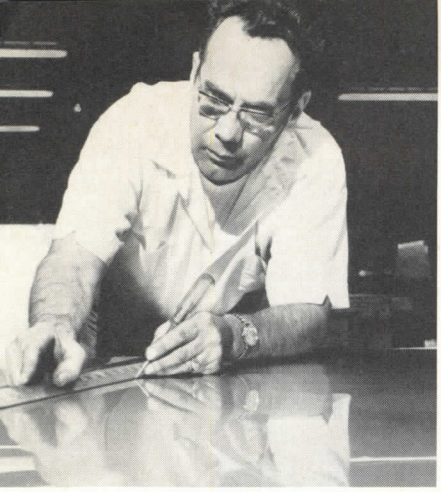
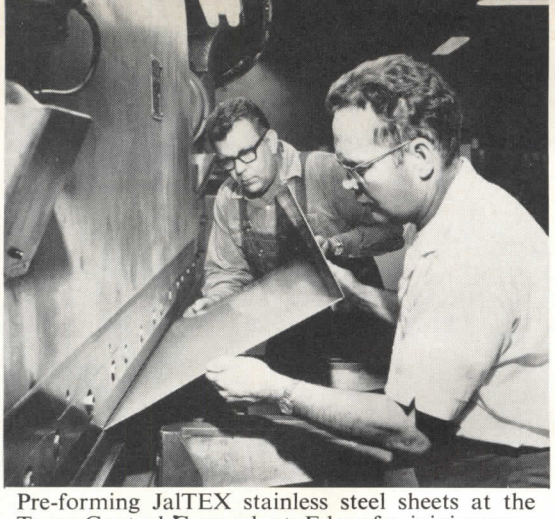
Fabrication and installation ease of

stainless steel flashings

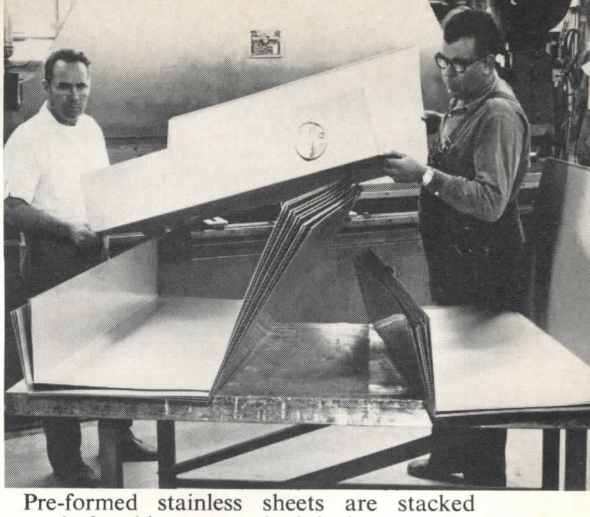
proved in new Eugene, Oregon, department store job.



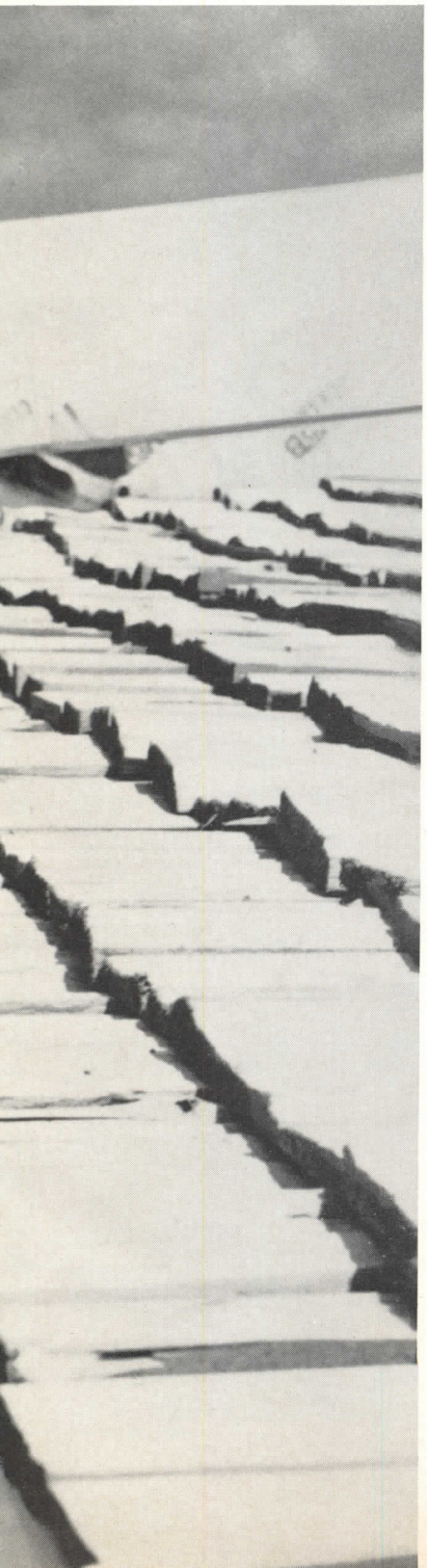
e stainless sheets marked up here for press rk, were formed by the mechanical con- ctor, Temp-Control Corp., Portland.



Pre-forming JalTEX stainless steel sheets at the Temp-Control Corp. plant. Edges for joining were crimped one-half inch for flat-seam joining.



Pre-formed stainless sheets are stacked ready for shipment to the job site.



Pre-formed parts of Type 304, 26 gauge JalTEX stainless steel were delivered to the site by the mechanical contractor.

Pre-formed flashings were easily positioned prior to joining.

Formability, corrosion resistance and compatability with other materials were reasons why dead-soft JalTEX stainless steel was specified for through-wall counter flashing, base flashing, gutters, parapets and roof capping for the Meier & Frank Co. department store in the new Valley River Shopping Center in Eugene, Oregon.

Robert Wynkoop, local branch manager of Temp-Control, mechanical contractors, reported that this was the first job his company had done with JalTEX stainless. "It is so much easier in forming and installation that JalTEX stainless steel must be costing us less in production time and effort," Wynkoop stated.

All forming was done in Temp-Control's Portland plant. Sections were bent to conform to gutters, parapets and the like. Installed gutter sections were held by stainless steel clips secured with stainless steel nails, eliminating the need for nailing through metal. Conventional solder was used for strong joints.

MEIER & FRANK CO.
a Div. The May Department Stores Co.

ARCHITECT:
Bear, McNeil, Bloodworth & Hawes

PROJECT ARCHITECT:
Seaton B. Griswold

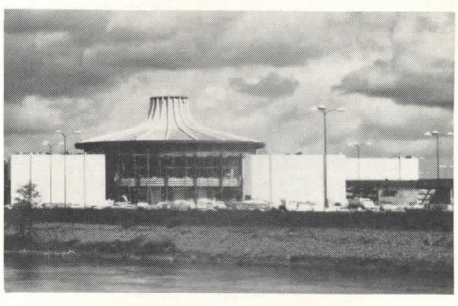
ASSOCIATE ARCHITECT:
Peterson & Smith

DESIGN CONSULTANTS:
Raymond Loewy/William Snaith, Inc.

MECHANICAL CONTRACTOR:
Temp-Control Corp., Portland, Ore.

STAINLESS STEEL DISTRIBUTOR:
Esco Corp., Eugene, Ore.

JalTEX:
304 Stainless, .018", 2B Finish



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Bold Bid For Big Business

Denmark, a nation of less than 5 million, has embarked upon an airport project which will cost close to an estimated $500 million — a project which proves that the Danes are plotting a steady course as an air nation.

From the looks of it, there wasn't any red tape to cut when the question of a new jetport for Copenhagen came up in Denmark. The Danes all seemed to agree that no matter the cost, such a facility is a basic need.

In February 1969, the Minister of Public Works presented a bill to the Danish Parliament, suggesting the location of a new airport. In April, the bill was approved; in May, four engineering firms were selected as consultants; in August, their preliminary report was ready; in October, they sent their final report to the Airport Planning Committee and now, generalized designs, runway configurations, estimated cost and timetables have been developed; forecasts of passenger and cargo traffic have been made.

With such speed, one would expect construction to get started within a year or two. But that's not how the Danes have figured it out. Design of the terminals will begin only in 1975 and the airport itself will open in 1985. The reason for this is planning that makes economical sense:

Kastrup, Copenhagen's present airport, is due for expansion which will carry it up to 1985. That year, it will have reached its absolute capacity. Income from Kastrup, after payment for the expansion, will go to the Saltholm fund. Therefore, in order to get this fund as large as possible and also in order to get the fullest return possible on the investment for expansion, Kastrup will be used as long as feasible.

With an opening date for Saltholm as early as 1980, income from Kastrup would still be so low that the new facility would start out with a deficit that would not even be absorbed after the 10th year of operation. Given five more years, with a 1985 opening, Saltholm will have a fund from Kastrup so much larger that the airport will yield a working profit in its second year.

Hoping that Norway and Sweden would take part in the venture, Denmark invited the two to participate. The three nations have, after all, been the so-called United Nations of the Air since shortly after World War II, when they formed Scandinavian Airlines System. But the two declined, so now, Denmark undauntedly goes the long way alone.

When it opens, Saltholm will be able to accommodate about 40 million passengers annually, which is about 25 percent over the estimate for Copenhagen. The ultimate capacity is set at 60 million.

The Danes, then, are moving into a position which will place them well ahead in the air-game for years to come. And while getting there, they can sit back and follow the international development in the field, reaping other nation's experiences with airport layout.

However, the consultants to Saltholm and SAS, which contributes almost 70 percent to Copenhagen's air traffic, have naturally formed some opinions about terminal design. Their interest centers around two main types: the linear, in a chain configuration, and the satellite (*see* AIA JOURNAL, Sept., pp. 40 and 35, Houston Intercontinental and Dallas/Fort Worth Regional Airports). The former, with centralized functions and connections to planes through short fingers, is most suitable for collective surface transportation; the latter, with decentralized functions and direct connections to planes, is best suited for individual land traffic.

Whichever is chosen, the individual units will be of moderate size, each capable of handling 5 to 8 million passengers yearly. Cost of the plans would be about the same.

According to Henrik Kiby, SAS project manager for Saltholm, the use of mobile lounges has not been considered so far. This, he thinks, is mostly because of the general opinion that they lead to increased running expenses for passenger handling and also because of the severe difficulties foreseen with this system in connection with the handling of large capacity aircraft and unwanted traffic on the Tarmac. In the final analysis of terminal type, Kiby says, their possible use will be reconsidered.

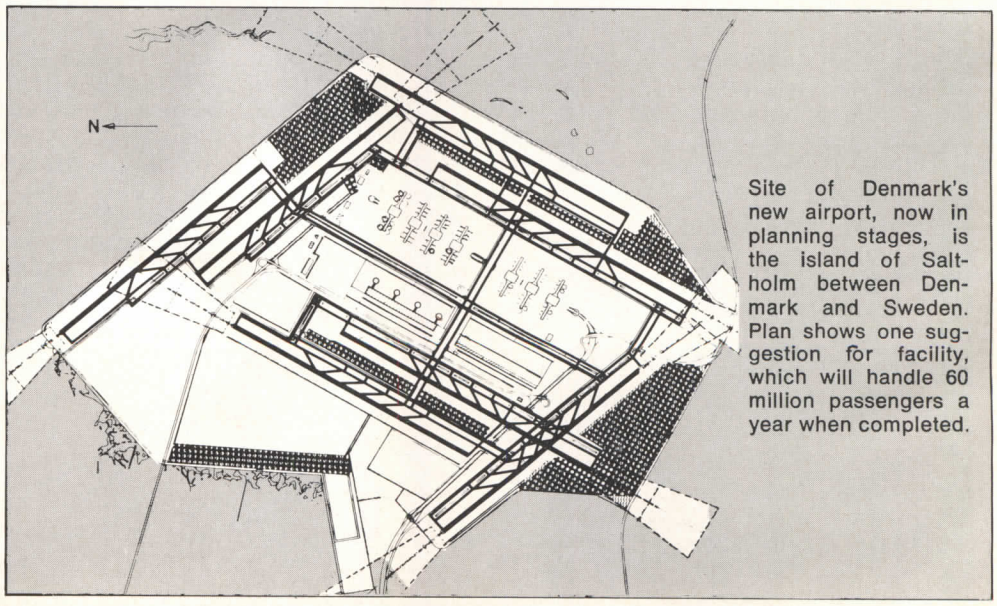
Saltholm, an island which consists of limestone under 3 feet of moraine clay and sand, is located between Denmark and Sweden and presently occupied by two families. Its size is 5.8 square miles but it will be built out to almost double that with 535 million cubic feet of sandy soil to provide for the seven runways it will have when completed.

A tunnel about a quarter of a mile long will connect Saltholm with the Copenhagen area; its six lanes will be blended into the roadsystem in and around the Danish capital. One lane in each direction will be reserved for high-speed buses, which will stop at strategic points in the city. The requirement for a rapid transit system on rails is, the airport consultants agree, not likely to occur during the present century. However, in order to keep traffic in line with the roadsystem of greater Copenhagen, public transport will be encouraged and private cars will most likely have to pay toll for use of the tunnel.

When Kastrup operations have been transferred to Saltholm, the intention is to make a Copenhagen area/Saltholm/Sweden bridge connection. The entire traffic capacity of the tunnel will be needed for the airport traffic and the bridge, it is expected, will mainly carry local traffic.

Not only the new airport but also the bridge will bring industrial and commercial development to the region. And Saltholm, built from the start for supersonic transports, stands every chance of becoming Europe's major air gateway for passengers as well as for cargo.

BESS BALCHEN



Site of Denmark's new airport, now in planning stages, is the island of Saltholm between Denmark and Sweden. Plan shows one suggestion for facility, which will handle 60 million passengers a year when completed.

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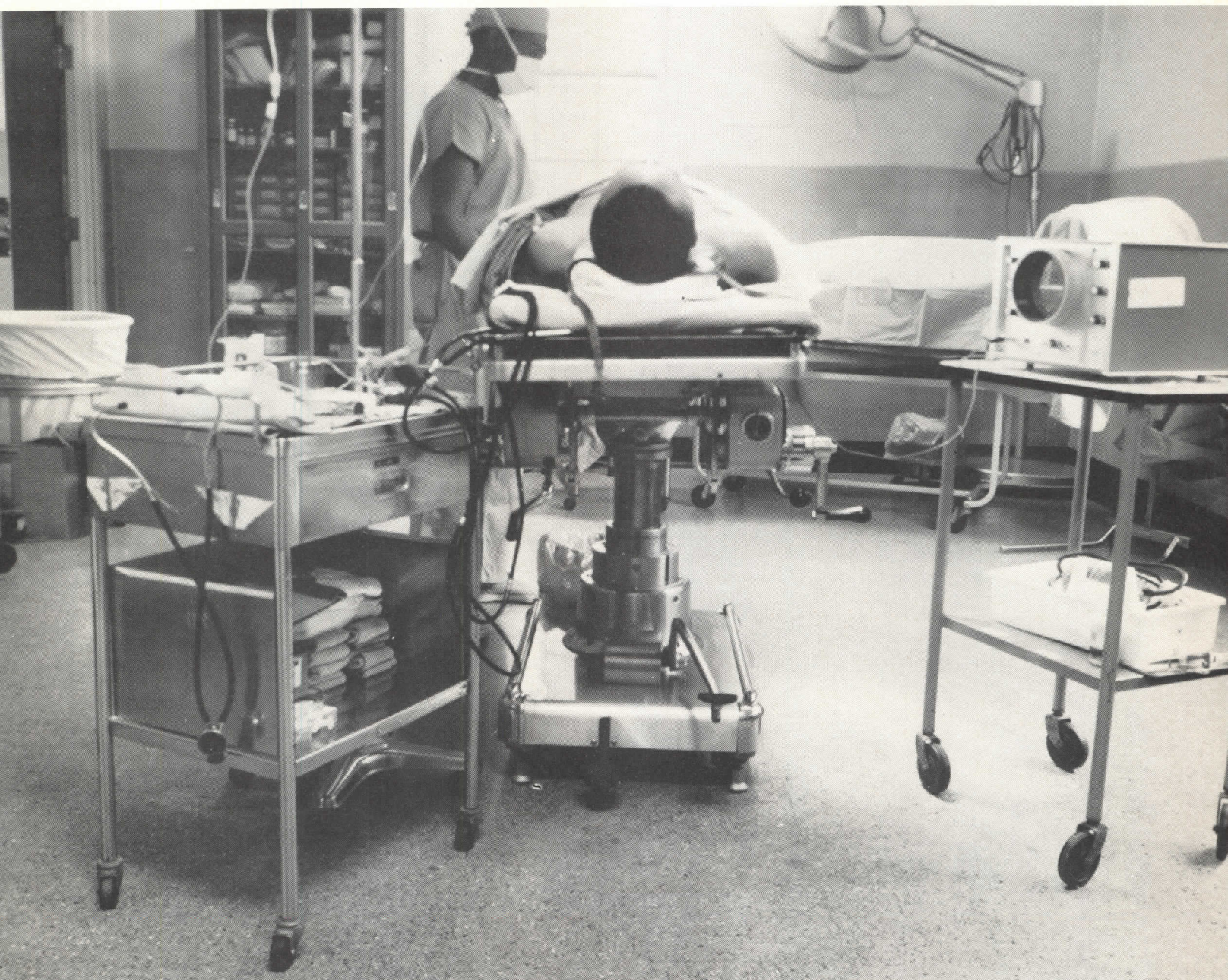


There's Condulite, for example.

Let's Be Seated— More Comfortably

Hard, sterile and impersonal — that's how passengers describe most airport departure lounges. Max Jacobson, architectural student at the University of California at Berkeley, whose interest in such lounges was sparked by Robert Sommer's "The Lonely Airport Crowd" in *Air Travel*, April 1969, conducted an interview with air travelers and presents here some ideas for improvements.

Why don't air terminals have comfortable, friendly holding gates for the travelers? Most airlines — and certainly most at the smaller terminals — don't provide more than what amounts to storage rooms, and along with them a feeling of loneliness and alienation.

No doubt one could suggest that economics, ease of maintenance or lack of imagination are the deterrent factors. But perhaps these factors are irrelevant if we cannot state with some assurance that passengers would indeed want pleasanter departure lounges. What is lacking, maybe, is knowledge about the users' feelings and preferences. However, when terms are heard such as impersonality, loneliness, alienation and sterility in connection with the waiting lounges, the time has come when the user must be consulted.

Consequently, we asked travelers to describe how they felt about the holding gate they were sitting in (a gate at a West Coast airport) and then to describe their ideal imaginary lounges. The room we visited is about 55x25 feet; it has beige walls, white ceiling, white linoleum floor and fluorescent lighting. It has 35 yellow plastic form chairs, four in a row, back to back. The entire wall facing the apron is composed of curtain wall glass and plastic panels. Michelangelo Antonioni could probably use this room as the set for one of his movies.

In our interview, we depended mainly on a semantic-differential or forced-type questionnaire, in which the subject is offered a number of bipolar word pairs with a seven-step graduated scale between them. This technique is biased toward those who are quite competent with the English language; on the other hand, it enables the average subject to express rather personal feelings anonymously and therefore encourages him to respond honestly.

The essence of the answers from the 36 passengers interviewed was that they found the lounge both hard and impersonal. They expressed desire for a soft and personal lounge, at the same time more active and potent (the opposite of sterile).

Sex or age made no difference in the answers; neither did the purpose of the travelers' trips. The only significant difference was that women were more interested than men in having their ideal lounge "precise."

How can lounges be improved to make passengers feel that they are in a more human space?

The use of warm colors and the introduction of softer materials such as carpeting on the floor and a warmer lighting overhead would help. But primary culprit is the parallel, back-to-back seating. Although the first goal of the airlines is to have a functional airport, it still should not be difficult (or expensive) to provide holding gates with:

- conversation areas for groups of up to four people
- some degree of identity and consequently some degree of privacy
- a place or places for temporary storage of coats and small parcels.

Finally, the seating must be flexible enough to accommodate the mix of group sizes occurring at each departure without requiring excessive janitorial service.

The conditions which promote conversation between people are quite specific: The conversants will either want to sit facing one another directly or at some angle toward each other so that visual contact is maintained without neck strain. The distance between them should be less than 5½ feet but no more than 2½ feet. The conditions which promote a feeling of privacy are dependent on the degree of crowdedness in the room. However, if two strangers don't wish to converse but must sit quite close, they will prefer to sit at an angle away from each other, if not back to back.

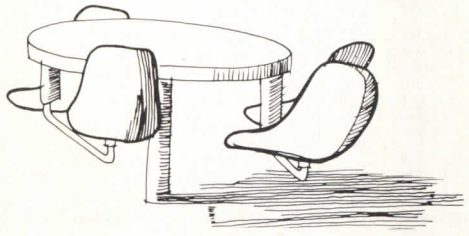
The parallel seating so often found in public waiting spaces simply does not allow for either comfortable conversation or for adequate privacy. If two people in these parallel seats want to converse, they must twist around to face each other and simultaneously lean back so that they can see each other without crossing their eyes. More often, one person will simply give up and stand in front of the seated friend. These difficulties are compounded in groups of three or four.

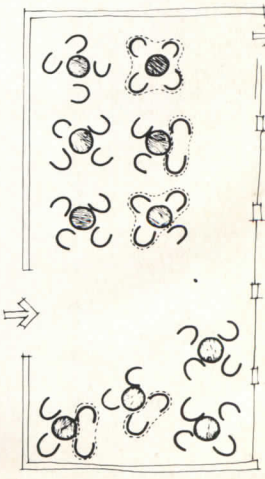
That parallel seating doesn't provide adequate privacy between adjacent seats is demonstrated by the frequent empty seats between occupied end seats. Also, occupants of parallel seating will often place their coats or parcels on the next seat to prevent someone from sitting so close. (The distance per se is not the critical factor. Back-to-back seats *do* provide adequate privacy.)

An alternate scheme would involve grouping seats around low tables and allowing the seats to rotate 90 degrees to the right and left. This arrangement is completely flexible, allowing for any mix of group sizes. It provides good conversation configurations for any size group and allows for privacy between groups and for single travelers. Further, no straightening up is required after departure.

Since the passenger is indeed sensitive to his surroundings, the lounge designed with his comfort in mind will be perceived as a personal space. When he finds that his need for privacy is respected, his attitude toward waiting — and probably the airline — will change. He will get a respite from the stress and alienation of modern public life. □

Parallel seating is good for storage of packages and bundles but bad for intimate, even casual, conversation. Better seating fixtures and arrangements are suggested at right.





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Architectural Inquiry Highlighted

Research papers on industrialized housing, behavioral patterns, urban transportation and other subjects will be presented at the annual Architect-Researcher's Conference in Cincinnati on November 1-3. Further information regarding the papers, abstracted here, may be obtained from the authors.

Architectural Research in Britain. Geoffrey Broadbent, Portsmouth Polytechnic, England.

Architectural research in Britain before the Oxford Conference in 1959. The development groups. The development of research standards by bringing researchers from other fields such as environmental physics, psychology, sociology, etc. Research at various levels: spasmodic, descriptive, predictive. Formulation of new architectural theories. Work of the RIBA Research Committee with discussion of paper on strategies for architectural research. Application of research results into practice. Some case studies: Cambridge; University College, London; Strathclyde; Portsmouth; etc.

Are the New European Building Systems Applicable to US Housing Needs? Helmut Schulitz, University of California at Los Angeles.

The introduction of well-known European building systems to the US is based on the erroneous assumption of similarities between the financial, technological and sociological situations in the US and Europe. The existing European systems were designed to overcome the pressing postwar housing needs, and many still apply technologies and management techniques of 20 years ago. A "new generation" of European building systems is now being developed which is little known in the US. The new concepts differ from the older systems in their ability to adapt to changing user requirements, physical deterioration, functional obsolescence and reuse. This paper examines these new systems and their applicability to the US.

Behavioral Research for Architectural Planning. Lawrence Wheeler and Ewing Miller, University of Arizona and Ewing Miller Associates.

Ten years of work are discussed in which analyses of responses to constructed environments have been performed by a psychologist on behalf of a firm of architects. This has involved campus residence halls, general campus environmental factors and responses of working people to physical factors in many offices. More than 3,000 respondents have contributed material for these projects. The results have been instrumental in improving building designs. Communication between the behavioral scientist and the architect has improved as a common vocabulary developed and each professional could understand the implications of his own work in terms of the needs of others.

BIDS: A Regional Economic Information and Analysis System for the Building Industry. David S. Haviland, Rensselaer Polytechnic Institute.

One of the major problems facing owners, architects, contractors, labor and others who participate in the building industry is that they must operate in a market about which they have very limited information. A regionally oriented, industrywide construction information and analysis system which attempts to provide some of this information for industry decision makers is now under development at RPI. The concepts behind the project were presented to AR/5 in Wisconsin two years ago; this presentation will note progress and results to date.

Breaking the Box Barrier in Industrialized Housing. Edward Allen, Massachusetts Institute of Technology.

A nonmodular, fully automated building system is proposed as a preferred alternative to panel or box systems. A synthetic multipurpose material is pumped in liquid form to a moving placement device which extrudes it as a course of solid material bonded to previously placed courses. The resulting single-piece structure includes floors, walls and roof. Participation of the user in design and construction is effected through his creative interaction with the computer system which controls the moving placement device. An almost limitless range of shapes and sizes of dwellings is made available to the user, and no cost penalty is incurred through the building of nonrepetitious or irregular forms.

A Building System for Ghanaian Housing. J.P.R. Falconer, Washington University.

One objective of Ghanaian research is the exploitation of indigenous materials for improved, less costly housing. This paper describes a cooperative program between the University of Science and Technology, Kumasi, and Washington University, St. Louis, directed at greater utilization of timber, the most abundant yet least utilized local building material. Design consists of an "open" framing system, forming a planning and building unit of shop-fabricated posts, beams and connections which facilitate horizontal and vertical extensions by self-help and mutual-aid methods. Roofing and walling alternatives include traditional on-site techniques, craft industry products and shop-fabricated panel systems. A prototype was erected on the Kumasi campus to test fabrication and assembly procedures. Cost and performance data were obtained on which to base recommendations to industry and housing agencies. Lessons learned here may be applicable to other low cost housing projects.

Building Systems — Why Concrete? Samuel Aroni, University of California at Los Angeles.

Concrete has been used extensively in building systems abroad, and its use in the US is rapidly increasing. What are the problems and the advantages of concrete building systems? Consideration is given to a variety of questions, including flexibility, weight, joints, appearance, acceptance, unskilled labor, etc. What is the promise of new developments? Fast setting cements could speed up production and reduce costs; polymer concrete and fiber reinforcement could significantly improve mechanical properties and durability; chemical prestressing could reduce cracking; and aerated concrete technology could produce lightweight elements of superior insulation. These questions and directions of needed research are discussed, with various illustrated examples.

Controlled Density Concrete for Housing Construction. William H. Wilson, University of Oklahoma.

Conventional concrete weighs about 145 pounds per cubic foot with a strength of 3,000 psi. To prevent condensation from forming, an exterior wall would have to be 20 inches thick. Reducing the density to 70 pcf can produce a 6-inch wall without condensation with strength adequate for wall bearing structures three floors high. Light aggregates, chemical gas cells, air cells and combinations can produce controlled density concretes. With proper mix design, shrinkage controls and precasting techniques, low cost housing can be manufactured as a systems design process. A pilot building is presently under construction in Teheran, Iran. Other US projects are presently being designed. Research has been underway since 1964 in Oklahoma.

Defining the Facility Needs of a Regional Data Processing Center: A Programmer's Workbook. William F. Winslow, Rensselaer Polytechnic Institute.

The programmer's workbook is designed to assist 12 local planning teams in programming essentially similar to regional educational data processing centers in New York State. Viewing the facility programming process as a translation from educational administrative and operating needs to the physical space required to house those needs, the workbook leads the programming team through several interconnected steps. Early steps deal in terms with which a center's administrators can identify: departments, staffing patterns, specific activities, meeting needs and hardware configurations. Later steps translate this information to architectural terms: spaces, square footages, door sizes, acoustical barriers and other physical requirements.

Demonstration of Techniques to Simulate Exterior and Interior Spatial Environment. Henry Wright, Kansas State University.

Demonstration of methods for simulating exterior and interior architectural space with special emphasis on natural and artificial lighting and combinations of natural and ar-

continued on page 78

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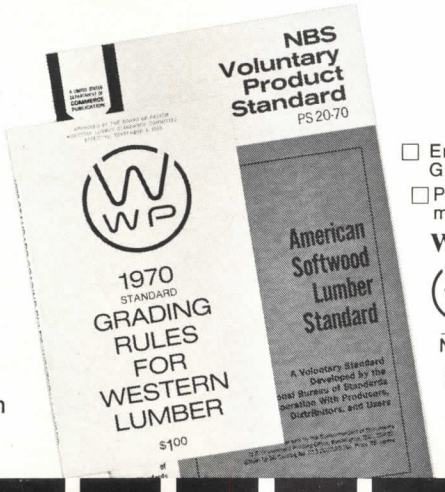

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Inquiry *from page 76*

tificial lighting. These techniques were developed with the use of a Heliodon and a snorkle camera that was perfected under a research grant from Smith, Hinchman & Grylls. Methods have been devised which enable a student to actually "get into" models of convenient size, view them from the usual eye level and analyze a space relative to the light level within the interior models. This space simulation technique permits students to form more relevant value judgments between design alternatives. Color slides and the snorkle camera will be used to demonstrate these techniques.

Egress Arrangements in University Residences. R. S. Ferguson, National Research Council of Canada.

Some results of a study program which examines historical, social and technical aspects of building regulations are reported. The program's purpose is to develop concepts or assumptions which help to solve the practical problems arising in the development and use of Canada's national building code. A primary assumption acknowledges building as an environmental control. A corollary is that regulations apply only where building as a control fails. These failures can be remedied by specific knowledge which, experience shows, replaces regulation. Some specific problems and solutions related to university residences, including the concept of "suite," generic plans and occupancy characteristics, are discussed.

The Grid House: A Prototype Low Cost Self-Help Housing System. Richard S. Levine, University of Kentucky.

The Grid House concept incorporates ideas about construction, space planning and community organization. The house is defined by three-dimensional perimeter concrete grid walls in which all functions are housed. The grid walls define large interior spaces that become community or family, social spaces not having to serve particularized functions. The approach to construction is the maximum localization of the building process. A few basic raw materials are delivered to the site together with the industrially made, reusable forming system. Forms walk up grid walls as they are cast. The simple process uses unskilled labor and the nature of the system encourages growth, from dwelling to community.

Judicial Facilities Study. A. Benjamin Handler, University of Michigan.

This paper describes a study designed to develop performance standards for all the facilities concerned with the administration of justice. Recently completed, it was jointly sponsored by The American Institute of Architects and the American Bar Association and financed by the Ford Foundation. The paper deals with the scope of the study, how the problem was analyzed and the results obtained. It consists of the following: nature and scope of the problem; theoretical and conceptual framework; and methodology employed to derive facility requirements from a study of the judicial system, its components and specialized procedures. Among the topics discussed are: analysis of objectives; critical examination of operations; activity, people and space identification; movement and other communication patterns; spatial dispositions; environmental criteria; and spatial quantities.

"My House": Scattered Site Equity Housing. Joel P. Zingeser, Caudill Rowlett Scott (on leave with the National Bureau of Standards).

A description of the areas of investigation data gathering and analysis approach and findings of a study conducted for the City of Hartford Redevelopment Agency. The purpose was to determine the feasibility of developing 235/236 housing on five vacant, scattered sites. Areas of investigation included: the families, the neighborhoods, the economics of housing, site analysis and the regulations governing housing. The data gathering and analysis approach included: direct meetings, field notes, a tote board analog, housing activity cards sessions, "draw-my-house" sessions, neighborhood meetings, school enrollment analysis, housing conference, "squatters" (brainstorming sessions) and a computer model for simultaneous correlation of program, land use and economic factors. The findings indicated the uniqueness of the moderate income family in Hartford, the history, characteristics and concerns of the neighborhoods, the cost of housing, the physical problems of developing the vacant sites and the means of implementing the 235/236 program.

On the Development of Functional Design Methodology for Health Care Facilities. Ernest W. Parti, Carnegie-Mellon University.

The process of designing health care facilities is evolving from intuitive methods to more formal computerized procedures in order to satisfy the increasingly restrictive and complex functional requirements for modern health care. This paper presents a general framework for the functional design of health care facilities in which the specific problem of designing general hospitals is discussed. This functional design process is examined with regard to general procedures of decomposing the hospital system into its elementary component parts, methods for determining relationships between these parts and techniques of synthesizing the parts into innovative design.

Operation GREAT: Computer Application to Architectural Design. Sheldon Lee Anonsen, Ellerbe Architects.

Interactive computer graphics is a tool which has immense potential for use by architects in the design process. It permits the architect to make design decisions in real time while being assisted by the computer in maintaining desired functional requirements. It also permits continuous cost control during the design process. In an effort to determine the feasibility of using interactive graphics in our current practice, Ellerbe Architects initiated and funded the research project "Operation GREAT," using the facilities of the Hybrid Computer Laboratory at the University of Minnesota. The results of this research project were extremely favorable.

A Policy for Industrialization of the Building Sector. Arthur D. Bernhardt, Massachusetts Institute of Technology.

This paper describes a policy for developing the mobile home industry and for using this industry as a catalyst for radical industrialization of the building sector. Aiming to substantially increase the industry's efficiency and responsiveness to user needs, an industrial organization analysis along with exploratory and normative forecasts determines for the industry its optimal politically feasible development direction, indicating its future role within the housing sector. A course of action to effect this role is recommended. As a case study, the paper outlines the future role of the architectural profession and identifies criteria for the corresponding reorientation of architectural education.

Research in Environmental Engineering. Frank J. Powell, National Bureau of Standards.

Aspects of the research program of the Environmental Engineering Section, Building Research Division, NBS, are given. Selected current research efforts are presented and discussed in terms of problem definition, technical approach for study and experimentation and progress achieved. Subject areas include thermal performance of whole buildings, heating and cooling loads, mechanical systems and controls, air movement and distribution, indoor air pollution and air cleaning and the computerization of environmental engineering problems.

Research in Joints and Jointing for Component Building. Tibor Csizmadia, Washington University.

The "open" system, about which there is much talk and which implies utopian catalogs of compatible building components, is a long way off, mainly because of the problem of jointing. Under traditional circumstances, the project designer (architect or engineer) decides upon the detailed form of the "adjacent components" and presumably does so in full recognition of the consequences of his design decisions on jointing. The manufacturers of the components, first, and the assembly contractor, second, are tied by his decisions. When the components are standardized (in the specific sense of being designed before and without reference to any individual project in which they are used), the decisions are no longer focused on one designer with centralized responsibility but are spread among a number of manufacturers. If standardization is taken to mean the increased use of factory-finished building components, not only must all the decisions which affect joints and jointing be coordinated but they must also be absolutely correct since the factory-finished components cannot be adjusted on site.

Selecting Visual Properties of Architectural Surfaces: A Psychological Approach. Clarke A. Burnham and Clayford T. Grimm, University of Texas.

Within the architectural profession there is no rational technique, i.e., no methodology derived from systematic research either to guide the architect in his expression of a de-

sign concept or to assess the extent to which that concept is expressed in the spatial forms and the visual properties of the material surfaces of a building. The psychological approach here employed involves matching the connotative meaning of the design concept with the connotative meaning of visual properties of architectural surfaces. Psychological relationships between measurable physical properties of architectural surfaces and psychological responses to these physical properties have been investigated by the semantic differential.

The mobile home industry and its relation to industrialization has broad implications for the architectural profession.

Some Thoughts on the Direction of User Requirements Research. Charles Masterson, Bosti, Buffalo.

This analysis seeks to develop user requirements information in a form that can be effectively used in the design and construction process of a major program builder ($2.5 billion of space). Conventional analytical techniques are basically reductionist in character. They have depicted the man/environment system as a simple linear feedback structure — a relationship that is not corroborated either by research or by actual experience. The author recommends holistic rather than parametric research on the man/environment interaction. User manipulable systems of building and direct user-specified designs for the environment are evaluated for their payoff potential.

Strip Highway Project. Frank S. Kelly, University of Tennessee.

A five-month research program sponsored by a federal Title 1 grant, the Strip Highway Project was conducted by students and faculty of the University of Tennessee's School of Architecture. Selected as representative of US "strips," Knoxville's highways were studied in terms of their historical development, land use characteristics, traffic patterns, visual definition and order. From this background, practical solutions applicable to existing highway problems evolved in conjunction with concepts for avoiding future roadway blight. Found to be a negative influence on the highway environment, zoning was carefully analyzed and a more effective ordinance written.

Studies on Housing of American Indian Communities. Chester L. Sprague, Massachusetts Institute of Technology.

Three areas of study: historical development of architectural and village forms of pueblo-dwelling Indians; analysis of current federal housing policies and achievements leading to recommendations of new policies with the goals of transforming the present federally directed housing process with its numerous fragmented acts of inefficient and paternalistic benefaction into a more efficient user accepted, directed and operated housing process; and new designs for villages, buildings and equipment as related to the housing problems of Alaskan native peoples, both Eskimos and Aleuts.

Unified Transportation Systems and Future Urban and Regional Development. Robert M. Beckley, University of Wisconsin — Milwaukee.

This research, sponsored by the Graham Foundation, was conducted in the belief that new methods are needed for future planning to consider adequately a new generation of societal needs and transportation technologies and their impact on urban and regional development. The study identified more than 100 forms of urban and regional transportation, developed methods for comparing transportation systems using a standardized data base, developed methods for describing the physical effort required in interfacing systems and the effort required in moving through complex transportation networks.

Vertical Transportation in Highrise Campus Buildings. Jeffrey L. Lyon, Computing Research Systems Corporation (CRS2).

In order to provide meaningful data on the cost and design of vertical transportation systems in highrise campus buildings, CRS2 developed a deductive computer-based model employing patterns of existing class schedules at Manhattan Community College. This model has been used to study questions concerning the relationship between building parti, campus massing and the generation of vertical transportation loads; the degree to which the cost of the vertical transportation system is dependent upon building parti, campus massing and equipment type; and the proper equipment □

books

Effects of Sonic Boom. John H. Wiggins Jr., Palos Verdes Estates, Calif.: J. H. Wiggins Co., 1969. 174 pp. $16.

With the SST, a political and sociological issue of national and international importance, authoritative information on the effects of sonic boom should be welcomed. This book, however, is limited to its physical effects on structures. The author, a consultant with the US Air Force Institute of Technology and teacher of a course on sonic boom analysis, states that he has prepared the text "with an eye toward the architect, engineer, insurance official, adjuster, airline official and government official."

The book includes chapters on theories of the generation and propagation of sonic boom shock waves, the development of formulas for calculated overpressures of booms and superbooms, the responses of elastic structures to dynamic loads and the behavior of typical building components under stress. There follows a discussion of the natural forces: shrinkage, settlement, thermal expansion, water leakage and elastic deflection, which can cause structural damage. This presentation is elementary for the architect but might be valuable to the layman if it is recognized to an equal degree that damage of the magnitude described and frequency implied can be prevented by adequate design and construction — the responsibility of the architect and contractor. The book concludes with a section on "Damage Inspection Tips" and a discussion of litigation. There is an extensive bibliography but it goes only to January 1968.

The report of the Environmental and Sociological Panel of the President's Ad Hoc Supersonic Transport Review Committee, published in the *Congressional Record* of October 31, 1969 (three months after the date of Wiggins' book), states: "All available information indicates that the effects of the sonic boom are such as to be considered intolerable by a very high percentage of the people affected." Wiggins makes a few passing references to noise problems, such as pointing out in his "inspection tips" that those who are physically shaken by a boom may look for, find and attribute to the boom damage which had previously gone unnoticed. There is no formal recognition of physiological and psychological damage nor any attempt to extrapolate data based on military overflights into estimates of the effects of the increased traffic of the SST. Referring to the inadequacy of available test data, Wiggins recommends that more cumulative damage tests be conducted with a very high degree of accuracy, *"for the cumulative damage argument is prophesied as being the biggest one that can be used in the courtroom against an SST."* (Author's emphasis.) This is incredibly naive.

The book contains some information which, if carefully evaluated, may be of reference value to the specialist, although the theoretical and empirical mathematical analyses are, to this reviewer, carried to a degree of refinement not justified by the degree of accuracy with which it will be possible to estimate the values of the variables concerned. The basis for establishing boom overload values (expressed as static loads in psf) is substantially less than that available to establish code values for wind and seismic stresses. Nevertheless, Wiggins recommends using these values in court to evaluate the probability that damage could or could not have been caused by sonic boom.

The value of this book, even to the specialist, will be contingent on its being used in context with other information.

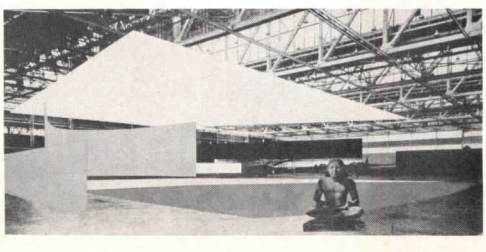
EDWARD A. MERRILL, AIA

Ludwig Mies van der Rohe: Drawings in the Collection of the Museum of Modern Art. Introduction and notes by Ludwig Glaeser. New York: Museum of Modern Art, 1970. 31 plates. Limited edition, unbound sheets, boxed, $75; spiral-bound edition, $20.

"Among the most compelling architectural images ever made" is the accolade given to some of the drawings of Ludwig Mies van der Rohe in the collection of the Museum of Modern Art in New York. Mies was a master draftsman whose drawings have been called also "the most beautiful renderings of the century."

The Museum of Modern Art has published a selection of the drawings from its own Ludwig Mies van der Rohe Archive which was established in 1969 as a repository for the architect's drawings and documentary materials. The plates present projects which were never actually built, since with few exceptions only drawings of unrealized work have found their way into any collection. Each of the five projects, conceived between 1921 and 1923, presented architectural innovation through brilliantly executed drawings. Three of these projects are in this publication: the Friedrichstrasse Office Building (1921), the Glass Skyscraper (1921) and the Concrete Building (1922).

The book contains also fountain pen sketches, described as being "as personal as handwriting and as incidental as notebook entries — which, in many cases, they actually were." Drawings are grouped by technique with the earlier sketches and pencil perspectives at the beginning. The later drawings are montages, combining cutout reproductions and hard-line studio drawings.



There is a revised chronology of Mies's early work, confirmed by the architect before his death. Notes contain supplementary material such as reconstructed plans and illustrations of projects not included in the plates.

The pages of both editions (one is a limited edition of 125 copies with the sheets unbound) are 18x24 inches, a size sufficient to capture the spirit and proportion of the plans. Framed, the plates would make a stunning contribution to the walls of an architect's office.

Blueprint for Professional Service Corporations. William J. Burke and Basil J. Zaloom. New York: Thomas Y. Crowell Co., 1970. 206 pp. $5.95.

Professional architects who have thoughts about incorporating will find this book invaluable. It tells about advantages and pitfalls; tax rulings; legal and accounting aspects; pensions and profit-sharing plans; and many other facets of incorporation difficult to find elsewhere. The authors concede that advantages and disadvantages of incorporation cannot be stated universally for the entire country, since state corporation laws vary widely.

Standards for School Media Programs. American Association of School Librarians and the Department of Audiovisual Instruction, National Education Association. Chicago: American Library Association, 1969. 66 pp. $2.

This replaces the 1960 school library standards and 1966 audio-visual standards. The designer of school libraries should have this publication because it provides a framework of guidelines to excellence, flexible enough to meet every school's requirements. The chapter on media center facilities is particularly pertinent for the architect.

The BOCA Basic Building Code. 5th ed. Chicago: Building Officials Conference of America, 1969. 504 pp. $12 hardbound, $10 paperbound, $14 loose-leaf with 16-ring vinyl binder.

Approved changes in the BOCA code are published annually in supplements; a new edition, such as this one, is prepared every five years and contains all approved changes since the previous edition. For the first time, the code is available in three different bindings: hardbound, paperbound and loose-leaf.

Recommended Practice for Engineered Brick Masonry. McLean, Va.: Structural Clay Products Institute, 1969. 337 pp. $7.50.

Written primarily for the practicing structural engineer, this manual will assist the architect as well in the design of brick masonry structural elements and systems. The recommendations are based on test data, current design practice and construction experience. □

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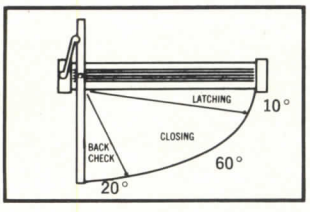

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Oct. 15-17: California Council of Architects, Ahwahnee Hotel, Yosemite National Park

Oct. 15-17: Indiana Society of Architects, Atkinson Hotel, Indianapolis

Oct. 15-18: Pennsylvania Society of Architects Forum, Lancaster

Oct. 19-22: New York and New England States Joint Regional Conference, the Laurels, Monticello, N.Y.

Oct. 22: Nebraska Chapter Fall Seminar, Omaha Hilton Hotel, Omaha

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Oct. 23-24: Illinois Council of Architects, Peoria

Oct. 28-30: Texas Society of Architects, Sheraton-Fort Worth Hotel, Ft. Worth

Oct. 29-31: Architects Society of Ohio, Stouffer's Cincinnati Inn, Cincinnati

Nov. 4-6: North Central States Region, Raddison South Hotel, Bloomington, Minn.

National

Oct. 11-14: Joint Transportation Conference (Transportation: An Interdisciplinary Challenge), Sheraton-Chicago Hotel, Chicago

Oct. 17-21: American Institute of Planners Annual Convention, Minneapolis

Oct. 19-22: American Society of Engineers Annual Meeting, Statler Hilton Hotel, New York, N.Y.

Oct. 22-25: Industrial Designers Society of America, Pocono Manor Inn, Pocono Manor, Pa.

Nov. 1-3: Architect/Researcher's Conference, Stouffer's Cincinnati Inn, Cincinnati

Nov. 3-6: Industrialized Building Exposition and Congress, Louisville, Ky.

Nov. 4-8: National Trust for Historic Preservation Conference, Charleston Municipal Auditorium, Charleston, S.C.

Nov. 15-18: National Conference on the Arts and the Human Environment, Conference Center, University Park, Pa.

Nov. 16-18: Component Editors and Executive Meetings, AIA Headquarters, Washington, D.C.

Nov. 18-19: Building Research Institute, Fall Conference and Annual Meeting, American Hotel, Washington, D.C.

Nov. 27-29: Association of Student Chapters Annual Forum, University of California, Berkeley

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Oct. 28-30: International Environmental Design Conference, Mellon Institute, Pittsburgh

Dec. 14-18: World Congress of Engineers and Architects, Hilton and Sheraton Hotels, Tel-Aviv. ☐

letters

UDAT Program Called 'Superficial'

The report on the Urban Design Assistance Teams ("Vehicle for Urban Improvement") in the August issue was depressing.

I have some familiarity with Lynn, Massachusetts, having spent the early part of my life there and having served on the City Planning Board years ago. When I first saw the report on Lynn, proudly on display at the Boston convention, I was appalled at its unabashed superficiality.

Lynn is a once-prosperous industrial city which for 50 years has been inflicted with deep-rooted economic problems. A team of architects, none of whom had ever been in the city before probably, fly in, spend a day and a morning looking at the city and talking to a few people before meeting to "formulate ideas for recommendations." Of course, their report is shallow, superficial and silly. It could be nothing else.

More shocking than the platitudinous inanities presented as recommendations for this hard-pressed city is the exposure of the ignorance of the AIA and its individual members of the real and tough social, economic and political problems that are racking Lynn and other American cities. These problems are not going to be solved by a strict sign ordinance nor by the replacement of shabby and ugly street furniture nor by any other form of exterior decoration passing under the name of urban design.

Our cities are probably the most complex institutions ever created by man. Surely, the concern of the AIA for the well-being of our cities can find more significant ways of expression than through the simple-minded Urban Design Assistance Team program. I am afraid that the present approach would find a parallel if a team of physicians, sent out by the American Medical Association, should prescribe a package of cosmetics for a seriously ill person after a casual look at the patient. THOMAS W. MACKESEY, FAIA
Ithaca, N.Y.

Rebuttal by Two Chairmen

I am afraid that Mr. Mackesey, having recognized the complexity of cities, has given up. Or else he is looking for the easy applause which goes to the winner of a hand-wringing competition. Although not a participant in last fall's Urban Design Assistance Team, I myself had occasions to observe Lynn, Massachusetts, at close hand and, surely enough, Lynn is one of the knottiest examples of the old mill town which once lived for commerce and which now, with much of its commerce channeled elsewhere, is no longer sure what to live for.

To say the foregoing is not to say that Lynn, nor Mr. Mackesey, should give up hope. His successors in the Lynn Planning Department a generation later were among the most enthusiastic sponsors of the Assistance Team. It is appropriate to mention at this point that a primary purpose of the teams is to draw public attention to the constructive forces already at work in the community (often and hopefully including the AIA local chapter).

It is unfair of Mr. Mackesey to imply that street furniture was the focus of the team's recommendations when a simple reading of Mrs. Barr's excellent article would clearly indicate the contrary.

Always subject to new interpretations and emphases, the Urban Design Assistance Teams are one of the most down-to-earth programs ever sponsored by the AIA. Of all the criticism, commentary and other feedback needed to keep the program healthy, I am sure the most valuable will be that from the communities visited and from others who are on the urban firing line.

ROBERT S. STURGIS, AIA
Chairman, Urban Planning and Design Committee
Cambridge, Mass.

Mr. Mackesey incorrectly describes the Lynn Urban Design Assistance Team as "a team of architects"; it was actually a diversified quartet of which only one is a practicing architect. One other is an architect who works as a planner. The third team member is a professional planner and the fourth a transportation engineer. Further, the visit was not so brief as insinuated and was preceded by a reconnaissance and followed by at least one return visit.

This well-rounded team dug much deeper than Mr. Mackesey implies. It offered a large number of recommendations dealing with such questions as changing economy and population, use of existing assets, redevelopment of various kinds, new land uses, several recommended architectural and urban design studies, revision of the entire traffic system, parking questions, cityscape matters and grave governmental problems. Mr. Mackesey missed all this and somehow reached the conclusion that the team never went beyond suggesting a sign ordinance and new street furniture (both of which are badly needed).

The Urban Design Assistance Teams have made useful contributions by getting various people to communicate who had not done so before, by suggesting design possibilities which had not been contemplated, by getting people to recognize the assets of their communities, by introducing the concept of urban design. They have not assumed the task of planning cities, nor have they limited themselves to cosmetics. Present plans are to widen the scope by such methods as lengthening the contract and offering assistance on a subsidized basis. HENRY STEINHARDT, AIA
Chairman, Subcommittee, Urban Design Assistance Team Program
Mercer Island, Wash.

Awards Programs/ Architectural Barriers

For more then 10 years, the Eastern Paralyzed Veterans Association and our 24 brother chapters have devoted a great deal of time and effort toward a program to eliminate architectural barriers, those obstacles which deny the elderly and handicapped adequate housing, education, employment and recreation. During this period, our successes in this program have only been measured by the sympathetic and close cooperation of numerous members and chapters of the AIA.

I was distressed, therefore, to see the renderings of public buildings that received the 1970 Community and Junior College Design Awards as reported in the March AIA JOURNAL. I greatly admire the esthetic values of these structures, but I could not help but be appalled at the lack of consideration for the physically handicapped.

Due to their impairments, the physically handicapped are more reliant upon education to become productive and respected members of society than their nonhandicapped counterparts. As can be determined by the descriptive copy, the aforementioned designs have barred successfully at least 15 percent of the student population from use of these schools. National statistics show that 30 million Americans are physically handicapped. The number increases daily through advances in medical science.

I should like to call your readers attention to the New York State University Construction Fund's checklist which stipulates specifications relative to such structures. I am hopeful that this information can be disseminated in order to create a greater awareness of the architect's role in designing structures for use by the *total* population.

J. L. MANDELLA
Architectural Barriers Coordinator
New York City

ED. NOTE: see jury chairman's comments, July, p. 66.

Architectural Gerontologists

It is with interest that I read the review of Joseph D. Weiss' book, *Better Buildings for the Aged*, by Dr. Virginia Stone in the May issue. The call for more imagination in the interior layout and design of buildings for the elderly is well taken.

Having designed over 60 nursing homes, convalescent hospitals and rest homes, as well as housing for the elderly, we are well aware of the design problems confronting the architect in the field of geriatrics.

The two great influences, however, in promoting advanced design in these buildings are 1) the financing and 2) the client. With tight money, high interest rates and a great profit motive, the chances of innovations in a proprietary owned facility are practically nil. If the profit motive is removed and the client is a nonprofit organization, the opportunity of introducing more imagination and new ideas is enhanced.

Dr. Stone's use of the term "architectural gerontologist" intrigues me since it is the first time I have ever heard the word "gerontologist" connected with architecture. If the suggestion is that there is a need for

architects and other specialists in the field of planning for the aged and infirm to gather and to pursue further discussions and planning, I'm all for it. SOL S. RICHMOND, AIA
Cambridge, Mass.

More on Nantucket

Concerning your article on Nantucket in the August issue, I should like to remind you that this is not the first time Nantucket was honored by the AIA.

In 1938, Everett Uberto Crosby, a "layman," was selected as an honorary member of the AIA for his successful work and writings on the preservation of Nantucket's unique architecture.

HENRY LEE WILLET, HON. AIA
Philadelphia

ED. NOTE: On August 10, the Smithsonian Institution in Washington launched a traveling exhibition which will circulate nationally and feature the work accomplished by the Historic Building Survey during six years of recording an architectural study of Nantucket. The national tour began at the Octagon where it will remain until November 1. The photographs and measured drawings of Nantucket's dwellings and public buildings are mounted on 24 panels. Arrangements for the exhibition may be made through the Smithsonian's Traveling Exhibition Service, Washington, D.C.

Two Fellow Architects on Eugene Mackey

I want to thank you for the article about my father, Eugene Mackey, FAIA, in the August issue. Viewing him as a parent, yet also as a fellow architect, I feel fortunate to have worked with him on existing projects. The Tate Library is unquestionably a fine building, ranking with the Climatron and the new Medical Sciences Building at Washington University as examples of his finest work.

The spirit and drive that we shared with him was electric. Every aspect of design was important and open to analysis. As Harry Richman, AIA, said on occasion, my father made everything a little more important than it really seemed at the time, only to be appreciated more when completed.

There is a story that illustrates my point. In the design of the Medical Sciences Building (300,000 square feet, nine stories), the mechanical ductwork and piping were designed to go in shafts on the outside of the building. There seemed to be two solutions to this problem: the shafts could be round or square. From a cost standpoint, the square was less expensive; from a design standpoint, the round was the better solution.

One of the large donors to the project thought the shafts should be square, as did many of the doctors. One evening my father and one of the doctors went to the donor's home. The host left the room to get refreshments, and my father turned out the lights leaving only a drafting lamp on, which lit up the wooden model with the round shafts. The stage was set. The donor returned, but still was not convinced. He was asked to pick up the model, close his eyes and run his fingers over the round forms. As he was doing this, my father said that since many beautiful forms found in nature are round he believed that the shafts as well should have this appealing form. That was it. The lights went on; the decision was made.

Today much architecture is performed as a dull production-line affair. I feel that my father showed us a way to make architecture come alive as a human participating occasion and event. EUGENE J. MACKEY III, AIA
St. Louis

The article in the August issue on Eugene Mackey, FAIA, and the Fieldston School's Tate Library perceptively reflects the character of the man who enriched the lives of all of us who knew and worked with him. It is both a special tribute to Eugene Mackey and the AIA JOURNAL for its insight into the human as well as the architectural aspects of the profession. HARRY B. RICHMAN, AIA
St. Louis

ED. NOTE: Richman, a principal in the architectural firm of Murphy, Downey, Wofford & Richman, carried the Tate Library to completion after the death of Eugene Mackey in 1968.

The AIA JOURNAL encourages expressions of opinions from its readers but reserves the right to edit for length and style. Address letters to the Editor at the Octagon.

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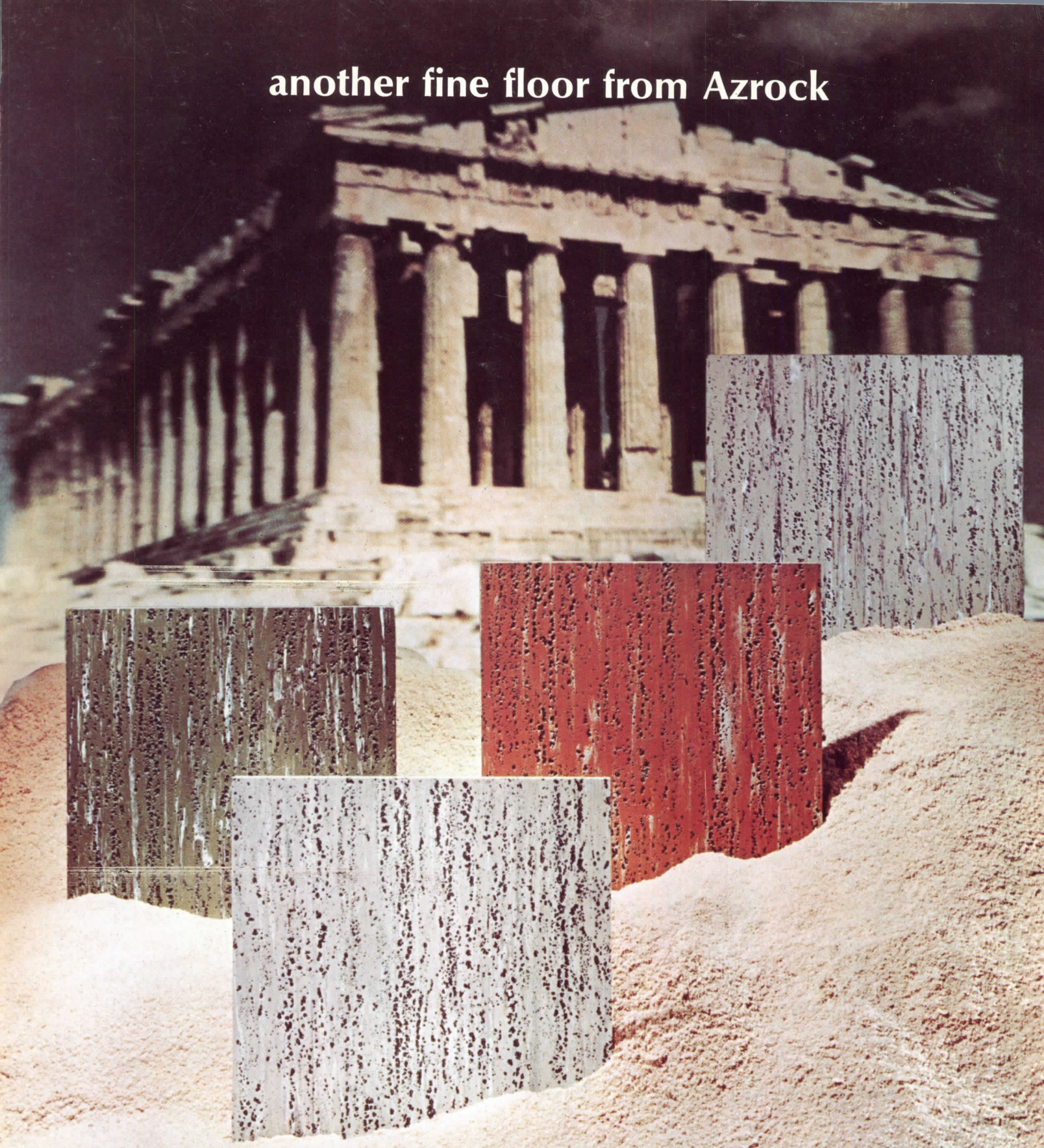

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