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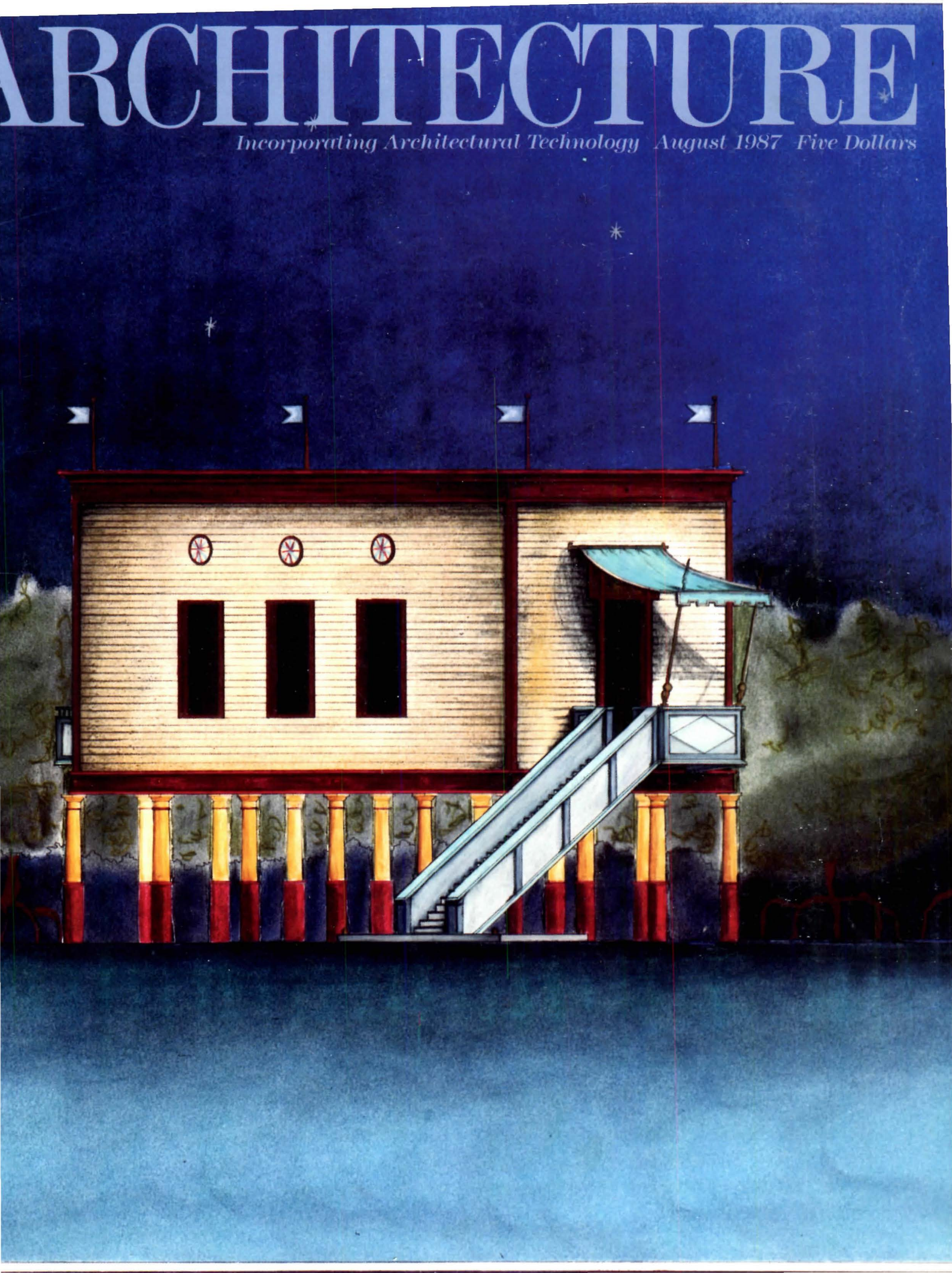

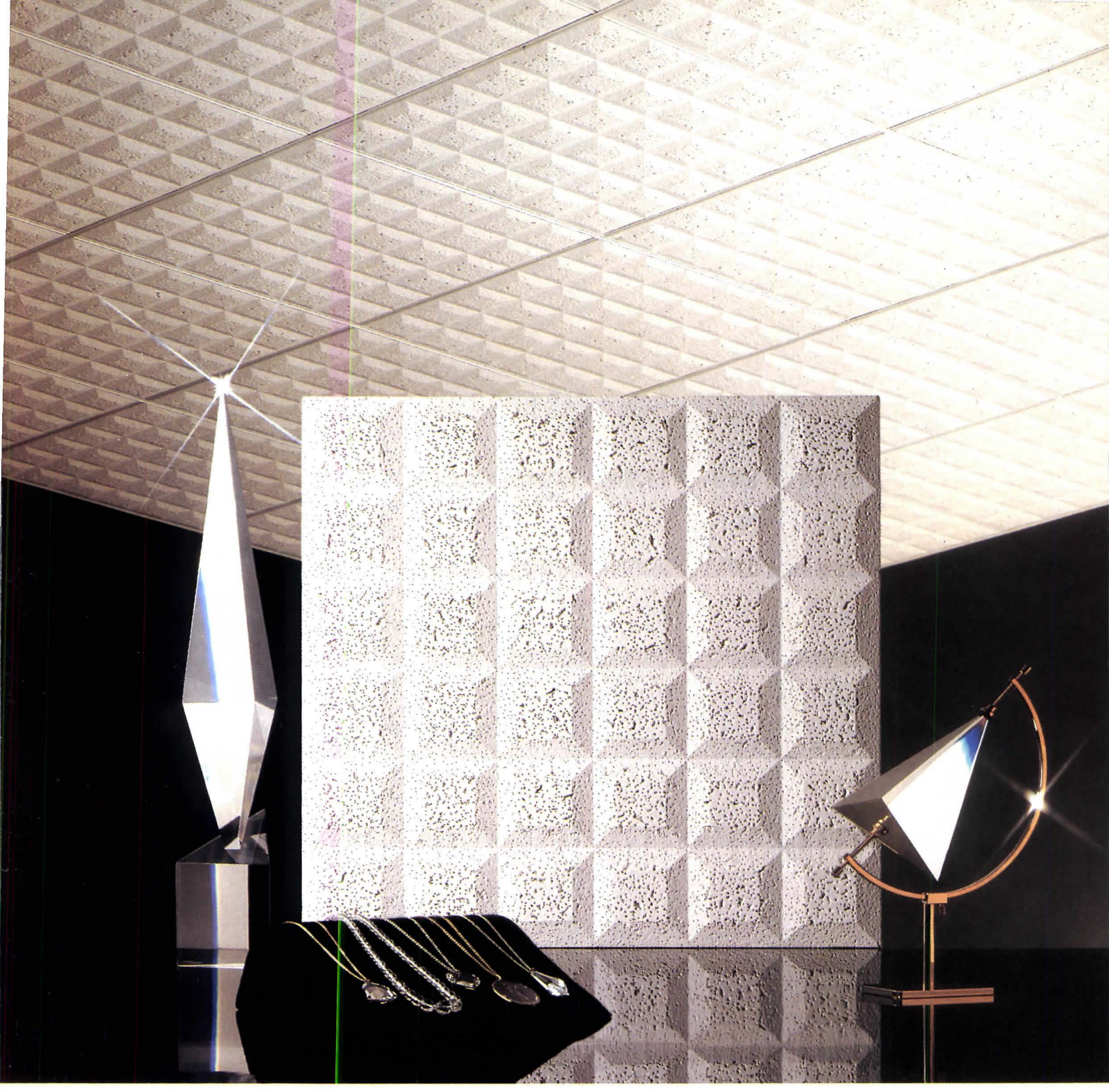

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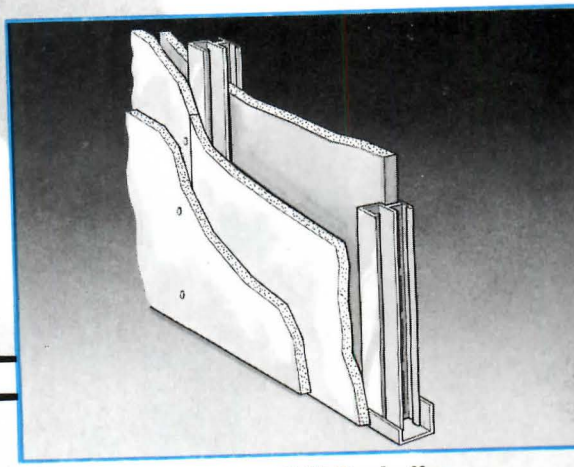

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Two campuses that strongly influenced the character of their universities and architectural schools: Rice (page 36) and Thomas Jefferson's University of Virginia (page 42).

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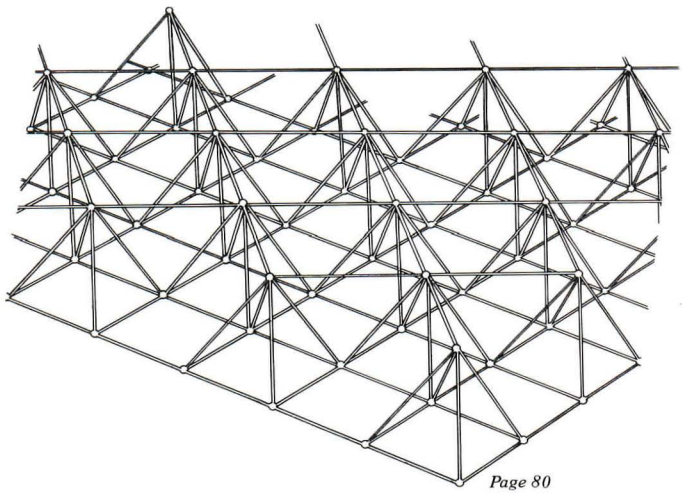

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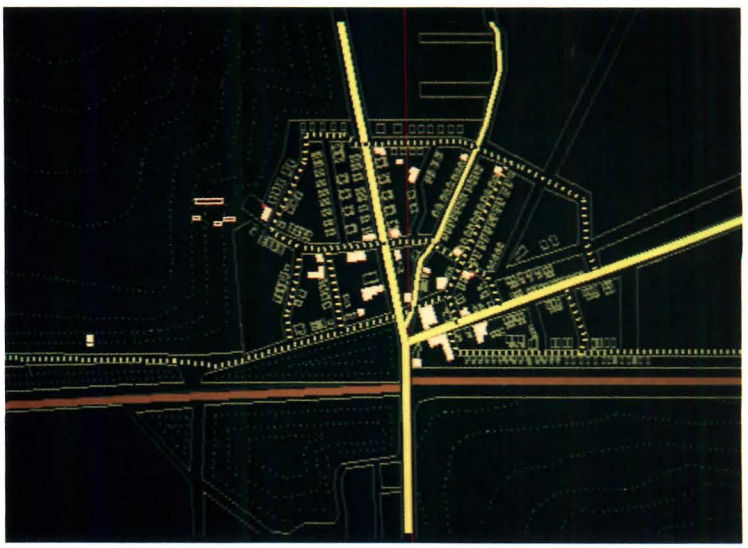
Cover
University of Miami student Jesus Amado's interpretation of the flora, fauna, and geography of South Florida, entitled 'The Monument,' with Teofilo Victoria as design critic (see page 52).

News

Technology & Practice



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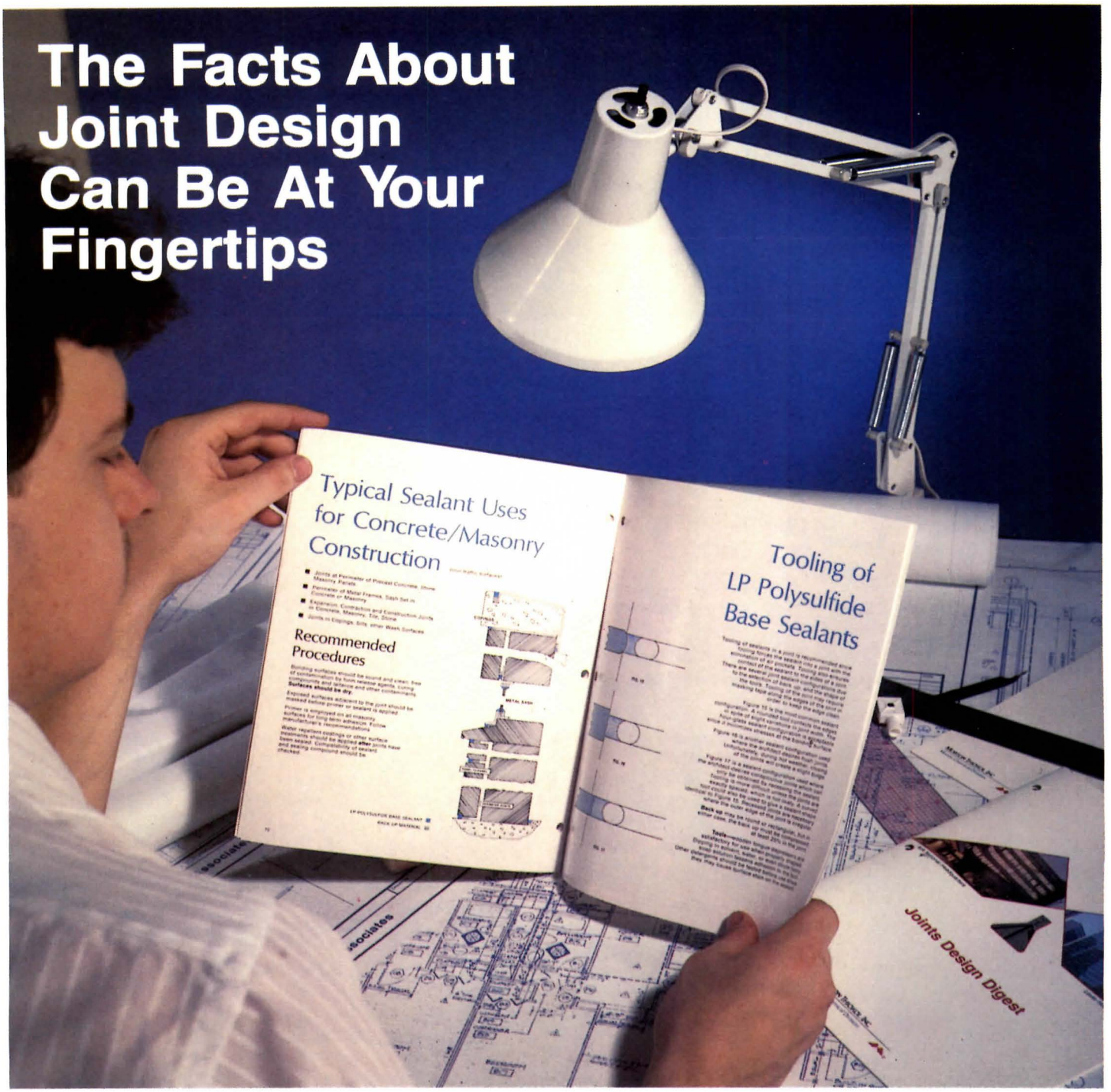

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EVENTS

Sept. 1-2: Workspace '87, Exhibition and Conference, San Francisco. Contact: Currie McLaughlin, Workspace '87, 665 Chestnut St., San Francisco, Calif. 94133.
Sept. 2-3: Northeast Regional Energy Exposition and Symposium for Industry and Commerce, Hartford, Conn. Contact: Jacqueline Harris, Northeast Utilities, P.O. Box 270, Hartford, Conn. 06141.
Sept. 3-5: American Institute of Graphic Arts Design Conference, San Francisco. Contact: Kay Bergl, AIGA, 1059 Third Ave., New York, N.Y. 10021.
Sept. 8-12: Workshop entitled "Visual Communication in Architecture," Des Moines, Iowa. Contact: Eino Kainlauri, 290 College of Design, Iowa State University, Ames, Iowa 50011.
Sept. 9-13: NETWORK—An Exhibition and International Conference, Montreal, Canada. Contact: Francine DuHamel, C.P. 9, Place du Parc, Montreal, Quebec, Canada H2W 2M9.
Sept. 10-11: Affordable Housing Workshop, Kansas City, Mo. Contact: Vicki Groat, American Planning Association, 1313 E. 60th St., Chicago, Ill. 60637.
Sept. 12: Seminar "In the Realm of Ideas," Spring Green, Wis. Contact: Richard Carney, Frank Lloyd Wright Foundation, Taliesin, Spring Green, Wis. 53588.
Sept. 13-16: International Conference on Shelter for the Homeless, Ottawa, Canada. Contact: Cassie Doyle, Canadian Conference, Box C.P. 1987, Station/Succ. C, Ottawa, Ontario, Canada K1Y 4G1.
Sept. 16-19: Annual Convention of the National Association of Women in Construction, Reno, Nev. Contact: Donna Meidling, NAWIC, 327 S. Adams St., Ft. Worth, Tex. 76104.
Sept. 17-19: Urban Waterfronts Conference, Washington, D.C. Contact: The Waterfront Center, 1536 44th St. N.W., Washington, D.C. 20077.
Sept. 17-Oct. 1: A/E/C Systems '87 Study Tour to Hong Kong and Japan. Contact: Rosalyn Moss, A/E/C Systems Japan 1987 Tour, 10 Midland Ave., Newton, Mass. 02158.
Sept. 22-25: Course in Practices and Procedures in Asbestos Abatement, Salt Lake City. Contact: RMOCEH, Registration Coordinator, University of Utah, Bldg. 512, Salt Lake City, Utah 84112.
Sept. 27-30: Construction Management Association of America Conference, Boca Rotan, Fla. Contact: Karl F. Borgstrom, CMAA, 12355 Sunrise Valley Dr., Suite 640, Reston, Va. 22091.
Sept. 27-30: Conference on Design Automation and Vibrations, Boston. Contact: A'ndrea E. Messer, American Society of Mechanical Engineers, 345 E. 47th St., New York, N.Y. 10017.
Sept. 30-Oct. 2: Society for Marketing Professional Services Convention, Chicago. Contact: SMPS, 801 N. Fairfax St., Alexandria, Va. 22314.

LETTERS

Pompidou and Les Halles: I was thrilled as usual by your May issue wrap-up of American architecture and was in general agreement with Cathy Simon's elevation of museums to a new level of prestige [page 121]. But permit me one carping correction.

She suggests that the plaza in front of Center Pompidou was "created, sadly, by the destruction of Les Halles." She's got her construction sites mixed up. The Pompidou site was an empty, dilapidated parking lot when I worked in Paris in the mid-'60s, and I remember that it had been a vacant eyesore for over a century. Les Halles were, sadly, being taken down at the time, but the great pavilions were several blocks to the west and they made way for the vulgar Forum des Halles.

I join in mourning the passing of Les Halles, but find the Pompidou and its splendid surrounding spaces an unreserved delight. *Robert F. Gatje, FAIA*
New York City

Gehry at Irvine: Frank Gehry's Information and Computer Sciences/Engineering Research Facility at the University of California at Irvine [May, page 147] appears to have been designed by four separate designers who were not talking to each other. To me, it was the responsibility of the job captain to make these "fragmented building forms" fit together.

. . . I don't think that the so-called "abstract design" can be based in part on the fact that "there was no permanent dean in office and no specific knowledge of exactly who would occupy much of the research building and what their needs would be." Should not the architect have required the university to designate a responsible person to establish a reasonable set of requirements for the building as to its size, cost, number of occupants, and use functions of the various spaces? Later, if the individual spaces were either "surprisingly underoccupied or crammed full of equipment and hand-me-down furniture," this could have been caused by a lack of coordination between the university's planning officials of the computer and engineering departments and those charged with the actual use of the building, or by subsequent changes in class sizes or requirements.

In my opinion, the elements of the building are unrelated to each other in scale, form, fenestration, and function in plan and elevation. *Roland K. Kuechle*
Walnut Creek, Calif.

A Guggenheim Proposal: Having closely followed the ongoing debate over the proposed expansion to the Guggenheim Museum, I believe that even the best of the proposed compromises will not give any of the concerned parties what they need and want. The museum director and staff will not get the support space they require nor exhibition space that all can agree is suitable for the display of paintings. The community will get another mid-block tall building that they do not want. And the world will be left with an architectural masterpiece further adulterated.

I propose that the Guggenheim be restored and converted into a museum for American architecture, and that the Guggenheim collection be housed in another building elsewhere in New York. . . .

By establishing a foundation to purchase and maintain a Frank Lloyd Wright museum of American architecture in the building currently housing the Guggenheim collection, we would be serving the interest of the staff and directorship by providing them with the means to secure space specifically suited to their needs; we would be serving the community by retaining the current bulk of the building; we would be serving New York by maintaining a world-renowned landmark while getting a new museum for an old collection and by beginning a new collection for an old museum; and we would restore and preserve one of man's highest architectural achievements.

Let those who have criticized the current plan for altering the museum, and those who claim the current building unsuitable for their needs, and those who profess a love and respect for the master, and those who bask in the light of a creative genius form a foundation to buy the building, restore and preserve it, and in so doing save it while making it possible for other works of beauty to be housed elsewhere. *Charles Boxenbaum, AIA*
New York City

Glazing Surfaces: One of the diagrams in your article on selecting glazing types [April, page 116] sparked quite a debate around our office. Whether Surface No. 1 in insulated glass is the inside or outside has a fundamental impact on all the analysis and esthetics of glass. Your article identified Surface No. 1 as the inside surface. I was taught in school and [in practice] that it is the outside surface. Please clarify. *Stephen J. Sawyer, AIA*
Tucson, Ariz.

According to our sources, Surface No. 1 can be either.—Ed.

Amplification: The project team for the Frank Lloyd Wright Home and Studio, Oak Park, Ill. (May, page 184) includes: Architects: John G. Thorpe, AIA, William B. Dring, AIA, Donald G. Kalec, Carl J. Hunter, Karen Sweeney, Oak Park, Ill. Associate architect: The Office of John Vinci, Robert A. Bell Architects; Fred C. Burghardt, AIA. Director of research and restoration: Donald G. Kalec. Project architect: Ann K. Abernathy.

The opening photograph of Jersey Devil's hoagie house (July, page 52) is an east view, with office at left. The house's floor plans were transposed.

The Institute

AIA Convention: Design, Practice, And Fun in the Orlando Sun

Orlando, Fla., was the perfect setting for almost 7,000 AIA conventioneers to address the theme "Fact, Future + Fantasy"—a place where more than 20 years ago a man named Walt Disney hoped to create a city of the future, which he called "the experimental prototype community of tomorrow." His utopian city never materialized (unless you view suburban sprawl as the city of the future), but Disney was responsible for "The Magic Kingdom" and EPCOT Center, which certainly are prototypes for theme parks. However, Disney's biggest contribution and still the main goal of his company is to "make people happy and to make people smile."

The convention's major programs appeared to be designed to address the three components of the theme: Walt Disney World representatives would provide the fantasy; economist Pat Choate, the facts; and Philip Johnson, FAIA, his views on the future of American architecture. However, Disney representatives gave a straightforward description of the company's successful blending of business and fun, while economists, practitioners, and developers provided facts as well as predictions, opinions, and maybe a few of their own fantasies.

And Philip Johnson refused to coin the "ism" for the next decade, saying, "I cannot advise or counsel you, my young contemporaries. You know as much as I do. I can only describe the scene as I see it."

Kenzo Tange, Hon. FAIA, winner of this year's Pritzker prize and the AIA gold medal in 1966, presided at the opening of the exhibit of new products and technology and served as the Institute's first honorary convention chairman.

In addressing the business of the Institute, AIA delegates elected officers for next year, approved four business items, and adopted two resolutions.

Benjamin E. Brewer Jr., FAIA, of Houston will serve as first vice president during 1988 and as president of the Institute in 1989. Brewer was unopposed in the election. He is president and a founder of Sikes Jennings Kelly & Brewer, and has served as Institute vice president, a board member, and president of both the Texas Society of Architects and the Houston Chapter/AIA.

Three new vice presidents were elected for 1988. Sylvester Damianos, FAIA, of Pittsburgh serves on the board of directors and is a member of the planning program and budget committee.

Also elected vice president was Norman L. Koonce, AIA, of Bogalusa, La. He currently serves on the board and is a former president of the Louisiana Architects Association.

John M. Laping, FAIA, of Buffalo, N.Y., will also serve as a vice president next year. Laping represents New York State on the board and served as president of the New York State Association of Architects.

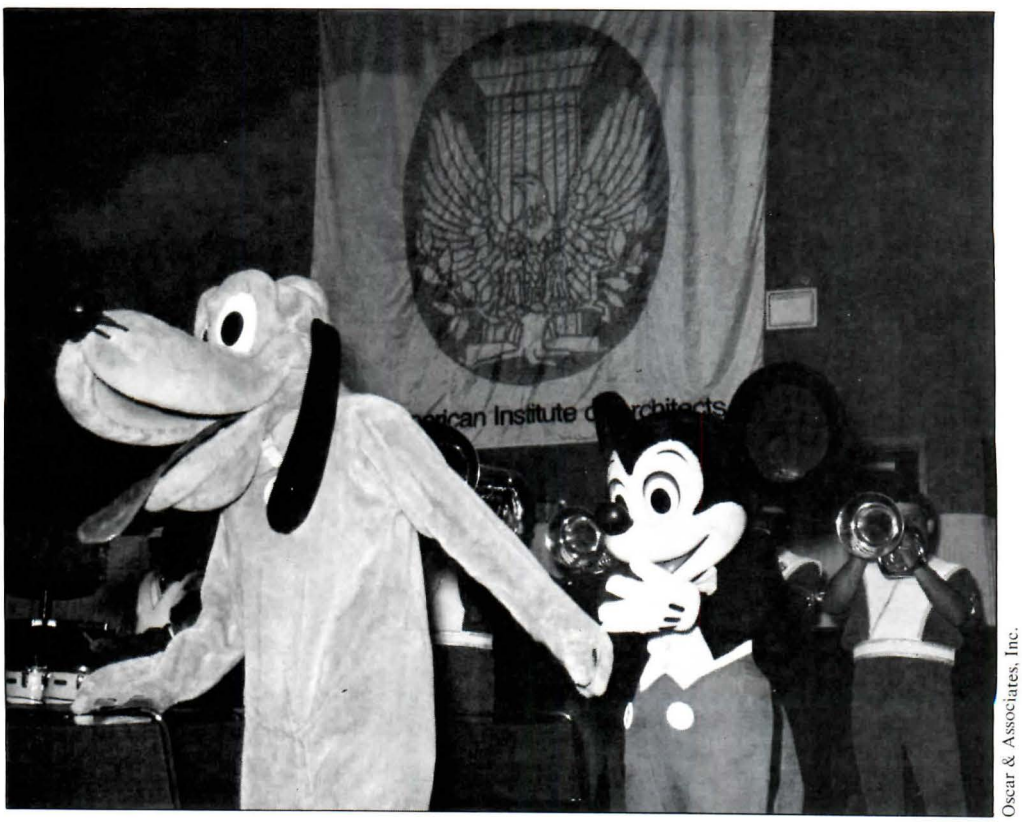
Thomas J. Eyerman, FAIA, was elected to a two-year term as treasurer. He is partner in charge of firmwide finance and administration for Skidmore, Owings & Merrill. He is also a former president of the Chicago Chapter/AIA. Philip W. Dinsmore, FAIA, will serve his second year of a two-year term as secretary.

In other convention action, the delegates voted to eliminate graduated dues and maintain a single dues amount for the AIA member category, to establish a one-time payment for members emeritus, and to establish one dues amount for associate members. The delegates also agreed to raise the maximum number of regional directors on the board from 32 to 34.

In response to federal government regulations that do not allow architecture firms to be reimbursed for many business expenses, the delegates adopted a resolution calling for federal law that would "expand the allowable category of expenses in the computation of the overhead component of billing multipliers to include normal business expenses." The delegates also adopted a resolution to "examine the impact of Institute guidelines for the formation of chapters."

—Lynn Nesmith

News continued on page 14



Mickey and friends entertain after Disney representatives' presentation.

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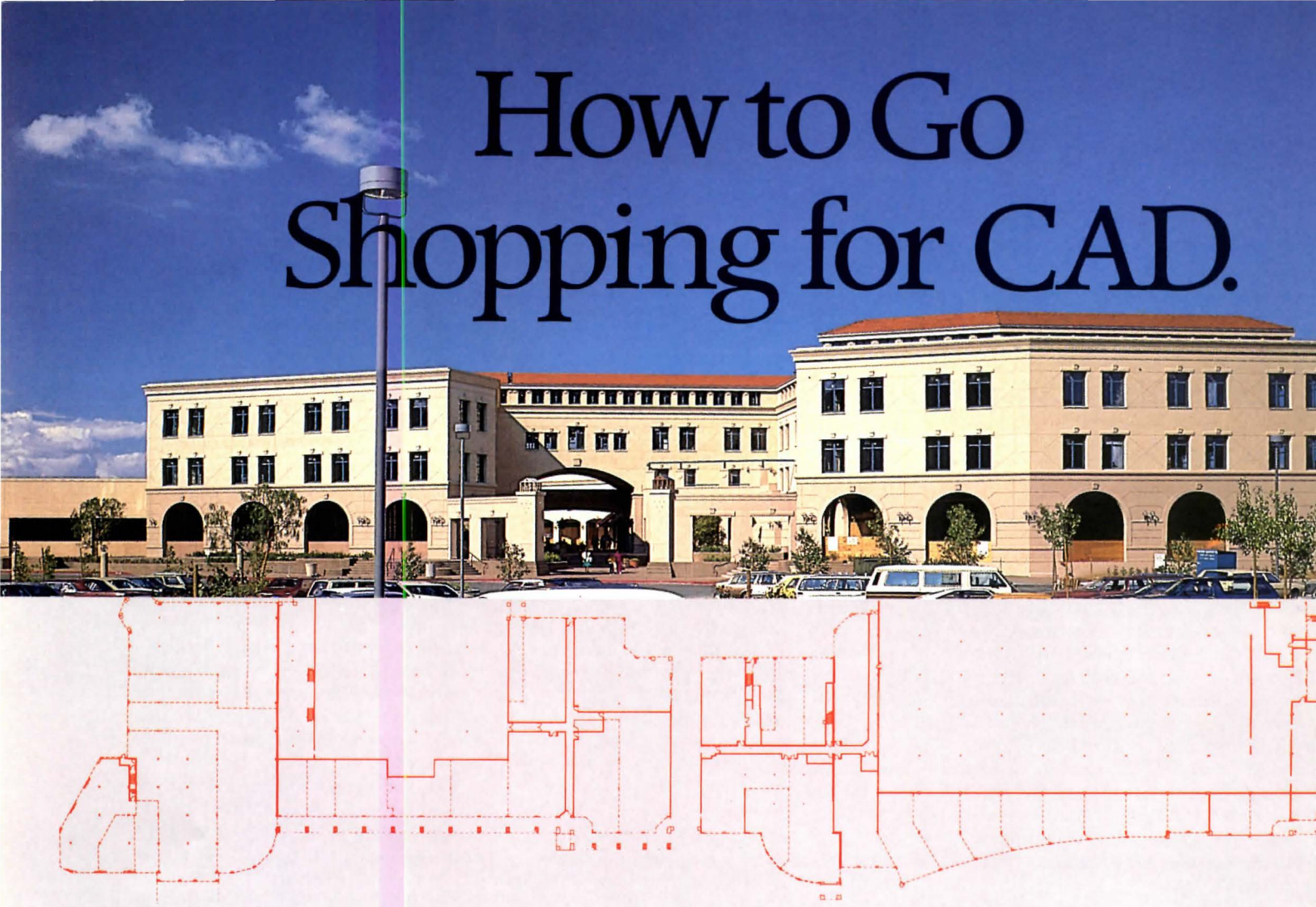

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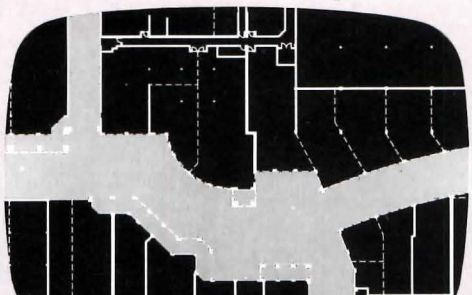

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Economist Choate and Others Explore Economy and Market

AIA's convention program on "economy and market" could have been subtitled "everything you always wanted to know about the coming economic crisis but were afraid to ask." Economist Pat Choate presented a global perspective on the American economy and addressed the foreign penetration of the U.S. market, a deteriorating infrastructure, government "indifference," and an "underskilled, undereducated, and undermotivated work force." He also questioned whether our country's "great prosperity" is really an illusion.

Later in a roundtable discussion on economic issues, Atlanta financial analyst J. Chandler Peterson predicted that one-third of American architects would be out of business within the next three to five years. (For a region-by-region analysis of the current building economy, see page 78.)

Choate, who is the director of the office of policy analysis at TRW Inc. and author (with J.K. Linder) of *High-Flex Society: Shaping America's Economic Future,* said that "our country is no longer doing well what it used to do best and that is compete." To compete effectively in the international economy, it's imperative that Americans "look at the world as it really is rather than how we want it to be."

Choate observed that "our economy is not performing as well as it did during the Kennedy era of economic isolationism. We're not meeting the challenge of foreign competition."

In the area of architectural services, the U.S. market share has decreased from 15 percent in 1972 to 7 percent today. In the high-tech industries, the American economy had a $26 billion surplus in 1981; the surplus today is $2 billion.

Choate outlined several "either/or" choices that he said are wrong. We don't choose between a manufacturing economy and a service economy because they are interdependent and if either one fails the other will fail. We don't choose between industrial productivity and high employment—the high productivity that comes at the cost of a large loss of workers will eventually result in increased employment in a healthy economy. And, said Choate, we can't choose between free trade and protectionism.

Our policies governing foreign trade, which were developed 30 or 40 years ago and based on our own free market, are no longer appropriate in today's global economy, according to Choate. The open trade policy worked until there was a "resurgence of other economies that haven't adapted to our model."

Choate identified major obstacles facing American businesses. The emphasis on quick profits rather than long-term investment and the growing influence of financial institutions (specifically, pension funds) will contribute to the downfall of one market after another, he said.

Choate also emphasized the important role of the federal government in improving the global economy and described the steady decline in our public works infrastructure. Our country now spends one-half the amount we spent per capita in 1965 on building and maintaining our infrastructure.

The final obstacle Choate identified is our work force, which he said suffers from "neglect and lethargy. We must find new ways to reward workers, to retool workers, to make education a normal part of the work experience."

Following Choate's speech, Robert Campbell, AIA, moderated the roundtable discussion with Choate and Peterson that explored the effects of the changing economy and tax reform on the practice of architecture. Others on the panel were George Hartman, FAIA, of Washington, D.C.; Thomas W. Ventulett III, FAIA, of Atlanta; George A. Christie, vice president and chief economist for McGraw-Hill Information Systems; and Florida developer James Walter Kersey.

Echoing Choate's predictions of an economic crisis, Campbell started the program by stating that the "next president will be Herbert Hoover" no matter who is elected.

However, Christie pointed out that, although competitiveness is a major problem, it's not the only problem facing architects. He focused on changes in the tax laws, rising interest rates, and the recent overbuilding of offices and apartments. Last year was a record year for construction, according to Christie, but the walls are closing in on the building industry in 1987. "Tax reform is bringing commercial development back to reality," Christie said. Now it becomes necessary to construct buildings for the purpose of "sheltering people instead of sheltering incomes."

On a more optimistic note, Christie predicted a selective decline rather than a general collapse. He also anticipated the demographics of the American population over the next five years to be more favorable for architects.

Commercial work will decline in the next few years, Christie predicted, but residential, retail, and institutional work will grow. Kersey said he expects the office market to drop from 1.3 billion square feet built in the last 10 years to 350 million square feet in the next 10 years.

Peterson outlined the major problems in the construction industry. As the money center shifts in the global economy, "capital is going to be the final determinant if there are going to be projects to be built," he said, adding that "if you are not international in your practice in some form or another in the next three to five years you are not going to be in business.

"Tax reform is bad for you as a profession," Peterson said. "The cost of capital has been dramatically impaired by the changes in tax laws."

Kersey, however, did note that new tax laws will have one positive influence. "We now have to look at a project on its merit and make a decision based on sound economic judgment," he said.

Hartman responded to Peterson's prediction, saying that, "if one-third of architects go out of business in three to five years, it's because one-third of architects today are not making a living." Hartman also said that "architects are militantly unaware of economics."

Developers, as well as architecture firms, are cleaning house—getting rid of marginal properties and marginal people. "Those of us who come through it, and I think a lot of us will, will come out of it much stronger and much better, after this relatively minor irritation," said Hartman.

To this comment Campbell responded, "Only an architect would say that the loss of one-third of all architects in three to five years was a minor irritation."

Ventulett, the other architect on the panel, addressed the problems brought on by overbuilding during the past five years and said that the architect will be working in a more realistic market in the future. "We are no longer looking at artificial stimuli for projects. They are no longer there," he said.—Lynn Nesmith

Design Theme Programs as Diverse as Today's Architecture

The convention featured a number of diverse design theme programs and roundtable discussions—ranging from a panel discussion by six AIA honor award-winning architects, to Florida design case studies, to a symposium on the challenge of meeting strict security requirements (in embassies and government buildings) without sacrificing quality design, to the closing ceremonies where Philip Johnson, FAIA, gave his view of the state of the art of architecture.

Johnson reminded the audience that nine years ago on receiving the gold medal he used the AIA convention podium to espouse the shift away from the International Style to a "direction called by some postmodernism." This time, rather than make predictions for the future, Johnson chose to "describe the scene" as he sees it.

"We no longer believe in inevitable perfectibility in architectural design, as Mies did," Johnson said. "In his mind Mies had perfected design, and we should all learn how to do it from him. . . . We are not sure of our way. We talk no more of one avant-garde direction or another."

In describing today's architectural milieu, Johnson said that "in looking for a precedent of this glorious efflorescence

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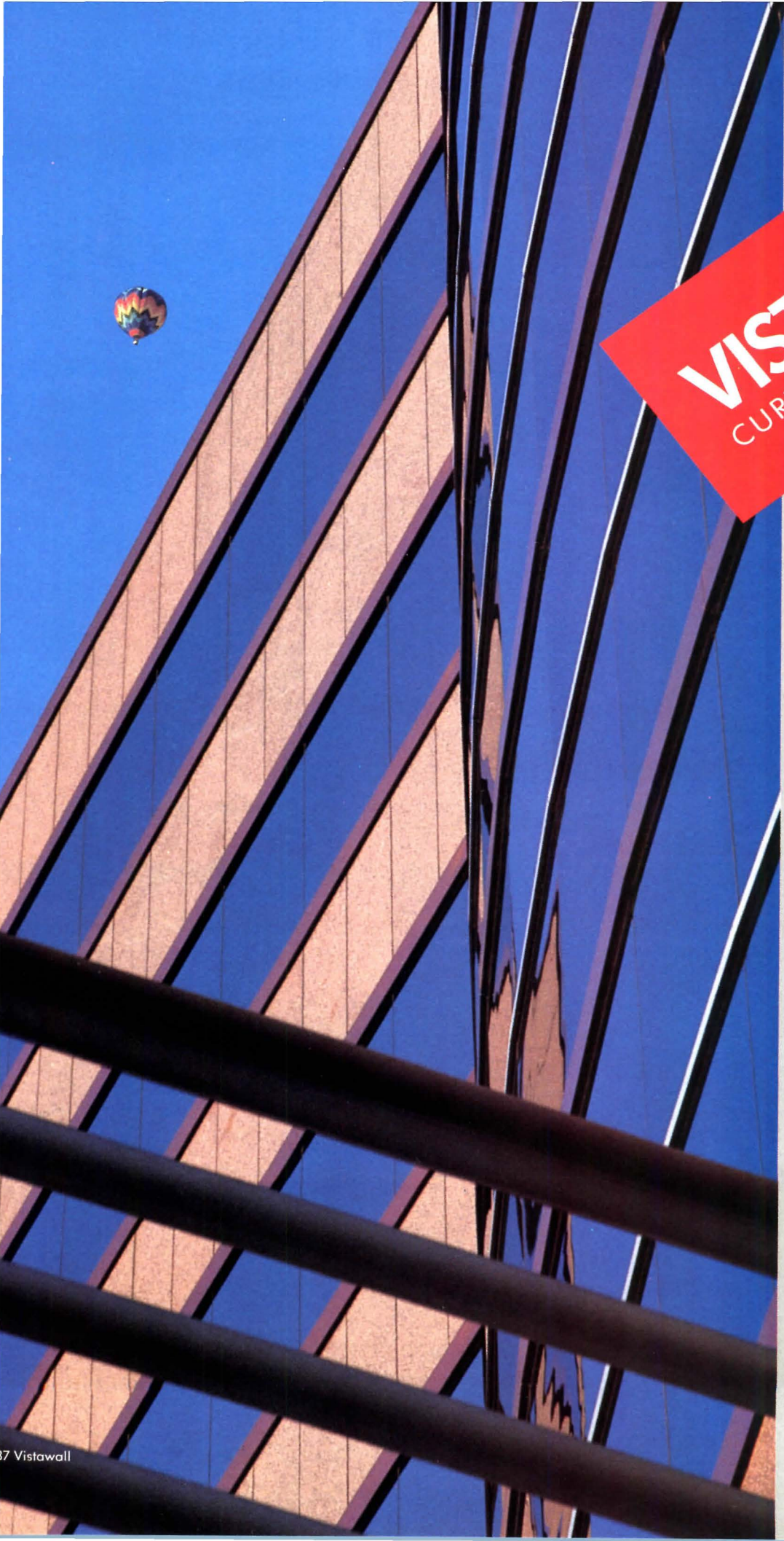

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The Institute *from page 14*

I find only one: the heyday of the Empire when the British were far more powerful in the world than we are today." Johnson called this period, around 1900 in Edwardian England, the "Wrenaissance," where a series of extraordinary eclectic and original kinds of design flourished—"the neo-Georgian, the neo-baroque, the neo-mannerist, the arts and crafts, the free style, the Flemish gable houses and Gothic and Byzantine churches, the grand manner and stripped classic." Johnson added, "It's beginning to sound like Charles Jencks's latest book."

Although Johnson said that the purpose of his speech was not to "advise or counsel" the audience, he did offer this: "Work hard, learn to build, learn to draw" and, "realizing the kind of world we live in, learn to sell, learn to 'socialize,' learn to make speeches at AIA conventions."

Following Johnson's speech a panel of architects and architectural writers further explored trends in American architecture. Kurt Andersen, critic for *Time* magazine, reiterated Johnson's remarks earlier that evening about the importance of tall buildings in creating an urban identity and called skyscrapers "a beacon of culture and all that is right and wrong" with our society.

Andersen also declared the "historicist versus modernist" battle over. Paul Goldberger of the New York *Times* elaborated on the claim, saying the conflict today is not between postmodernism and modernism but rather "the city versus the individual building."

Johnson's former partner, John Burgee, FAIA, said he also has witnessed great changes in the profession. "When I started practicing, Mies and Corbu were the high priests; it was almost like a religion," while today there are no dogmas. Goldberger agreed but said that today many "young architects are searching for a quasi-religious meaning to architecture."

The issue of the architect as a superstar was addressed by Paul Gapp, critic for the Chicago *Tribune*. Clients such as Donald Trump and Gerald Hines, Hon. AIA, seem to be latter-day Medicis, and they are seeking out superstars, and the mass media encourages the cycle, Gapp said. Goldberger concurred, saying it's a bit disconcerting to see Helmut Jahn, FAIA, on the cover of *GQ*.

Following the presentation of 1987 honor awards, jury chairman Henry N. Cobb, FAIA, and two of his fellow jurors, Rebecca Binder, AIA, and Robert A.M. Stern, FAIA, joined moderator Robert Campbell, AIA, to discuss with six of this year's recipients their projects.

Michael Graves, FAIA, and William Pedersen, FAIA, compared their Humana and Procter & Gamble headquarters. Although both are corporate buildings, the site, program requirements, and the character of the two companies were very different. Campbell suggested that the Humana is a more monumental building in the "business of glorifying the corporation," while P&G "knits itself less assertively into the existing context of the city."

Oscar & Associates, Inc.

Johnson, who has received almost every architectural award, was presented a portrait made of black and white Legos.®

However, Binder said that the street and city have benefited by both buildings, and added that the attention to details is commendable.

Next, architects Robert Venturi, FAIA, and Thomas Payette, FAIA, talked about their collaboration process on the Lewis Thomas Laboratory at Princeton University.

Payette started the presentation, saying, "If we are truly a collaboration, Bob will interrupt me at some point, or I will do the same later." Payette said that at the onset an agreement was reached on "where the ideas were to flow from and where responsibility would lie." In the simplest terms, Venturi did the outside, Payette the inside. However, Payette said, both architects encouraged suggestions and criticism, and Venturi expressed what he called a contradiction between the inside and outside of the building. Venturi concluded with the advice, in any collaboration, to "be nice to each other and laugh a lot."

The roundtable concluded with Fay Jones, FAIA, and Antoine Predock, FAIA, discussing regionalism in terms of their award-winning houses.

Predock said, "Regionalism is when you can't get a job out of state." Stern offered that "fundamentally, regionalism is an important idea," although he said he didn't consider Predock a regionalist.

In describing his Reed house, Jones credited the clients' request for indigenous materials, simple forms, and energy efficiency. He concluded, "Regionalism should not be a goal, it should be a result."—Lynn Nesmith

Architecture as an Image on Television and at Disney World

Two of the major programs at the AIA convention explored the role of architecture in creating fantasy, image, and illusion. In the opening session, Michael Mann, creator and producer of the television series "Miami Vice," talked about how filmmakers use architecture to express feelings and moods. At a later session entitled "The Developer/Dreamer," two representatives from the Disney organization explored the philosophies and the creative collaborations that have determined the direction of their company.

Mann explained the process of using a space to tell a story or to serve as a catalyst to generate feelings. Architecture can create a backdrop or a terrain, according to Mann, who admits his architectural vision of Miami seen each week by television viewers is an "artificial terrain."

Mann uses Miami's varied architecture—from art deco motels to Arquitectonica's Atlantis apartment building and Spear House—not only as a stage set but also as a vehicle to create dramatic action and movement.

If an architect is most comfortable making a speech accompanied by a slide show, it's only natural that a film producer would bring along video clips. In addition to segments from "Miami Vice," Mann presentation was highlighted with clips from his other television series, Las Vegas-based "Crime Stories," and his two movies "Thief" and "Manhunter."

Peter Rummell, president of Disney Development Co., and Martin A. Sklar, executive vice president of creative development for the Walt Disney Co., talked about the importance of "people, smiles, and fun." The power of that "Disney magic" was evident when, at the close of the program, Mickey Mouse and friends and a 14-piece brass band brought the audience to a standing ovation.

Rummell explained their goal of combining traditional development planning with the Disney philosophy. The company starts with "a story, a big idea, a vision of the final product." Later come the budgets, contracts, and details.

Out of this collaboration has evolved a design point of view Rummell called "entertainment architecture. It's not postmodern or classical or contemporary. But it can, in fact, be any of those." Rummell maintains that there is no reason why an office building dedicated to the "deadly serious business of profit and loss cannot make you smile."

With that introduction, Rummell showed a slide of a model of a proposed 300,000-square-foot office building by Michael Graves, FAIA, with the Seven Dwarfs posed in a classical Greek manner and Mickey Mouse dancing on the roof. Rummell also showed a proposed 250,000-

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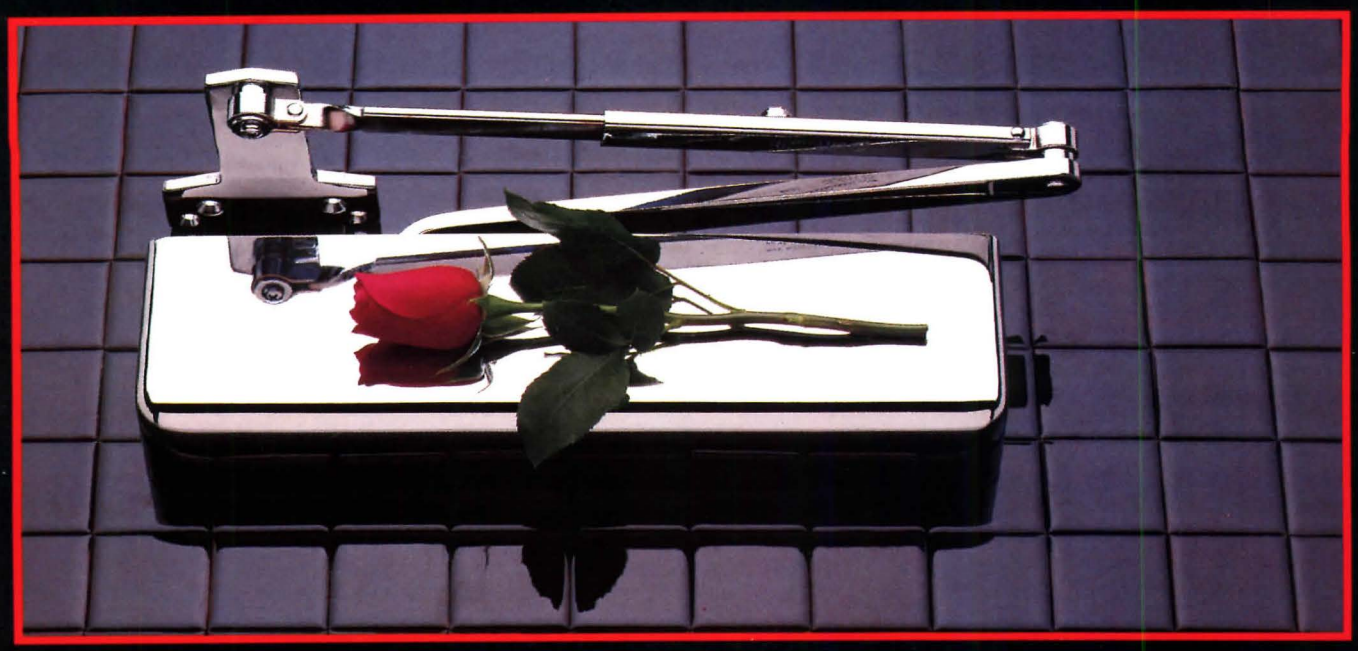

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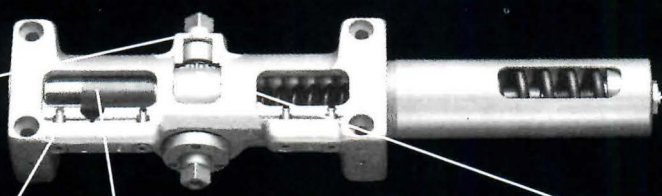

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The Institute *from page 18*

square-foot office complex by Cesar Pelli, FAIA, which had two yellow and blue towers that bore a striking resemblance to a pair of mouse ears.

"We know that creating fun is not necessarily easy," Rummell said. "It doesn't happen by accident. . . . Architecture is the same. It must take into account circumstances and the surroundings and the reason for which it's being designed."

Sklar gave a brief history of the Disney company and talked about the storytelling approach to planning a theme park. In describing Main Street in the Magic Kingdom, Sklar said the buildings are intended to create a sense of harmony that gives visitors "reassurance that the world does not have to be chaotic."

The Disney program was the basis for a roundtable forum on client-architect relationships. Moderated by Robert Campbell, AIA, the panel included A. Eugene Kohn, FAIA; Antoine Predock, FAIA; Wing T. Chao, AIA, vice president of Disney Development Co.; C.L. Davidson III, senior vice president of Gerald D. Hines Interests; Robert J. Boerema, FAIA, of the Florida Department of General Services; and Roger L. Pickar, of the Marketing Consortium.

In his opening comments, Campbell posed the question, "How do you avoid kitsch or do you try to avoid kitsch?" He also said it is a milestone that Graves and Pelli are doing work for Disney.

Representing the Disney organization, Chao said, "We are a different kind of client." The company's unusual requirements encourage flamboyant architecture, but in the next 10 to 15 years the Disney Development Co. will build more architecture outside the theme-park genre. "We believe we can continue to make a new chapter in architectural history," said Chao.

The other panelists addressed more traditional client/architect relationships and talked about the economic problems facing both architects and developers. Davidson predicted a renewed emphasis on proven working relationships between architects and developers and an increased demand for functional, cost-effective building "without gimmicks."

In selecting an architect for a state project, Boerema said the main criterion is that the building meet the program requirements. "We are careful about hiring award-winning architects," he said.

Marketing consultant Pickar said the generalist's attitude is not the way of the future and recommended that architects become more specialized to survive in the changing marketplace. However, both Predock and Kohn disagreed.

On the issue of client relationships, Kohn gave the architects in the audience a "pep talk" and urged them to "stop sitting back and taking the abuse." He called for educating tenants to demand quality and better buildings. "Hold your heads up high," he said.—LYNN NESMITH

Architects and Children Create 'Legotecture' at Convention

Twelve honor-award-winning architects, about 100 kids, and half a million Lego® bricks—that was the scene at the AIA convention on Monday morning. Billed as a "fun-filled design charrette," the event was part of the AIA environmental education committee's series of children's programs.

After two hours of construction, the final designs could be viewed as representative of the current state of architecture, "a pluralistic, even eclectic, free-choice kind of architectural milieu where all kinds of architecture (or styles of architecture) could survive," to quote Philip Johnson, FAIA, in his convention speech.

Some architects approached the job with a predetermined grand scheme, others let the kids take over, and still others allowed the buildings to evolve.

Helmut Jahn's soaring and colorful design could have been the model for his next project. He did admit, however, "we had three collapses before we got the structure right."

The diverse approaches within one firm were evident in the designs by three architects from Kohn Pedersen Fox Architects. Robert Cioppa, AIA, and his followers created a large-scale urban plan. "We built our design the same way America was built," he said. A. Eugene Kohn, FAIA, and Alex Ward both built skyscrapers.

Antoine Predock's creation, a UFO attractor, was a solid black wall punctuated with four small windows, which he, with a somber smile, called a Darth Vader wall.

The most flamboyant design was by Tom Grondona, AIA, architect of Claudia's bakery, the most flamboyant of the 1987 honor award winners. Entitled "group architecture," the scheme had several children wrapped in masking tape, each holding a Lego® creation.

Michael Graves, FAIA, visited several teams to give advice. "I decided to serve as a consultant," he said.

Taking a different approach, Frances Halsband, FAIA, built a laurel of delicate green Legos® and wore it around her neck. But it might have been Fay Jones, FAIA, who had the best idea. "I let the kids teach me," he said.—LYNN NESMITH

News continued on page 22

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Outreach

Teaching Teachers to Teach About Architecture

In Kansas City, you find them surveying the downtown, closely examining the new architecture and the old. In St. Louis, they compare the newly renovated Union Station to its counterpart in Kansas City. These surveyors of downtown architecture are elementary and high school teachers discovering with excitement the potential of a new subject—architecture.

These new architecture buffs are participants in "teaching the teachers" programs, now found in several states. The goal is to reach as many of the nation's 2.5 million teachers as possible, who in turn will teach millions of students.

"Given limited resources and the time most architects can devote to the education of children, the impact will be greater if architects work with 30 teachers rather than 30 students," says Alan Sandler, director of AIA's environmental education program. While the "teach the teachers" efforts do not preclude architects in the classroom as an educational tool, such programs allow teachers to tailor more closely the classroom offerings to their students' abilities. According to Sandler and other experts, the payoff will come in 20 years when the students are in decision-making positions in the community.

"Great architecture is really the product of great clients as much as it is of great architects," says Vernon Reed, AIA, director of the Missouri Council/AIA's "teach the teachers" program. "That's one premise behind many efforts to develop a more sophisticated public who will demand high design quality in the built environment."

A leader in teaching the teachers is the Kansas City Chapter/AIA and the Missouri Council/AIA. By July, 1,700 teachers had enrolled in graduate-level courses on teaching architecture. The beauty of the subject is its tangibility—courses are usually geared to a specific city and its architecture. For example, in St. Louis and Kansas City a recent topic was the city environment as a classroom. Also in Kansas City were courses on the art deco influence, Kansas City landmarks, and a more generic reading of the streets.

In Missouri, courses usually run 15 to 30 hours and center around the following: building a vocabulary; field trips; putting the architecture knowledge base into the context of social studies, geography, math, art, science, music, history, politics, economics, and climate; identifying issues that call for informed evaluation and judgment, including technology, preservation, conservation, esthetics, and planning; establishing interdisciplinary connections in learning activities and curriculum; and providing opportunities for community involvement.

What teachers often find most intriguing about the discipline of architecture is the interdisciplinary nature of the subject. "Teach the teachers" courses are also being given in Des Moines, Albuquerque, Seattle, Tampa, and in Springfield and Columbia, Mo.

Still, educators and architects recognize the value of one-shot programs, such as the one held in Oklahoma City, last year. Through the local chamber of commerce's adopt-a-school program, 3,000 sixth-graders, 93 teachers, 93 architects, and 93 architecture students created learning stations for outer space. The program was so successful it was adopted by the Young Astronaut organization as its competition for 1987.

Of note is the effort of local architects with children of the Philadelphia school system to inventory over a five-year period the city's architecture—everything from neighborhood buildings to door styles. And the Iowa Chapter/AIA released an audiovisual show entitled "Buildings Speak: The Language of Architecture," which looks at five elements of architecture—form, scale, color, texture, and materials—and can be used to teach educators or students.

Rising in popularity are architecture exhibitions for children. Originally at the Museum of History and Art in Anchorage and now in Seattle, "Form + Space = Architecture" relates architectural concepts to school subjects—math, physical and life sciences, social studies, art, music, and health education. For example, the section entitled "You Are Architecture" compares body systems to building systems: a ribbed double dome with a compression ring relates to the human rib cage; the electrical systems of a building are compared to the body's neurological systems; and the building's structure to the body's skeletal system.

The section "Procession of Portals" has a cave opening, mirrored Egyptian sarcophagus, and column capitals. A favorite section is the geometric architectural forms achieved by hanging Nerf balls from the ceiling at varying heights: pyramid, cone, vault, dome, and rectangle. A curriculum accompanies the exhibit, designed by Anne Taylor, a professor of architecture at the University of New Mexico, and George Vlastos, an architect from Casper, Wyo. The exhibit will move to Albuquerque in 1988.

At the Staten Island Children's Museum in Snug Harbor, N.Y., the exhibit "Building Buildings," designed by Lee Skolnick, an architect in New York City, was intended to "train children to use their eyes and their minds to think about the buildings they see every day, to understand how they were conceived and designed, how they were built, and how to relate to their surroundings and to the people who use them," in Skolnick's words. The exhibit centers around six questions: Where do we build? How do buildings speak to us? What goes on in there? How do buildings make us comfortable? How do buildings stand up? Who builds buildings?

—Nora Richter Greer

Aspen Conference Addresses Design Successes and Failures

"Success and Failure" was the theme of this year's Aspen Design Conference, held in Colorado June 14-19 and chaired by Michael Crichton, an author of science thrillers.

The most outspoken participant was Brendan Gill, now the architecture critic of the *New Yorker,* who appeared in a panel on preservation. Gill said that success in preservation brings heavy responsibilities, whereas failure can be something of a relief. "What is our responsibility to help people preserve buildings that we have told them they must preserve against their will?" he asked. He gave downtown churches as examples of buildings that often cannot reasonably be maintained by their dwindling congregations. "A beautiful church is for all Americans and should be an issue addressed by the federal government," he said.

Turning to New York City, Gill decried proposals for mammoth office complexes in Times Square and Columbus Circle. Times Square "will soon be dark after 5 P.M. and occupied only by people in imitation Brooks Brothers suits carrying little briefcases."

Gill decried a huge mixed-use proposal for a site in Columbus Circle, saying that the city, without consulting the public interest, had simply sold the site to the highest bidder for $485 million. "What on earth kind of building must you build there to get your money back?" he asked. "So one of the most moral architects I know, Moshe Safdie, has consented to design this monstrous building that will cast a shadow in winter the entire length of Central Park and will be one of the most conspicuous and ugliest buildings in New York."

Other kinds of architectural success and failure were the topic of a discussion of the John Hancock Tower in Boston, designed by Henry Cobb, FAIA, of I. M. Pei & Partners. Structural engineer

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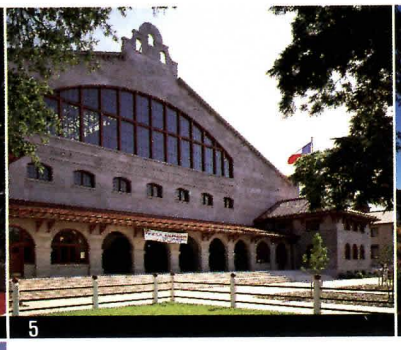

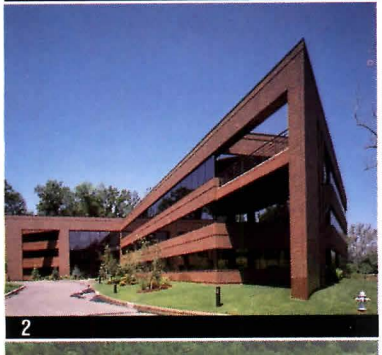

At first glance, it's difficult to imagine how these six different buildings are related. But if you take a closer look at their histories, you'll find they all share a common theme: the washrooms in all six buildings have been refitted with Sloan flushometers.

True, these buildings don't look old enough to need major plumbing repairs. But the fact is, the original flushometers that were installed just didn't hold up. Even after repeated servicing, they continued to malfunction. They didn't shut off properly. They leaked at the stops. In some cases, they even flooded the washrooms. In short, they weren't Sloan flushometers.

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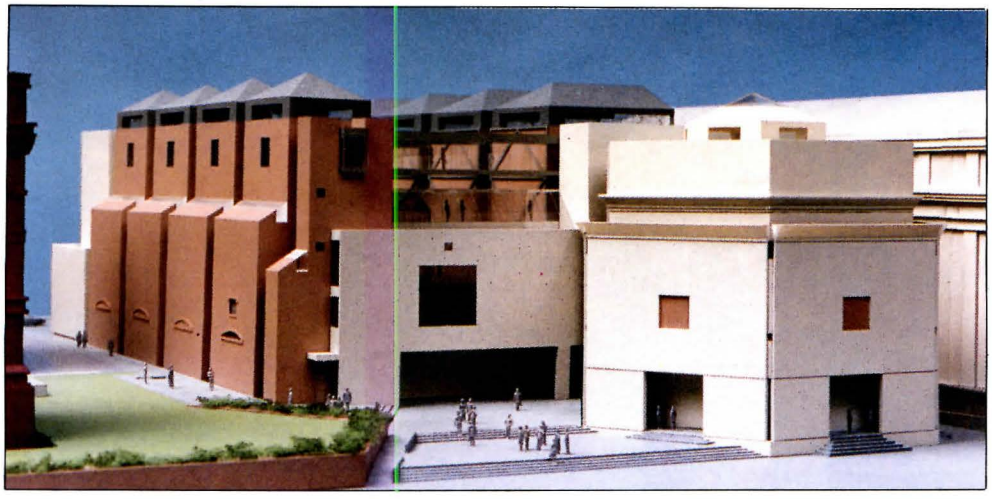

Holocaust Memorial Museum: A scaled-down building for a museum to memorialize the Holocaust has won approval from the Washington, D.C., Fine Arts Commission. The architects, James Ingo Freed, FAIA, of I.M. Pei & Partners, and Notter, Finegold & Alexander, pushed back by 35 feet a hexagonal, limestone-clad, semidetached pavilion on the front (at right on the model, above) and reduced the overall size by about 10 percent. The building remains organized around a long, three-story, skylighted court surrounded by eight brick towers; museum director Arthur Rosenblatt, FAIA, says most of the reductions came in public circulation areas. The museum is to be built near the Washington Monument and Jefferson Memorial.

Outreach *from page 22*
William LeMessurier explored the causes of this famous building's several technological disasters. These included earth movement around the excavation, causing settlement of nearby buildings and utilities; the failure of the windows, all 10,344 of which had to be replaced; the problem of sway in the wind, which required installation of massive sliding weights on an upper floor; and the fear that the tower might actually fall over, which led to the stiffening of the core and to a revision of national structural codes. Also discussing the Hancock were urban planner Edward J. Logue, Hon. AIA, and critics Peter Blake, FAIA, and this writer, who concluded that the tower is perhaps a successful architectural sculpture but is a problematic piece of city-making.

Michael Sorkin, critic for the *Village Voice* and professor at Cooper Union, gave an unsummarizable lecture that was the highlight of the conference. Among a battery of topics, Sorkin noted the perversion of functionalism one sees in the jet fighter or atomic bomb ("so sleek and compact—a precisely realized synthesis of bang and buck—the formal system is isolated from its consequences, mass murder") and in the house designs of Peter Eisenman, FAIA ("a perversion of utilitarianism—mannerist functionalism—totems of architectural rigor—functionalism at its most anemically inbred and insular"). He talked about the contemporary world of simulations of reality, as in Disney World or lip-synching pop singers, suggesting that such palatable kitsch substitutes familiar signs for the vicissitudes of reality and—because it is easier and often more satisfying than the actual world—can attract architects into practicing it.—Robert Campbell, AIA

Du Pont Honors Two Architects

The Du Pont Co. has awarded two architects cash prizes of $10,000 each in the first "Hypalon excellence in architecture" awards program. Carlson/Ferrin Architects of Seattle was honored in the new construction category for Larry's Market, a local supermarket. In the reconstruction and restoration category, Einhorn Yaffee Prescott of Albany, N.Y., was cited for the Equinox Hotel in Manchester, Vt.

The awards program, open to all registered architects in the United States and Canada, recognizes buildings completed within the past five years that incorporate single-ply membrane roofing systems based on Du Pont's Hypalon synthetic rubber. Awards jurors were Laurence Booth, FAIA, of Chicago; Robert A.M. Stern, FAIA, of New York City; and Richard Guy Wilson, Hon. AIA, of Charlottesville, Va.

The awards jury recognized Carlson/Ferrin Architects for using "high-tech materials in a very spritely way" in Larry's Market, a 45,000-square-foot shopping complex with a bakery, deli, fish market, wine shop, and flower shop, arranged around a central supermarket area. The architects chose industrial building materials and forms to give the market a "food factory look."

Einhorn Yaffee Prescott was honored for the exterior restoration of the Equinox Hotel, a 125,000-square-foot summer resort hotel composed of 20 interconnected wooden buildings constructed between 1800 and 1950. Engineering systems were inserted into the older buildings, and new buildings were designed to respect the historic context while projecting an identity of their own.

Deaths

Howard Barnstone, FAIA

Howard Barnstone, FAIA, died in his Houston home in April. One of the best-known and most influential architects, educators, and architectural writers in Texas, he was 64 at the time of his death.

Born in Auburn, Me., Barnstone attended Amherst College and earned bachelor's and master's degrees in architecture from Yale. He joined the faculty of the University of Houston college of architecture in 1948, serving as professor of architecture from 1958 until his death.

Barnstone began his architectural career as a committed modernist, and was among the first architects in Houston to accept and proselytize for the Miesian gospel of trabeated steel and brick and glass infill.

He worked in partnership with Houston architect Preston M. Bolton, FAIA, from 1952 to 1961, producing a number of widely published houses, and from 1966 to 1969 with Eugene E. Aubry, FAIA. In other years he maintained his own architectural practice, employing a significant number of architects who now lead firms throughout Texas.

He won a national AIA award of merit in 1966 for the Vassar Place Apartments in Houston and a national AIA honor award in 1978 for the Menil-Carpenter residence in East Hampton, N.Y. His other well-known projects include the Rothko Chapel in Houston (with Aubry), the dramatically cantilevered Maher house in Houston, the Riboud house in Arizona, with its undulating interior walls, and the Schlumberger Research Center in Ridgefield, Conn., designed with Robert Jackson, AIA, of Austin. His last major project, also designed with Jackson, was the Schlumberger Austin Systems Center, completed earlier this year.

In 1966, Barnstone published *The Galveston That Was.* The book, featuring photographs by Henri Cartier-Bresson, is credited with renewing awareness of the all-but-forgotten past in Galveston. It marked, at the same time, an interest in wider architectural exploration that showed in the projects Barnstone and his collaborators designed throughout the 1970s and '80s.

His second book, *The Architecture of John F. Staub, Houston and the South,* was published in 1979. Architectural historian Vincent Scully called it "one of the books that began to revise architectural history to include things that the modern movement had refused to look at." It coincided with Barnstone's growing interest in the role of historical precedent in architecture.

Architect William F. Stern, a colleague at the University of Houston, says Barnstone's work "consistently pursued the idea of architecture as invention. For those of us lucky enough to have been

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Deaths *from page 24*
touched by his architecture and writings, the influence was far-reaching."

Frank Welch, FAIA, of Dallas says that Barnstone, as a writer, influenced the critical climate of the entire state for almost four decades. Philip Johnson, FAIA, who worked with Barnstone on several projects including the Rothko Chapel, the Menil residence in Houston, and the Art Museum of South Texas in Corpus Christi, said, "He was a great ponderer, a very quiet man, devoted to his work."

A fund in Barnstone's memory has been established at the library of the University of Houston college of architecture.

—Joel W. Barna

Mr. Barna is editor of Texas Architect *magazine.*

Richard Roth Sr., FAIA

Richard Roth Sr., FAIA, 82, the second-generation architect who shaped a reputation for providing developers with the greatest amount of space for the lowest possible cost, died in June.

Roth was one of two sons of Emery Roth, an orphan from Czechoslovakia who emigrated alone to America at age 13 in 1884, founded his own architecture firm at the turn of the century, and during the 'teens and '20s became prominent in the design of New York City apartment houses and hotels, among them the Ritz Tower and the St. Moritz. Richard Roth joined his father's firm immediately after graduation from MIT in 1928 and was made a partner with his brother Julian in 1938. (Julian, who survives, was responsible for production.) Although the founder died in 1948, the firm continues to bear his name.

During the postwar period, Richard Roth guided Emery Roth & Sons through numerous commissions for high-rise buildings in Manhattan; the firm worked both alone and in collaboration with other architects. Notable was the Pan Am Building of 1963 (with Pietro Belluschi and Walter Gropius), which stirred controversy for blocking the vista up and down Park Avenue and for its enormous volume of office space; the General Motors Building of 1968 (with Edward Durell Stone); the World Trade Center of 1970-77 (with Minoru Yamasaki & Associates); and the Palace Hotel of 1979, a dark glass high-rise behind McKim, Mead & White's 1880s Villard brownstones on Madison Avenue.

Commissions outside New York include the Madison Hotel in Washington, D.C., and collaboration with Michael Graves, FAIA, for construction documents on the Portland Public Services Building.

Roth was chairman of the board at the time of his death. Emery Roth & Sons continues under the direction of Richard Roth Jr., FAIA.

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Myron A. Jordan, AIA, of Richfield Springs, N.Y., was the architect for many schools, churches, and community and institutional buildings in central New York State. He graduated from the school of architecture at Syracuse University before opening his office in Richfield Springs in 1932. A native of that community, he died there in February at the age of 85.

Frank W. Stevenson Jr., AIA, was vice president and chief designer of the firm Paderewski, Dean, Albrecht, Stevenson in San Diego. He received his bachelor's and master's degrees from the University of California at Berkeley. Stevenson's buildings in the San Diego area include Lindbergh Field's East Terminal, the San Diego Gas & Electric Company's Station B, and the Ford Building remodeling into the Aerospace Museum in Balboa Park. He died in March at the age of 52.

BRIEFS

Call for Entries

The National Computer Graphics Association is seeking entries for a design competition in computer animation. Professional and nonprofessional entries will be judged in 11 categories; entries must have been completed after Jan. 1, 1987. The deadline for entries is Dec. 1. For more information, contact Nancy Flower, NCGA, 2722 Merrilee Dr., Suite 200, Fairfax, Va. 22031.

International Design Competition

The Municipal Art Society is sponsoring an "idea competition" for a four-mile stretch of New York City's waterfront from Battery Park City to 44th Street. While aimed at architects, landscape architects, urban designers, and environmental artists, the design competition is open to anyone who registers by Sept. 28. Submission may be drawings, essays, sketches, photography, or videotapes. The jury will award cash prizes totaling $15,000. For more information, contact Municipal Art Society, 457 Madison Ave., New York, N.Y. 10022.

Student Competition Winners

The Association of Collegiate Schools of Architecture announced the winners of the fifth annual ACSA/American Wood Council student design competition. The program cited winners in two categories. The students honored for proposals for a wood design institute were: Eric Kellogg Beach of Rice University (first place); Harry A. Mark of the University of Texas at Austin (second place); Ame M. Engelhart of the University of Cincinnati (third place); and David P. Ramstad of North Dakota State University and Michael Philip Rose of Rice University (honorable mentions). Winners in the open category were: Jeffrey Allen of King of Tulane University (first place); Rosemarie O'Grady of Cornell University (second place); Gibson Midgley Jones, also of Tulane (third place).

Lighting Design Competition

The International Association of Lighting Designers is sponsoring a design competition for permanent lighting installations completed after Jan. 1, 1985. Products, equipment, and lighting designs for theatrical performances are not eligible. The deadline for submissions is Sept. 30. For more information, contact IALD, 18 E. 16th St., Suite 208, New York, N.Y. 10003.

PCI Research Fellowship Grants

The Prestressed Concrete Institute has awarded Charles W. Dolan, Alex Yuan Rong, and Tee-Liang Wong research fellowship grants totaling $8,000 for their proposals benefiting the precast, prestressed concrete industry.

Revised Publication Available

An updated version of the publication *Wood Flush Doors* is available from the National Wood Window and Door Association for $4. To purchase copies, contact the NWWDA, 205 W. Touhy Ave., Park Ridge, Ill. 60068.

ULI Publication

The Urban Land Institute's publication *ULI Market Profiles: 1987,* containing a descriptive account of development market sectors and statistical details on the market, is available for $110 plus $5 shipping and handling from ULI, 1090 Vermont Ave. N.W., Washington, D.C. 20005. □

ARCHITECTURE

Our chosen way of dealing with architectural education is not to make pronouncements or expound lengthy theories but to investigate and show what is actually happening at a set of schools each year, something we have been doing now for four years to considerable reader response.

Without abandoning our aversion to generalization, it is possible to make some overall observations on what these profiles have indicated. They indicate, most dramatically, an enormous diversity in the schools' approaches to the mysterious business of education. This is scarcely surprising, and mirrors the diversity in the art and profession of architecture outside of the walls of academe.

Other than this, however, there is little such mirroring going on. Another thing that the profiles show with some force is a wide divergence between the schools and practitioners in the very ways in which they look at architecture. They differ in their perspectives, their agendas, their points of emphasis.

This always has been the case to some extent, as it is in almost any other field, but some recent trends have widened the divisions between schools and practitioners. One is a tendency among the schools to move more deeply into the realm of theory. There is often more emphasis on meaning and allusion than on building. Indeed, there are schools where students learn more about "deconstructionism" than about construction. There is a widespread drive among teachers of architecture to legitimatize it as a discipline as rigorous (and as arcane?) as any in the university.

At the same time there is a visible tendency in the profession toward pragmatism. This is inevitable given economic uncertainties and the changing position of the architect in the construction marketplace. Many practitioners most value architectural graduates who can play immediately useful roles in their firms in terms of productivity and profit. At the extreme of pragmatism there is a vocal minority (vocal enough to sometimes sound a majority) to whom design is effete and theory no business of the master builder.

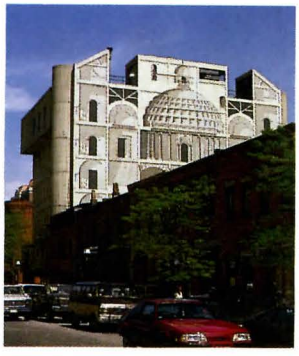
AIA has taken on education as a priority, and our suggestion of a priority within a priority would be to heal some of these divisions by seizing every opportunity to bring schools and practitioners to common ground.

As we have reported in the profile series, there are some promising steps in this direction. There are schools in which students divide their time between studio and classroom instruction in design and theory on the one hand and office experience and training in practice and construction on the other. There are others in which local offices take over studios for a semester, involving students in the work currently at hand. There are places (one described in this issue) where people already working in offices can further their education after hours and the faculty consists mainly of volunteer practitioners.

These models need to be built upon and others devised. The opportunity for change is there. For in the end students, faculty, and practitioners have one thing in common that transcends their differences: all have chosen to pursue that evanescent but luminous thing called architecture.—*D.C.*

'Anyone Can Walk In Off the Street'

The unique, volunteer-staffed Boston Architectural Center. By Michael J. Crosbie



Michael J. Crosbie

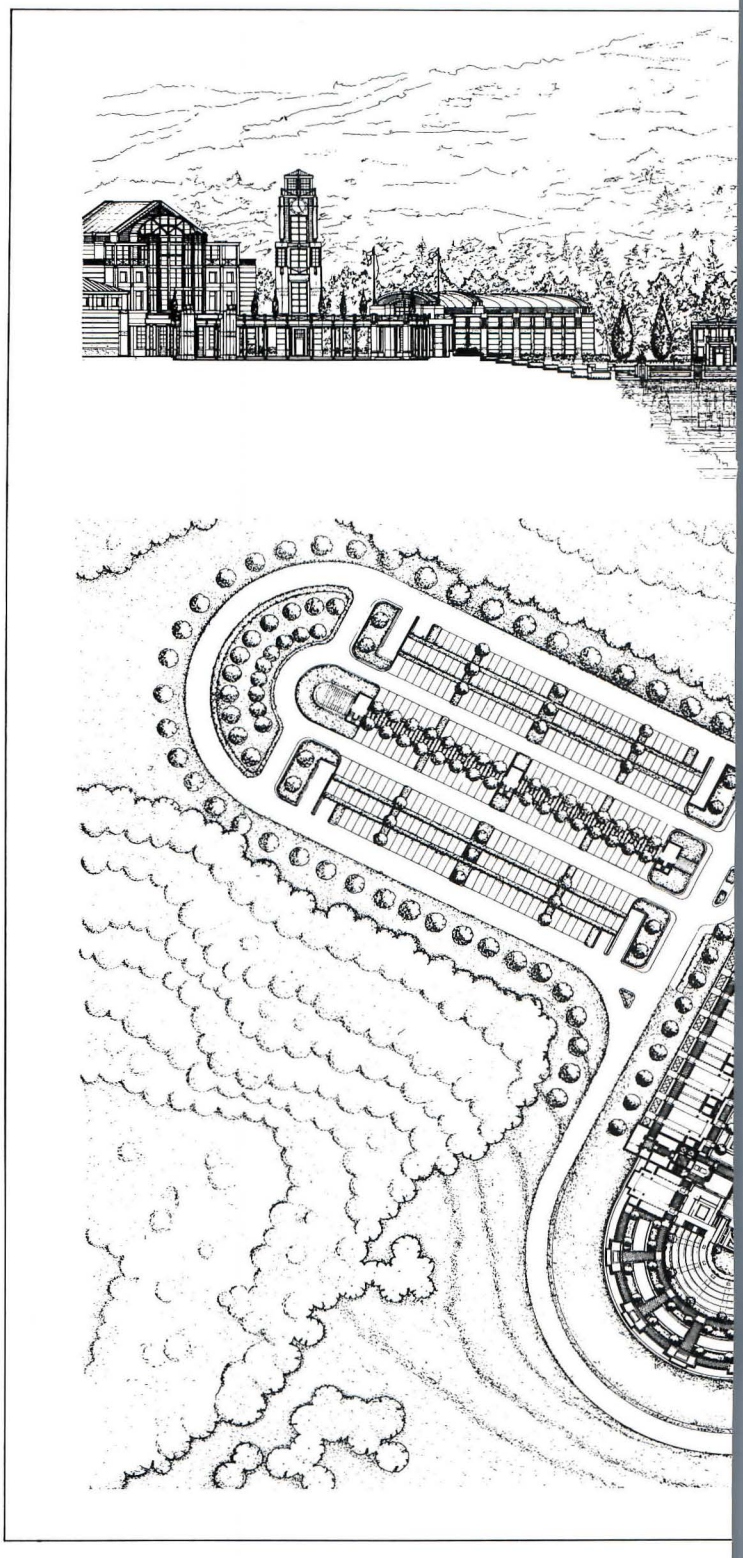
Great institutions revere their time-honored traditions. But for an architecture school, the weight of tradition can stunt its growth. A school that bases its tradition on unquestioned doctrine or the work of its founder soon becomes static. The Boston Architectural Center is a school rich in tradition, but that has not impeded its development. It has sustained the BAC as a place where virtually anyone can walk in off the street and enroll, pay very low tuition, and enjoy the benefits of a faculty that is entirely voluntary, drawn from the city's wealth of practitioners. The BAC is really a product of the profession, supported by the architectural community. Like H. H. Richardson's Trinity Church or Charles Bulfinch's Massachusetts State House, the BAC is one of Boston's sterling architectural achievements.

The BAC did not start as a school. When it was founded in 1889 its initials stood for the Boston Architectural Club—a place where local practitioners could meet informally and socialize, mount exhibits, and conduct lectures open to a public interested in architecture. Soon there were evening classes in pen and ink drawing and watercolor taught by architects for the benefit of their draftsmen. Eventually courses in structures, design, and architectural history were added. The club attracted some of architecture's greats such as Wright, Gropius, and Fuller, brought in by Arcangelo Cascieri, FAIA, who has been the BAC's dean for 50 years. In 1944 the club was reorganized as the Boston Architectural Center, with a curriculum of architectural study, and the school flourished. In 1971 its architectural certificate program received its first accreditation from NAAB, and in 1979 it became a degree-granting institution.

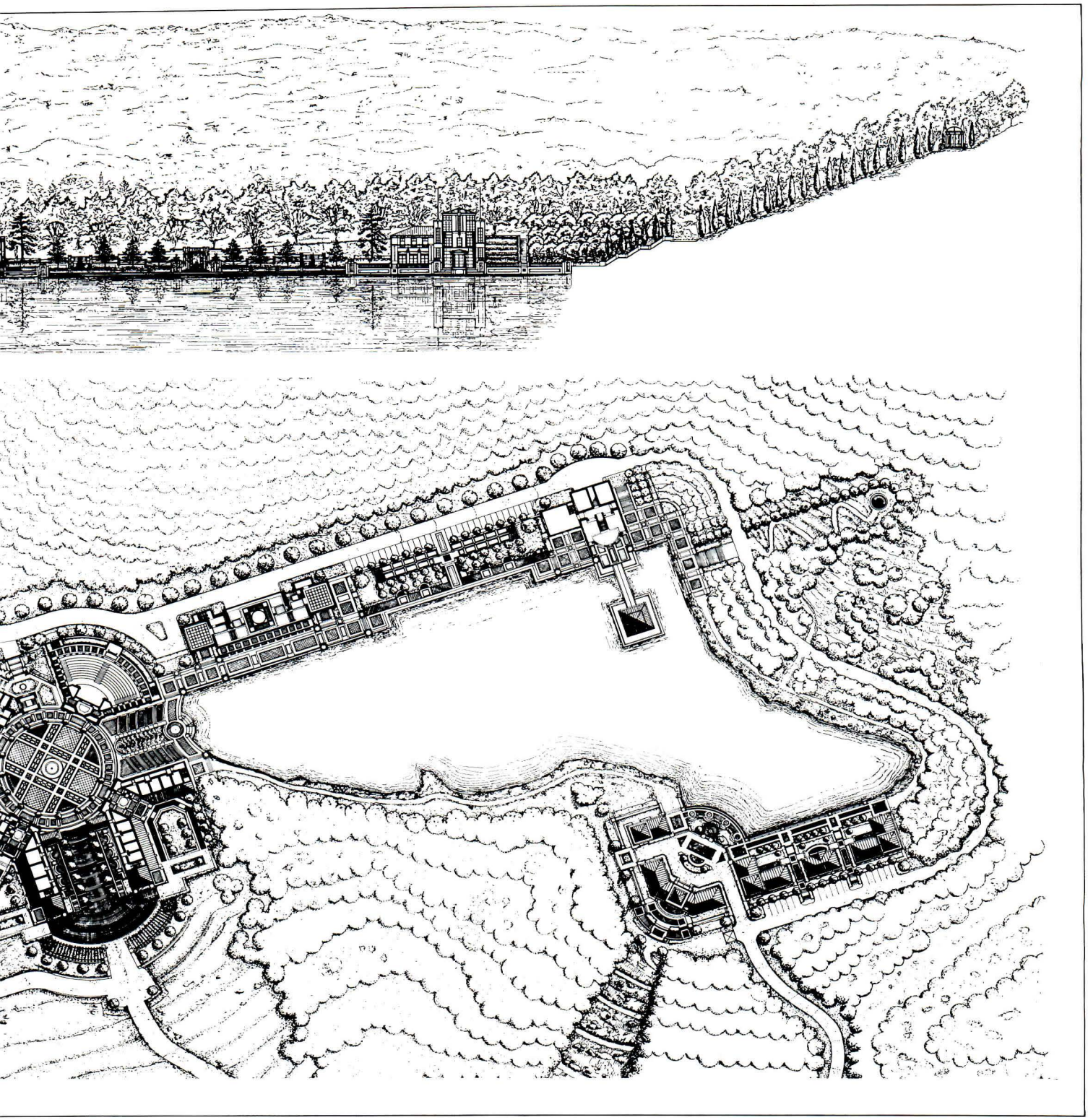
The BAC is located on Newbury Street in Boston's Back Bay, housed in a brutalist building of raw concrete, its south facade decorated with a *trompe l'oeil* by Richard Haas. It has the feeling of a storefront architecture school with its glass-enclosed exhibition space open to the public. The openness is part of the BAC's charter—that it be accessible to anyone interested in the study of architecture, and in fact it still offers continuing education classes that are very popular.

Admissions are on a first-come, first-served basis to anyone with a high school diploma. The tuition is about $1,800 a year. The B. Arch. program is structured in six years, but students rarely complete it in less than seven or eight years because they are working full time while attending the BAC's night program. Many use the school as a testing ground for their career choice. They may sign up for a year, try it out, drop out for awhile, come back, put their education on hold because of personal matters, and then pick it up again. One recent graduate received her degree after 20 years in and out of the BAC.

The open admissions policy results in a student population that includes people from just about every social stratum, with personal backgrounds just as broad. As one student described it, "There are 40-year-old mothers of five who come to school here, and people so wealthy they don't need to work who just want to get interested in architecture. There are those right out of high school and others with degrees in other fields who are making a career change. Most people have a substantial life experience, and they bring that to the school." The BAC's president, Bernard Spring, FAIA, admits that "it's easy to say that the range of students we get is a big mish-mash, but it is. I would characterize them as being middle-class, not upper-class and not really poor, under-class people. It's a very middle-class outfit, and that's why these students hack away at it for six or seven years—they have those values that keep them on the job."



The policy of low tuition and open admissions was instituted so that anyone, no matter what their financial resources, could study architecture, but the BAC no longer attracts students from the chronically underprivileged. "Poor kids who can't go to school—that's not the kind of people we get," remarks Spring. "I haven't seen a poor kid out of high school since I got here seven years ago. If they're academically talented they have other



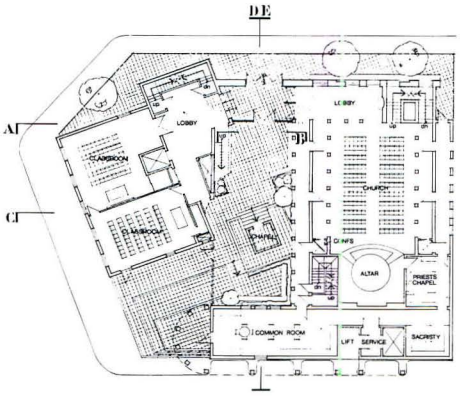
Facing page, the BAC's quarters; low building at right in photo will house new studio space. Above, thesis project for a corporate campus by Madelena Schoenhardt, with James K. Knight as adviser.

opportunities open to them—they apply to Harvard and get a scholarship." Because the student population is virtually an unknown quantity, Spring describes the BAC's mission broadly. "We concentrate on making outstanding silversmiths," he says, "turning out excellent general practitioners, which is unusual, because most general practitioners are not excellent."

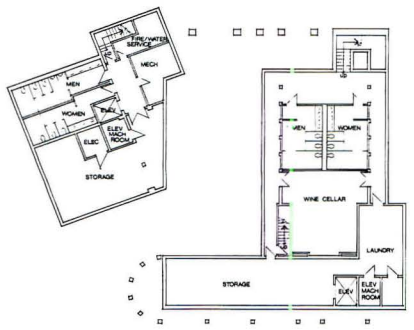
The BAC has traditionally drawn its students from the Boston metropolitan area, but with the rising cost of a college education, students are now coming from all over New England, some from as far away as Maine and Vermont, which makes for a very long commute to a night school. And more students are coming from other parts of the country, moving to Boston for the expressed purpose of attending the BAC.

Open admissions and low tuition rest upon the bedrock of a volunteer faculty. Everyone who teaches at the BAC (excepting the administrators and one history professor) is paid nothing.

Yet the BAC has never had difficulty drawing volunteers to teach studio and lecture courses. There is a tradition of young architects teaching there, testing their ideas or making a contribution to the profession. They number about 200 every year, with one-third turnover every semester; more than half teach for two or three years, and about 10 percent have a long-term affiliation with the school. "The major motivation for people to teach here is to get their feet wet as instructors," says Alexander Ratensky, who ended his seven-year term as the BAC's director of education this past semester. "There are people who use this as an exploration of teaching, and others who realize that the academic market is incredibly competitive and that having



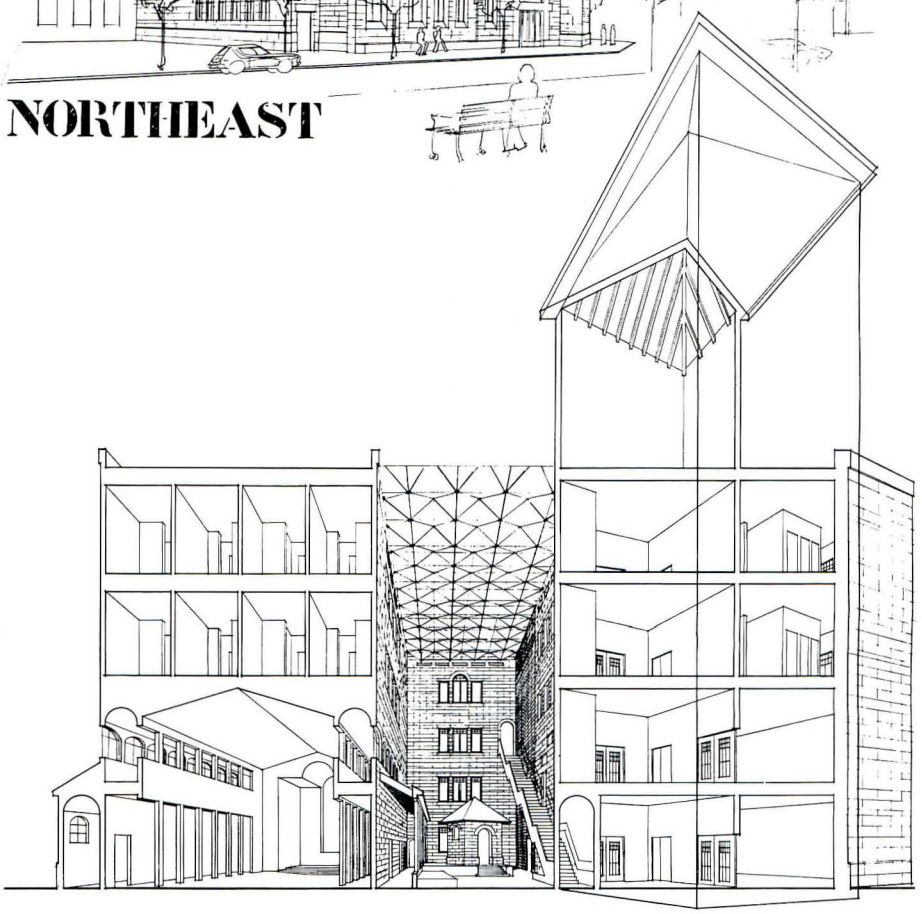
LEVEL 1



LEVEL 0 BASEMENT

This page, thesis design by Keith Hoffses for a Franciscan friary in an urban setting, with Alan Beveridge as adviser. The ground floor of the friary includes an atrium space with an open staircase and access to a small chapel.

NORTHEAST



SECTION PERSPECTIVE - A

taught successfully with positive peer and student evaluations is a terrific asset."

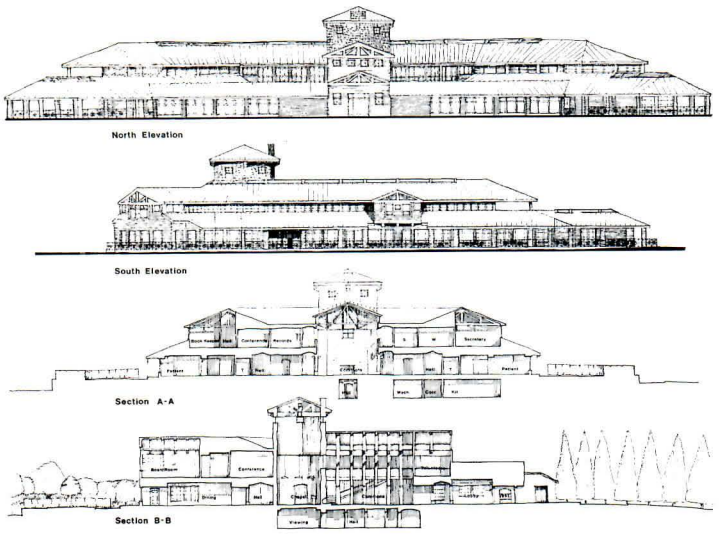
Like the students, teachers have open admissions. Most of them come to the BAC on their own to volunteer. They match up their interests in teaching a studio course with the BAC's requirement that students complete a range of design projects in housing, commercial buildings, community facilities, and urban design. A smaller number are referred to the BAC by local practitioners or BAC instructors, while others are sought out by the school because of their expertise in certain areas.

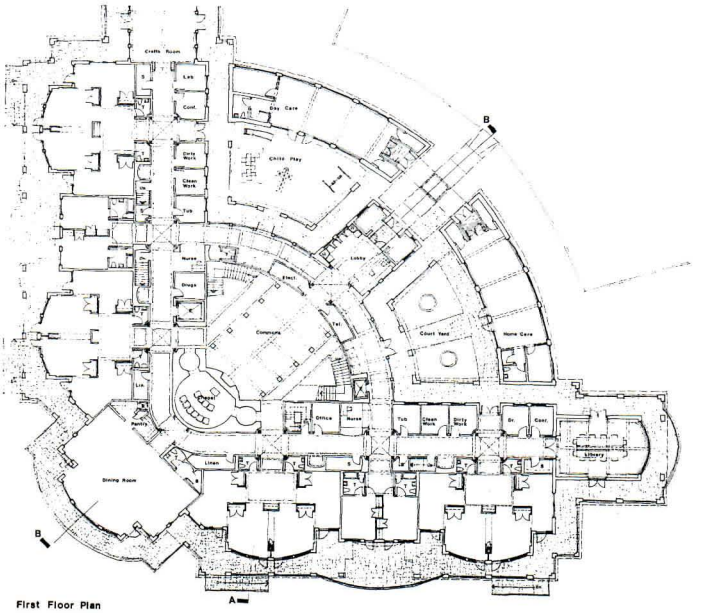
"Most of our instructors are people who love being in architecture school," says Spring. "In school they were testing things; they graduate, and all of a sudden they're in an office listening to some boss telling them what to do. So this is a wonderful place for them to come right after school. Once they get established in the profession and are allowed to be decision makers, they begin to drift away from the BAC."

The focus of a course's content, its ideological tack, and how the course is conducted are totally up to the instructors. "The place has such an incredible openness, there are so many opportunities if you're willing to take them," comments Derek Barcinski, an architect with Moshe Safdie's office who has taught introductory design at the BAC for the past few years. "If you have an idea that you're pretty shaky on, like basing a design course on the work of Stieglitz or Klee, the BAC gives you the time to work on it and play with it, and to find your own level. It also allows someone who's practicing to give something back to the profession."

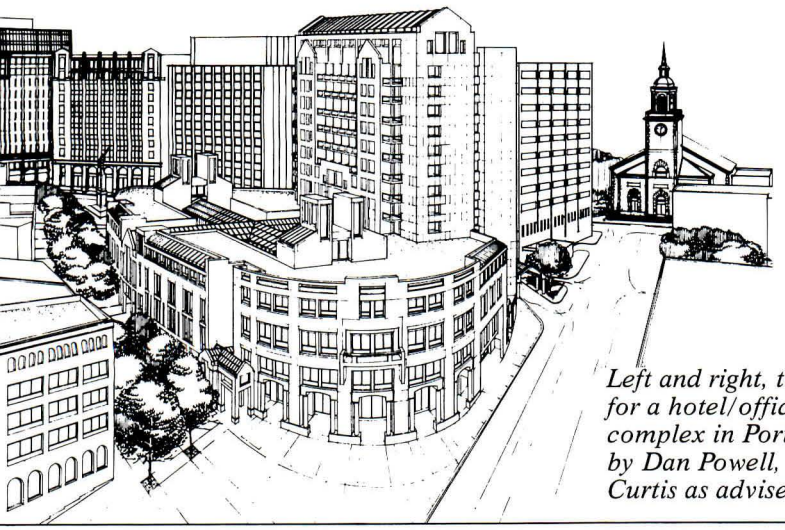
David Tobias, a senior associate with Peter Forbes & Associates, is a BAC graduate who has taught there for the past few years and has replaced Ratensky as education director. To him, the BAC is a place where architects can take the time to think about their practice in the context of a studio problem. He also points out that as a testing ground for teachers the BAC is held in high regard by other schools. "A couple of weeks ago I was talking to Harvard's architecture chairman, Rafael Moneo, and he said, 'I need a teacher, anybody good you can suggest?'"

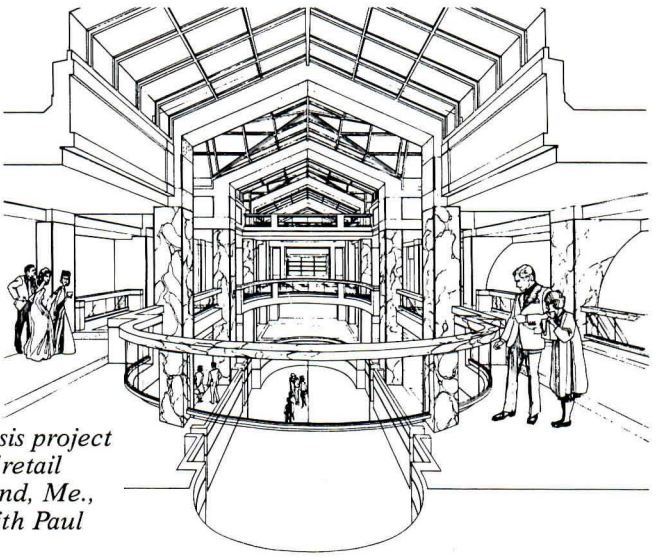
The students perceive the volunteer faculty as a rich resource, one that presents a spectrum of approaches to architecture that few schools can match. "The faculty's dedication is incredible," said one student. "Out of nine studios, I've had eight excellent ones. You can really run the gamut and learn a lot of different things." Most of the instructors are recent architecture graduates, quite a few from Harvard, who have practiced for a year or so.





Above, thesis student Richard Schmidt's design for a hospice in Roslindale, Mass., with Bradford White as adviser. The hospice is organized around a common area at the center of a fan plan, whose hinge is a chapel juxtaposed to a hearth.





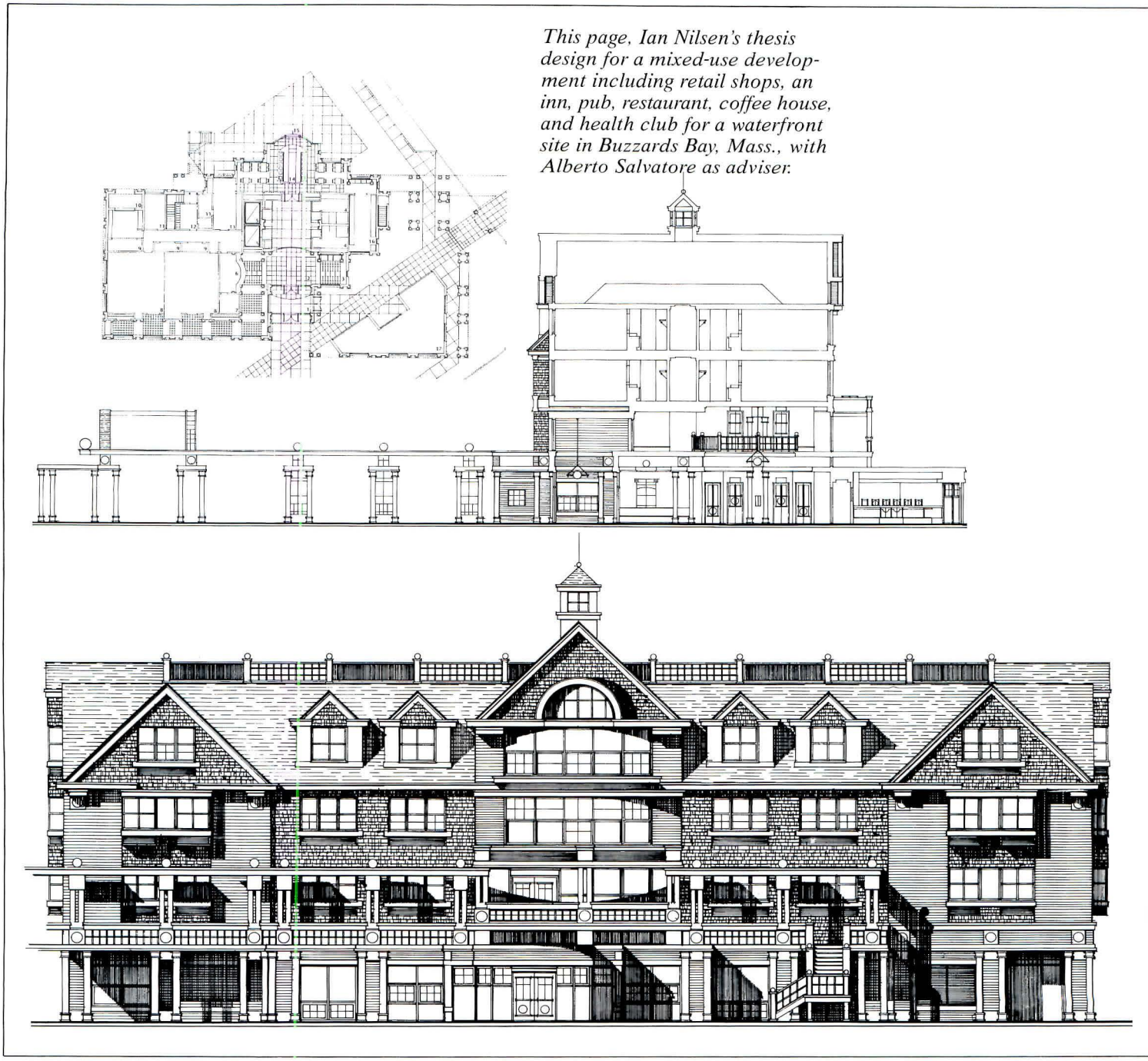
Left and right, thesis project for a hotel/office/retail complex in Portland, Me., by Dan Powell, with Paul Curtis as adviser.

This means they're roughly the same age as the students, who are typically in their late 20s. When you walk into a BAC studio it's hard to tell the students from the instructors, and the relaxed, informal atmosphere makes education a collaboration between the two, a sharing of ideas. Paul Marx, who has taught history at the BAC for 12 years and who was recently hired as a full-time instructor, loves the congenial atmosphere. "The students are participating in life, they're interested and involved. There isn't a gulf between the students and the faculty." The students reciprocate in appraising their instructors as colleagues rather than superiors. "We don't have prima donna architects who walk around with six or eight students in awe," one student remarked. "Our instructors are approachable; you can argue with them. The most exciting studios I've had are ones where I've spent the entire studio going against what the instructor was telling me and questioning myself. At the end I either gave in or stuck to my guns, but I learned something in the process."

On the down side, instructors sometimes find that the students' extensive past experiences can block their appreciation of new, unfamiliar ideas. Because the students work in architecture full time, they may use their office experience as a benchmark for their education. This is especially true in the introductory studios. "Sometimes you have to overcome tons of detrimental real-world experience," comments Barcinski. "When you talk about a design's structure, they understand that you have to frame a door with double 2x4s, when what you mean by structure is the conceptual relationships of the design."

The students' work in architecture offices is considered an integral part of the curriculum. The work experience is monitored by the BAC's work curriculum coordinator, Don Brown, AIA. Periodically students review with Brown what their duties and responsibilities are at work, what they're learning there, and how their studies at the BAC are contributing to their job performance. As the students move up through the program, they are taking on more responsibility at work and, at least in theory, their night and day lives are meshing. Many report a greater overlap of work and school experience.

The BAC's night-school, "learn while you earn" format has allowed many people to join a profession that would otherwise be closed to them. But such a format exacts its price. The most obvious one, of course, is time. Time is at a premium for the BAC's students. Architectural education is not the leisurely pursuit found at conventional schools. As one BAC student put it, "The most widely abused drug at this school is caffeine."



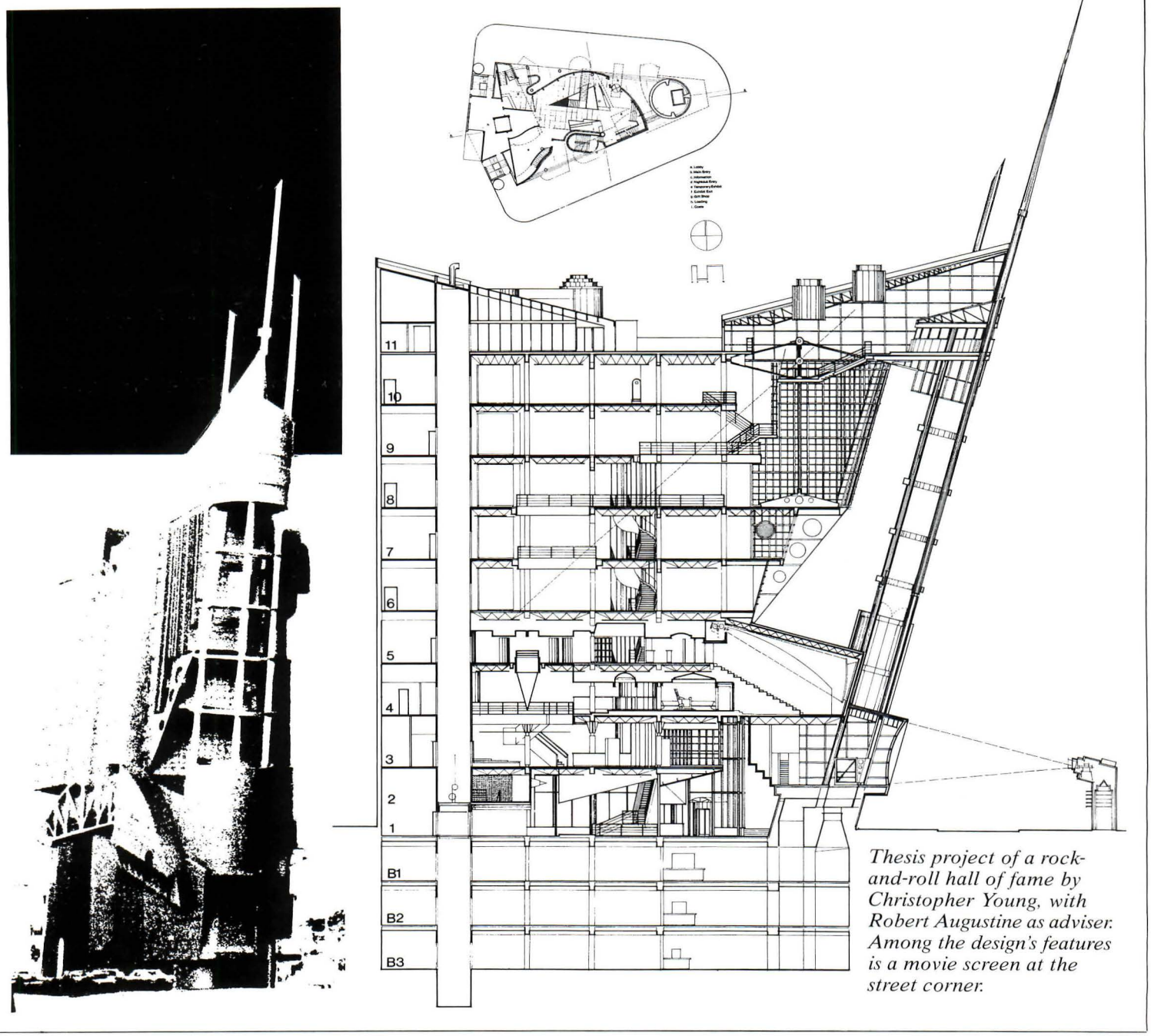
This page, Ian Nilsen's thesis design for a mixed-use development including retail shops, an inn, pub, restaurant, coffee house, and health club for a waterfront site in Buzzards Bay, Mass., with Alberto Salvatore as adviser.

Because it's a night school, the BAC's courses are condensed. The studios are three hours long, one night a week, where conventional architecture schools have four-hour studios three times a week. In shorter studios less time can be devoted to design and presentations. Spring believes this contributes to the perception among some in Boston's architectural community that BAC graduates are not good designers. "The people who make that observation are talking about facile designers, not good designers," says Spring. "When you go to a conventional architecture school, you sit in studio for 40 or 50 hours a week designing. You get very good at representing design ideas. Our students don't learn that. They're not trained to look like the good designers coming out of Harvard—they can't do it quickly and in a carefully developed way."

This perception, coupled with the fact that BAC graduates have more office experience than the average architecture grad, has earned them the reputation of being hard-working technicians, "the backbone of the profession," as they are often described. Strong back, weak mind, as the saying goes, so the compliment turned on its head is a put-down. The students are very sensitive to their reputation and carry the weight of the BAC underdog mentality. "I've heard that at Hugh Stubbins's office they have two rooms," a student told me. "One is for Harvard grads and the other for BAC grads. In one they design, in the other they draft."

But that attitude at the BAC is changing. The students are much more attuned to theoretical issues and exploratory design and the quality of their work has steadily improved in the past few years. "I think it's the end of a popular myth about the school," says David Tobias. "There's a wave moving across the BAC," another student reported, "that students want to know more about graphics and theory. We don't want to be pegged as just being the ones who know how to run an office before we graduate. We want to be able to compete nationally in areas of design." Participating in design competitions—one way of getting the work out—is hard to do at the BAC because of the time constraints. "To enter a competition you have to bring everything else in the school and your life to a halt," one student said.

Another deficiency pointed out by faculty and students is the absence of the studio's role as a social center in the school, a place for bonding and learning from each other. "Missing the studio experience is a big deal here," comments John Williamson, a BAC graduate who now teaches an upper-level studio. Williamson went on for his master's degree at Harvard's graduate



Thesis project of a rock-and-roll hall of fame by Christopher Young, with Robert Augustine as adviser. Among the design's features is a movie screen at the street corner.

school of design and compares the experiences. "When I was at the BAC, I remember a lot of agonzing over work in my apartment by myself late at night. At the GSD, if I agonized over something I could talk to the guy sitting next to me. You learned a lot about the process of making things just by osmosis."

To mitigate this problem, some of the BAC studios meet more than once a week, usually after hours in the instructor's office. Paul Marx takes his history students on trips—two weeks abroad or a long weekend in New York City. "We're together for long periods, and that's good because you're either looking at architecture or on the bus talking about what you looked at." And there are plans to institute a long studio that will occur in the third year. The BAC is in the process of buying a 7,500-square-foot building next door to house third-year and thesis studios. Third-year studios will run nine hours a week, either two or three days. "It will limit the students' choices of other classes," comments Tobias, "but it will add the advantage of group camaraderie, which will help them to work harder and better."

Longer studios will also present an opportunity for visiting design critics, who are impractical and expensive for such short studios. Ratensky recalls one unannounced visitor, however. "One of our instructors from Harvard invited Stanley Tigerman, who was visiting there, to come over to the center and speak to her studio class. In the studio next door, a student was making a presentation about an architect he had chosen to report on, and the architect he'd picked was Tigerman. As he was showing the class a photograph of the architect from a magazine, Tigerman walked through the doorway. The class had an apoplectic fit."

The BAC shows no signs of slowing down. In fact, as college costs continue to rise, more students can be expected to take advantage of its program. Spring believes that as long as local architects volunteer their time and talents the BAC will flourish, although he has some concern about new architecture programs nearby, such as those at Boston's Wentworth Institute and Roger Williams College in Rhode Island, siphoning off the BAC's best instructors for pay. But being part of a great Boston tradition has a value all its own. As instructor and BAC graduate John Williamson reflects: "Every once in awhile I realize what this school is—volunteer faculty, open admissions, low tuition, work-study. It's an impossible scenario that takes advantage of these great natural impulses that you wouldn't think could keep a school going for nearly 100 years. But there it is. There's nothing like it." □

A Sprig of Ivy Grows in the Southwest

Rice University school of architecture. By John Pastier

The Rice University campus is dominated by a 72,000-seat football stadium that was for many years the largest in the Southwest Conference and even now is large enough to hold the entire student body and faculty 19 times over. This suggests a certain regional character replete with high achievements on the field and lower ones in the classroom. But Rice is famous for its scrupulously correct athletic recruiting, its losing teams, and its academic excellence. Its mascot is not a steer or a cougar, but an owl. In nearly every respect it bears a far closer resemblance to Ivy League schools than to its SWC rivals.

© Paul Hester

Similarly, when one enters the 300-acre, 75-year-old campus through a dense bosque of live oaks, and glimpses Ralph Adams Cram's highly personal Mediterranean revival buildings, it is clear that the brash and usually booming city of Houston has been magically left behind. There is an air of calm and a civilized quality that is almost palpable; this is a rare and special place. Indeed, Rice is a fairly well-kept secret, modest about its considerable accomplishments in a region not noted for institutional or corporate modesty. It was founded as a tuition-free institute using the Cooper Union as its model, and, even though it now charges tuition, the cost is about half that of comparable institutions thanks to a half-billion-dollar endowment that is the third largest in the nation on a per-student basis. Rice's academic reputation and relative affordability draw high-quality applicants, both graduate and undergraduate.

The architecture school is small, with 200 students and 14 permanent faculty members, but it quietly lives up to the larger institution's standards. It commissioned James Stirling's first work built in the United States, the expansion and remodeling of the architecture school's building (above) in 1980-81. Two of the school's offspring, the Rice Design Alliance speakers' programs and the quarterly journal *Cite,* are cornerstones of the Houston architectural community's intellectual life, if not that of the entire state. The faculty has no international stars but seems able to turn out good crops of students year after year, assisted by a good selection of visiting faculty each year. Dean Jack Mitchell characterizes his school as "a self-confident place."

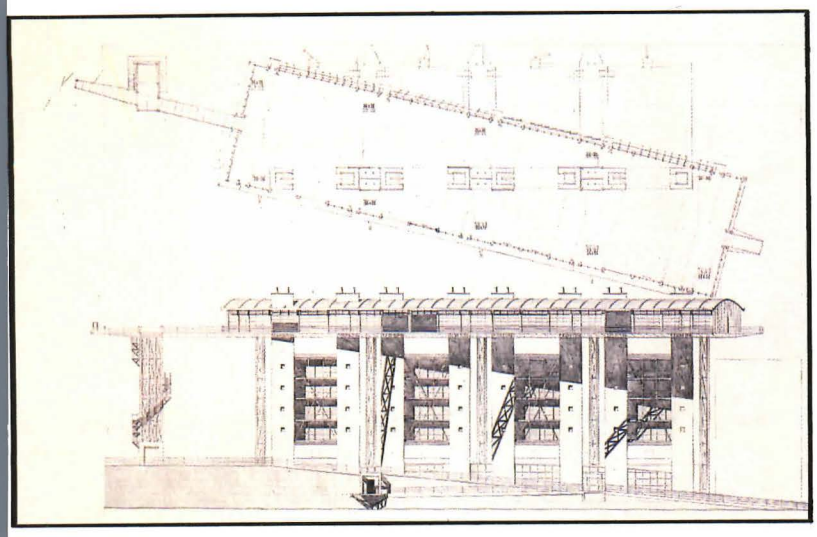
But it wasn't always so. Measured by the calendar, much of the school's history was less distinguished. It began as a department under William Ward Watkin, an employee of Cram's who supervised construction of the first Rice buildings. Heading the school from 1912 to 1952, Watkin seems to have been essentially an authority figure. One droll bas-relief on the chemistry building shows him disciplining his cowering students with a T-square; and an alumnus from his last years describes his demeanor, with some irony, as "godlike." After a caretaker period of a few years, Donald Barthelme, a well-respected local modernist architect, was brought in as head. He soon ran into conflict with the faculty, who succeeded in having him removed. In return, he managed to get the school's accreditation revoked.

This jolt, occurring around 1960, marked the school's coming of age. Barthelme's successor, William Caudill, was an organizational genius who simplified and professionalized the curriculum, as well as an inspirational figure who energized the school. Caudill was followed by David Crane, FAIA, an urban designer from Philadelphia who sparked innovations, including the establishment of the Rice Design Alliance (RDA), but also raised some hackles. Crane was followed by Mitchell, whose low-key, 10-year term has stressed academic consolidation and consensus building coupled with a major expansion and improvement of the school's physical plant and the formation of a very involved advisory council.

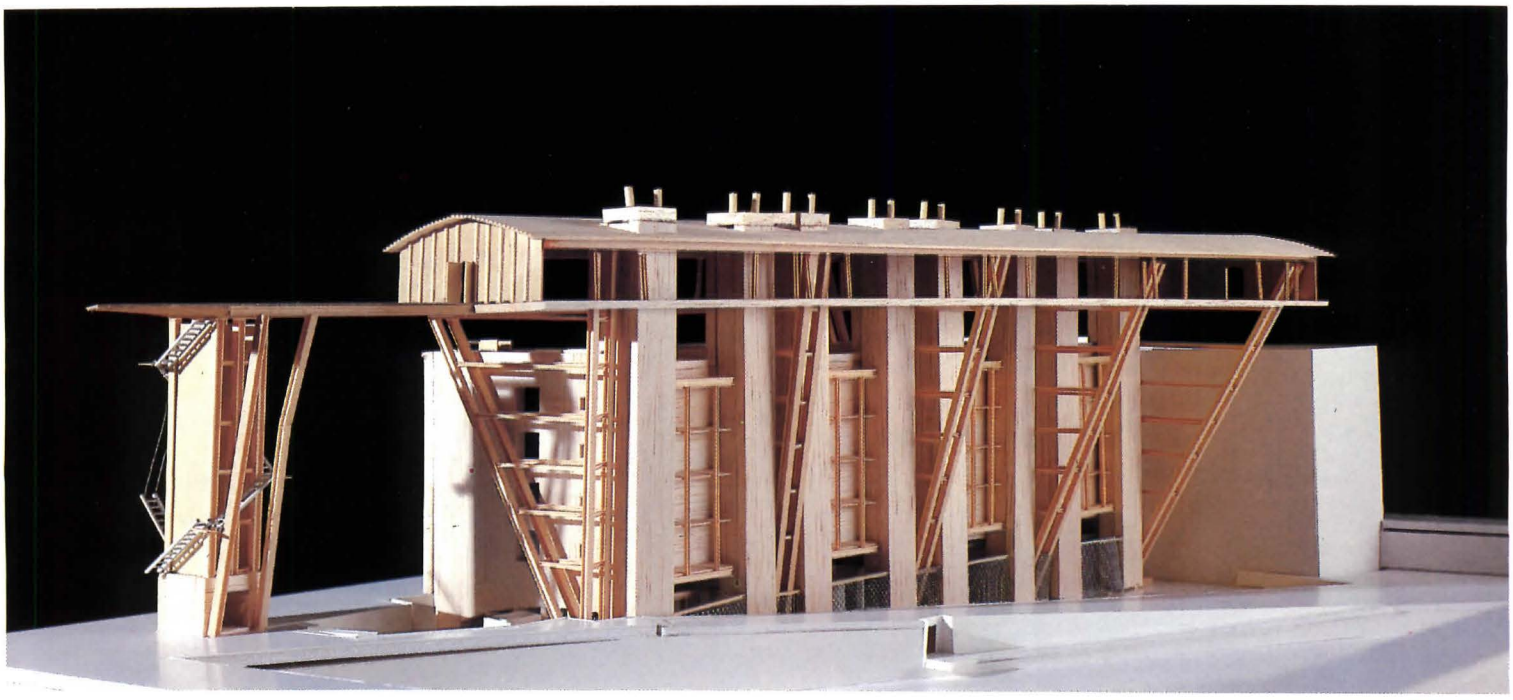
Much of the school's merit stems from the quality of its students. Excellent students are attracted by the university's high reputation and moderate tuition—$4,900 for the 1986-87 academic year. Additionally, 60 percent of the freshmen get full scholarships, as do most of the graduate students. The school can be very selective about admissions: only about one-fourth of the undergraduate applicants and about one-sixth of the graduate applicants are accepted. Each applicant is given a personal interview, and many are given two. Professor Anderson Todd, FAIA, in charge of the qualifying graduate program for students with no previous architectural education, finds his students consistently "very bright." William McMinn, FAIA, an alumnus and advisory council member who is now dean of architecture at Cornell, says, "Rice will always have good work because it will always have good students."

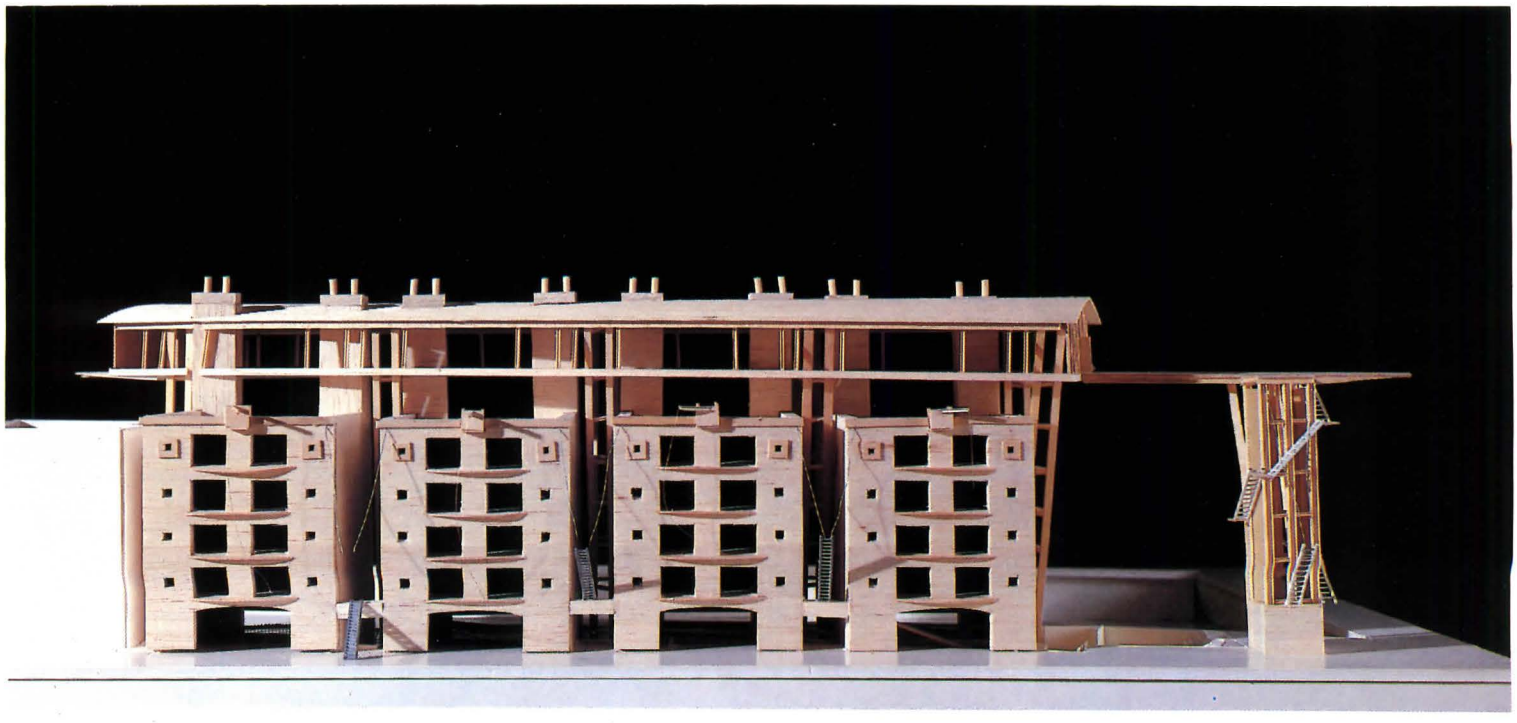
As the school's fame has spread, the architecture student population has become more cosmopolitan. For a long time Rice was primarily a Texas institution. Now, a universitywide policy has Texans making up half the entering students, but in architecture the proportion is much lower. Last year only two of the freshmen came from within the state. Undergraduate curriculum chairman Gordon Wittenberg notes that "the architecture school is not getting qualified Texas or Southern applicants." This may mean that it gets more qualified applicants from elsewhere. Clearly, it is no longer just a regional school; one 1987 graduate is Ricardo Bofill's son.

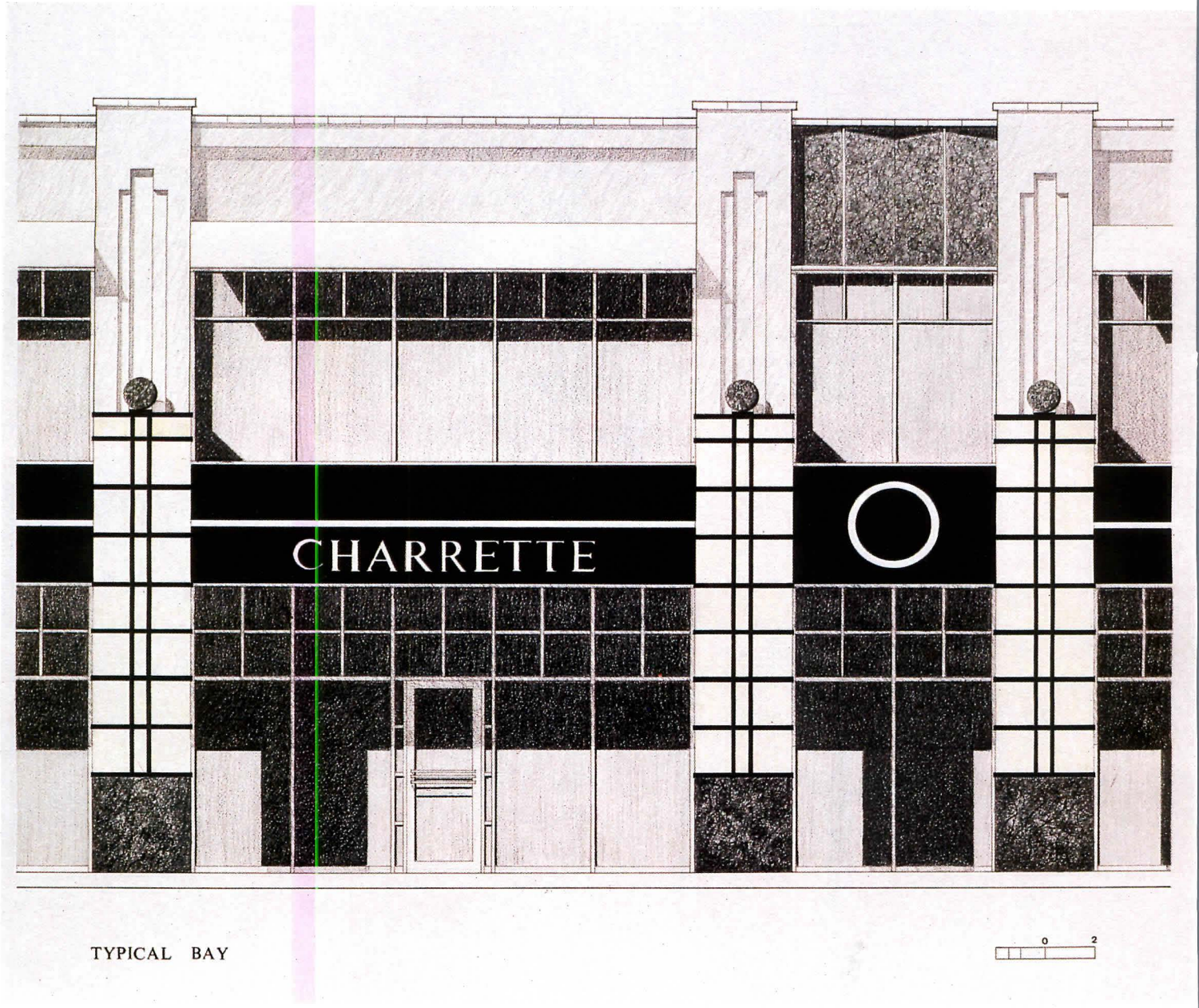
But as good as the Rice students are, there may also be something lacking. Rice's "civilized" quality (the word is essential to understanding the place) may preclude some other important characteristics. Craig Hodgetts, a frequent visiting critic, finds that "the design work at Rice is always solid and competent, but you don't see projects that break through at the top and really take off." Professor William Cannady, FAIA, an



This page, artists' housing in Boston by senior Charles Renfro, with William Sherman as critic. Drawing, left, shows plan of studio level (above) and elevation facing a freeway.







Above, elevation detail of university retail center by graduate student Claire DeLaura, with William Cannady as critic.

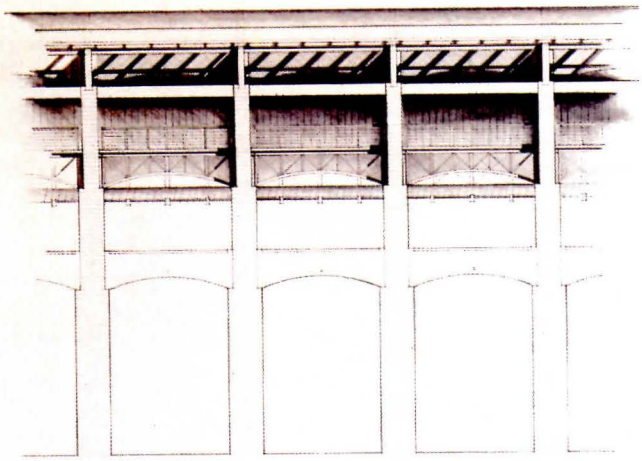
outspoken and energetic Texan who is second in seniority on the faculty, says that "we have polite students who never ask questions of guest lecturers. We filter out those kinds of people [who ask questions]. I'm sure that I wouldn't have been admitted here as a student. Although we have a diversity of faculty, we have a similarity of students."

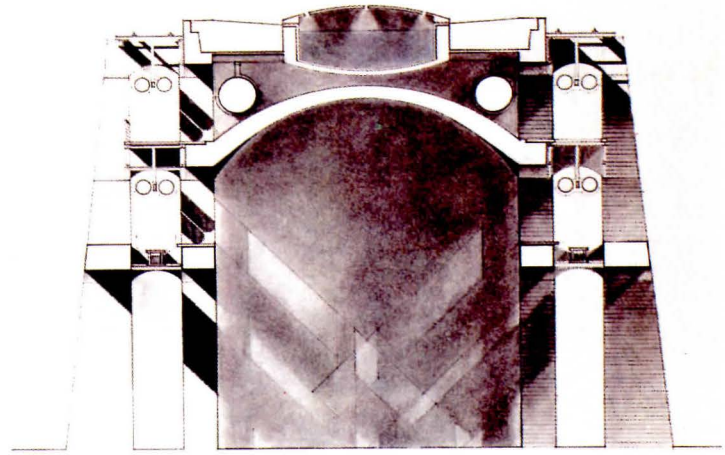
That faculty diversity is somewhat unusual, given the faculty's small size. Cannady observes that "one table takes the whole faculty. We all fit into one room. There is no one philosophy; we seek balance." Mitchell sees the school as "a self-correcting academic arena" and "a product of faculty consensus" but also speaks frankly of the faculty's "diversity and divisiveness." William McMinn feels that "the school has been somewhat fragmented and needs more unity." One student compares the faculty to "parents who fight in the bedroom and then come out smiling." Others say, "There is diversity of opinion." "There is no dogma, and no sense of direction." "Leadership is a problem." "The faculty is fragmented and politicized."

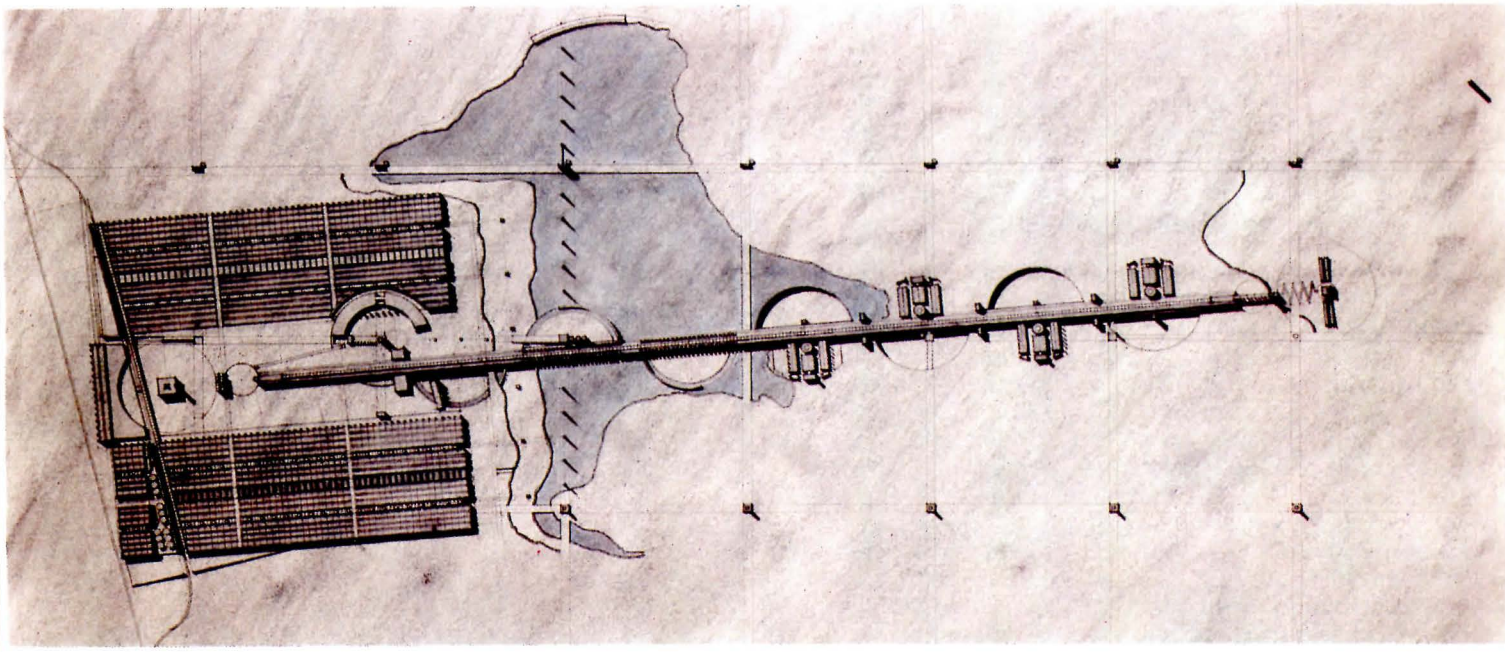
The divisiveness can be described in at least two ways. Professor John Casbarian, AIA, who is also a principal of Taft Architects, believes a current issue at the school is "the balance between professionalism and poetics." Given the example of Taft's work, one might assume Casbarian sees the issue in terms of balance. But Professor Peter Waldman says Rice is "heavily engaged in professional training." He finds some lack of intellectual rigor in both the undergraduate and graduate programs and observes that the "undergraduates are well taken care of—perhaps too well." He adds, "An architectural thesis is an exercise in independent thinking," implying that this is an ideal rather than reality at the school. He also feels that "no one [on the faculty or in administration] has enough power."

Some of the students define the division in simpler terms of younger faculty versus the old guard; not unexpectedly, they equate youth with virtue. Paradoxically, they note that while "the new people are valuable and accessible, they can't always get it across in a class situation," and they speak of the younger faculty members' "inexperience and disorganization."

With a faculty of 14, there are inevitably gaps in the curriculum. Mitchell believes in letting "people teach what they are interested in—you may miss a base or two, but the excitement is there." Some of the gaps are narrowed by visiting critics, guest lecturers, and occupants of the Cullinan Chair. This last is supported by a million-dollar endowment and brings in such diverse scholars as landscape historian J. B. Jackson, architectural historians Kenneth Frampton and Spiro Kostof, and environmental artist Robert Irwin to teach, give public lectures, and deliver papers that later are published. Six visiting critics come to the school each year, and recent ones have included Rodolfo Machado, Mark Mack, Michael Dennis, Lars Lerup,







Graduate student Scott Wall's service aqueduct (top, detail and section) and site plan for a factory. Peter Waldman was critic.

James Stirling's partner Michael Wilford, and Taft partner Danny Samuels, AIA. The guest lecturers are brought in under two programs: the RDA organizes theme lecture series for the public that often include figures such as Aldo Rossi, Mario Botta, Hon. FAIA, and Frank Gehry, FAIA, while the school itself arranges more frequent lectures usually involving academics or locally available lecturers. Students consider both sets of lectures valuable but cite some problems: faculty complaints that the school lectures usurp studio time, and the lack of an auditorium large enough to meet the ticket demand.

The RDA may have no counterpart at any other U.S. architecture school. In effect, it is a public service of the university that benefits the community even more than it does the architecture school. (Correspondingly, most of its funding is private.) Its lectures are the principal public source of architectural ideas in the nation's ninth-largest metropolitan area, and its third most populous state, *Cite,* the RDA's quarterly tabloid journal, addresses public issues and intellectual concerns in timely, intelligent, and for the most part nonacademic fashion. Recently, the RDA cosponsored a national design competition for a downtown park that, although heavily compromised by hasty business-community decisions, nevertheless set an important precedent for public projects in the city. (Previously, all of Houston's competitions had been for private undertakings.) Another school activity serving Rice and the community alike is the Farish Gallery, the city's only architectural gallery. Run on a shoestring, it has maintained a full and varied schedule since its founding in 1981.

The preceptorship program is another effective mechanism supplementing the Rice curriculum. Originally initiated by Caudill as a two-week arrangement, it may be the single most valuable element of the Rice program. After four years, undergraduates receive a B.A. and then are placed in selected architects' offices where they work nine to 12 months before returning to school for their final year and a Bachelor of Architecture. Undergraduate architectural education at Rice is therefore a six-year process involving two degrees and a year of work. (There are some exceptions: at the end of the second year, a few marginal students are asked to enroll in architectural studies rather than the professional program. Half accept this suggestion; the others do not have their major approved.)

The offices in the preceptorship program include local offices, prominent offices in the Northeast, and even foreign offices. Cesar Pelli, FAIA, who has sponsored several Rice students over the last two decades, calls it "a good system" that provides valuable contacts for students and gives the school a presence outside its immediate region. Students seem unanimously enthusiastic and describe the program as "excellent." For one, the experience was so heady that "it was difficult to come back—

Right and below, elevations for a U.S. Immigration and Naturalization Service border station, Brownsville, Tex., by graduate student Sabir Kahn, with Andrew Bartle as critic.

you suddenly realize how much of school isn't worth doing."

Indeed, the fifth year seems problematic. Students speak of feeling abandoned in the design studio after returning from the office. (This may reflect an unusually high degree of personal attention in the preceding studios.) Fifth-year students do not do a thesis but rather partake in a joint studio with fourth-year students, who, because of the preceptorship process, are really two years behind them. There is some student sentiment for a required fifth-year thesis, but it is tempered by the troubled recent history of the graduate thesis. There seems to be full agreement among administration, faculty, and students that the graduate thesis needs to be better defined and better organized. That process was attempted in the academic year just ended, but with unsatisfactory results.

Among other problems is a 13,000-volume library collection that is separated from its card catalog and is decidedly skimpy for a school of Rice's age, resources, and quality. Another is the long-standing absence of an architectural historian in the department. (One finally was hired last year, but most of his energies had to go into teaching design studio.)

There is also a subtler problem, which may be the dark side of the school's civilized character: a lack of urgency. Granted, this phenomenon is widespread throughout all of academia, but, after having made nine visits to the school over the course of the last six years, the Rice energy level and pace strike me as below those of many schools of the first rank.

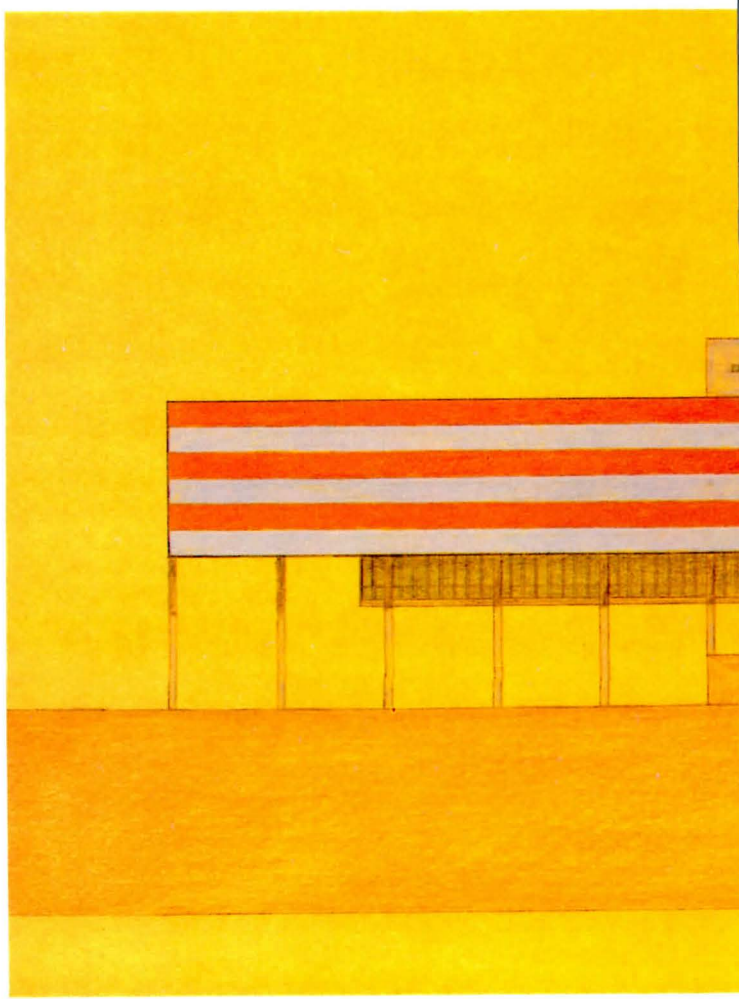
How these issues will be resolved is not clear, for administrative uncertainties now face the school. The office of director, principally responsible for school administration, has experienced high turnover and is now vacant. Mitchell's second term as dean is nearly over, and it is not known whether he will continue. On one hand the school is doing quite well, while on the other there are imperatives and opportunities for it to do even better in the future.

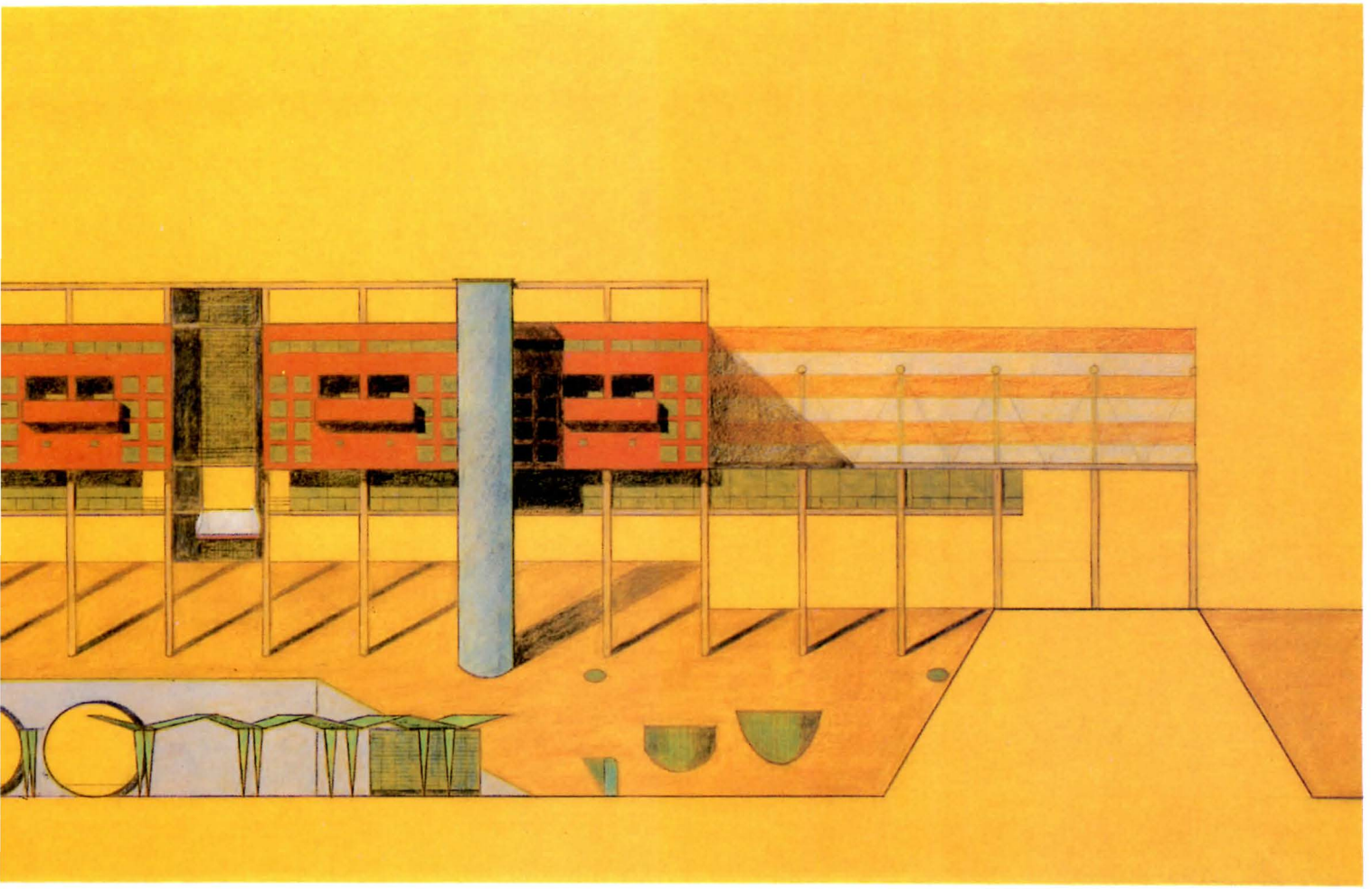
Those imperatives and opportunities stem from the recently initiated advisory council and from a vigorous new university president. The advisory council has not only the usual and indispensable benefactors and fund-raisers but also a complement of outside educators, a design-oriented practitioner, and even an architectural journalist. While some of the members believe their main task is to spread the good word about the school (a tactic that seems to have cost one Rice rival, the University of Texas at Austin, some credibility), the council as a whole seems intent on understanding the school and identifying areas for improvement.

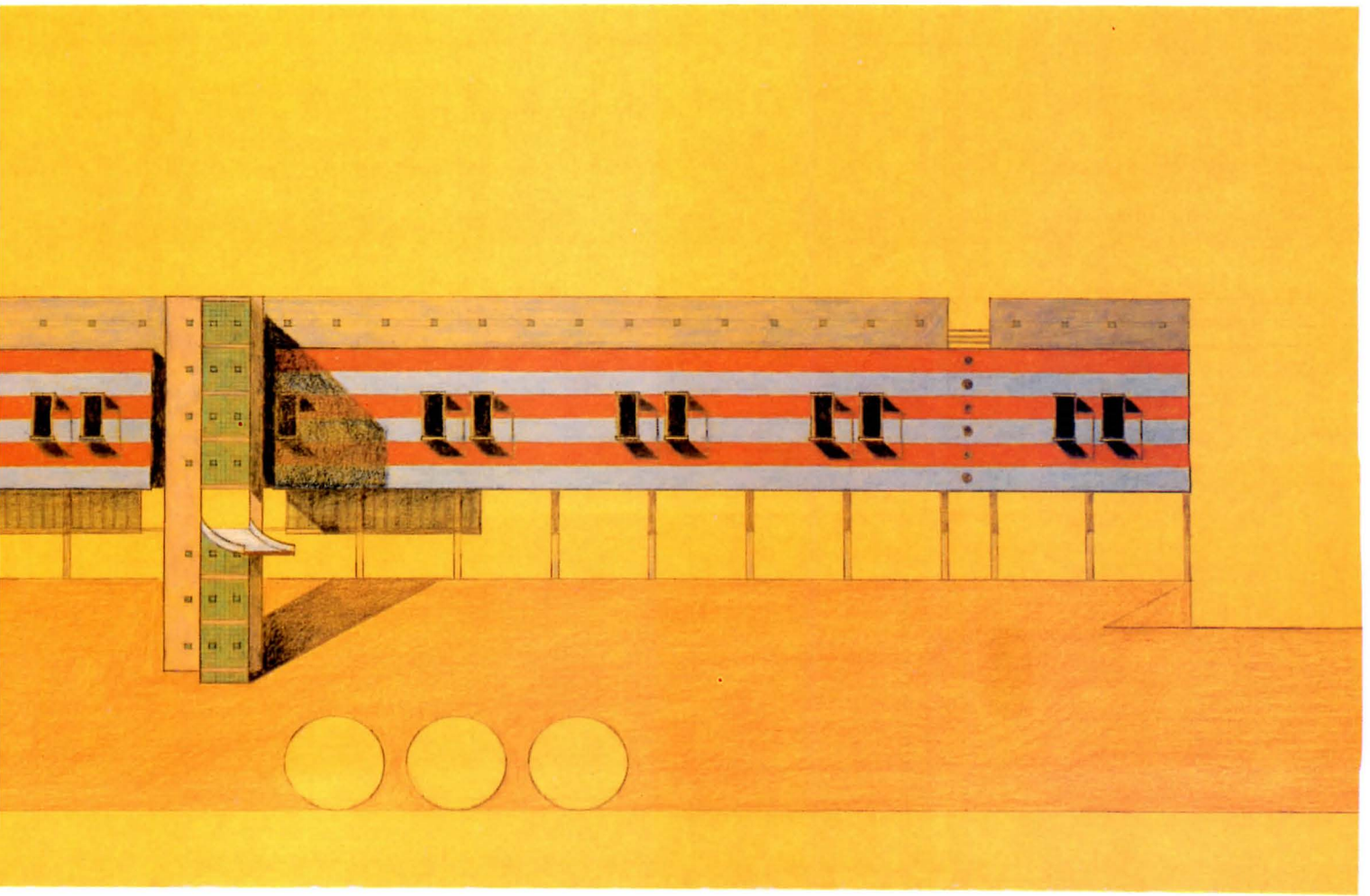
The new university president, George Rapp, has raised the sights of the entire institution by initiating a universitywide curriculum restructuring that, as one of its effects, challenges the architecture school to contribute to general education at Rice. The school's response seems unclear so far.

At present, the Rice architecture school is pre-eminent in its part of the country and has developed something of a national reputation. Cornell's Dean McMinn says his school loses some promising students to Rice, which he calls "a major institution in this country." Pelli, a former dean at Yale, says, "I am quite well impressed with the school, and it has some incredible opportunities. It's small, controllable, and doesn't have a huge bureaucratic apparatus. Its two greatest assets are that it is able to offer a high-quality education at a bargain rate and that it has a young, energetic, and clear-headed president."

With the architecture school approaching an administrative turning point, it will be interesting to see how well it will be able to capitalize upon those assets. If only moderately, then it will remain a very good school, especially for its part of the country. But if it develops a sharper sense of urgency, and perhaps admits a few students who don't fully fit its customary profile, it has a good chance to enter the topmost rank of American schools irrespective of location. □







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Steeped in History, Shaped by Urbanism

University of Virginia school of architecture. By Marguerite N. Villecco

The school of architecture at the University of Virginia was first proposed by the university's founder, Thomas Jefferson, in 1824. He envisioned it as part of the school of mathematics, where students could gain a scientific education in the principles of classic architecture, from the grandeur of imperial Rome through Palladio to the neoclassical revival in 18th-century France. These are the principles that, combined with American invention and materials, gave the nation Jefferson's own architectural masterpiece: the campus of the University of Virginia. But the legislature refused to fund the architecture school. That would take nearly another 100 years.

During this period, the university's didactic influence on American architecture issued from the "academical village" Jefferson had designed as its campus. Jefferson had founded the University of Virginia as a free university with no required courses, no degrees, no compulsory chapel, and no prescribed duration—a student could leave whenever he felt sufficiently educated. The university's design represents Jefferson's architectural, educational, and political ideals: it is a place to learn and a place to learn from.

It was in 1919 that historian Fiske Kimball presided over the founding of an architecture program. This was shortly after he catalogued and published a collection of Jefferson's drawings that confirmed Jefferson was the university's architect. Kimball was named the first chairman of architecture, within the school of fine arts, the same year Walter Gropius founded the Bauhaus in Weimar. Ten years later, Edmund Campbell, dean of the Beaux-Arts Institute of Design in New York, was appointed the first dean of the school of architecture.

From its Jeffersonian and Beaux-Arts roots, the school moved into the modernist period ushered in by the Bauhaus. By the 1960s the school was clearly in the modernist camp, as is evident from the building it now occupies. Designed by Pietro Belluschi, FAIA, as an adviser to Sasaki Associates, the building was completed in 1970 while Joseph N. Bosserman, FAIA, was dean.

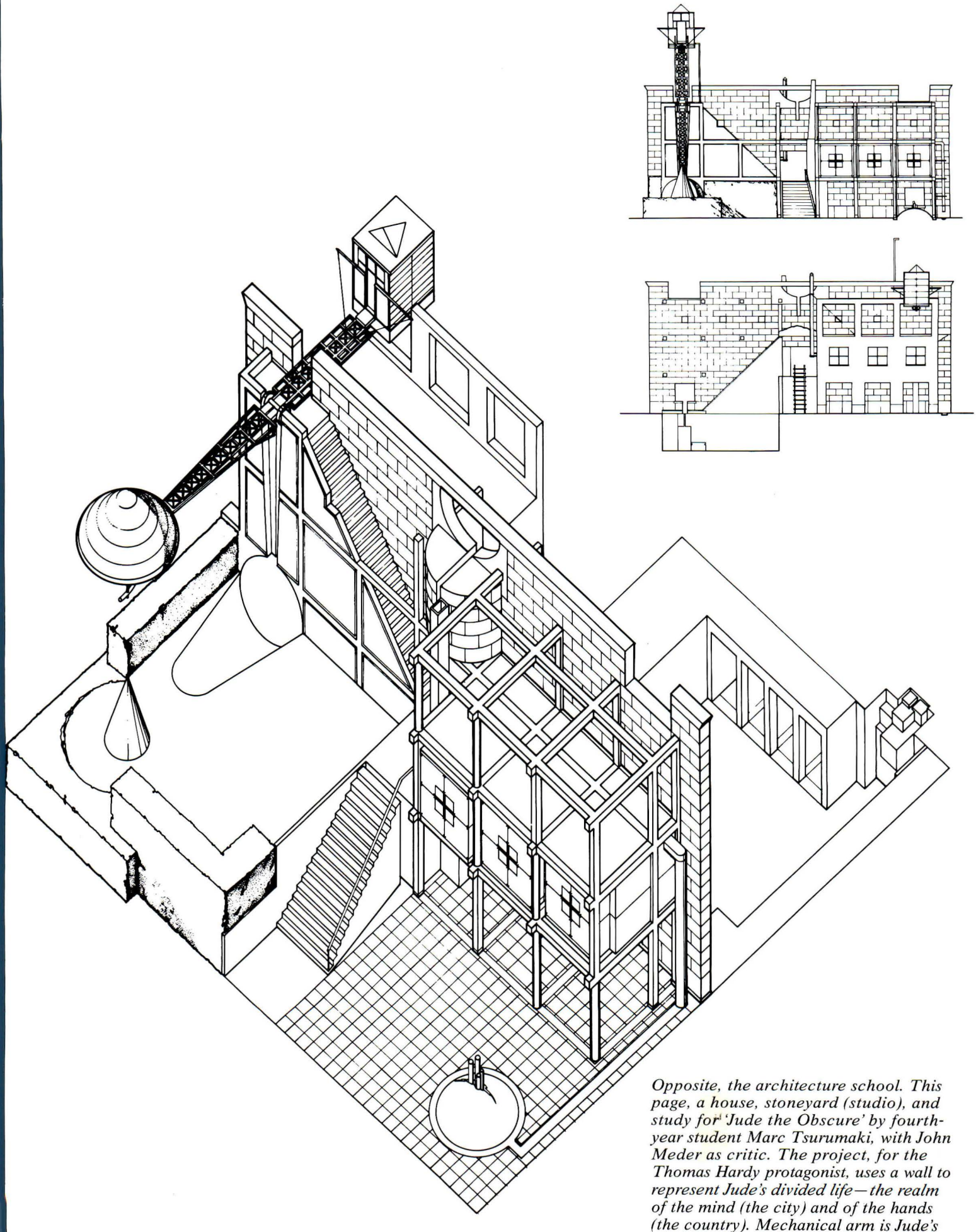
Bosserman presided over a number of changes in the school, some of them structural and some ideological. The structural changes included reorganizing the school into four divisions: architecture, landscape architecture, architectural history and preservation, and urban and environmental planning. At about the same time, the architecture division changed from a five-year program to a four-year undergraduate and two-year graduate program for the first professional degree. Ideologically, the school became more critical of modernism and more committed to history and theory as a basis for design. By 1974 it evolved into an essentially new school, the ideological precursor of the present school. New faculty, including Bruce Abbey and Robert Dripps, fresh from schools such as Cornell and Princeton, started to gain management roles in the division of architecture. The school increased its emphasis on history and theory and aligned itself more with the humanities and less with the social sciences. In short, the school started to come full circle, back to ideas about architecture that Jefferson espoused.

The current dean, Jaquelin Robertson, FAIA, arrived in 1980, and his impact is clear if not complete. Erudite and political, Robertson (who worked with Edward L. Barnes, FAIA, and is now in partnership with Peter Eisenman, FAIA) is an architect and planner with impeccable Old Virginia credentials, experience in former Mayor John Lindsay's New York City midtown planning office, and later work as a developer. He can sound more Jefferson than Jefferson when talking about architecture, education, civic responsibility, and moral leadership. But, whereas Jefferson's heart remained rural, Robertson's is urban. His passion is the American city, its history, growth, and manifestations; his oft-cited model is Jefferson's academical village.

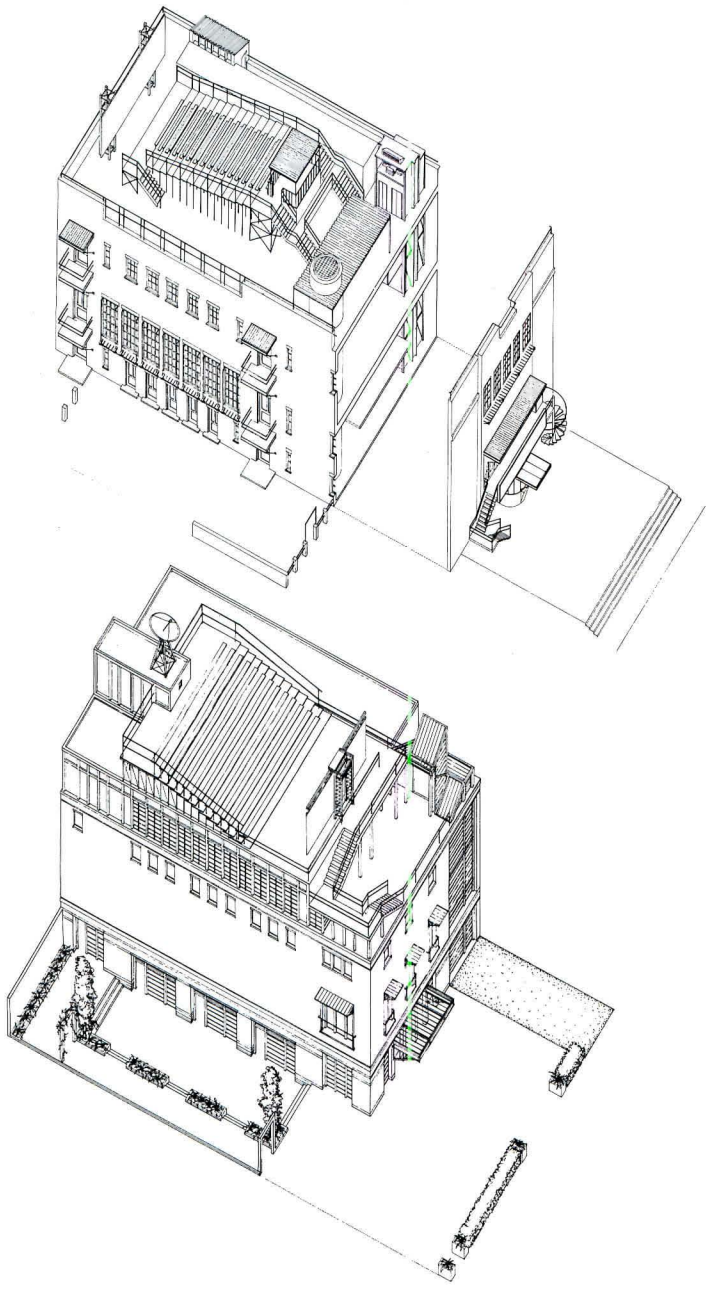
Robertson sees his role as dean in four areas: the school, the university, the state, and beyond. Within the school, his overall goal is understanding American urbanism and its uniqueness. The emphasis on urbanism may seem odd given the school's arcadian location, but Robertson notes its proximity to the urban centers of Washington, D.C., and Richmond, to suburban office/shopping developments like Tysons Corner, and to myriad small, historic towns of Virginia. Cities are "where the action will be over the next 15 years," he insists. He is also concerned with bringing the design disciplines together and he encourages multidisciplinary efforts—"essential in real-life design and development," he says. And he is particularly interested in seeing history and preservation provide a common cultural and ethical basis for dealing with the city. Toward this end, Robertson has separated preservation from the architectural history division and instituted a certificate in preservation as an option for graduate students in all four divisions. He also established the American urbanism program now gaining momentum in the architecture division.

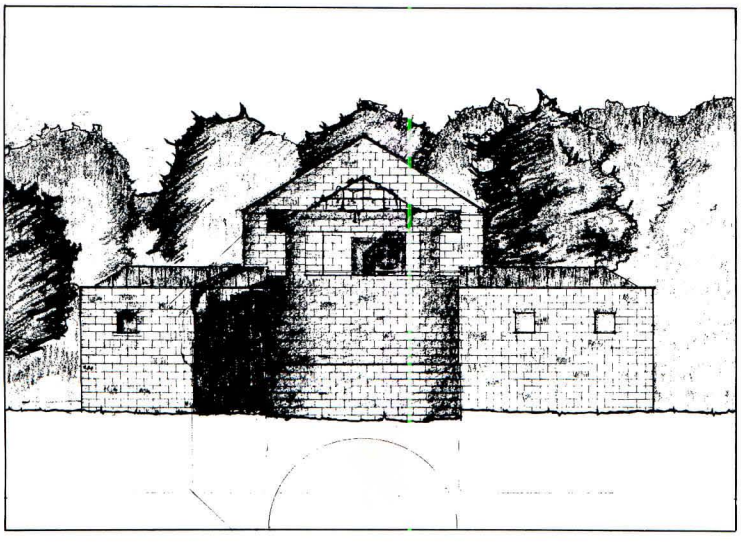
The school does not have a lot of visiting critics, but Robertson uses the Jefferson connection to increase the prestige of those he can support: there is a Thomas Jefferson Memorial Foundation visiting professorship that Robertson has used to bring leading urbanists, theorists, and designers to the school. Recent Jefferson appointments include Kurt Forster, Leon Krier, Colin Rowe, Edward Logue, Hon. AIA, Demetri Porphyrios, and Michael Dennis. The school also awards a Thomas Jefferson Memorial Foundation medal in architecture, which becomes an occasion for lectures, shows, and debate; recent winners have included Vincent Scully, Edward Barnes, Robert Venturi, FAIA, H. H. Aga Khan, James Stirling, Hon. FAIA, and Romaldo Giurgola, FAIA.

Robertson has also pushed hard to bridge the disciplines within the school, instituting regular meetings of the chairmen. This has proved effective in generating discussion, but less effective in deed. The architecture and landscape architecture divisions share many of the same values, concepts, language, and interest in history and theory; they are also studio-based. History, while very influential, has its own requirements; few of its students take architecture or landscape courses. And planning con-



Opposite, the architecture school. This page, a house, stoneyard (studio), and study for 'Jude the Obscure' by fourth-year student Marc Tsurumaki, with John Meder as critic. The project, for the Thomas Hardy protagonist, uses a wall to represent Jude's divided life—the realm of the mind (the city) and of the hands (the country). Mechanical arm is Jude's study that allows views over university's walls, where he was denied admittance.





Top, a film and photographic institute by graduate student Starling Keene, with Jude LeBlanc as critic. Middle, the same project by Tyler Horseley. Both place film theater on rooftop. Above, modern greenhouse for 18th-century gardens by third-year student Craig Mutter, with Edward Ford as critic.

tinues to be a very different discipline, with its own methods, language, procedures, and interests; like planning schools in other universities, it is oriented toward policy and economics as well as physical design. While "we are happy to be in a design school, which is oriented toward action, there is little crossover between faculty, students, or projects," says David Phillips, chairman of the division. Preservation has proven the most successful bridge and is cited as such by each division.

Within the university, Robertson seeks greater influence for the architecture school in shaping policy. "We were believed, but not respected," he says. Thus he directs the school to do what it can for the university; he became chairman of the architect selection committee for the campus, he brings nationally and internationally known architects for new projects, and he set up the Jefferson Restoration Advisory Board to oversee the university's Jefferson legacy. The campus lawn is a personal issue for Robertson. "It has to do with me being a Virginian and it has to do with the lawn being the most profound cultural asset the university possesses," he says. Robertson claims to have directed about 90 percent of his fund-raising efforts to the lawn—a mixed blessing for the school.

Within the state, Robertson tries to make the school a cultural and design resource. The relationship with the state could in some ways be tricky; the school admits a majority of its students from outside the state, and the nonresident architects selected by Robertson's committee to design campus buildings are doing jobs that some Virginia architects considered an entitlement. In service to the state, therefore, the school concentrates on giving advice and technical assistance on preserving and enhancing towns, cities, and landscapes. Robertson has become an airwaves proselytizer regarding local and state planning and development problems and opportunities. At first, the native Virginian, tainted by his years in New York City, came on too strong. He had to learn to hold off a bit, but "then it was like throwing a match into a drafting room—boom!" Now the problem is how to serve the demand for Robertson's advice. Another of the school's strategic assets is its Institute for Environmental Negotiation, a part of its planning division, which addresses such issues as whether there should be uranium mining in Virginia and what should be done with Richmond's waterfront. The institute brings public and private interests to the table with enough success to have earned a national reputation for its work.

At the national level competition is severe, but Robertson sees a special niche for the school as a center for study and discussion of American architecture, urban design, and the built and natural landscape. For such sessions the school offers what no other can: Jefferson's lawn and meetings in the rotunda. Recent events the school has hosted include two national meetings of mayors to discuss urban design issues.

Since the mid-1970s, when the architecture school was reorganized into its four divisions, the architecture division has not experienced major disruptions. Abbey and Dripps have influenced it most over the last decade, formerly as co-chairmen and now, respectively, as division chairman and director of graduate studies and the program in American urbanism. Abbey will become associate dean next year; his successor as chairman has not yet been announced.

Abbey has refined and consolidated the program, making subtle changes. There are more career paths open to students, including construction management, preservation, urbanism, computers, and theory, as well as design, and Abbey has concentrated on the quality of the teaching. "A good school depends on good teaching and people, not curricula," he says.

Few major changes are envisioned now, although a new chairman might have different ideas. The elements under closest scrutiny include the second-year studio, which the university is challenging; getting more technology into the curriculum; and hiring some research-oriented faculty, which also is a universitywide concern. The size of the school, now the statistical norm for architecture schools, is not expected to change.

The first-year curriculum has no studio, but an introductory

course on the language and concepts of design. Students' projects involve manipulations of form and color and visual analyses of ideas and phenomena.

In the second year, the emphasis is on values and gaining facility with the elements of architecture through studios. In this year, too, students start to enter the culture of architecture, living in the building, talking about architecture more and more, and feeling more separated from their liberal arts classmates, who are less likely to talk about their majors *all* the time.

By the third year the projects are more complex; integration becomes a focus and there is more emphasis on the investigation of ideas and types. Students learn the idea of architecture as a political act. It becomes clear that history is something you can use or ignore, but you must know it. The third year starts to winnow the class as students decide whether they really want to be architects. Abbey stresses the role of counseling during this time: "Not everyone should be an architect, [but] the decision to leave should be a free one, not a failure."

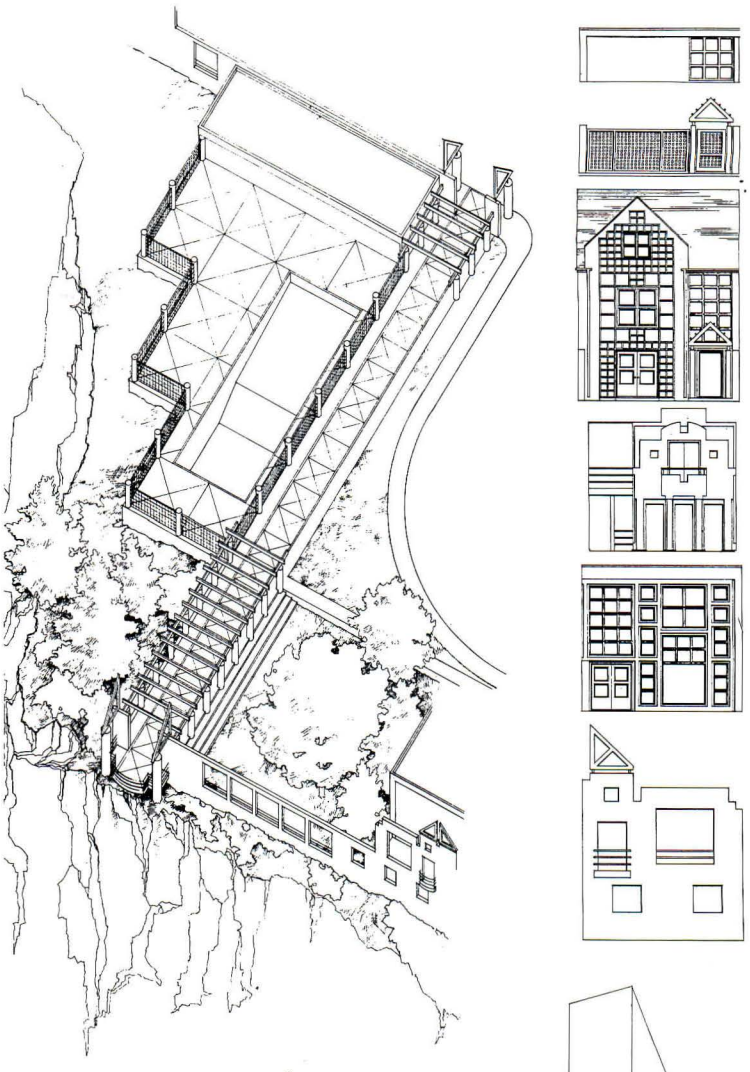
By the fourth year most students know whether architecture is for them. Graduate school looms; awareness of what they do and do not know grows. The studios become more diverse, with some clearly poetic—for example, a studio taught by John Meder that drew its "program" from the Thomas Hardy novel *Jude the Obscure,* whose protagonist is named for the patron saint of lost causes. Other studios are urban, or rigorously architectonic, or theoretical. One student did an independent study project that concentrated on a facility for a member of a primitive tribe—New York commuters. The student is headed for Princeton this fall.

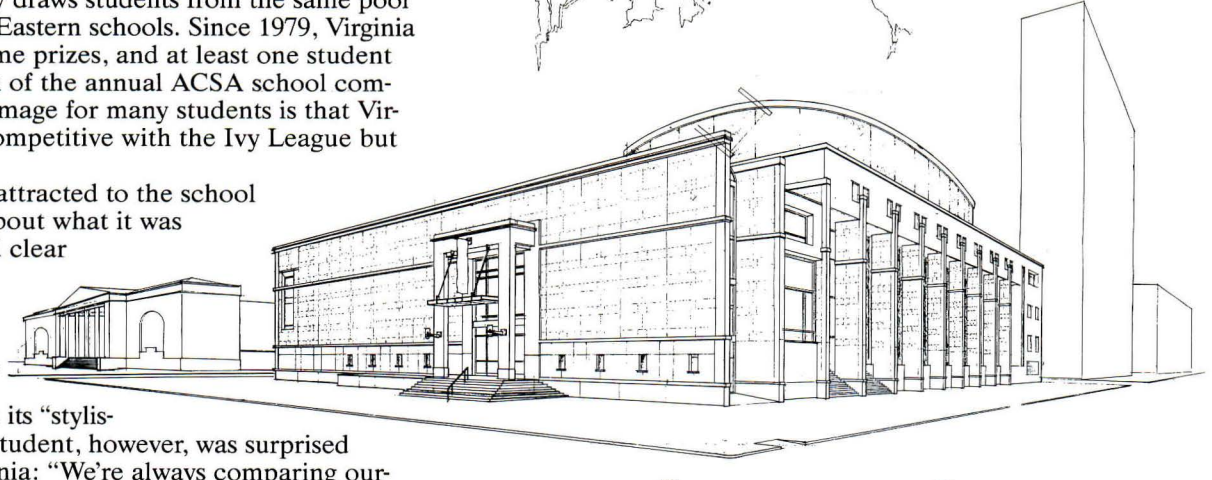
Although located in a public university (albeit Jefferson's), the school clearly aspires to Ivy League excellence. Its undergraduate program has a reputation for sending its best graduates to top schools; currently, 26 are at Harvard, Princeton, Yale, and Columbia and another 12 are in Virginia's own graduate program, which increasingly draws students from the same pool of achievers as do the elite Eastern schools. Since 1979, Virginia graduates have won six Rome prizes, and at least one student has been premiated in each of the annual ACSA school competitions. The compelling image for many students is that Virginia offers an education competitive with the Ivy League but at a fraction of the cost.

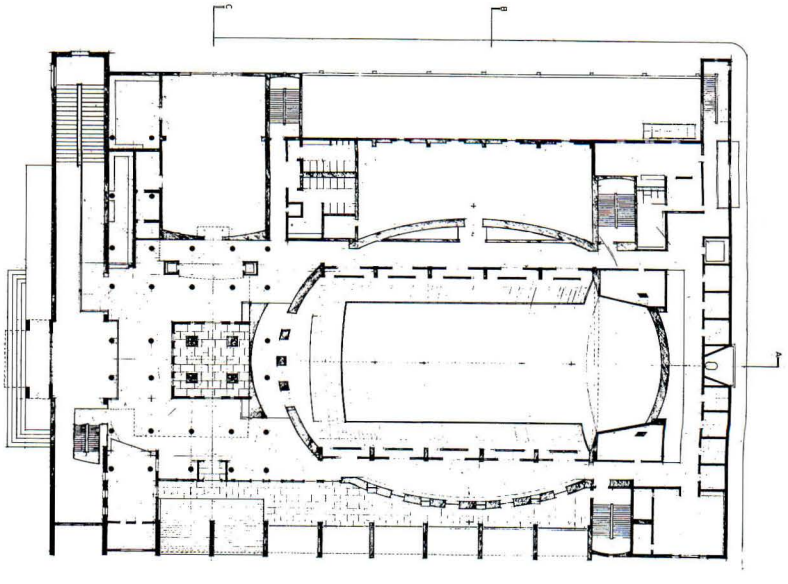
Students have also been attracted to the school because "it seemed clear about what it was doing" or "students seemed clear about what was expected." A number of graduate students have found Virginia more relaxed than Harvard, with its "professional competition," or Princeton, with its "stylistic mandate." At least one student, however, was surprised by the competition at Virginia: "We're always comparing ourselves to the Ivy League, never to other Southern schools."

The graduate program is structured in three sequences: Path A, which is three years and a summer for students with non-architecture degrees, such as English, mathematics, or history; Path B, which is two years for students with undergraduate preprofessional architecture degrees; and Path C, one year, for students with professional degrees.

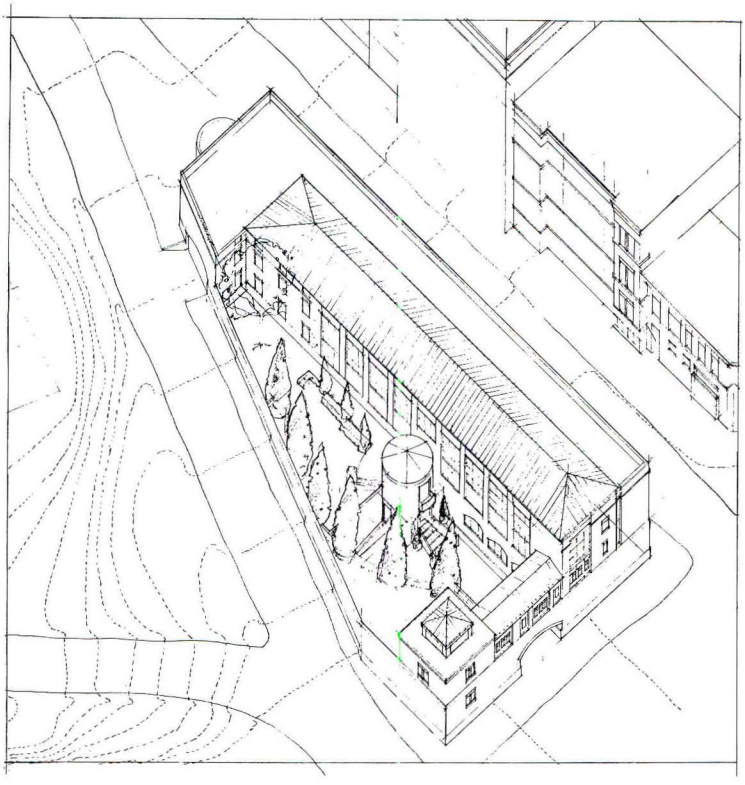
The graduate program has become a primary focus of the school in the last few years; the school has primarily been known for its undergraduate program. When Robertson came, he was somewhat skeptical about the whole idea of undergraduate architecture, but is now a strong supporter "in the context of a strong liberal arts university like this one." But there has been a noticeable push at the graduate level, with Dripps and Abbey teaching studio exclusively at that level.

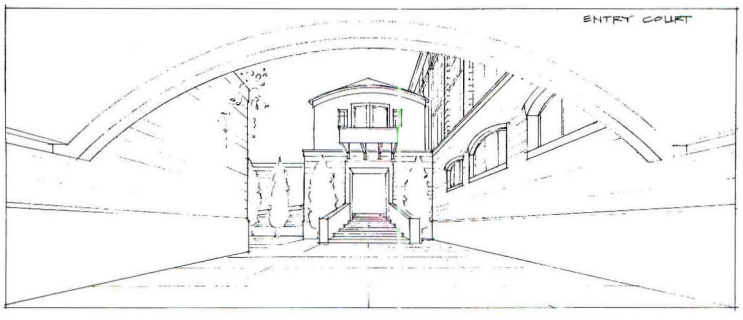


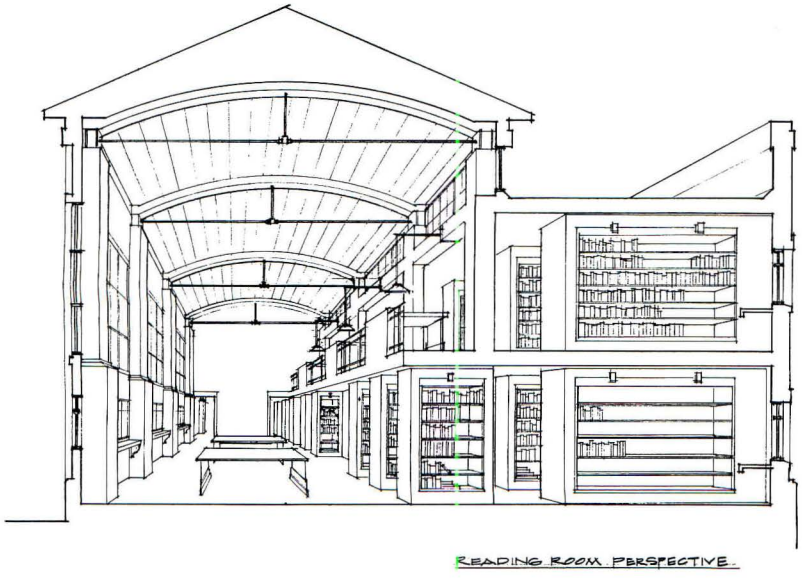




Top, perspective and facade studies for housing, by graduate student Gregory Koester, with Carlo Pelliccia as critic. Middle, perspective, and right, plan, for Philadelphia symphony hall by graduate student Joe Pryse, with Robert Dripps as critic.







This page, an urban library by graduate student Nancy Chambers, with Bruce Abbey as critic. Ground level perspective shows library entrance in garden court; interior is reading room, with stacks at right. Facing page, three new facades for the Boston Public Library by graduate students John Kirk (top), Michael Kennedy (lower left), and Nancy Chambers, with Abbey as critic. Students expressed changes in architecture over last 100 years.

Roberston speaks of history as the school's mother discipline and, clearly, history shapes the images and discourse of the school. The history faculty includes five full-time architectural historians—more than at any other school in the country, according to its chairman, Carroll W. Westfall. The division of architectural history and preservation gives its own undergraduate and graduate degrees (a Ph.D. program is in the works) and maintains a strict sense of its own integrity as a discipline. "We're insulated from becoming court jesters, or just a service to the architecture department," Westfall avers.

Westfall, who came to the school about three years ago from the University of Chicago, is adamantly an *architectural* historian. He draws sharp distinctions between architectural history and art history, his original field. In general, the approach to history at Virginia is typological and structured for an architect's use in practice. Abbey has said that Westfall teaches history the way the design faculty teaches architecture: "It leads to a coherent view of the world."

Westfall illustrates his typological approach to Renaissance history as follows: "There are five building types—that's all there are—the temple, domus, theater, portico, and palazzo. Each can be understood in urban as well as architectural terms. For example, the palazzo is an urban building block as well as a building. The urban fabric of a Renaissance city was a series of streets or corridors running between blocks, some largely empty and holding churches, others accommodating political activities, others empty to serve as markets, and the rest filled with palaces. It was used the same way in Daniel Burnham and Edward Bennett's plan for Chicago."

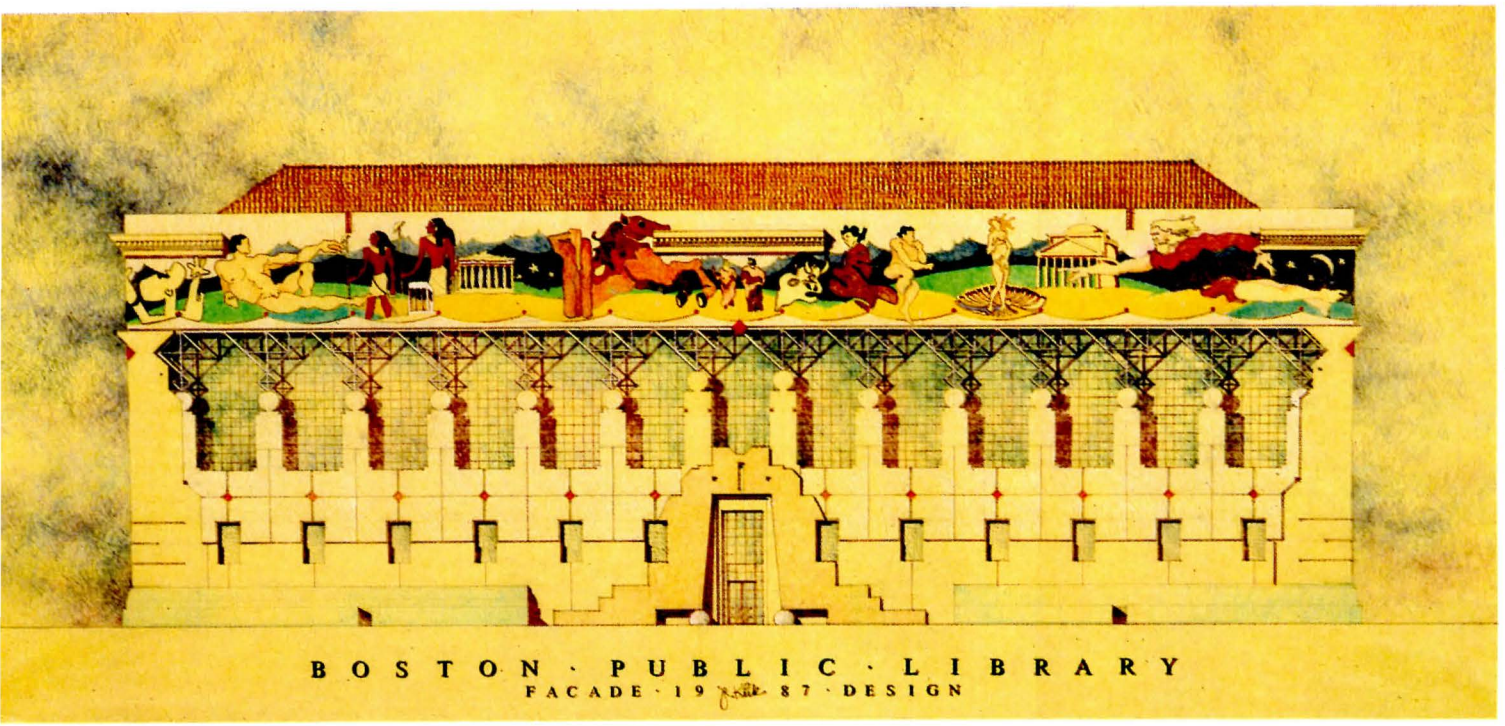
Westfall is effective. Many students and faculty consider him the most influential teacher in the school. Students are expected to come out of his courses able to show *how* they know something as well as what they know, and the rigor has a lasting effect on many.

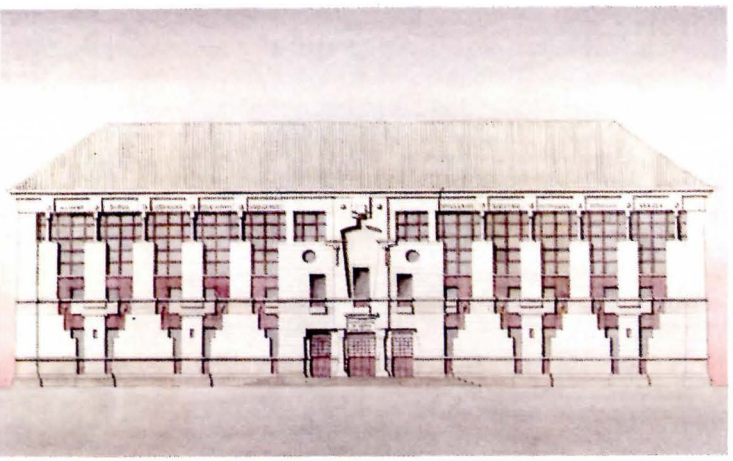
Students learn the precepts of Renaissance architecture and urban design; they know the contributions of Brunelleschi, Alberti, Bramante, and others. They come to understand the compositional hierarchies for building Renaissance cities: the sacred over the secular; the public over the private. They see how designers can reveal those hierarchies: bigger is more important than smaller; central is more important than peripheral; freestanding is more important than embedded; and something well designed (revealing intellect) and highly finished (demonstrating finer craft and material) is more important than something less so. Most students accept the idea that architecture and urban design are essentially political acts and thus accept the connections between Renaissance design, Thomas Jefferson, and themselves.

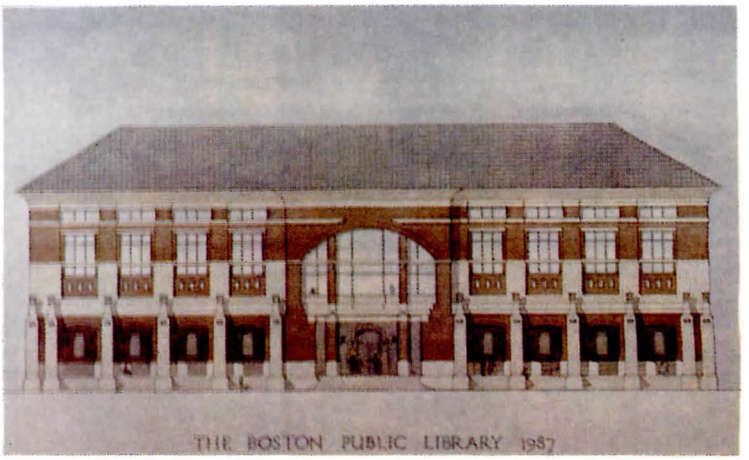
The school of architecture uses history and theory as the building blocks of an architectural education, not to determine the form a building but to inform decisions in its design. Westfall's approach to history makes the idea of building and city one; it lends itself perfectly to the school's increasingly strong emphasis on cities.

The program in American urbanism is an option available to graduate students in all divisions. The school intentionally did not call the program urban design because, says Dripps, the program director, "Urban design programs are often a haven for poorer designers. Here we wanted the best designers involved. We try to make it the most exciting design opportunity."

American urbanism started as an honors program, although it was never formally described as such, within the regular curriculum. The idea was to integrate urbanism and design; the primary means would be two studios and lectures on the history of urban form. One studio investigates the parts, ideas, and representation of cities, with the premise that the mode of representation affects how one thinks and designs. Its first project, "Representing the City," is now being published and includes a historical exploration of the concept of a city and its representation, using Charlottesville as a case study. As the various modes of representation (a Nolle map, for example) led to markedly different perceptions of the city, the students were forced to







rethink their image of the city and their own design proposals.

Another urbanism studio assigned students cities all over the world to analyze for building typologies—basilica, rotunda, porch, square, gate, roads, aqueduct and sewage systems—and for implied rules of assemblage. They applied the results to Charlottesville, for which they designed hotels, gas stations, malls, and restaurants along a road that is now becoming a commercial strip.

The ideas seemed manageable at first and then overwhelming, says Dripps. The development corridor itself seemed fundamentally wrong; it cut off residential areas and preempted a public realm. Some students made the road into a parkway with clustered development built around schools. Others developed the parkway as an extension of the town and made connections to neighboring surburban areas. In general, students discovered that there are few precedents and that suburbs are more often denigrated than designed. "We did not find solutions, but we discovered better problems and how to state them," says Dripps.

At this point, however, the American urbanism program is more provocative than clearly defined. Although interdisciplinary in concept, it uses the language and methods of architecture; and only a few landscape architecture and virtually no history or planning students are involved in the studio-based urbanism program. David Phillips, chairman of the urban and environmental planning division, says, "The [nonarchitectural] disciplines have a different language and approach. We would approach the study of urbanism differently" and use different materials. Warren Byrd, chairman of the landscape architecture division, calls the program a "great idea" but notes that interest has not yet been matched by contributions from every discipline. "It's difficult to tell landscape students that they need to appreciate architecture and cities—it's almost antithetical for some. They think about nature and art, doing gardens, and preserving the environment. Urban design is much broader and we don't yet have the sophistication of the architects."

Within the architecture division at the graduate level, the program generates considerable excitement and has attracted excellent students. An urban sensibility is becoming evident. Sandra Parsons, a graduate student, is clear on its value: "Urbanism is a way of examining and understanding the city and acting responsibly toward the city as an architect." The program is something to watch.

The preservation program has been successful where the American urbanism program has not in integrating the disciplines. This is due in no small part to the program director, Mario di Valmarana, a remarkable presence at the school, who is adamant in proclaiming, "I am not a preservationist." Indeed he is not, in the conservatory or artifactual sense. "To save one Victorian house in the midst of 15 skyscrapers is not the focus. You might as well move it into a museum—it's the same thing."

Valmarana speaks of preservation in ethical and moral terms, calling it a sensibility, not a profession. His is a sensibility honed through generations of his family living in Palladio's Villa Rotunda, which he and his brothers still own (giving students access to Jefferson's ideal). His view of preservation eschews the

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Diverse School with a Special Mission

Hampton University department of architecture. By Donald P. Ryder, FAIA

Hampton University, states John Spencer, FAIA, chairman of the department of architecture, "is a school dedicated to the education of black citizens." Although Hampton generally draws students with high SAT scores, the department supports the part of the greater university's mission that seeks also to "enroll and educate the poorly prepared but frequently brilliant student whose promise has been overshadowed by lack of opportunity." In the department of architecture, the mission then assumes a special and more specific challenge: to train minorities for a profession whose minority representation historically has been low.

Spencer cites statistics as proof of Hampton's success. Ninety-five percent of Hampton's graduates over the last 10 years are in professional offices or design-related employment or in pursuit of a second degree. Alumni have achieved significant stature in private offices, public institutions, and professional education. Approximately one-third of Hampton's graduates go on for graduate degrees at schools such as MIT, Harvard, Columbia, Penn, VPI, the University of Virginia, North Carolina State, and the University of Illinois.

The students who benefit from Hampton's architecture program are diverse. Predominantly from the black middle class up and down the Eastern Seaboard, the student population of 150 consists of 10 percent Caucasian and 10 percent foreign students, with a 20 percent female enrollment.

Hampton was founded in 1868, after the Civil War, by the Freedman's Bureau to help solve the problems of the thousands of former slaves who had gathered behind Union lines on the Virginia peninsula. Its mission was to train selected young men and women "who should go out and teach and lead their people." Support in the early days came from philanthropic and religious groups and from federal land-grant funds during the period from 1872 to 1920. Its first classroom building was erected in 1871.

From its inception, Hampton developed a strong building skills program, with many campus buildings designed and built by faculty and students. The early program was known more as a building construction engineering program than a program in architecture. Course work in architectural drafting was offered to students in industrial arts technology and building technology in the early 1900s.

Architecture as a separate program began in the 1930s when architectural design was offered in addition to mechanical drawing. A four-year professional curriculum was established within the division of technology in 1946. Bachelor of Science degrees were given to students majoring in architecture for the first time in 1948. In 1955 the program was lengthened to five years. In 1965 Bertram Berenson became the second head of the program (after William Moses, who had established the four-year curriculum) and began to revise and improve the curriculum. By 1967 Hampton graduated its first class in the B. Arch. program. Under the leadership of Spencer, Hampton received its first accreditation.

Mr. Ryder is a principal with the New York City firm Bond Ryder James and teaches architecture at City College of the City University of New York.

The campus is beautifully located in Hampton, Va., in the tidewater area on Virginia's peninsula, where the James and York rivers join at Chesapeake Bay. Campus buildings are drawn from a rich variety of styles reflecting various periods in the university's history. The architecture department is housed in Bemis Laboratory, a building designed in the industrial style of the 1930s by Theo Ballou White and constructed by trade school students. The building contained a masonry lab, plumbing shop, and electrical shop and up until the '50s functioned under the master builder concept for students of building construction, who actually laid brick. The entire building program of the campus served as a laboratory for students.

Bemis, an industrial lab, works well also as a studio building. High-ceilinged lab spaces are ringed around a central atrium space that spirals (like the curriculum) through the entire building. This central space, which includes a mezzanine, contains the main open vertical circulation and includes administrative offices, faculty offices, and exhibition space for student work, both permanent and temporary.

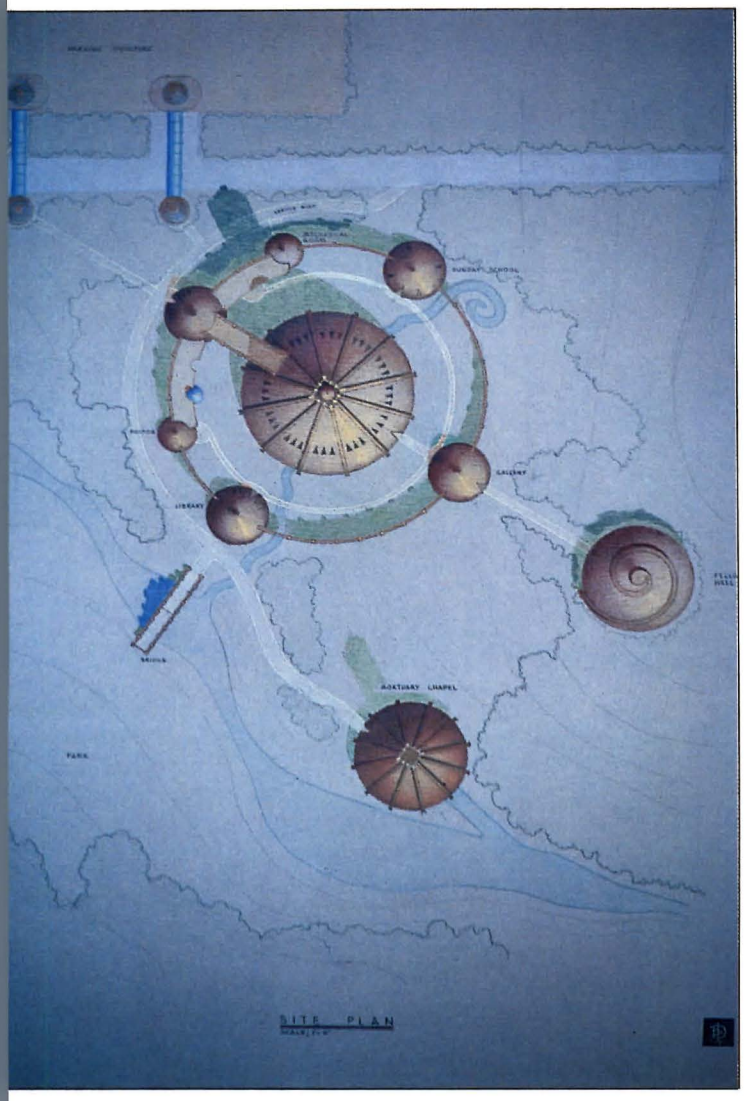
Bemis's location on campus is slightly off the beaten path, yet everyone knows the building as "the one that's open 24 hours a day." Everything about Bemis inside bespeaks of a physical presence and ambience that makes one understand what seems to be an unusual closeness in spirit and clarity of goals among students and faculty, all of whom seem to be happy captives of their environment. Everyone knows one another, and faculty can pretty well track any student at any time. How good this is for students is open to question. Spencer mentions seeing certain students on the tennis courts and questions their being there instead of in studio. On the other hand, it's not uncommon for faculty to drop in any time of evening to give crits, and for Spencer to pay a visit now and then after Sunday chapel.

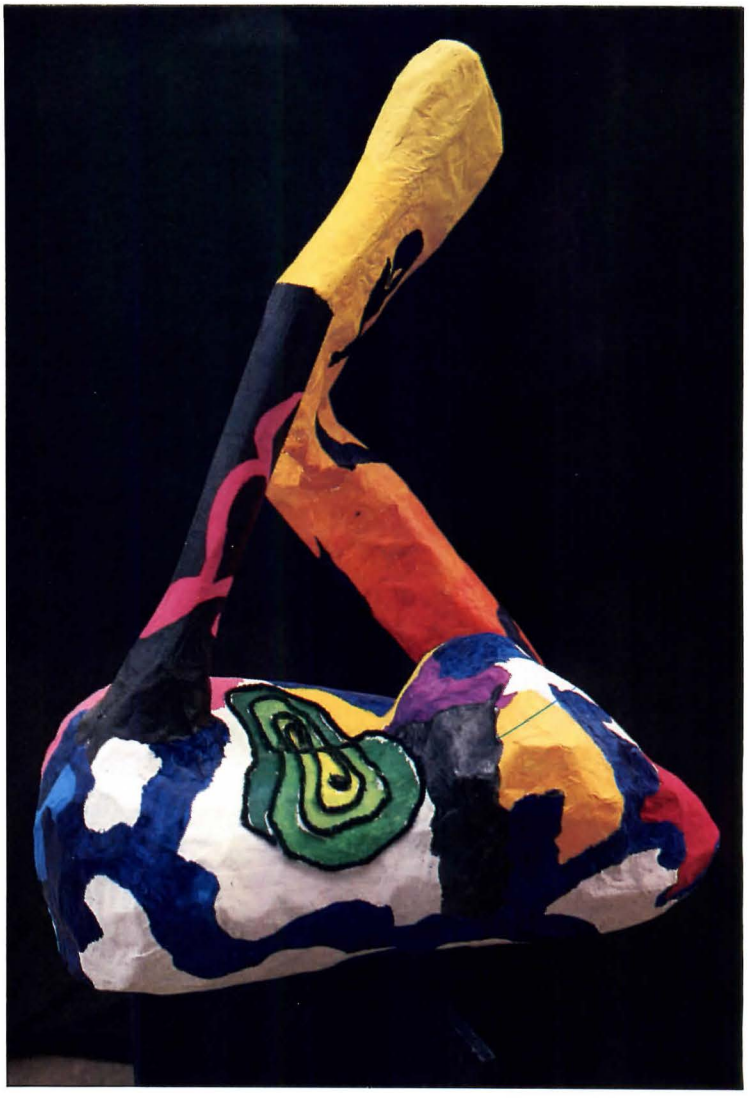
Hampton's five-year program must satisfy the dual purpose of providing a general as well as a professional education; therefore, part of the first two years is given over to the liberal arts. The remainder of the program concentrates on architectural subjects through the fourth year, at which time students are offered a broad range of architectural and other electives.

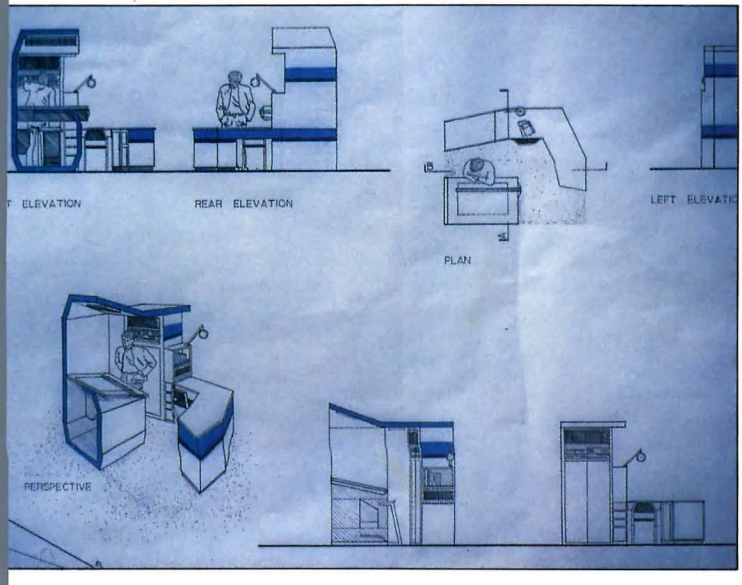
This comprehensive curriculum is taught by eight full-time faculty. Racially diverse, well-rounded, and talented with a variety of specialities (including tropical architecture), six of the eight have their own practices. However divergent their personal design philosophies may be, as a whole the faculty members consistently support the university's mission and department objectives in their strong commitment to teach and to train their students to become employable graduates.

The training begins with John Peter's first-year studio, where, aside from the more traditional design problems for personal spaces, he uses abstract space projects and nonobjective color studios to help expand students' graphic abilities. To promote an art exhibit, Peter and second-year instructor Joseph Russotto had teams of students design and construct a series of field structures that by the use of color, form, and structure would lead people from any part of the campus to the exhibit.

Second-year studio problems continue the use of color and promote imaginative skills and presentation techniques. A

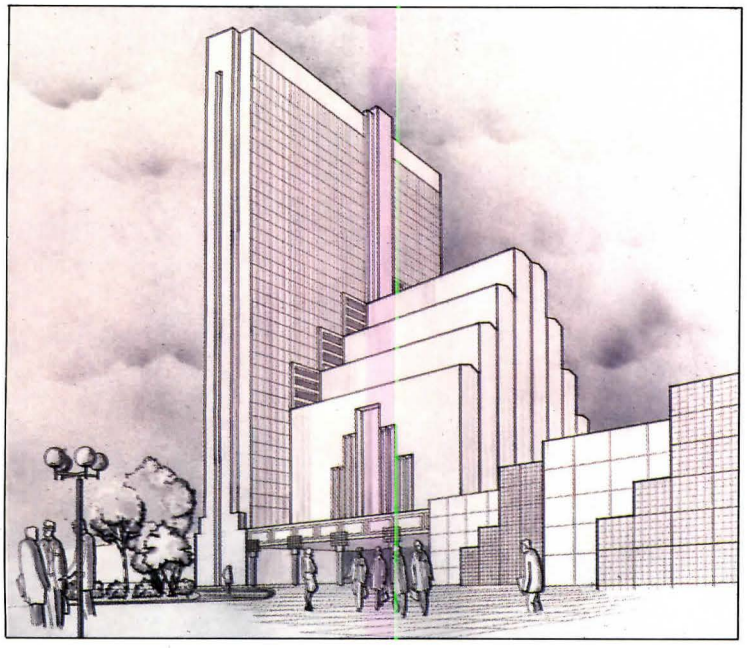


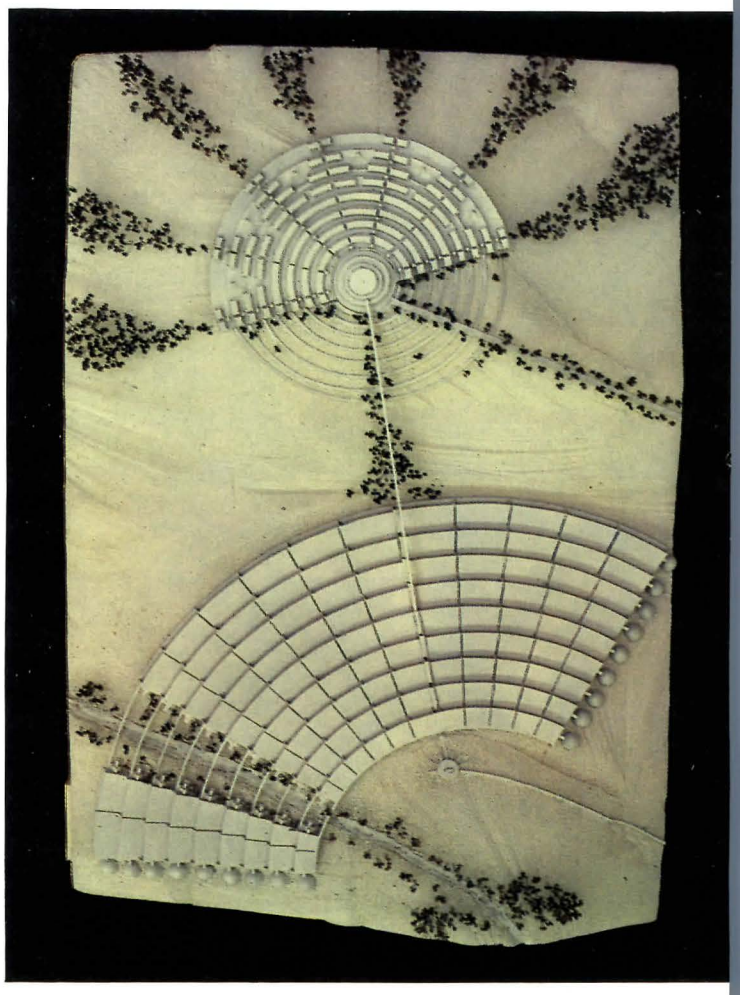




Facing page, Bemis Laboratory, home to Hampton's architecture department. Above, 'abstract design' by first-year student Sharlene Cobbs, with John Peter as critic; above left, second-year student David Vollin's 'church based on black cultural history,' with Joseph Russotto as critic; left, 'student studio space' designed by first-year student Lamonte Woodward, with John Peter as critic.

Below, fifth-year student Lavoris Sutherland's thesis project is a convention center for downtown Norfolk, Va., with James Hall as adviser; right, Joseph Hunter's thesis project, 'Mountainview,' is an experimental living/working community, with James Hall as adviser. Facing page, thesis project for a national maritime museum on a Baltimore harbor-front site, by fifth-year student Elizabeth Ordway, with John Spencer as adviser.





second-year problem given by Russotto required the students to design a "black church." While many students perceived no physical differences between a black and a white church, the complexities of black life and history became apparent as the students did research documenting African influences on religion relating to the evolution of worship spaces. Professor James Hall III, AIA, points out that architecture is taught at Hampton just as it is at any other school except that the insertion of "black church" problems sensitizes Hampton students to the unique realities of being potential "black architects."

If the first- and second-year design studios teach the pure pleasure of intuitive and soft line creativity, then the third year must be described as hard line and pivotal. A decided change happens that Hall describes as "creative rationalism," which begins the process of inquiring creatively and becoming aware of the constraints that discipline architecture. Mechanical and structural courses run concurrently and, allowing that only an intuitive understanding of those disciplines was assumed before the third year, the student now must begin to understand the realities of putting it all together. The process of architectural problem solving and decision making becomes more explicit during the third year. Analysis and synthesis give design a more physical reality. Students are required to ascertain how architects shape structures and to define reasons for making decisions.

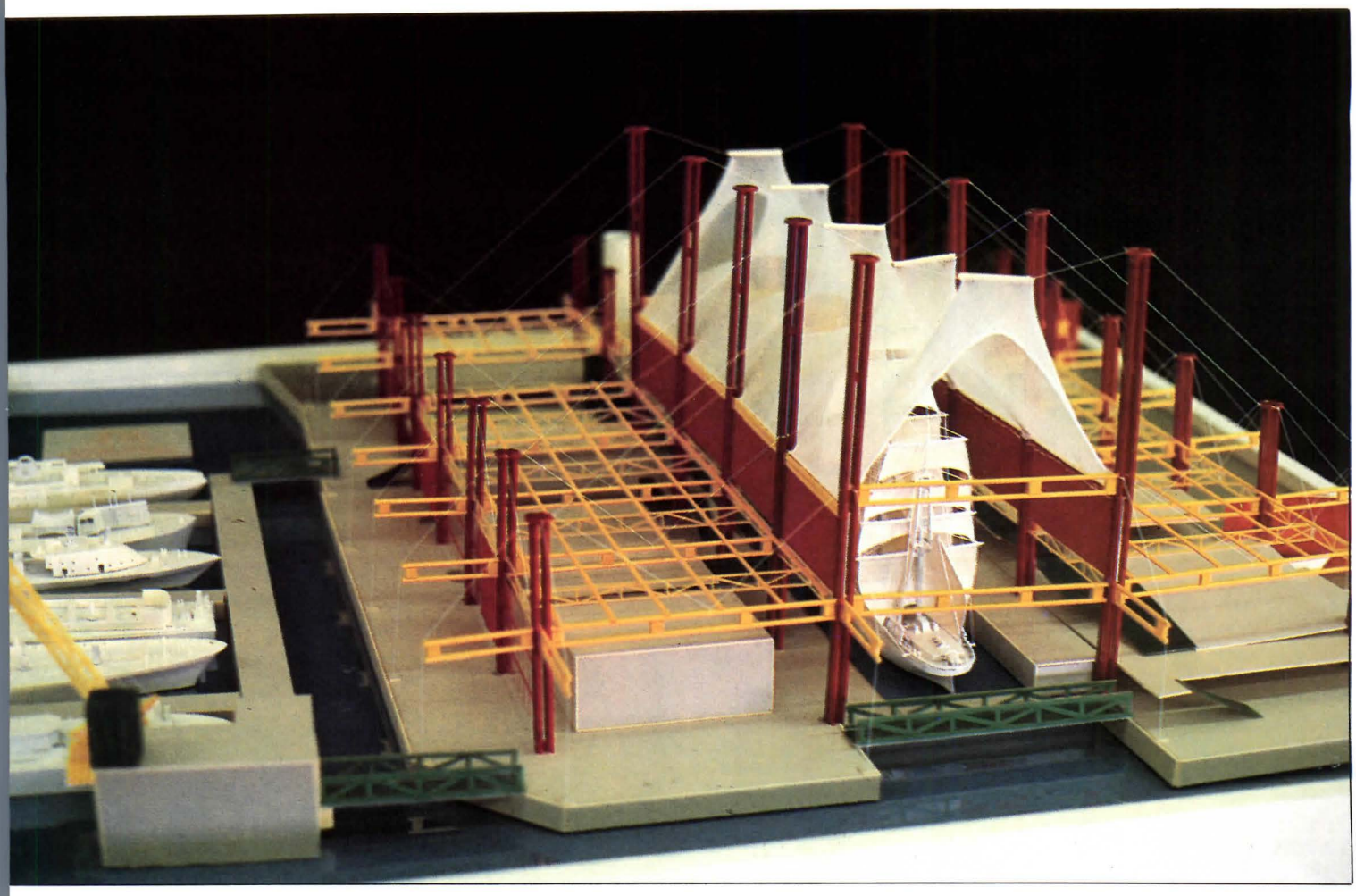
Solie Banerjee, a fourth-year studio instructor and history teacher, meticulously builds on the lessons learned in the third year. Problems become more complex and involve larger buildings and multibuilding complexes. Elements of site, structure, mechanicals, and the transitions of masses are studied and coordinated.

Hampton's fifth year is directed by Oscar Northen, AIA, a Yale graduate who has significantly broadened the scope of the final year. Realizing that the curriculum needed to address a wider range of issues (since Hampton has no related degrees or majors), Northen developed a sort of catch-all course whose overview includes rehabilitation, restoration, and renovation, as well as urban-planning design problems. These subjects are covered in a six-credit-hour required course in the fall of the fifth year. Northen has used the urban planning component to study real urban issues in the Hampton area. For example, responding to a new hotel being built on the Hampton waterfront, the classes' urban analysis clearly proved the new building to be a mistake. The hotel is being built, but the students' project has provoked questions and public concern for the future of the waterfront. Another study involved the rejuvenation of about 20 blocks of a deteriorating part of town. Students analyzed the area, did street-front studies, and interviewed store and land owners. The Urban League asked for a presentation, which resulted in local citizens hiring professionals to develop and improve their property. A future study will be directed toward restoring to its 19th-century condition the North Carolina slave plantation recently made famous by Dorothy Redford, who traced the history of hundreds of black slaves who had lived and died there.

Along with this is a two-credit-hour research course for thesis. Northen is the studio instructor for thesis, which is offered in the terminal spring semester. The system involves the entire faculty, with each faculty member acting as adviser and critic for two or three students. The curriculum's spiral is again consistent: the problems become bigger and more complex. Thesis problems have included an all-purpose sports stadium in Cleveland, a housing complex, a proposed maritime museum, and a new baseball stadium for Baltimore.

Throughout the curriculum the studios offer problems with a wide range of academic references. The school's conscious objective of preparing students for the traditional work of architectural practice permeates and provides a pedagogical theme. This practical and analytical approach requires that students program and research their design problems using case studies and submitting report booklets as standard requirements.

The question inevitably asked is whether or not this emphasis on problem solving and analysis in developing design solu-



tions leaves any room or allows much time for more ideological probings or experimentation in design. If indeed there is more emphasis on the technical and practical aspects of design and if this represents a true cross-section of the school, then this fact draws no apology from Spencer. He admits that Hampton's education is broad-based and not esoteric. He maintains that Hampton can't afford to concentrate just on producing the world's great designers, since that's what plenty of other schools are trying to do. He insists that his graduates be employable, and for that condition to be guaranteed they must have "an edge." That edge has to do with their ability to synthesize, to analyze, to solve problems. Hampton students develop these skills as well as the skills for writing and interpretation through their preparation and research of design programs. One senses that the development of these skills is the real backbone and basic strength of Hampton's program.

Other questions arise. In a curriculum so tightly structured, is the Afro-American experience addressed? Does the program recognize any limitations imposed by the society into which these students go? The consensus is an emphatic "yes." Faculty and students agree that the Hampton experience provides answers.

This experience begins in the lobby of Bemis. Pictures of and articles about black architects are pinned up, and the role models are there to see. Spencer, as chairman and teacher, is the premier role model whose powerful influence permeates the curriculum through his teaching of office practice and management. Where better to speak on experiences in the offices and the professional world? Spencer relates the story of William Moses, the first professionally trained black architect to teach at Hampton. Moses entered the competition for the Virginia entry to the New York World's Fair in 1939, and won. When it was discovered that Moses was black, he was denied the honor of winning. In a perverse fit of decency the judges decided to give Moses the prize money but not the prize. The runner-up designed Virginia's entry.

Guest lecturer lists always include at least one black architect, in most cases a practitioner who is more than willing to relate the facts of life to the students. Some of those visiting Hampton have included Jeh Johnson, FAIA, Robert Nash, FAIA (past national vice president of AIA), Robert Wilson, Harry Simmons, J. Max Bond (dean at City College's school of architecture), and Richard Dozier, AIA. Recently, students could see and meet black architects when NOMA (National Organization of Minority Architects), an organization established in 1972 to address problems facing black architects and black communities, had its annual meeting at Hampton's campus.

In spite of limited funds, Hampton has drawn other visiting lecturers such as E. Fay Jones, FAIA, Louis Sauer, FAIA, Forrest Wilson, and Sarah Harkness, FAIA. Recent travel programs include a four-week summer tour to Rome, organized by Joseph Russotto, and Professor Craig Julien's six-week travel/sketch program in Great Britain. Both programs are open to students from other universities as well as Hampton.

Faculty and students interviewed admit to department shortcomings, most of which are caused by the limits of available funding. The lack of adjunct faculty denies enrichment of the curriculum and forces the electives available to be taught by an already overburdened faculty. Students, while admiring the intimate and familial quality of the school, also are aware of Hampton's physical isolation from major architectural and urban centers and therefore feel a lack of exposure to good architecture. Faculty members in particular would like to see the curriculum expanded to include related and allied degree-granting programs of study. This lack of funds has also severely inhibited faculty research possibilities.

Hampton's accomplishments, considering the scope of its mission, are truly commendable. *Its students are proudly and* widely involved in the architectural profession. The school has proven the viability of its mandate and is now at the crucial point in its development—when being good is not merely resting on laurels but creatively seeking new limits to its noble mission. □

School Reflects A Local Culture

University of Miami school of architecture.
By Michael J. Crosbie

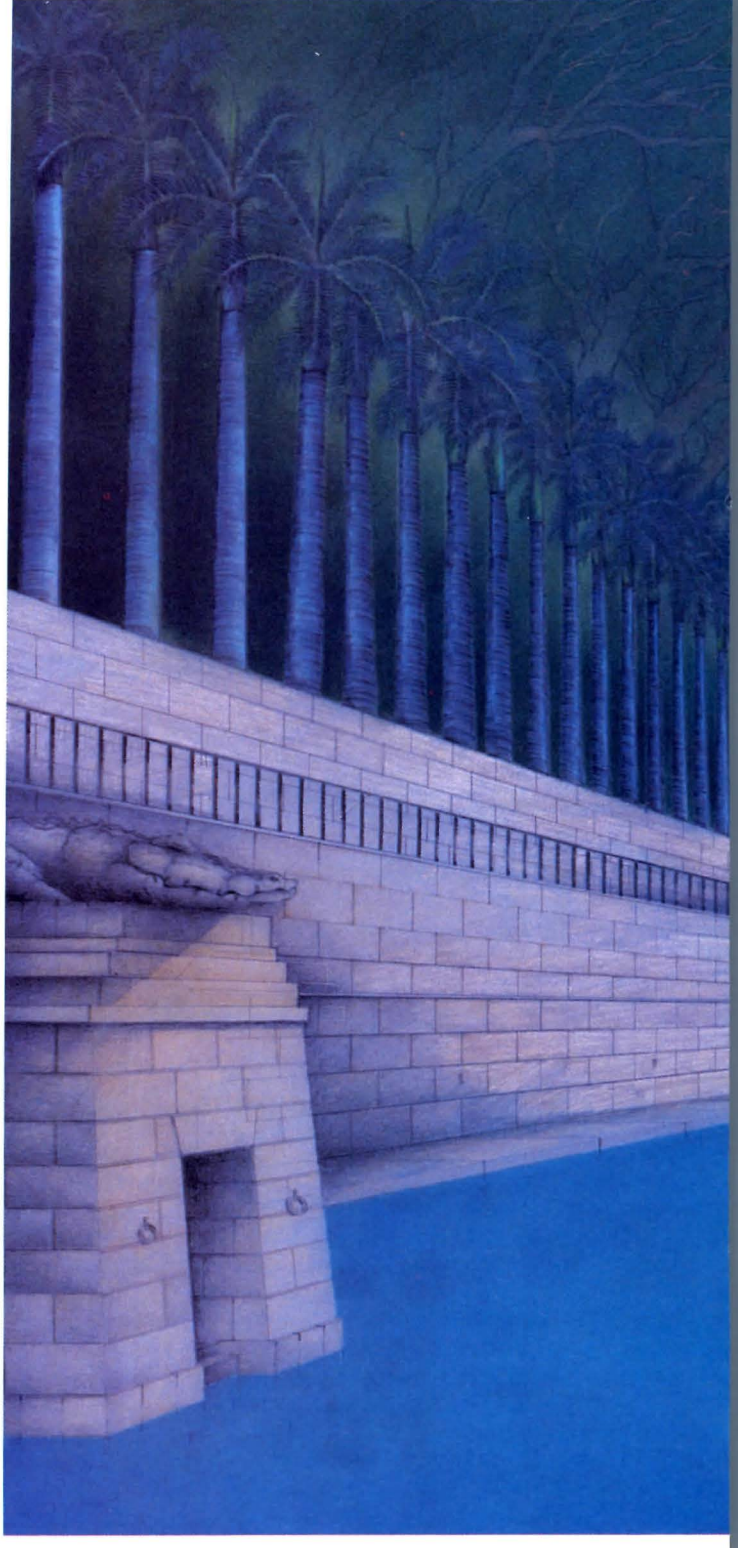
The school of architecture at the University of Miami in Coral Gables, Fla., is relatively new. Although there had been architectural instruction at the university since 1927, it was a small department among others in the school of engineering. The architecture school emerged in 1983, moved to its own facility in 1984, received its first NAAB accreditation in 1985, and since then has gained a reputation in East Coast architectural circles as a solid five-year undergraduate program led by an energetic faculty and populated with keen students.

All this, of course, did not happen spontaneously. The groundwork for an independent school was laid a decade ago when the department was under the leadership of John Steffian, AIA, who has gone on to become dean of architecture at the University of Maryland. Miami professors who were there during Steffian's tenure speak highly of his efforts to awaken a competent but sleepy regional program and to infuse it with a broader agenda.

Under his leadership the department started, and the school continues, a visiting critics program (which draws architectural all-stars from around the nation), team teaching (in which lower-level studios are led by a group of faculty instead of one master with assistants), and the hiring of bright, young professors who have become role models for many of the students. At the time of Steffian's departure the department was ready to emerge from its cocoon as an independent school.

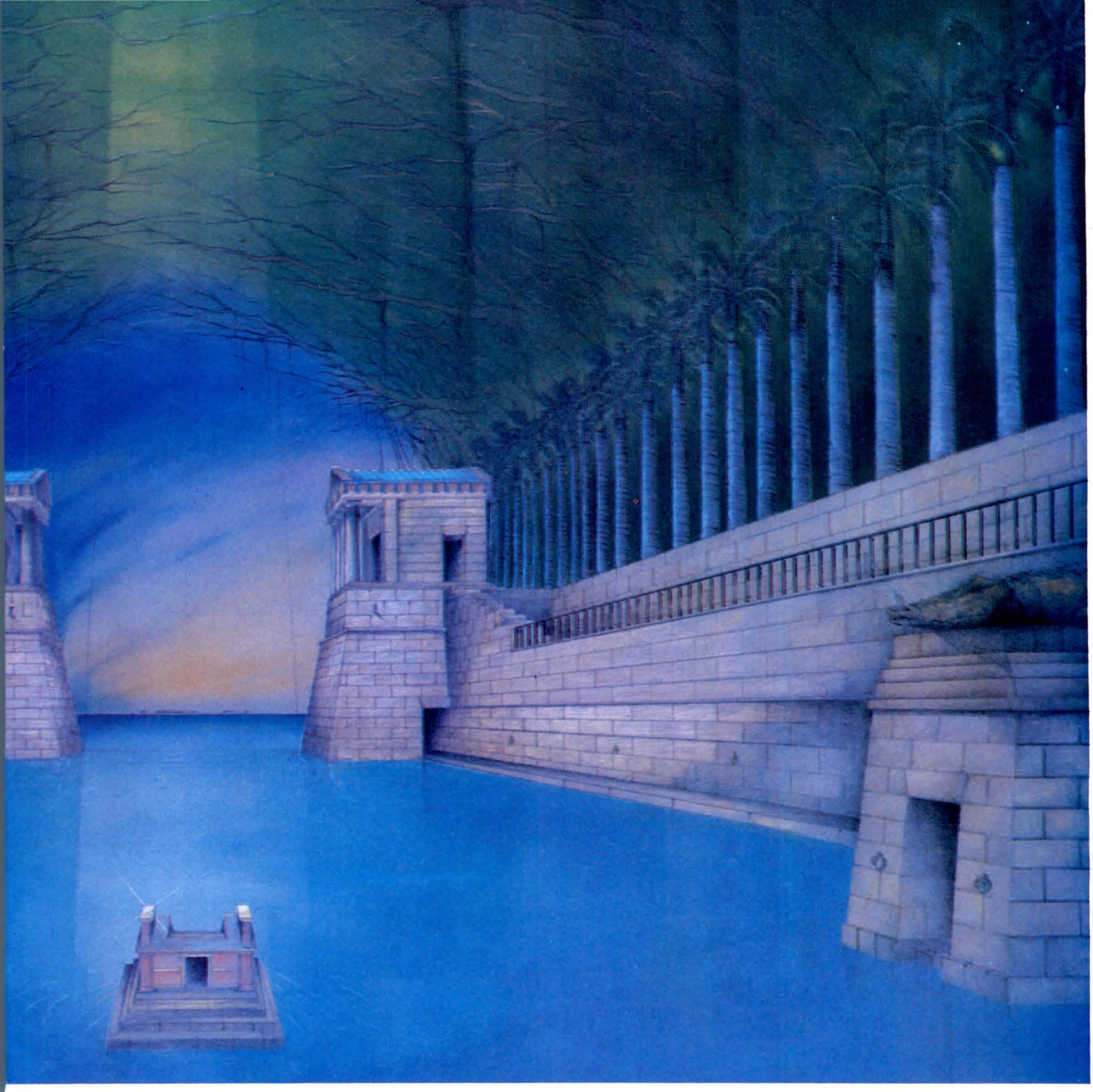
As Thomas Spain, who has taught architecture at Miami for more than 20 years, describes it: "Steffian was in his last year, on his way to Maryland, and had nothing to lose. So he sat down with the university provost one afternoon and said, 'Here's a department that's in pretty good shape, but it's not going to blossom where it is.'" Steffian's timing was perfect because a new university president had just arrived and, adds Spain, "New presidents always like to start new schools."

The new school was doubly blessed because Miami's new president, Edward T. Foote II, was a fan of architecture, having been exposed as a Yale undergraduate to the charismatic lectures of Vincent Scully. Foote later worked as an assistant to Nathaniel Owings at the Washington, D.C., Pennsylvania Avenue Development Corp. The architecture school's new dean, Thomas Regan, had no trouble convincing Foote that the quality of architectural education is related to the quality of its physical setting, and the school soon moved out of its cramped quarters in the engineering building to a miniature campus of renovated dormitory buildings designed by Florida's first woman architect, Marion Manley, in 1947. Architecture professor Jan Hochstim, AIA, designed the renovation of these Bauhaus-style buildings, making them vibrate with bright blue doors, yellow windows, and red railings. There's no mistaking these buildings for anything but an architecture school.



A number of other changes, some initiated by the university and some by the school, have strengthened the architecture program. "Before the university started its campaign to increase the quality of the student body," explains Regan, "the architecture faculty decided that SAT scores of 1,000 were the minimum to get in." That decision immediately boosted the quality of the students. The university soon followed suit in an effort to purge its reputation as "Suntan U," where students enrolled for a four-year, beer-guzzling beach party. The university decreased its student population, and architecture's enrollment dropped from 500-plus to 350. Concurrently, the number of faculty increased, and, although the architecture faculty remains small (fewer than 20), three new positions this fall will improve the student/faculty ratio.

The school's curriculum is structured so that the students get a broad exposure to architectural basics early in the program.



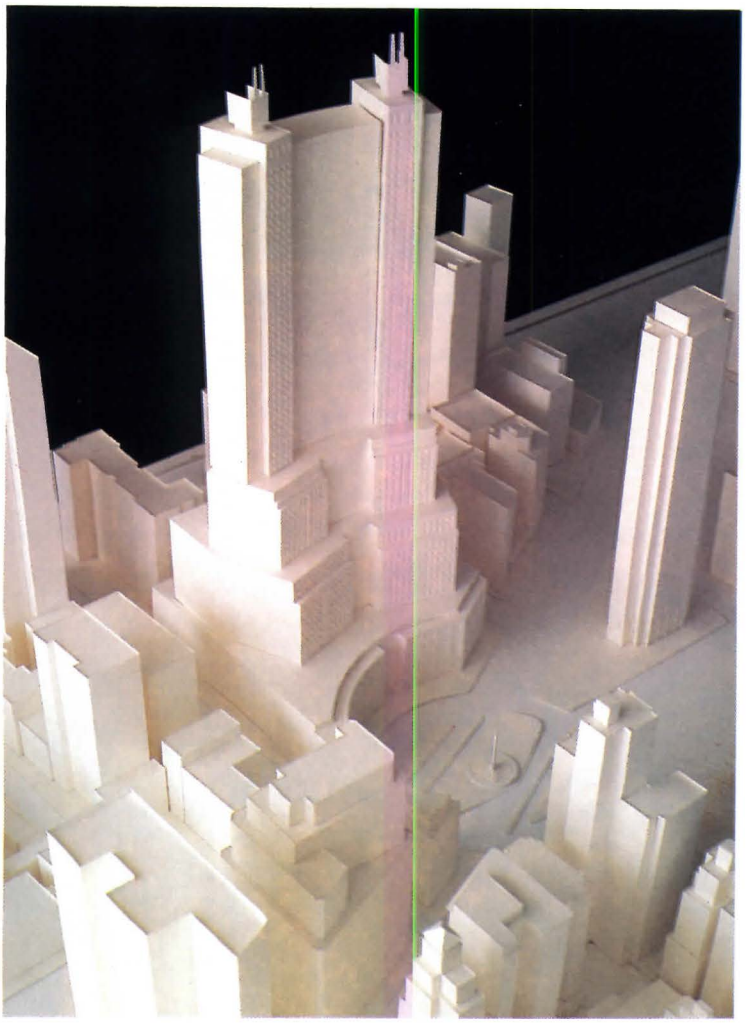
Photographs © Prakash Patel

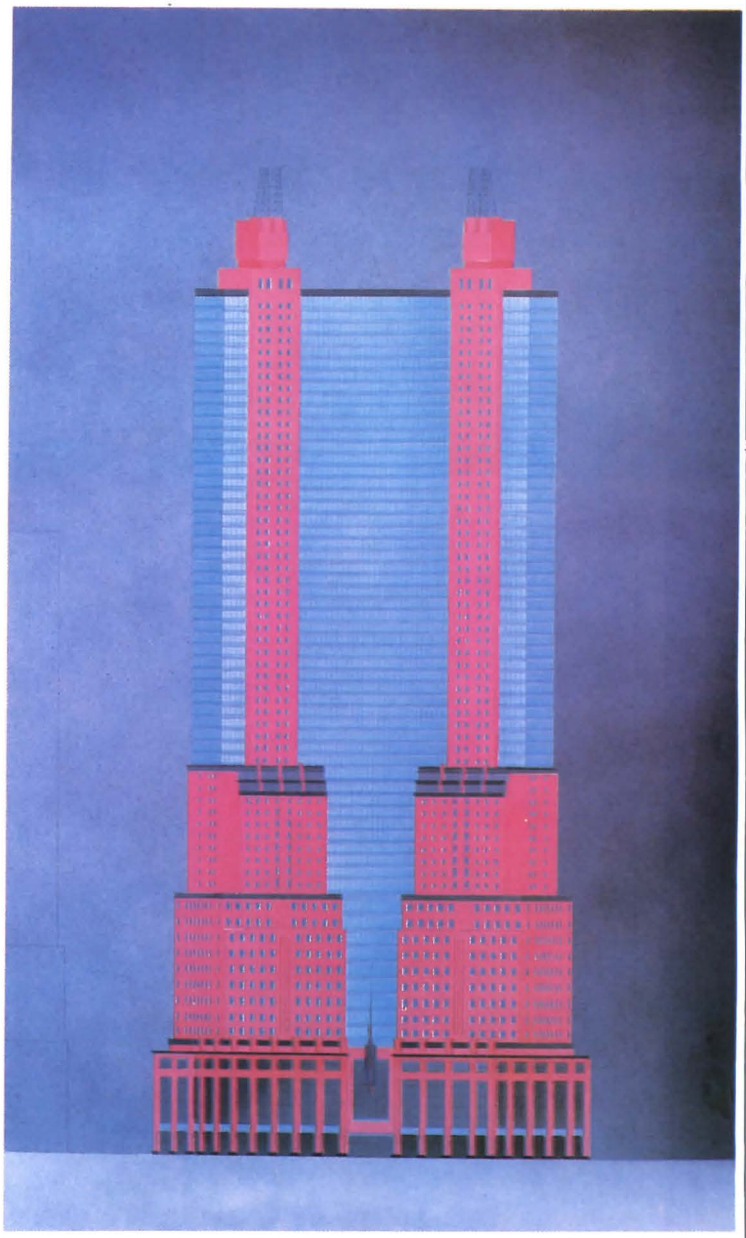
Facing page, University of Miami's school of architecture, with its open-air jury room by Richard Haas. Above, 'The Monument' by Juan Caruncho, with Teofilo Victoria as critic.

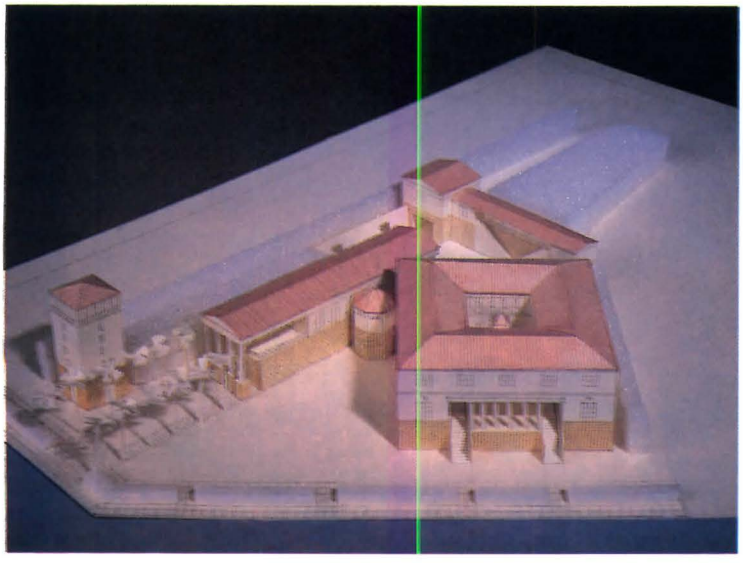
The first four semesters concentrate on the dimensions of architectural problems: human factors and programs, environmental and cultural factors. Simultaneously, students are learning methods of graphic expression. They are also required to take a minor in a discipline of their choice; the most popular are art, music, and philosophy. In the fifth and sixth semesters students are introduced to methods of architectural intervention, such as structure and materials, and environmental and technical systems, which are applied within the legal, political, and professional contexts of architectural practice. "We try to cover all the basic aspects of architectural design in three years," says Tom Spain. "By the time students finish the third year, they're expected to know the essential dimensions of an architectural problem and how to grapple with them."

The studios in these first three years are taught by a team of three or four faculty members. Each teacher works with a portion of the class on a studiowide project. Teachers rotate for the next project and work with a new group of students. "We try to match up people in teams that basically agree with each other," explains Gary Greenan, director of the program, "so that the students get different opinions but with a consistency of instruction and grading." Final projects are juried by the entire team; thus individual teachers are encouraged not to present too subjective a viewpoint in their criticisms.

Another element in the curriculum's first three years is the "theme semester," in which there is an attempt to integrate material from lecture courses (such as mechanical equipment or programming) with the studio projects. In American architecture schools lecture courses are subservient to the studio, and finding a way to integrate them has been the Holy Grail of architectural educators. At Miami—and other schools that have







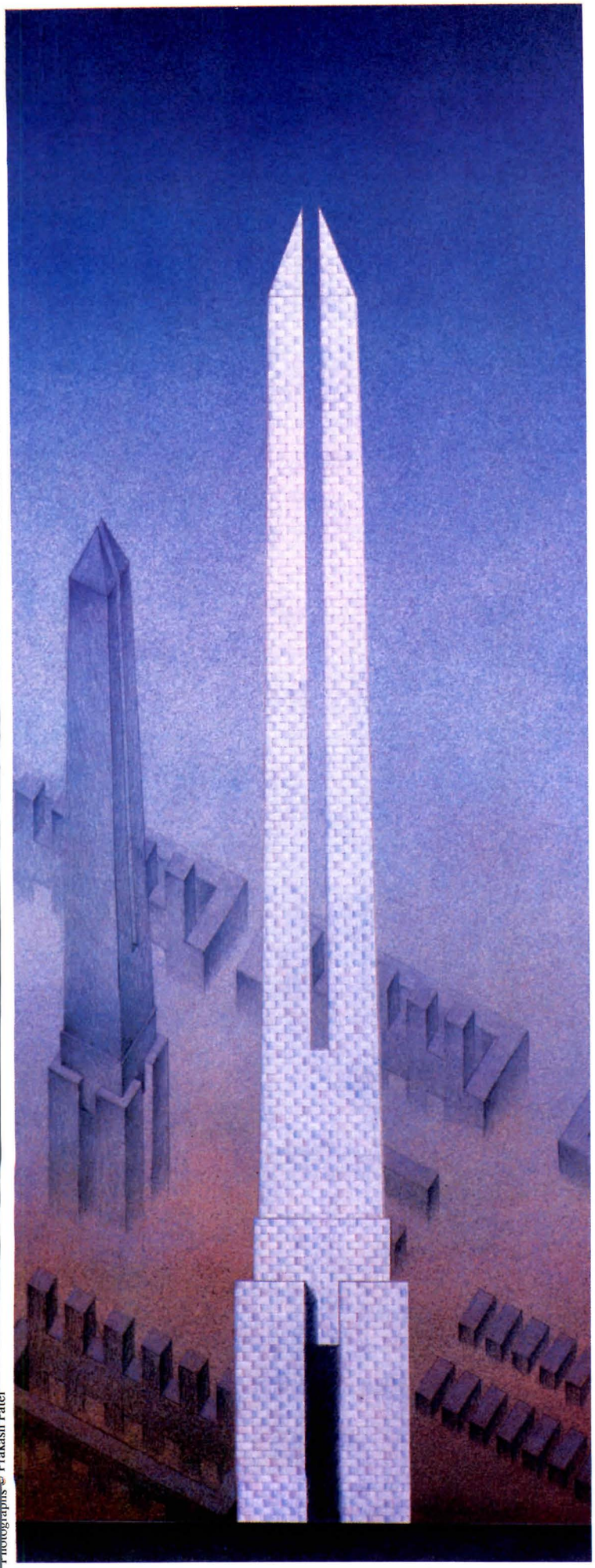
Top, left and right, model and elevation for an office tower on New York City's Columbus Circle by Scott Hedge, with Thomas Navin as critic. The studio's program was based on the recent Columbus Circle competition. Above, a house and garden on Biscayne Bay by Yossof Matrusdi, with Tomas Lopez-Gottardi as critic. The site was a parcel in Cocoplum, a private, affluent development.

tried this—studio projects are expected to address issues that are being covered in the lecture courses for the semester.

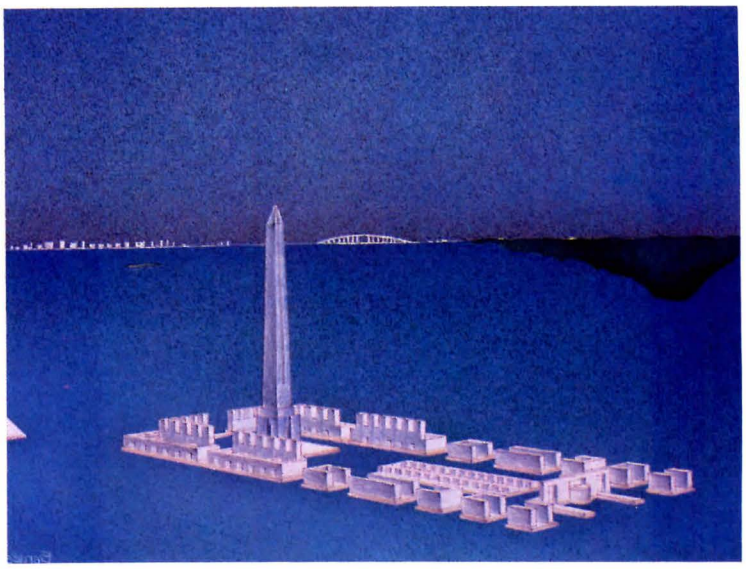
"In the best of all worlds the people who teach the lecture courses would either be members of the studio team or would come into the studio periodically and relate what they're talking about in class to what's going on in studio," comments Spain. "That happens occasionally; I wish I could say it happens all the time." The students have mixed opinions of the results. "Sometimes it works and sometimes it doesn't," said one student. "It all depends on how closely the faculty works together. At times it happens the other way around—in the environmental class they use your studio project for a case study."

In the last two years of the five-year program the students are "turned loose," as they describe it, applying what they've learned in studios of their choice. By this time they have had exposure to just about every professor through the team format and can make their choices accordingly. To spice up the selection, one or two visiting critics teach studios every semester; their number has included Alex Krieger from Harvard, Gavin Macrae-Gibson from Yale, and Rodolfo Machado and Michael Hayes from the Rhode Island School of Design. (The Suntan U image, as it turns out, sometimes works in the school's favor to attract visitors from the Northeast for a few months of studio near a good beach.)

In the past, the school attracted most of its students from the Miami area, and, while in recent years more have been coming from other parts of the United States and the world,



This page, design for a winter headquarters of the Organization of American States at the entrance to Miami from the sea, by Reynaldo Borges, with Thomas Regan and Teofilo Victoria as critics.

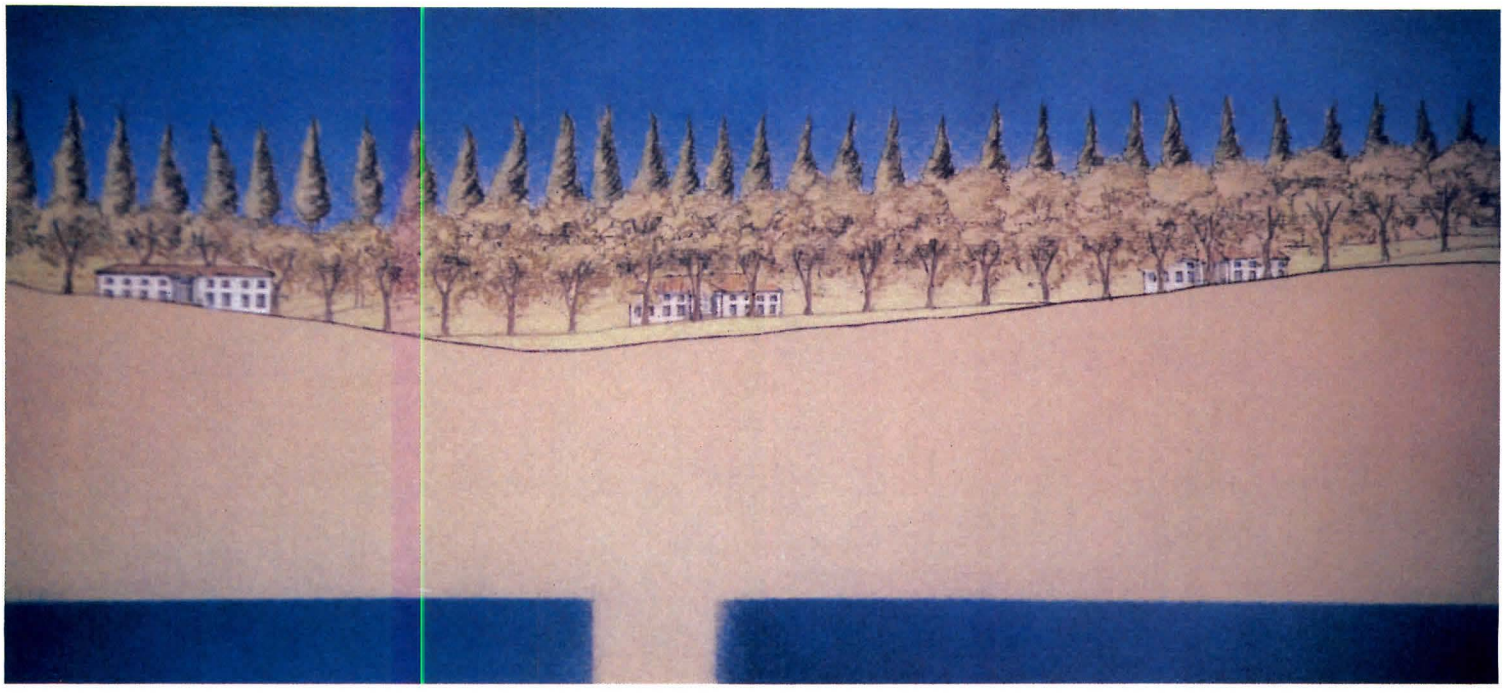


the school's flavor is still decidedly Latin. More than half the students are from Florida and nearly a third are from outside the United States. This cosmopolitan, international mix gives the school a broadness usually associated with graduate programs. Students from Central and South America, the Caribbean, Africa, and Malaysia, working with U.S. students, help raise the level of architectural inquiry. "Having people from other cultures helps us to think about architecture as an international condition," remarked one student.

The school's location in the greater Miami area exerts a powerful influence on its students and their work and on the pedagogical aims of the faculty. Regan comments that he was drawn to the school as its first dean because of the city's open-ended nature. "The emerging Miami is fascinating because it's a frontier town, a town whose day has not yet come. But it will, and a lot of things can happen very fast here. The Arquitectonica firm showed that young people could get significant things built here, and for me that meant that ideas could be tested full-scale." Many of the graduates go on to practice in the Miami area, and Regan believes those who choose to stay are reaching a critical mass that will help shape the city. A few of the students I spoke with, especially those who claim Miami as home, bear out Regan's observations. "We've grown up in the city," said one, "and there's a strong sense of professionalism here—that it's a community service you're performing, in coming back to work in the city."

The blend of culture and locale that dominates this school is

Right and facing page, top, three computer images of a 'redesigned Miami' by graduate students Victor Dover, Joseph Kohl, and Erick Valle. The night shots were developed as a proposal for the city to illuminate Miami's skyline. Across page, bottom, design for a New York winery by Jeff Wright, with Jimmy Allen, Paul Buisson, Jose Gelabert-Navia, and Thomas Navin as critics. Below, design for an equestrian-oriented community in Kentucky by Valentain Delgado and Marina Negreiro, with Elizabeth Plater-Zyberk as critic. The studio's program was based on this year's 'American Life Competition,' sponsored by the American Institute of Architecture Students.

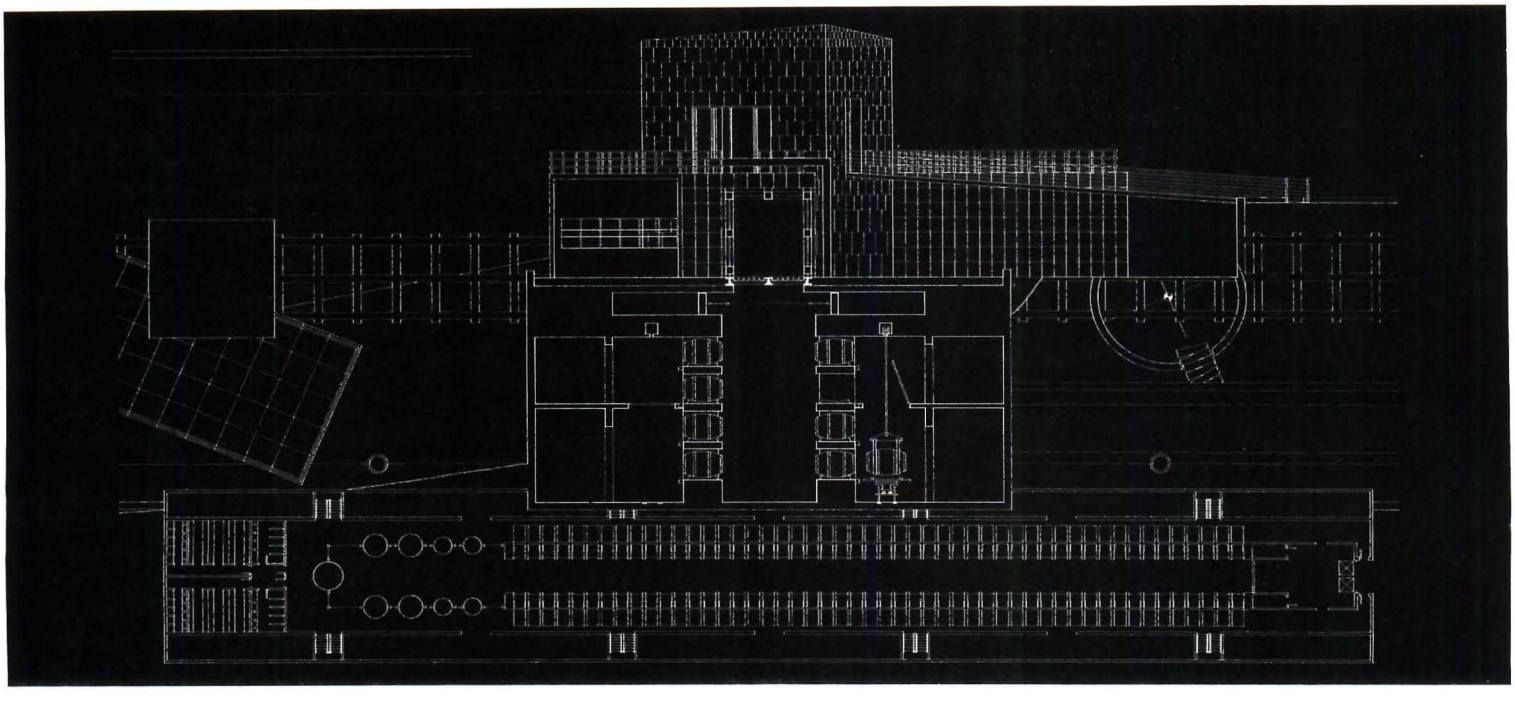


tied to Miami's built history—its links with European architectural precedents and their roots. A line in A.J. Liebling's *The Earl of Louisiana* says that the " . . . Mediterranean, Caribbean, and Gulf of Mexico form a homogeneous, though interrupted sea." Observes Elizabeth Plater-Zyberk, AIA, Miami's assistant dean: "I think we still see, although not in terms of a Spanish style, great connections with that part of the world because the methods of construction are similar and many of the concerns of establishing a place or an empire can be thought of as connected. For a number of us there's been a conscious looking back to ancient Western roots, Greek and Roman."

Plater-Zyberk's observations reflect her own architectural preoccupations and those of her partner, Andres Duany, AIA. Their work has received international attention and has influenced their students' work. But Plater-Zyberk and Duany are not Miami's gurus, and the students do not see them as such. A few students remarked, however, that the school's use of Miami's precedents is selective. "Our work can be described as being masonry, having little windows, pastels, classical architecture—that's the University of Miami," said one fourth-year student. "It's good because you learn that style well, but I'd like to know more about the work of Arquitectonica, which is not talked about here."

The faculty members at Miami appear to get along remarkably well. There is a lot of mutual support, which makes the team-teaching format possible. One does find a cleft between new and more established professors, in their interests; this is common in most schools. While some younger members may share a fascination with southern Florida's European antecedents, the faculty as a whole seems committed to teaching architecture as a professional discipline grounded in built reality. "The faculty may argue over style or architectural philosophy," says associate professor Joanna Lombard, AIA, "but they form a consensus that what we're about is physical design, and that consensus is felt by the students. There are faculty who stand for classicism as an ideal and those who are avowed modernists, but no one is suggesting that we should not build, which is true in some schools."

An architect who didn't care to build would be very lonely in this part of Florida, one of the fastest-growing regions in the nation. The pace of development, the crop of towers on Miami's skyline, and the open land ripe for building prompt some very basic questions about architecture that faculty and students address in design studio. "There's a search for a language to express the specialness of a place," says Lombard, and she ticks off issues of concern: "What's an appropriate building type, are there ideas about public space that should be reinforced, how do you deal with the suburban commercial strip, how can we make streets that people want to populate, how do we build downtowns, how should downtown Miami and Coral Gables be special? I think the school has a great role to play because it's not a place that's totally built out. It's a place where things are developing, and when you ask those questions and generate possible solutions, they can have very real impact."



Visiting critics and lecturers have been impressed with the intellectual climate at the school. Says Alexander Gorlind, a visiting lecturer at Yale who taught a seminar on landscape and modern architecture at Miami last semester, "I found the students very creative and the school vibrant. It was as much a center of activity as New York." Lombard adds that, in her experience, the students "have a great deal of energy and motivation, and a real eagerness to learn."

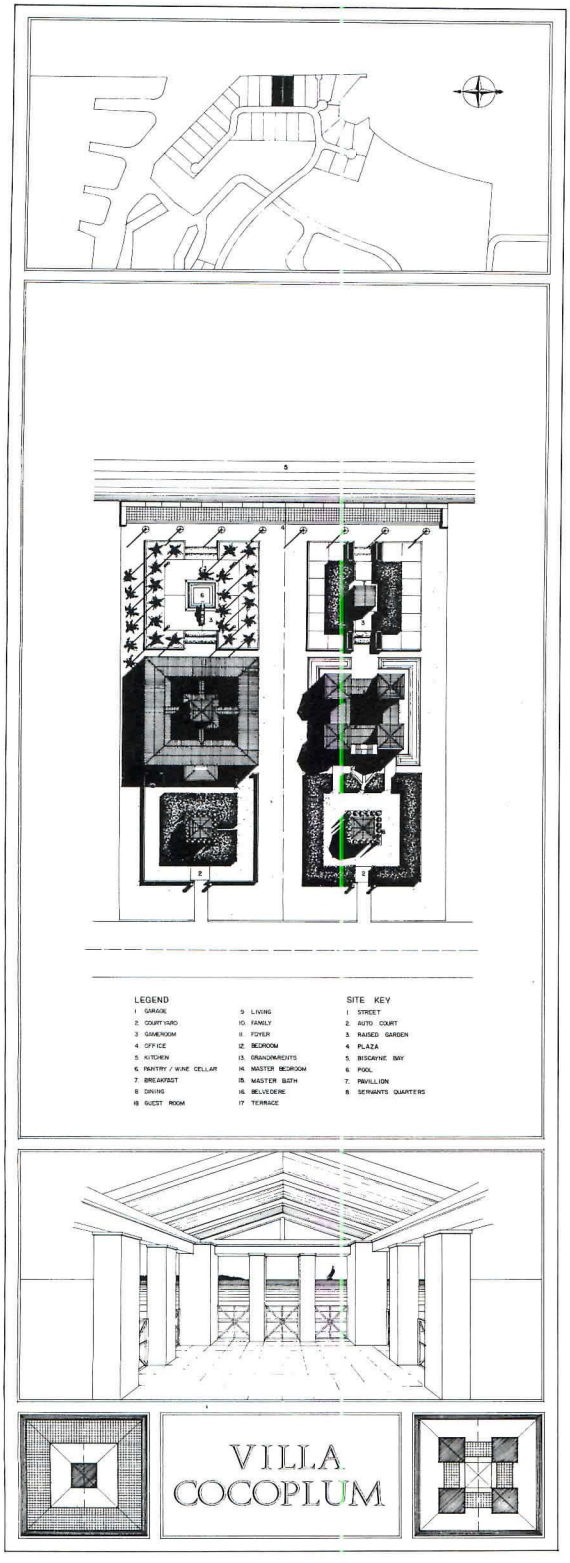
My visit to the school confirmed these observations, but I also found the students respectful and polite to an extreme and resistant to talking about the school. These students have a group mentality. They enjoy working together and learning from each other, and they seek recognition for their school rather than personal glory. They're competitive, but the focus of their competition is to produce good work as a class, not as individuals. "Since we all work together, you can't help but look around and see what the guy next to you is doing," explained one student. "You know if you're doing something wrong, or your work is not up to par with other students. It's going to be compared with that of your classmates. Either you don't turn it in or you stay up all night and do it better."

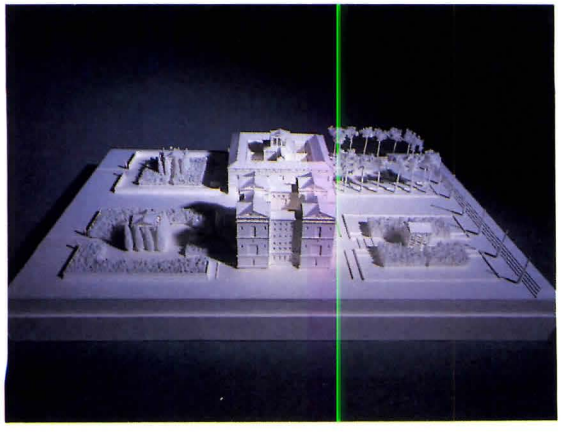
Similarly, their approach to design and studio work reflects an emphasis on architecture as part of a greater whole, on buildings as part of the fabric of the city and its context rather than individual monuments. There is a respect for what has come before, a deference to pre-existing conditions. "You have to have a precedent for everything you do here," one student told me. "There are not too many inventions or much risk-taking." An upperclassman remarked that he had seen "lots of freshmen come in who are immediately turned off by the idea of precedent because they want to do their own thing. This probably isn't the best school for that."

Gorlind noticed a similar attitude among the faculty: "They're friendly with each other and supportive, but in a certain way there's a clubbiness. You have to belong to a group. The school doesn't encourage the loner or the iconoclast. That might have to do with Liz and Andres's approach to architecture—going back to traditional urbanism. It requires not being a solo performer. The whole school is based on this idea of working together to make a better city."

As these pages show, the student work is stunning, and its sophistication and presentation appear to reach new heights every year. "They love to do beautiful drawings," says Plater-Zyberk. "I think that comes from some of the visiting critics, but the architectural media has influenced them. They buy books and magazines voraciously, and the drawing styles have a continuous evolution. That stylistic wave is a completely independent movement that the faculty enjoys watching."

Their drawings have made a splash on the national architectural scene, as Miami students enter and win design competitions with enviable frequency. In the past five years, Miami students have either placed or received honorable mention in more than 30 competitions. More than half of those students have received first or second place, and nearly a third the top





Left, site plans and models for adjacent Cocoplum sites—houses for two brothers, each house a solid/void reversal of the other—by Michael Sardinas, with Tomas Lopez-Gottardi as critic. Right, poster based on the architecture of Ledoux by Oscar Irigoyen, with Tomas Lopez-Gottardi as critic.

prize. The students are self-motivated to enter competitions, although doing so may be a way of emulating some of their professors, who have won quite a few competitions themselves. The students usually do the competitions in addition to their regular studio work and ask a professor or a principal in a local firm to help them. Lately a few of the competitions have been used as studio projects.

Gaining national recognition through their work has contributed to another remarkable phenomenon: every year, more and more Miami students are being admitted to some of the most prestigious graduate programs in the nation. With a five-year professional degree from Miami, there is no practical reason they need to go on to grad school, so it's obvious they're hungry to learn more.

When you ask Miami students where they've applied, they seem automatically to respond: "Harvardyaleprinceton" in an Ivy League slur. Many of their professors have attended these schools and encourage students to continue their education there. Not many respond with Penn or Berkeley, and Plater-Zyberk admits that Miami's network with those schools is weak. The way the students lump their top choices together makes you wonder whether they see any distinction among these very different programs. "The schools in the Northeast seem to have the same kind of thinking as here, so we'd be more comfortable," one student told me. Apparently, several prospective grad students take a road trip every year to visit the Ivy League schools and report back to their classmates. Miami should consider providing graduate counseling services to help students make those important decisions.

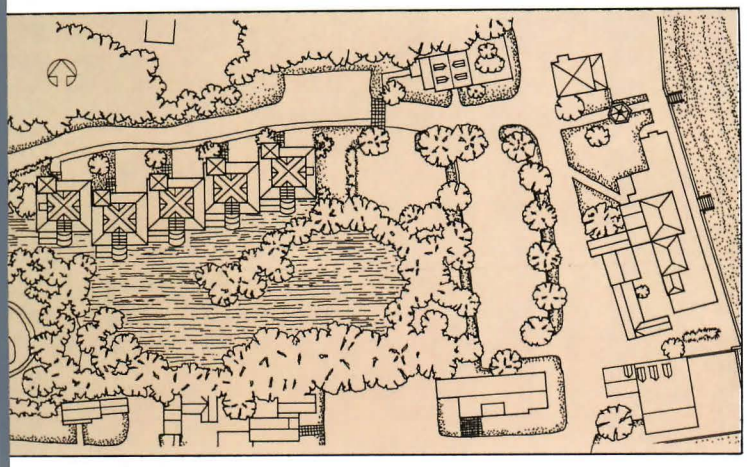
In a very short time, Miami's architecture school has come a long way. It's now in a position to claim a national reputation as one of the most stimulating undergraduate programs in the nation. A stake in that claim is the school's plan for a new $4 million building designed by Aldo Rossi, which will include a sorely needed auditorium and library. It will be Rossi's first building in the United States and will certainly draw more people to the school. "His building will go into the annals of art history," gushed architecture critic Beth Dunlop in the Miami *Herald* last February, when the design was unveiled. "Students of architecture and aficionados of the art will make pilgrimages to see it; the school of architecture will become a destination." Most of the students are excited about this prospect, even though the building probably won't be completed until after they're gone. As one student declared, "It will put us on the map."

Miami should continue to cultivate its national reputation through the intrinsic qualities of its program. One of those assets, one mentioned by few people at the school, is the work being done in Miami's tiny graduate program—what must be the school's best-kept secret. It's a post-professional degree program that now has four full-time students. Tucked away down the hall from Dean Regan's office, they are conducting work in computer-aided design that may be truly revolutionary. "We can interface AutoCAD images with photographic images," explains grad student Victor Dover in typical computerese. "We're the test site for software developers who wrote the programs that merge these applications."

What this means is that photographic images can be transformed into digitized, manipulatable computer images and vice versa. According to the students, Miami is one of only a few schools in the nation with these computer capabilities. Their work may eventually lead to breakthroughs in how we visualize architecture and how we design. The university should fully support the graduate program's work. In the next half-dozen years it may make a contribution that will affect the very practice of architecture. □

Photographs © Prakash Patel

Kaleidoscope



Stand of Towers Presides Over a Cape Cod Condominium

"Cape Cod is the bared and bended arm of Massachusetts," wrote Henry David Thoreau, "the sandy fist at Provincetown . . . boxing with northeast storms." You couldn't find a better ringside seat for the bout than the Red Inn condominiums in Provincetown by Ahearn-Schopfer & Associates of Boston. Provincetown is at the end of the cape, with a granite tower at its center that marks the land's terminus. Kevin Schopfer, AIA, says that the tower as landmark distinguishes the cape as a whole, referring to its old lighthouses and lifeguard stations along the beach. The condominiums' five towers not only are appropriate, given the locale, but provide excellent vantage points for overlooking wetlands and the ocean beyond.

Red Inn has 15 units in all, each tower entrance serving three units—a one-bedroom at ground level, a two-bedroom one flight up, and a studio at the top. The site is rather tight, bounded by existing buildings to the north and wetlands to the south. The entrances are on the north side at the base of each tower. This side is private with very few openings save for small windows that light the towers' stairways and horizontal windows in the loft bedrooms. The south side, by marked contrast, is open and lacy with white pipe railings that weave through the balconies, tying the five bays together. This side appears to have abstract towers with peaked roofs and rounded balconies. While the north side is a tight composition of cedar clapboard and shingles, the south side opens up with windows and balconies, each unit stepping out for views of the ocean.

As the condominiums rise in height they begin to fragment, the studio units appearing as tiny houses with gabled roofs, circular vents, small windows, and stovepipe chimneys. This gives the project a scale akin to the cape's architecture—small cottages of natural cedar and white trim, huddled together.

Because these are condominiums at the beach, where most of the action happens outside, the units are comfortable but not huge. The studios at the very top are snug, almost like ship compartments, with bedroom lofts accessible by ladders. The floors are bleached oak, the pitched ceilings clad in cedar, and the fireplaces finished in green marble. Bathrooms have warm mahogany counters. The kitchens are tight with crisp detailing. Throughout the units mirrors expand the space; some surround the fireplaces and others are in the window alcoves.

Out on the balconies, the sunlight is filtered by gabled trellises. There are breathtaking views not only of the water but of the condominiums themselves as they step back and down, the shingled roofs meeting the walls at close range, little nooks and crannies framed in white, creating a cozy, almost vernacular scale.—Michael J. Crosbie

Facing page and above, condominiums are entered at base of tower elements, whose top-floor bedroom lofts overlook the water; top, the condominiums' south face, marked by open decks.

© Peter Vanderwarker

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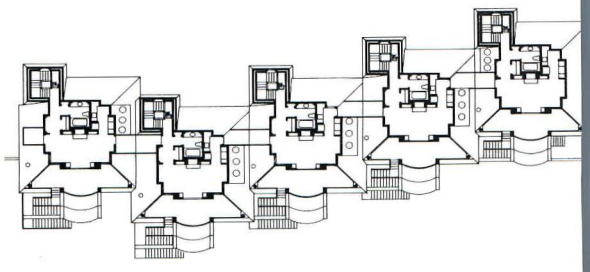
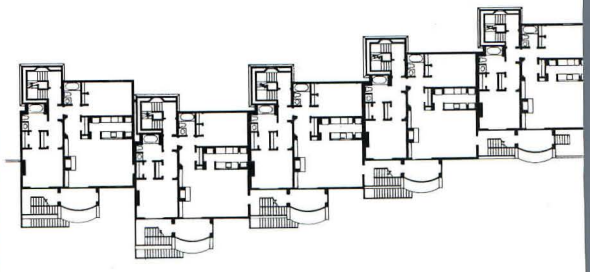
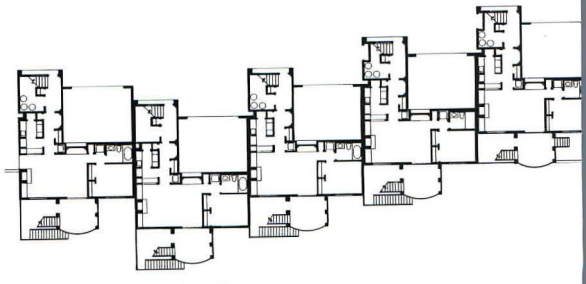


Third floor—studio units



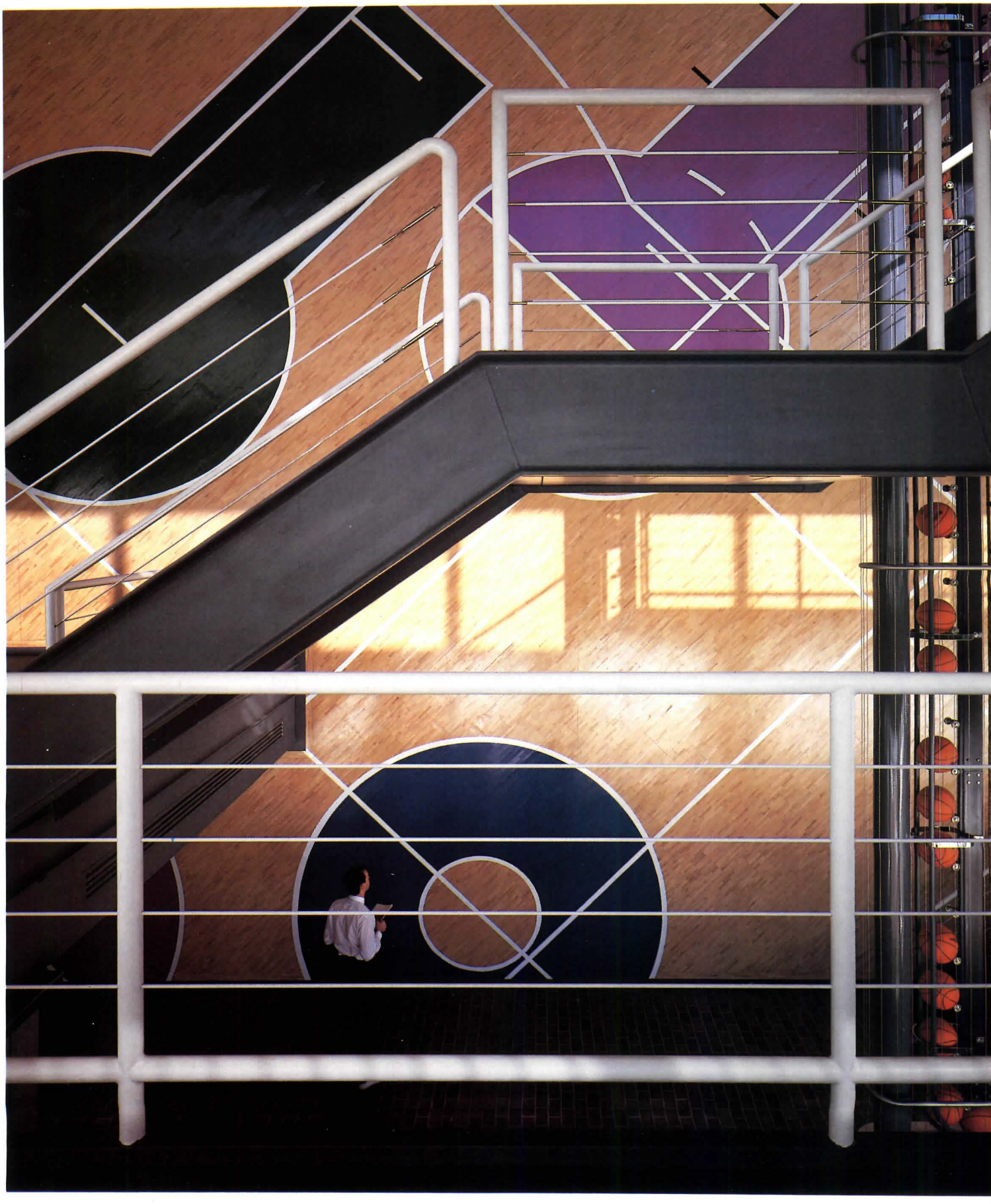
Second floor—2 bedroom units



First floor—1 bedroom units

This page, top and bottom, interiors of condominium units are light and airy, with natural cedar-clad ceilings lending warmth. Mirrors are used throughout to expand space; fireplaces are framed in marble; floors are bleached oak. Alcoves are filled with windows and built-in cabinets. □

Suitably Playful and Colorful Basketball Hall of Fame



© Steve Rosenthal

Springfield, Mass., is basketball's birthplace. At Springfield College in 1891, gym teacher James Naismith fastened a peach basket to a gymnasium balcony, and his students tossed a soccer ball into it. Cambridge Seven Associates' basketball hall of fame in Springfield has all the excitement and action of Naismith's invention—it is filled with light and color and buoyant volumes.

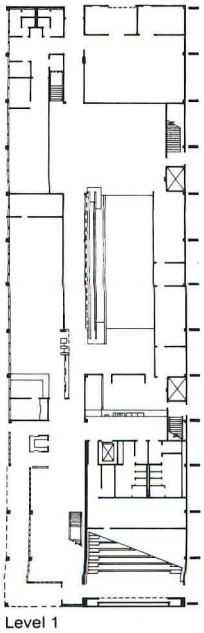
The building occupies a two-and-a-half acre site sandwiched between the east bank of the Connecticut River and I-91, an elevated highway. There is virtually no pedestrian access to this precinct of Springfield, which is walled off from downtown by the highway, but the hall of fame is just one element in a $120 million revitalization of the city's riverfront, planned by Benjamin Thompson & Associates. When he learned of the city's intent to build a new basketball hall of fame, Cambridge Seven's Paul Dietrich, FAIA, principal in charge of the project and a self-described basketball fanatic, took off for Springfield to make a pitch to design it. He got the job.

The building's visitors see it first from the northeast as they zip along the highway. From there the building looks like a gigantic billboard of hoopsters frozen in action. But the board is actually 17 three-story aluminum pylons, stabilized by steel cables. As one passes, the pylons appear to open up like an accordion, revealing the building.

The building's southwest elevation is a crisp orange frame that overlooks the river and a park designed by Sasaki Associates. The lobby, visible from outside, is a soaring space. Its north wall, finished in maple as a gym floor depicting the evolution of the court, is ticklishly disorienting. A steel staircase winds between the wall and a "basketball fountain," a caged conveyance that lifts balls three stories and then drops them.

Visitors start at the top floor and work their way down through various films on the game (a dozen or more, produced by Cambridge Seven), exhibits of basketball memorabilia (stunningly displayed in glass cases designed by the architect), and the hall of fame itself. The most popular attraction is the "Shoot Out," a 60-foot-long people mover from which you shoot at stationary baskets.—Michael J. Crosbie

Previous page and right, hall of fame lobby's north wall is rendered as gym floor, in front of which a 'fountain' propels balls that flicker. Left and top, building's west and east sides, respectively; below, visitors take their best shots in 'Shoot Out.'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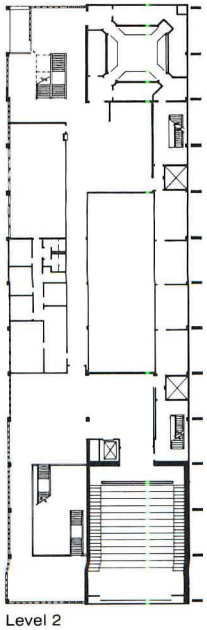
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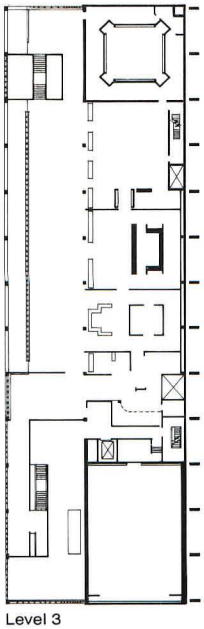
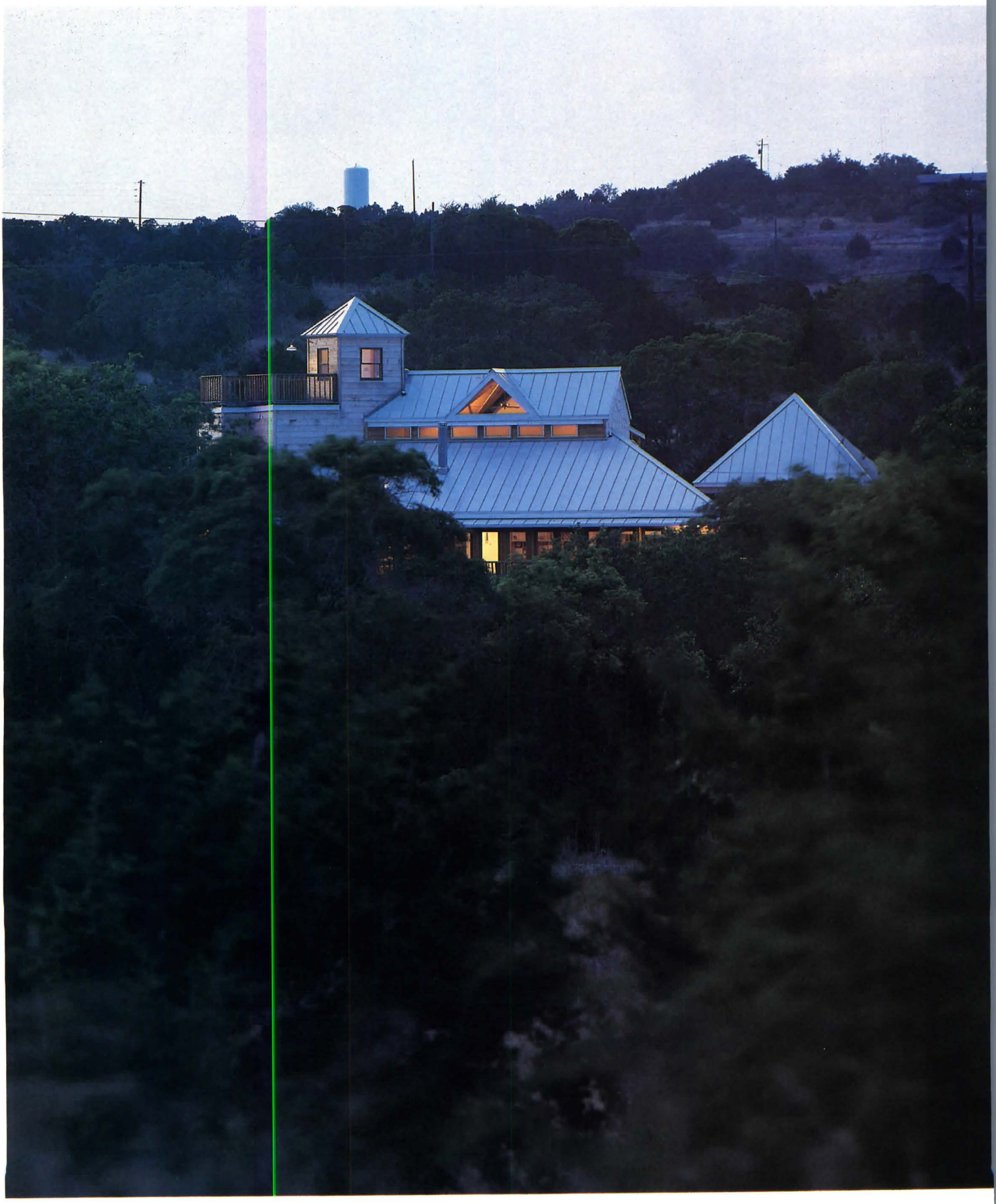
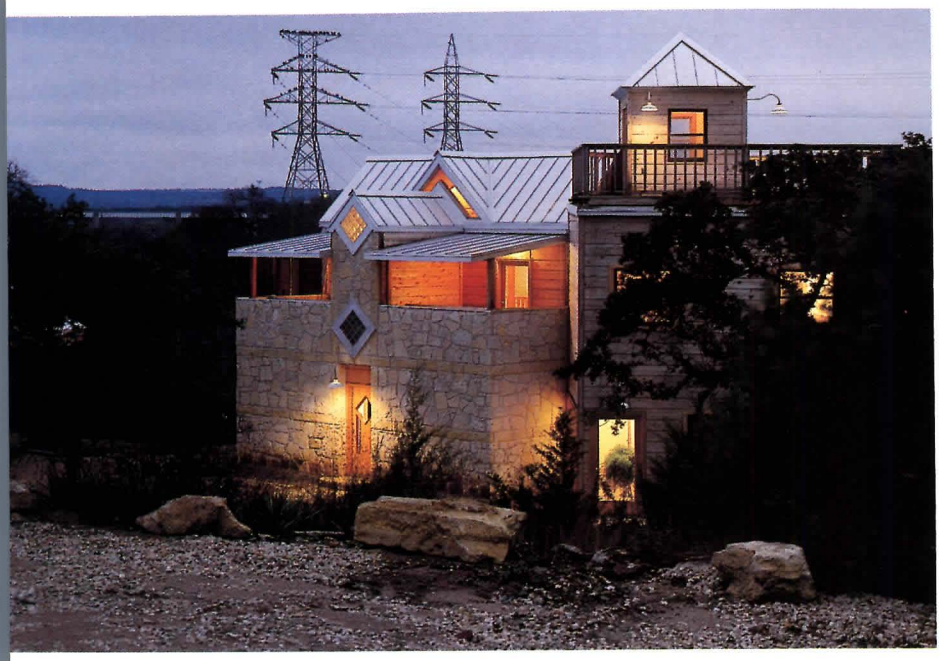
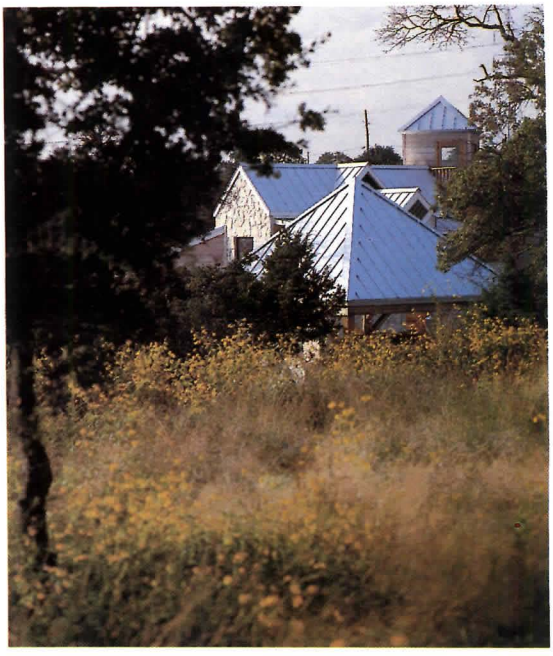

Level 3


EXIT

Country-Style Studio for an Architectural Photographer







Facing page, peaks and gables in hills northwest of Austin. Above, the front door on the north and view from the northeast.

After several years of building a successful business, Austin-based architectural photographer Greg Hursley decided it was time to build his own studio, which at that time occupied part of the family residence. His family of five (then—now six and still counting) could put the entire homestead to good domestic use. And building equity in a business property seemed like a good idea.

Since commercial lots in the city were too expensive, and since clients normally had no need to visit his studio, Hursley was attracted to the concept of a weekend house in the country that would double as an everyday workplace for him and his two assistants. The idea was that some sacrifice in accessibility would be an acceptable trade-off for an idyllic working environment with few distractions and a business property that, after years of appreciation, could be sold or used as a residence.

Hursley's search for a suitable lot led to Cloudy Ridge Drive, a remote, sparsely developed cul-de-sac within eyeshot and earshot of Mansfield Dam on Lake Travis. The scenic, two-acre site is a classic Texas Hill Country setting—a sloping topography of rocks, live oak, and cedar, liberally sprinkled with wildflowers in the spring and inhabited year-round by birds, deer, and armadillos. Approached from the roadway, the lot descends sharply as one wall of a wooded ravine and terminates with a creek at the bottom of the draw.

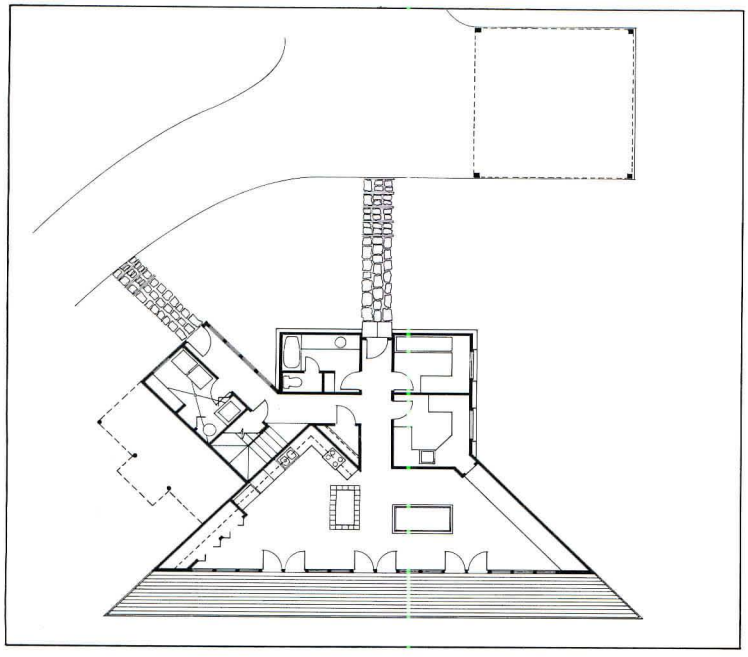
The fact that Hursley has working relationships with scores of architects made selecting one difficult. He decided on his client and friend, architect J.H. Eccleston "Excy" Johnston Jr., AIA, then of Austin and now practicing in Baltimore. As an architectural photographer of some renown, Hursley knew his studio would have to withstand a measure of scrutiny not unlike that focused on houses architects design for themselves. To that end, he looked to the author of a body of work known for its capriciousness, its bold if sometimes unrefined presence, and its capacity to achieve high impact in the absence of a high budget.

The design emerged both from the dual program—country house as studio—and from certain predilections of the client. While Hursley sought a strong design statement, he also insisted on a pervasive informality characterized by pragmatic use of space and materials. For the primary work space he wanted a long room, open to views, with a kitchen at one end. And he specifically desired a liberal use of natural, wide-plank pine for interior finishes. As for exterior materials, Hursley saw no need to deviate from the standard Hill Country parlance of limestone, cedar, and standing-seam metal roof. Johnston's challenge was to draw from this contextually appropriate palette without lapsing into regional cliché. And while the final design is not devoid of cliché—glass-block windows, colliding forms, peaked turrets—neither is it overtly regional. The success of the project depends upon one's ability to accept the little-bit-of-this and little-bit-of-that approach to making a cohesive architectural statement.

Hursley also had a distinct preference regarding another key issue: the siting of the structure in relationship to the slope of the lot. In short, he wanted a house *of* the hill rather than *on* the hill. While siting at the very top of the slope could have maximized views to the lake, Johnston instead designed the house to descend further into the site and actually to become part of what was considered the preferred view—the vast sweep of the rolling thicket.

The scheme resulting from all this revolves around the placement of a two-story limestone box on a rock ledge. Attached behind the two-story box, a pier-and-beam wood structure fans outward to form a triangle and slopes downward to single-story height at its rear wall. The third basic element is a two-story wooden box that splays into the right leg of the triangle and culminates above with a stair tower and observation deck. In front of and to the left of the house, enhancing the sense of a compound, is a freestanding carport whose hipped, centrally peaked roof echoes that of the stair tower. All of these elements work together to fulfill the dual role of studio and dwelling.

The limestone box is penetrated at its midpoint by the main entry corridor, which leads to the grand, triangular work space. Flanking the corridor to the right are bath and storage. To the left, a long rectangular bedroom has been partitioned to create two darkrooms—one for black-and-white processing, the other for color. The bedroom windows, blackened for the darkroom conversion, can still be raised to admit the fresh country air when darkness is not required, alleviating the ever-present odor



Above, loft doubles as office; glass door (left in photo) opens to porch. Right, the main work space with kitchen at far end.

of darkroom chemicals. The color print machine penetrates the rear wall so as to drop prints onto a work surface in the main workroom.

The upper level of the limestone box is occupied by a light-filled loft used as an office, which opens onto the triangular workroom below. The gabled roof above the loft is expressed inside by exposed structure and sloped ceilings. Toward the front of the house, above the main entry, the loft opens onto twin, semi-enclosed courts.

Here we find one of several instances in which Johnston's original vision seems to have been diluted by a departure from the original scheme (as is often the case when the architect is not retained to see a project through construction). Originally designed as open courts, the balconies now are covered by sloped canopies that appear to be an afterthought. Similarly, a pair of key icons—the diamond-shaped, glass-block front windows—would rest more comfortably if the vertical extension of the facade above the main entry were a full two feet wider, as originally designed. Johnston also envisioned galvanized metal or bright glazed tile, rather than cut stone, for the contrasting bands across the rough limestone facade (a vision that may be better unfulfilled).

Skewed off to the right of the limestone box, the two-story wooden pavilion serves as semidetached guest quarters. It encloses circulation and utility space on the first floor, part of which is cut away to accommodate exterior mechanical systems. The stair provides second-level access to the adjacent office/loft, as well as to a large bedroom with a bath housed in its own projecting bay. The rooftop deck above the bedroom, marked by the peaked stair tower, provides panoramic views and serves as an ideal location for photographing models against a backdrop of sky.

In keeping with its role as guest quarters, the two-story wooden box has its own entry, with a corridor pleasantly lined by light-admitting glass-door panels framed in wood. However, this provision for separate access in the form of an oblique entry also has the effect of neutralizing the impact and clarity of the main entry sequence.

A major strength of Johnston's composition is the appeal of the roofscape when viewed from a distance. The house assumes its most picturesque configuration as a lively assemblage of hipped, gabled, and peaked forms—light, white, and gleaming—floating in a sea of green. From a closer vantage point, however, these same roof forms seem somewhat tortured, overdetailed, and oversnipped in contrast to conventional standing-seam metal roofs that just hang there honestly and let the rain run off.

The real force of the overall design is the triangular workroom, which, in conjunction with the loft above, is clearly the main event. Wonderfully open and endowed with soft natural light, the room strikes a good balance between forthright suitability and sheer drama. Much of the room's appeal derives from the splay of the end walls, which fan out not merely to form a triangle but to embrace the sweeping outdoor panorama in one grand gesture. The rear wall of 16 wood-framed glass-door panels—foreshadowed at the entry to the guest quarters—extends the gesture, affording dramatic views and access to a full-width outdoor deck whose railing becomes the hypotenuse of the triangle.

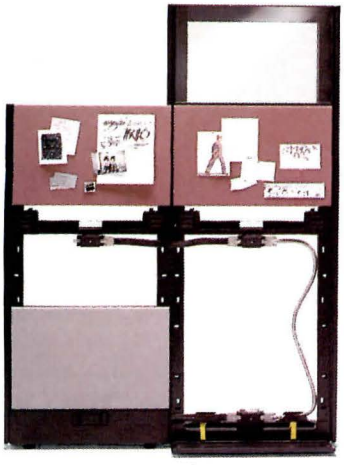
Nudging the edge of the thicket, the deck completes structural and symbolic gestures toward unity with the site. The deck is supported by cantilevered extensions of the studio's steel underpinnings, although it was originally designed to function as a wood truss supported by steel cables tying back to the main structure overhead. Too expensive to implement, this idea was nevertheless appealing. Aside from providing a measure of excitement through structural ingenuity, it represented a clever means of sheltering the deck with awnings and/or vines on cables at eight-foot intervals.

Within the grand room, Hursley and his assistants have kitchen facilities, open and concealed storage, and carefully organized work surfaces—all conducive to optimal efficiency in the context of an enviably relaxed environment. Floors, ceilings, and other finishes of unstained common pine set a suitable tone of informality. The room is all it was meant to be, and more. As the heart of the house, it sustains the house and makes it whole.—Larry Paul Fuller

Mr. Fuller is a principal in the Austin-based communication and graphic design firm, Fuller Dyal & Stamper Inc.

The Beauty of Ethospace

What You Get is More Than What You See.



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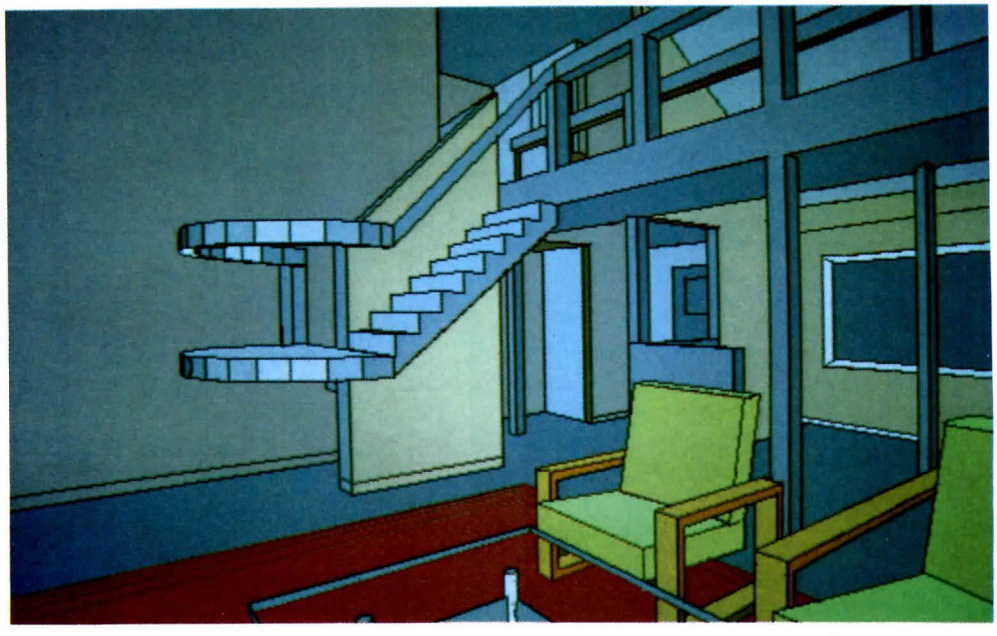
Technical Education of Architects

Educators discuss how it is, and should be, done.
By M. Stephanie Stubbs

The subject of architectural education raises many intellectually seductive and absorbing questions. Foremost, does questioning the value of our educational systems come around cyclically, like certain types of locusts, only to make a loud buzz and then disappear, or are we at a point in time when it is necessary to rethink architectural education? Is the traditional design studio a pedagogical dinosaur? Is our educational process too design-oriented, or too technology-oriented?

A search for universal answers to these questions might be termed a cross between a quixotic quest and a wild goose chase, for there are almost as many opinions as there are architecture schools, if not professors of architecture. Few professors deny, however, the importance of linking technical education to design education. In this article, nine architectural educators present their views on the integration of technical education into the design studio and offer some alternative approaches toward accomplishing this goal.



Students at the New Jersey Institute of Technology use microcomputer-based 3-D modeling in design studios.

Although each school's method appears to be unique, some common themes wind their way through these educators' approaches:

- While most of the educators agree that technical education is not adequate as taught in most programs today, they also feel that technical education is of higher quality than it was 20 years ago.
- Technical education is a reflection of the view of the profession toward architecture in general, and, on a broader scale, of society's current political and social mores.
- The architecture studio is, and will remain, the primary vehicle for architectural education.
- The teaching of technical subjects has become more specialized and more eclectic as a result of the great growth of technical knowledge in the field over the last 20 years.
- The integration of technical knowledge into architectural education is heavily tied to internship and practice itself. Only through practice do many integration issues finally make sense.
- Finally, educators express a general empathy for today's architecture students because it is more difficult than ever to attain an architectural education. Furthermore, professors deplore the heavier burden of choice of technical subjects that students face in the form of electives. Often, students lack the experience to choose wisely.

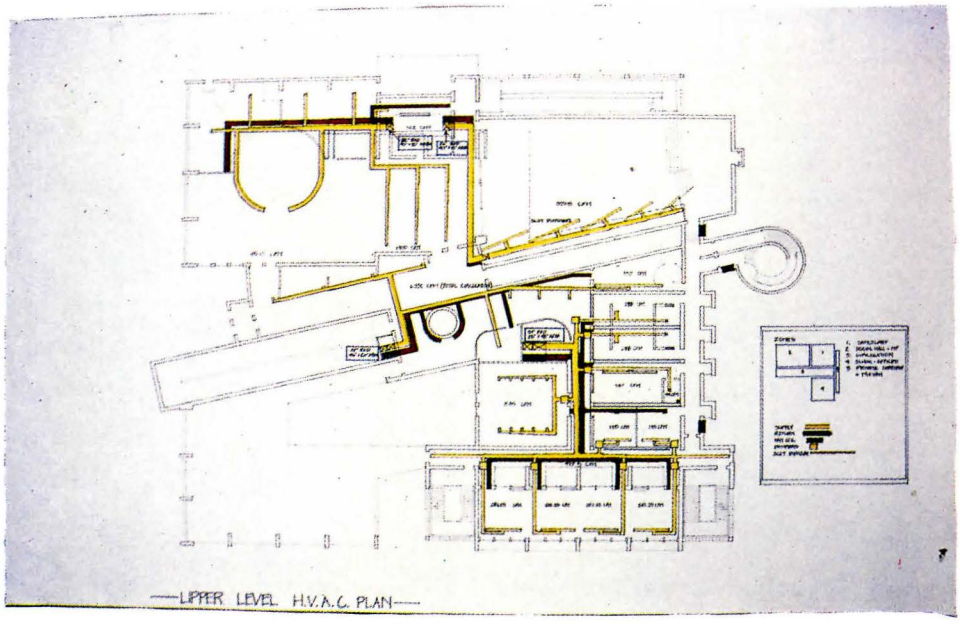
In order to establish a baseline for discussion, it is necessary to agree upon a definition of technical education. The National Architectural Accreditation Board (NAAB—the independent, nonprofit board that establishes accreditation criteria for architecture programs) mandates technology as one of the four major areas of competence the student must possess in order to be graduated with a professional degree in architecture. The NAAB handbook states: "The graduating student should be able to apply their knowledge of each [technical] system in the context of an architectural design project."

NAAB subdivides technology into four areas: structural systems, environmental controls and communications systems, construction materials and assemblies, and life safety and accessibility. These coincide closely with technical areas tested by the Architectural Licensing Examination.

However, not all agree that this definition is complete. For instance, Peter McCleary, chairman of the doctoral program in architecture at the University of Pennsylvania, states that production of designs and buildings is comprised of three parts: *technics*, or technical equipment, e.g. pencils, computers, hammers and nails, HVAC systems, etc.; *techniques*, or the technical processes of design, from hand craft to machine production; *technology*, or the theories of the discourse between societies and their environments in the production of the built world, e.g. craft, empiricism, and applied science. The NAAB's definition of "technology" is severely limited, says McCleary, to that understanding derived from engineering

or the applied sciences. Whether it be structures, environmental controls, or materials and methods of construction, there is little concern for the historical development of these aspects or for knowledge acquired through intuition or through the act of building. Questions of significance and of essence are totally ignored.

George Anselevicius, FAIA, dean of the University of New Mexico's school of architecture and planning, believes that structures and construction are the technical subjects basic to design because they are the shapers of the building form. However, he adds, "study of mechanical systems, the 'technology of comfort,' is rapidly gaining in importance because [the systems] are capturing a greater percentage of building costs due to advanced technology and computer demands. They also are the major source of users' complaints on how buildings function."



A technology-oriented studio at the U. of North Carolina allows students to incorporate knowledge gained in lecture courses.

There seems no doubt among this group of educators that the design studio as we know it is here to stay as the primary medium for architectural education. The teaching process of the studio professor with the student, which is done only pencil-in-hand-at-the-drawing-board, is unique to design education. This process, which Donald Schon of the Massachusetts Institute of Technology has termed "reflection in action," works incredibly but inexplicably well in the design studio, but it may not be the best medium for teaching technical subjects. Because technical education is traditionally relegated to the realm of lectures and seminars, it is small wonder that integration of technical subjects is difficult to describe, much less accomplish.

"We're missing the boat on integrating technical education because we don't realize it's not an either/or [design/technical subjects] situation," says Weston Harper, AIA, a design professor at Texas A&M's college of architecture and environmental design. "Technical courses tend to be taught in a survey format with no interface into the design studio, with perhaps the exception of the graduate level. At that point, integration is achieved through consultants teaching technical areas as part of the studio, and even then it is usually optional at the discretion of the students."

Bernard Spring, FAIA, president of the Boston Architectural Center, feels strongly that integration of technical subjects should happen right in the studio. "It should be through the studio that students get curious about technical issues. They should begin asking, 'How does that thing really go together?' A good studio teacher can turn them on to this integrated kind of thinking. And this ability to integrate is the difference between the creative architect and the technician."

Carl Bovill, assistant professor of architecture at the University of Tennessee, echoes this opinion. "All in all, design studio is where it's at for architecture students. Sometimes, though, I feel that design studio is not as based in reality as it ought to be—it's too far away from the realities of practice. As to whether students are graded for incorporating technical knowledge into their designs, that varies greatly with the faculty."

Faculty members capable of integrating technical subjects and design seem to be a rare commodity. In the U. Penn. graduate program, faculty members who teach technical subjects also teach design. In the second of three years, all students participate in a design studio where there is a concentration on the structural, mechanical, and constructional aspects of the design. This team-taught studio has faculty expertise in all of the technical areas. McCleary says, "All technical subjects taught at the introductory and intermediate level should be taught by architects; those architects who have a passionate interest in that aspect of architecture. Advanced technical courses might need to be taught by non-architects. In the studio, one begins with a concern for form, intention, and ideals. Through the design process the technical concerns, as well as those of ethics and esthetics, will give shape or reality to that ideal. Technical concerns oblige the student to face the 'facticity' of the world."

"Technical subjects should be taught to architecture students in a way that is conceptual and broad," says Anselevicius. "The exact methods for accomplishing this depend on the composition of the faculty. Foremost, you need people with a special competency in teaching design and a competency as generalists in technical subjects. If they have a technical specialty, all well and good; if not, team teaching is an alternative. Specialized subjects could be taught by consultants."

Anselevicius also warns against "studio overload." "You can't integrate all subjects into the design studio, or you end up integrating everything out," he says. "A number of subjects, such as acoustics and artificial lighting, are so specialized and so full of details that they need their own courses. They have their own criteria, and students' understanding of them can't be judged sufficiently in the studio arena."

Despite the seemingly incontestable role of design studio as the keystone of architectural education, there remain nagging questions about whether it is taught as effectively as it could be. These questions center on the finite amount of time students spend in school and how that time is apportioned, subject to the effects of shifting priorities in the profession itself.

Spring says it's always been the educator's dream to incorporate technical education into the studios, but students are in school

barely long enough to allow professors to get the design fundamentals across, and this situation does not appear likely to change. On the bright side, he feels that technical education in architecture schools is generally adequate in context and has greatly improved over the past 30 years. "The problem is that our priorities [for technical education] are off," he says. "This has happened because of dwindling interest in the modern movement, which was the driving force of the technical part of architectural education. You can't judge a school's interest in technical education by its curriculum list, because you can't always measure priorities by the number of hours that a course is taught."

According to McCleary, technical subjects were not as well integrated into design studio 20 years ago, but perhaps the quality of teaching in technical subjects was better. "The teaching of structures and environmental systems was better then; construction is better taught now. The quality is perhaps related to shifts in interest. The '50s and '60s interest in structures (for instance, Nervi, Le Ricolais, Fuller, Wachsmann) was supplanted in the late '60s by design methods (Christopher Alexander), systems thinking, and behavioral sciences. The shift in the '70s was toward prefabrication for a short period, historic preservation, and energy conservation. The '80s interests have been drawing, theories of architecture, and construction. The most positive shift has been away from borrowing theories from other professions and toward the study of architecture itself."

"Technical information *is* design information and they can't be separated," says Anselevicius. "The form of a theater, for instance, is shaped by the designer's knowledge of acoustics. In the 1960s, interest in technical subjects was supplanted by social issues, which was a reflection of society at large. One of the reasons is that technology, in some ways, had not delivered what it promised. It had not brought blanket solutions to humankind's problems. In many cases, it was seen as a threat. The latest concern with image and message has also downplayed the creative role of technology."

M. Stephen Zdepski, an associate professor at the New Jersey Institute of Technology, feels that the shift away from technical priorities has resulted, in general, in inadequate technical education. "Programs have become more liberal arts-oriented, and the technical subjects have been reduced simply to make room for the more general studies courses. Another contributing factor is that now, as opposed to 20 years ago, more technical areas are being taught—computers, daylighting, and energy are all examples—and these technical areas themselves have become more complex."

"A good example of a priority shift is the study of structures," says Gunter Schmitz, director of the State University of New York at Buffalo's advanced building technology program. "All architecture students have some exposure to structural systems, but as our priorities are changing we have cut down on teaching basic structural issues, say from six or eight semesters of courses to three or four, in order to offer a more eclectic education. One of the pitfalls of this eclectic kind of system is that we give the students a greater choice of what they will or will not study. Can you imagine what would happen if a medical student decided he or she did not want to study anatomy?"

Harper puts it this way: "Students are exposed to a more global set of ideas, but at the expense of nuts-and-bolts learning that enables them to make sense of what's going on. They consequently have trouble thinking on their own. It's a paradox—we have invented too many intuitive and personal rules for designing, and yet education as a whole is not intellectually rigorous. It's possible to get through architecture school today and not really know anything. Separately, technical subjects are not all that important. It's only when they are integrated that they start to make sense."

Interestingly, many professors who found fault with the NAAB definition found the same fault—that it includes life safety as a technical rather than a design issue. Zdepski says life safety is the technical area least well-taught in the schools, while structural systems and materials and construction systems are the best-integrated, with mechanical systems somewhere in the middle. "I would say that life safety is not the fourth domain of technical subjects—it is part of design as well as a component of structures, mechanicals, and materials."

"NCARB, through the way the Architectural Licensing Exam is structured, perpetuates the feeling that life safety is a technical issue rather than a design issue," says Harper. "This value judgment comes through to the students as well as the faculty, and consequently life safety is not taught as a whole system. A three-hour course is not the answer to life safety issues. Unfortunately, most design faculty are not competently trained to teach life safety."

Spring feels that life safety as a technical subject is in a particularly bad way, and unnecessarily so, because it is so easy to incorporate life safety principles into general design studios. "A few years ago, we tried a new life safety course given as a separate studio. From a practical point of view, the course was not successful because the students didn't get enough good examples of design work to incorporate into their portfolios, which is of major concern to them. We have since incorporated life safety issues into a lecture course. It's the same course, really, and that has proven more successful."

Bovill says, "I feel I have to push the codes in my studio courses—the students are generally aware of exit and means-of-egress issues, but beyond that they don't pay attention to the codes. I consider and present them as the 'game board' on which architectural design is played."

Internship usually fills the three-year gap between education and the taking of the architectural licensing exam. Anselevicius maintains that an internship, if properly administered, can also fill in the gaps in integrating design and technical training. It's important, he says, for students to be in the field, even while they are still in school. "It would be wonderful if the profession could guarantee a one-year internship for all architectural students as they end their studies. The schools could then require the internships as part of the degree program, and monitor and administer them. Unfortunately, the economics and logistics of administering such a program would be expensive and difficult for the profession and demand extra administrative muscle from the schools."

The Boston Architectural Center presents a unique model for studying the role of practice in bringing technical knowledge to fruition, because all students work full time in offices as they pursue their architectural studies (see page 30). BAC graduates are widely recognized by the profession for their technical knowledge and ability. "We don't teach any more technology than does any other school—it's simply that our students get the integration of technical subjects that comes only with practice," says Spring. "Technical subjects in practice are very different from the theoretical format that you get in school. I think that in reality it's only through practice that the true meaning of integration comes to students. There's no way

State of the Architectural Economy

It varies region by region and type by type. By Elena Marcheso Moreno

The results are in from the 1987 AIA survey of member firms, and architects are projecting that year-end tallies will show a modest increase in their firms' revenues over 1986 levels. This rise comes despite the downswing in the construction cycle and despite predictions of the industrywide distress that was to have been created by changes in the federal tax laws.

But business *is* spotty this year, with large regional variations in design activity. While income is expected to rise about 10 percent for architects nationwide, those who are the busiest are working in coastal areas, with Northeastern locations faring the best—cities like Boston, New York, and Washington. On the reverse side, designers in the energy states and other areas of the Sunbelt anticipate a real decline in their revenues this year.

In the most recent update to the 1987 Dodge/Sweets Construction Outlook, it is reported that the decline of construction contracting this year has been selective rather than across the board in regard to both regional markets and building types. So far, Dodge says, the weakness has been confined largely to the South and West, down 5 percent and 4 percent respectively in the first quarter. By contrast, the Northeast and North Central regions were still holding even with last year's peak rate of construction contracting through the first part of 1987.

While construction contracts are not a completely current indicator of design activity, the Dodge numbers are proving true, according to the AIA survey. In Texas, for example, architects in some cities are faring better than others, although none are as busy as they were during the boom times of a few years ago. The downswing in building activity has bottomed out in Houston, but in Dallas the construction cycle seems to be trailing by about one year. Since Dallas has evolved as an international banking center, it is insulated to some extent from the oil economy, and overall has sustained a higher level of construction.

"Most Dallas design firms are healthy and very few have gone out of business," says John McDermott, AIA, a professor at the University of Texas, "Things are not great here, but architects have work. They are not sitting around waiting for their last projects to close out." Although few firms are hiring, layoffs have been minimal so far. Young architects have the most to fear, though. McDermott says he has been receiving numerous inquiries for part-time teaching positions from architects with three to seven years experience—those usually not yet at the associate level.

In Boston it is just the opposite. A lot of hiring is going on, as well as a lot of pirating of good people away from competitors. "There is a real shortage of project managers—architects with about 10 years of experience—because, when business was slow in the early 1970s, the majority of young architects went to the Sunbelt and other places for jobs," says architectural consultant Allen Boemer, AIA. Boemer expects Boston to maintain its peak level of building activity for at least another two years.

Similar to regional variations, a comparison of building projects shows a mixture of weak and strong types. A shift in emphasis in building types is occurring, even in healthy markets. Investors are changing their strategies as they evaluate commercial building vacancy rates and the concurrent rush to purchase housing brought on by relatively low interest rates.

Tax law revisions are partly responsible for the change in the mix of building types. Without large write-offs from accelerated depreciation and other tax advantages, commercial office space is looking less attractive to a growing number of developers. Compounding the problem is the overbuilding that has occurred in the commercial market in the last few years.

A study of "America's Office Needs: 1985-1995" by MIT's Center for Real Estate Development and Arthur Andersen & Co. concludes that over the next 10 years the national volume of office space construction put in place must be only 50 percent of that of the last 10 years if high vacancy rates—as high as 25 percent in some locations—are to be diminished. That means a drop of 650 million square feet of commercial space from the 1.3 billion built in the last decade.

The study finds that overbuilding was fueled by readily available capital, inflationary escalation in rents, active foreign investments, and favorable tax laws. At the same time, the baby boom work force was absorbing additional office space. But the surge has ended, and, as overall job growth slows, commercial vacancy rates grow.

Office construction in the Middle Atlantic region is the one exception. Baltimore, Washington, and New York can sustain a continued office boom for at least the next 10 years, according to the MIT report. However, other areas will have to cut back, way back. To remain viable, places like Phoenix, Los Angeles, San Francisco, San Diego, Dallas, Houston, Austin, Denver, and Miami will have to reduce construction of commercial space well below 50 percent of what was built the previous decade. Interestingly, construction activity has not only cycles but also pulses. Ten years ago the majority of residential and commercial building was found in the West and the Southwest. High energy prices brought jobs, people, and new buildings to these areas. At the same time, the high interest rates that accompanied expensive energy slowed building dramatically in the Northeast. When energy prices and interest rates fell, Northeastern cities started making up for lost time.

The need to put the brakes on office construction apparently has not yet been felt by a number of developers. Commercial buildings are still a fairly hefty component of the architectural design business this year, overall about 15 percent, with the activity for larger firms approaching 20 percent, according to AIA's study. If the forecasters are right, that will have to change.

The outlook for multifamily housing also appears dim, as it is subject to many of the same investment and tax factors as commercial space. Following the rush to begin construction of rental apartment buildings before the close of 1986, when the new tax regulations took effect, few multifamily housing projects are now on the boards.

From its peak of $24.9 billion in 1985, office construction

dropped 13 percent to $21.8 billion in 1986, and Dodge predicts that it will decline another 18 percent in 1987 and continue on down to a low of about $13 billion in 1989. Likewise, multifamily construction volume fell $2 billion last year from its 1985 peak of $32.6 billion and is expected to level off at about $25 billion for the next two years until most of the surplus vacant apartment space now on the market is eliminated.

According to the respondents to the AIA survey, about 9 percent of all their work during the next year will be in single-family housing. House design comprises the largest portion of work for small firms (about 30 percent for firms with one to four employees), although it is only a minor activity in the larger firms (less than 2 percent for firms with 20 or more employees).

House building has flourished over the last few years in an environment of falling interest rates. Real Estate Research Corp., in its report "Emerging Trends in Real Estate: 1987," says that since the pent-up demand for first-time buyers has been satisfied, move-up buyers are now the principal market force. That means larger, pricier houses are in demand. The surge in construction of bigger, more expensive houses is accompanied by an increase in remodeling and additions as many households refinance at lower interest rates, often increasing their mortgage and capturing some of their equity to finance substantial additions. In 1985, $80.3 billion was spent on residential remodeling, and in 1986, $86.9 billion. The U.S. Commerce Department says that figure continues to rise.

Jim McKellor, AIA, director of the MIT Center for Real Estate Development, says that while there will still be substantial business for architects in the next few years, it will not be business as usual. He predicts that close to half the design work in the coming decade will come from a combination of housing and the renovation of existing commercial space. As more existing properties are bought and sold, he expects all sorts of upgrades—changes to the skin, new lobbies, and substantial tenant work.

Overbuilding and tax reform may have slowed construction for most nonresidential building markets, but renovation plans are increasing steadily. For at least a couple of years, the volume of nonresidential modernization permits is expected to rise about 10 percent annually from its 1986 level of about $22 billion. This includes office, retail, and warehouse buildings.

The flood of new buildings that recently came on line has increased the competition for tenants in many cities, which means that owners of aging buildings are forced to renovate in order to hold on to their share of tenants. However, age is not the only factor. New prime urban sites are not readily available, and purchasing a building for renovation is much less expensive than knocking it down and starting from scratch. Although most tax breaks for real estate were reduced or eliminated, credits for rehabilitation of old commercial buildings survived. In addition, public interest in preserving architectural landmarks is high.

While new construction activity varies quite a bit by area, each of the four major regions reports strong increases in permits for commercial building renovation and modernization. The value of that work is expected to be $24 billion by year end, compared with $19 billion in 1985. Architects responding to the AIA survey say that building renovation work is approaching one-third of all their business activity.

McKellor advises architects to take a lesson from developers and look at the trends in real estate, targeting some specific markets to go after. For example, we are seeing a shift in the retail market away from large shopping malls. Currently, 75 percent of all retail construction value is concentrated in small local shopping centers. This trend goes hand-in-hand with strong housing development, which attracts stores and entertainment areas.

After years of little activity, institutional building is emerging as a strong source of business for the construction industry—schools, hospitals, and public administration buildings. Because the underlying need for schools and hospitals is geared to demographics, Dodge projects that the demand for them should continue to rise over the next decade as the population of school-age children and senior citizens grows faster than other sectors of the population. Just since the beginning of the 1980s, the value of institutional construction has grown 50 percent, from an annual amount of $20 billion to its current $30 billion.

The architecture firms responding to the AIA survey indicate that their institutional work is on the rise. In addition to the schools and health care facilities, funded mostly by state and local governments, federal spending for construction is increasing after nearly 20 years, with almost $2 billion earmarked for building design services next year. □

1987 DESIGN ACTIVITY OF AIA MEMBER FIRMS—PERCENT OF REVENUES

Project Type	CT MA ME NH RI VT	NJ NY PA	IL IN MI OH WI	IA KS MN MO ND NE SD	DC DE FL GA MD NC SC VA WV	AL KY MS TN	AR LA OK TX	AK ID MT OR WA WY	AZ CA CO HI NM NV UT
Single Family	21.08	20.22	12.14	8.49	18.40	10.68	16.96	19.87	25.47
Multi Family	21.43	9.60	8.12	11.73	7.04	4.77	5.37	6.48	8.56
Office	12.00	14.68	17.65	15.24	16.24	14.45	12.88	14.12	10.79
Interiors	2.79	11.31	7.17	8.01	6.68	2.70	10.81	4.04	7.54
Retail	7.68	9.36	8.94	11.34	10.02	7.80	9.43	9.22	8.56
Hotel/Restaurant	3.72	3.56	3.92	5.90	6.14	3.52	3.89	2.57	5.80
Education	7.83	7.52	11.71	12.43	9.24	10.13	10.91	12.55	6.12
Health	6.65	5.03	8.26	6.79	7.03	8.77	6.97	6.26	6.12
Justice	0.73	0.92	1.01	1.45	1.74	0.94	2.32	1.98	1.15
Industrial	4.45	6.42	10.19	6.45	6.31	5.46	5.25	7.99	6.98
Urban Design	1.12	1.83	1.13	1.19	1.78	3.64	2.37	1.24	2.82
Other	10.52	9.56	9.76	10.98	9.39	27.14	12.84	13.69	10.08

Courtesy of Gauthier, Guite, Roy, Quebec, Canada

Of Space Frames, Time, and Architecture

Their romantic history and evolving technology.
By Forrest Wilson

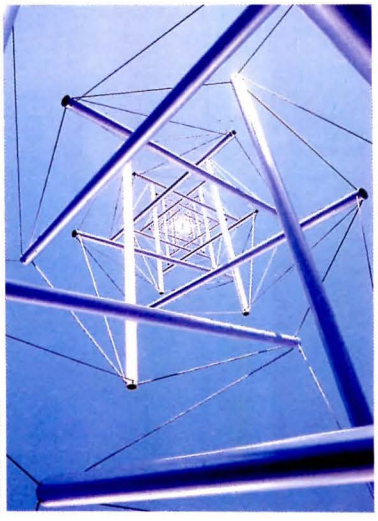
Is the space frame an idea whose time has come? There are more space frames planned for terrestrial and outer-space use today than during the heyday of modernism or the frantic conquest of space following the launching of Sputnik I. In a world where architects are said no longer to be enamored of structure, why are such exercises in structural virtuosity on the rise?

One reason, of course, is that the space frame is a romantic notion. Many of today's inventors and marketers are ingenious adventurers and imaginative dreamers: architects, engineers, industrial designers, and even a self-proclaimed space cowboy. Two decades ago the leading advocates of space structures were the best-educated and most affluent cultural dropouts the world had ever known. The commune builders of California, New Mexico, and Colorado dotted the countryside with ingenious arrays of inventive domes in weird configurations and unlikely materials. It was, some said, the expression of a truly American architecture worthy of the traditions of the New England house, balloon frame, grain silo, and steel-framed skyscraper.

The fascination with space structures has always transcended vocation and profession. One of the first and most successful of generally acknowledged and admired space structures was the work of a gardener named Joseph Paxton, a builder of greenhouses who also designed and built the Crystal Palace. Alexander Graham Bell flew space frame kites and built a 40-foot-high space-viewing tower to amuse his friends. In his spare time he invented the telephone. Konrad Wachsmann thought space frames merited his thoughtful, painstaking consideration, so he spanned 320 feet for the hell of it. Buckminster Fuller gave us geodesics, and the counterculture converted tensegrity into a religious experience, immortalized in the gospels *Domebook One* and *Domebook Two*. In the early 1970s, high school students, bearded physicists, and Hell's Angels used NASA computer printouts to establish chord factors to erect domes, which sometimes seemed like solar Casbahs on the rolling hills of California, the desert of New Mexico, and the high plains of Nevada.

Granted, space frame addicts, dropouts, and scientists are eccentric. But as the hippies of the '60s and '70s metamorphose into today's yuppies, space structures have become upwardly mobile. Instead of rounded domes for a tribal commune, Marine Corps barracks, or arctic radar, space structures now top urban atriums, casinos, jet airplanes, and gas digester tanks.

Still, though, even in our present prosaic world of historical patinas, the space frame carries the memory of mad genius, space cowboys, and what remains of risk-taking Icarus searching for a better brand of wax. What follows is a brief account of spaced-in, spaced-out, and outer-space structures.



Forrest Wilson

Sixty years ago, the Deutscher Werkbund exhibited the work of Mies van der Rohe, Le Corbusier, J.J.P. Oud, and others in the Weissenhof housing scheme. The designs were specifically proposed as rational fabrication methods for low-cost dwellings. But the works were distinguished mainly by their esthetic treatment of internal and external layouts and by their formally pleasing qualities of facade, roof, and fenestration.

As a foil for the modern movement, Buckminster Fuller worked on the evolution of an "energetic and synergetic geometry," from which evolved a series of "geodesic/tensegrity" structures. Fuller was searching for the maximal advantage in environmental-control structures through effective energy use. He used the term "energetic" to refer to individual parts of a system and "synergy" to define the way a whole system acts as more than the simple sum of its parts.

Fuller saw energy in structural systems polarized into push and pull, compression and tension. Historically, humankind's structures were dominated by great compressive strengths, mainly stone piled up in great mass. The tensile strength in natural fiber cords was used only in ships' rigging and guy ropes. In 1927, Fuller sought to separate compression and tension energy into their most advantageous forms. He designed relatively short compressive members and combined these with long cable tension members. He discovered the principle of discontinuous compression combined with continuous tension, employing each at maximal operational strength.

The space frame symbolized "optimization": it required less material than a linear system. A roof truss or a portal frame resists loads in one plane, but a dome—a typical space structure—cannot be analyzed as a plane system. It cheerfully resists loads from any direction applied at any point.

Facing page, space frame ghost, a tower of Gauthier, Guité, Roy's architectural memory of a vanished 19th-century blast furnace, being hoisted into place near Trois-Rivières, Quebec. Above, Ken Snelson's tensegrity sculpture in Bryant Park behind New York City's public library at Park Avenue and 42nd Street.

From theory to market

Architect Charles Attwood, who founded Unistrut Systems in 1942, began to practice about the same time Fuller was creating the Dymaxion house. Attwood saw the problem of modern architecture, practically, as one of getting more building for the client's dollar. More complex functions were being demanded of buildings; their uses were changing. If a building did not adapt it would become obsolete.

Buildings therefore should be constructed to be easily transformed with changeable parts that would be salvageable, Attwood believed. Demountable building systems were an answer. Since all building materials must be handled, their weight affects the cost of building. A demountable structure, easily changed, offers savings over the entire life of the building. And when the building is discarded the structure is easily disassembled for the parts to be reused. This makes it cheaper to use strong, durable, high-quality materials.

Attwood's system has often been described as an overgrown Meccano set because the parts can be so easily put together, taken down, and reassembled in seemingly endless combinations. The system was first used to support numerous kinds of electrical and mechanical equipment and for shelves and storage racks in factories, warehouses, and supermarkets. Unistrut Systems entered the space frame market in 1951. Its system was the "Model T" of space frames, but, unlike the car, the original Unistrut system continues to be the most popular system for short-span solutions.

It is a system of but four basic parts: a standard strut, a standard plate connector, and a nut and bolt. The strut is used interchangeably on the upper and lower planes and in the diagonal web of the roof trusses. Holes in the ends fit over lugs in the plate connectors. Erectors attach a single bolt and nut at each connection; nuts are identical and functions self-evident. Roof space trusses are put together in the field without measuring tapes, squares, plumb bobs, or levels.

Attwood had very little technical information available concerning the space frame stress distribution. Tests that he had conducted at the University of Michigan in 1952 confirmed that the space frame was unusually strong in proportion to its weight and that the entire structure acted as a single three-dimensional unit. A more extensive practical test of his theories came in 1957. At the request of the U.S. Department of Commerce, crates were packed with aluminum struts, steel connectors, and assorted other materials including colored Plexiglas, aluminum-faced plywood, prewired fluorescent lighting fixtures, and translucent plastic ceiling panels. The whole package was shipped to Utrecht in the Netherlands, where local workers erected a pavilion in four and one-half days. The pavilion was used as an exhibition for nine days and then dismantled in two and one-half days and shipped to Spain. Parts were added and a larger pavilion was erected in Barcelona. This building was used for about a month and then dismantled. Some of its parts were shipped to Salonika, Greece, for a trade fair and the remainder to Tunis, Tunisia, to be used as a television studio, a feature of the U.S. exhibit at the Tunisian Fair.

A quarter of a century ago the space frame was an exotic experiment. The builders of the U.S Pavilion at Montreal's Expo '67 were pioneers, although Buckminster Fuller had conceived the principles 40 years earlier. Today space frames are commonplace; no longer experiments designed in hopes of solving world housing needs, now they are covers for off-shore oil rigs, ships' radars, and NASA's proposed docking armatures in outer space. It is the latter use that takes them out of this world and begins a new chapter in the story of tensegrity initiated by Fuller in 1927.

Wendel Wendel, who calls himself the "space cowboy," has enthusiastically lassoed the problem of building in outer space. He sees outer space as the last frontier and space frames as a means of establishing himself as the first "land baron" on the moon. Wendel is an industrial engineer who entered the space structures industry about 15 years ago. The company he was associated with, Space Structures, has built space frames all over the world, including more than 100 for leading architects in North America. The company has taken the methods pioneered by Attwood and refined them for use in outer space, with the design objective of "one hand, no tools, no sharp edges."

Star Net is the division of Space Structures that contracts for the application of earth-based design and construction technology to construction in outer space. Its markets include space stations, military installations, free-flying platforms, antennas, telescopes, and tourism. Star Net designs, calculates, fabricates, finishes, and packages its structural networks, which are patented systems of struts and hubs for the erection of geometric forms.

Space Structures has a comprehensive computer-aided design system called SSCAD (Space Structures Computer-Aided Design) that facilitates structural design work. The initial structural network is generated through a computer keyboard. The computer calculates loads and stresses on the design's hubs and struts and performs structural analysis using the company's proprietary software. The program can be used for the linear analysis of any elastic, statically loaded, three-dimensional space truss.

The system selects the optimum strut size and weight for a given material. It determines the number of holes required in each hub as well as the angle of the holes and hole sizes. It then generates a bill of materials and costs, creates information to run computer-controlled milling machines, and produces color-coded drawings identifying the various strut members and their centers of gravity.

Star Net's first space-related contract was a feasibility study awarded by NASA's Langley Research Center in March 1985. The study confirmed the uses of the SSCAD system in developing the geometry, packaging size, cost-accounting method, and assembly plan of a 60-foot-diameter, deployable reflector antenna located in outer space.

The system that will be used as the modular framework for the main truss of the space station Power Tower consists of seven 15x15x15-foot modules, or bays, which can be expanded or reassembled using struts that can be replaced, relocated, and reused. The assembly has been tested in the McDonnell Douglas neutral buoyancy tank at Newport Beach, Calif.; and a one-quarter-size model of the seven bays is to be constructed.

The space station's present design calls for a 450-foot, hub-and-strut spine to which radar, telescopes, solar cells, and the crew's quarters will be attached. It is scheduled for construction in the mid-1990s at an estimated cost of $8 billion. NASA may make the hubs and struts from lightweight composites rather than metal. NASA also wants to develop robot assembly techniques in light of its estimate that astronaut labor would cost $50,000 an hour.

The space station Power Tower requires a different approach from those Space Structures previously used. The space station

is part of a new generation of outer-space design that emphasizes facilities rather than vehicles.

During the past 60 years the principles that Buckminster Fuller proposed in the Dymaxion house to solve the problems of world housing have been initiated, run through the industrial system into automated systems, and moved out of the world into space stations. Energy and synergy have been activated, but world housing problems have been relatively unaffected. Space frames create a fantasy of scientific and technological progress. They also evoke an image of "organic architecture" that dates from the time Joseph Paxton patterned his "ridge and furrow" glazing system for the Crystal Palace after the leaf structure of the royal water lily.

Space frames—the state of the art

The space frame may be defined as a three-dimensional structural system capable of load transfer through its network of interconnected members linked at nodal connection points. Tens of thousands of space frames have been constructed throughout the world, and the acceptance of this design medium has led to new applications. The commercial growth of space frames can be attributed to several factors: better understanding of the structural behavior of space frames through international conferences and publication of research and technical articles; introduction and widespread use of standard structural analysis computer programs and the availability of high-speed, low-cost computers; and proliferation of products in the marketplace offering the architect multiple choices of design media for projects requiring an atrium, a canopy, a large unobstructed floor space, a sloped glazing wall, a tower, a geometric form for identity, a skylight, or simply a decorative ceiling.

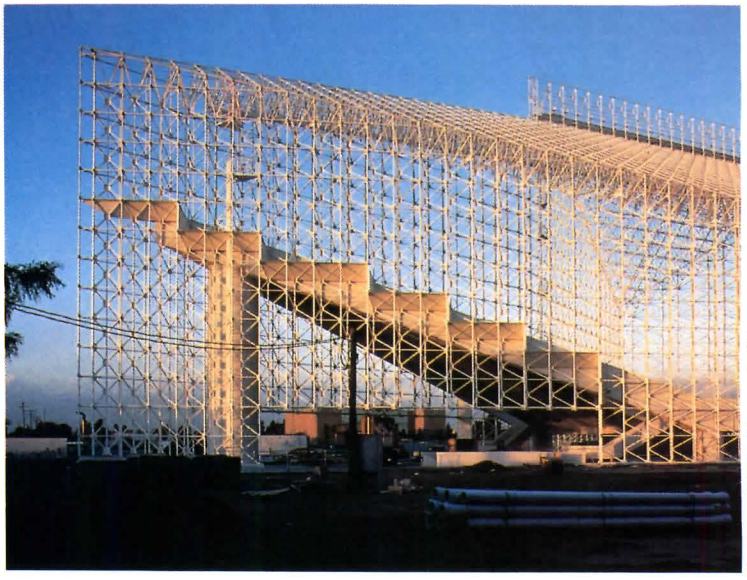
According to Bob Halverson, structural engineer with Skidmore, Owings & Merrill of New York City, there is a notable increase in proprietary space frame systems available. He also says space frames are a lot more affordable now.

Designing with space frames offers the architect almost unlimited freedom. Many choices are possible for the geometric shape and configuration, modular dimension, frame depth, support locations, node design, material finish, and price.

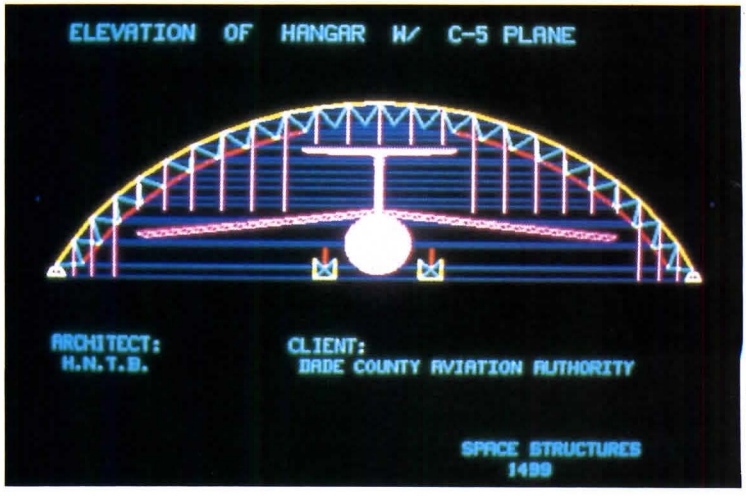
Halverson says, "Space frames are a wonderful way to span large distances with very light elements. They are light and lacy, a complex solution as opposed to the use of brute force. The first uses, several decades ago, were naturally flat planes, but now we are trying to adapt them to different conditions. In the Interfirst building in Dallas the geometry of the space truss matches the half-pyramid of the building. The Javits Convention Center [in New York City—see March, page 92], by contrast, has angles, turns, and twists. Space frames' best use is to enclose large volumes of space."

Space-frame "spanability" has been applied successfully in stores, shopping centers, and office complexes with spans of 30 feet to 100 feet. Longer spans for stadium roofs and airplane hangars also are practical with space frames, although the longer spans require particular care; an independent authority should review the work of the individual or company responsible for design, fabrication, and erection, and should inspect to ensure that the work performance meets the set standard.

Courtesy of John Burgee Architects

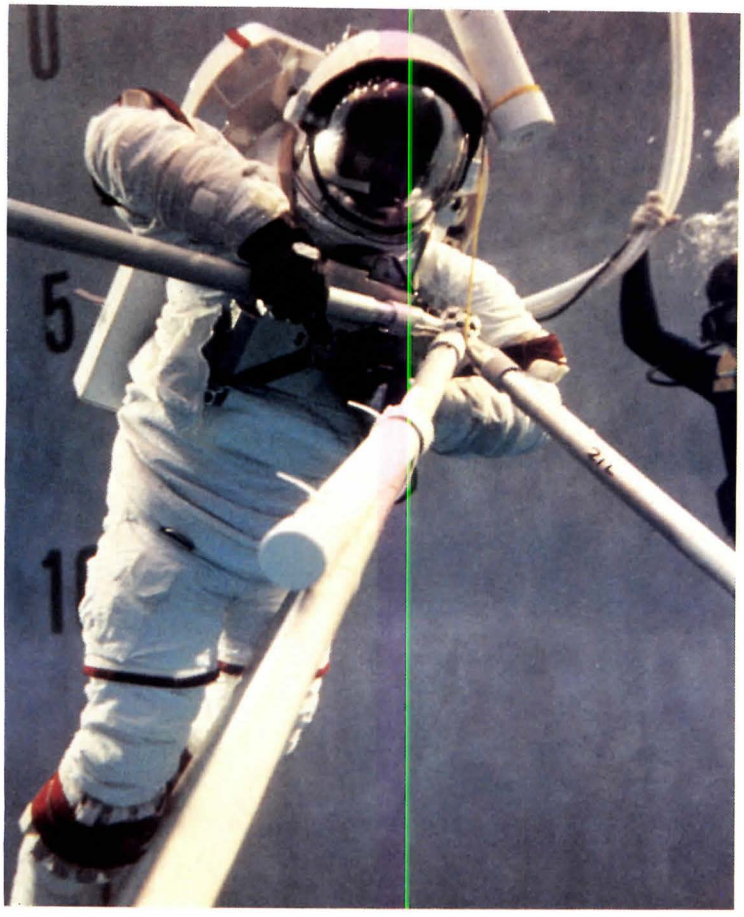


Courtesy of John Burgee Architects



Courtesy of Space Structures Inc.

Top and center, space frame outline of Johnson/Burgee's Crystal Cathedral under construction near Los Angeles in the late 1970s. Right, SSCAD drawing of plane and hangar.



Courtesy of Space Structures Inc.

Above, Wendel Wendel, the 'space cowboy,' assembles a space structure in McDonnell Douglas's underwater test facility.

Interfacing a "regular" building with a freestanding space frame, such as an entrance canopy, is also becoming popular. The connections are relatively simple. Standard roof deck or glazing systems may be installed on top of the space frame, with square or rectangular sections for the top chord. For a spherical node/round tube space-frame system, a purlin system is required to support the deck or skylight system. If the space frame is integrated with walls or glazing systems, the interface detail may be more complex. Careful study of these details, including full-size sections or mock-ups, may be required to help solve the interface problem to everyone's satisfaction.

When a space frame is viewed at a distance, the geometry and color will be the dominant characteristics of the design. Coming closer, one will notice the shape and size of the members, the finish, and perhaps the node design. Close-up, one will look at the connection details. John Loss, AIA, director of the Architectural and Engineering Performance Information Center (AEPIC) and professor of structural engineering at the University of Maryland, comments, "Space frames now appear to use smaller elements, with a finer texture. They are now down to the scale of human dimension. People relate better to that scale. And now they are visually textural and multifaceted, like jewels."

Today, the majority of applications specify square modules, though triangular, rectangular, and other geometric shapes are possible. For planning purposes, a space frame module can be thought of as a space grid. For example, modular dimensions of four, five, eight, and 10 feet are all possible choices for an 80x80-foot roof opening. The choice of grid dimensions may be determined by cost, interface, and span. In general, the larger the module for a given area, the lower the space frame unit cost because the joint, node, or connection cost is relatively fixed and there are fewer connections as the module size increases.

In space grids, the unit dimensions are dictated by many factors: the module height (span), member shape, building planning module, joint cost (the fewer the tributary feet to the joint, the more economical), ratio of bending stress to direct stress, and ratio of the horizontal spacing to the depth of the structure. Depth of a space frame also can vary to suit design, although a depth-to-module-size ratio in the range of 0.707 is considered optimal for the greatest structural efficiency.

Geometrically, the space grid can be visualized as a three-dimensional development of a flat, two-dimensional grid. The single-layer grid has only three polygons—the triangle, square, and hexagon—which allow a complete partitioning or filling of a plane. In dealing with space structures, we have to think of the unit cell as a three-dimensional unit-filling space. There are four types of relationships of top grid to bottom grid in double-layer grid geometries:

- Direct grids are two parallel grids similar in design, with one layer directly over the top of the other; thus both grids are directionally the same. Upper and lower grids are interconnected by bracing.
- Offset grids are two parallel grids similar in design with one grid offset from the other (in plan) but remaining directionally the same. The upper and lower grids are interconnected by bracing.
- Differential grids are two parallel grids that may be of different design and are therefore directionally different but are chosen to coordinate and form a regular pattern. Upper and lower grids are interconnected by bracing.
- Lattice grids have their upper and lower members braced to form a girder prior to erection; they generally are factory-fabricated assemblies. The upper and lower members are placed close together and, when joined by bracing, may be considered as a stiffened single-layer grid. In all other respects lattice grids are similar in appearance to direct grids.

Geodesic domes are space frames in the round. Their structure is formed by chords of a grid system of approximate great circle arcs on the surface of a sphere. A sphere is used as the shape for the structure because it encloses the greatest volume with the least surface area and doesn't rely on internal structure. The tetrahedron, the simplest polyhedron, encloses the least volume with the greatest surface area. The sphere is the strongest shape against internal and radial pressure; the tetrahedron against external and tangential pressure.

The grid for a geodesic dome is developed from a basic grid of spherical polyhedrons (polyhedrons projected onto a sphere). Regular polyhedrons are the best shapes from which to generate a grid because they have the greatest symmetry and regularity. Regular polyhedrons are formed when all face angles are equal, all edges are equal, all vertices are the same, all faces the same, and all dihedral angles are equal. A grid with polyhedrons composed of triangles works best because a triangle is the simplest polygon—the simplest subdivision of surface. An equilateral triangle is the simplest triangle, with all edges and angles equal; it is the only triangle regular enough to be a face of a regular polyhedron.

Structural behavior

Regarding the structural design of space frames, Loss says, "The change in space frames today from those 20 years ago is that now fewer of them are parallel cord. Their advantage is in acting like a two-way slab, but a linear as opposed to a solid system. There is more deflection control. And now architects understand them better."

Computer programs also have contributed to ease of space frame design. Matt Levy, a structural engineer with Weidlinger Associates in New York City, says, "The computer's virtue is that it makes it much easier to work with indeterminate structures. You do not have to use approximation, and that's a plus. The tendency is to optimize the structure by computer. On the minus side, you can only optimize for one set of loads, and there might be a set of conditions at the site that you did not consider. When doing space frame calculations by hand, you tend to be more conservative, and the design therefore has more built-in safety factors."

Because the space frame is a highly indeterminate structure with the ability to distribute concentrated loads evenly throughout the rest of the space grid, the buckling of a member under a concentrated load does not lead to the collapse of the entire structure.

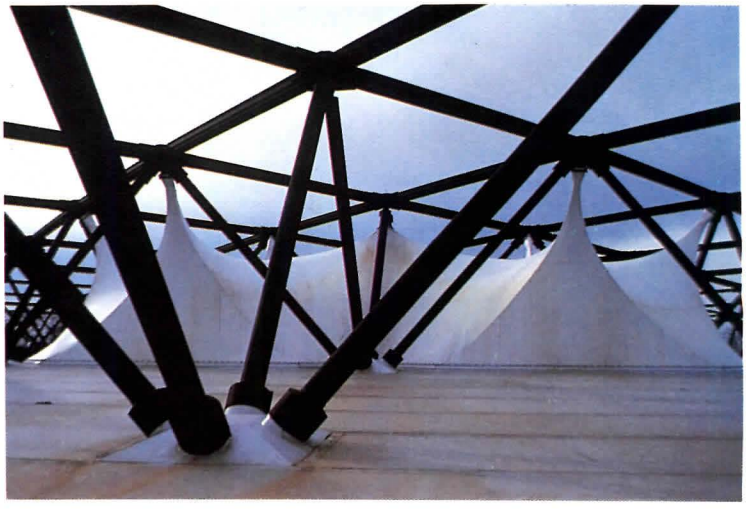
A space grid may behave as a grillage or as a slab. Offset and differential space grids, which behave as slabs, provide stiffness as pin-jointed systems whose members can be axially loaded with little bending, just as in a planar truss. The behavior of the space grid can be compared to that of a reinforced concrete slab, except that in the space grid the forces must follow the path provided by the members, instead of spreading as they would in a slab.

Offset and differential grid space frames can resist torsion or twisting movements through axial member loading alone; they are stiffer than the grillage type of space frame. Lattice and direct space grids function like grillages with top chords and bottom chords, with vertical and inclined web members contained in a plane normal to the flat roof or floor system.

No matter how many directions there are in such vertical trusses, the result is still a grillage of planar trusses and must be analyzed and designed accordingly. The actual force distribution of either type, slab or grillage, depends primarily on the nature of the supports.

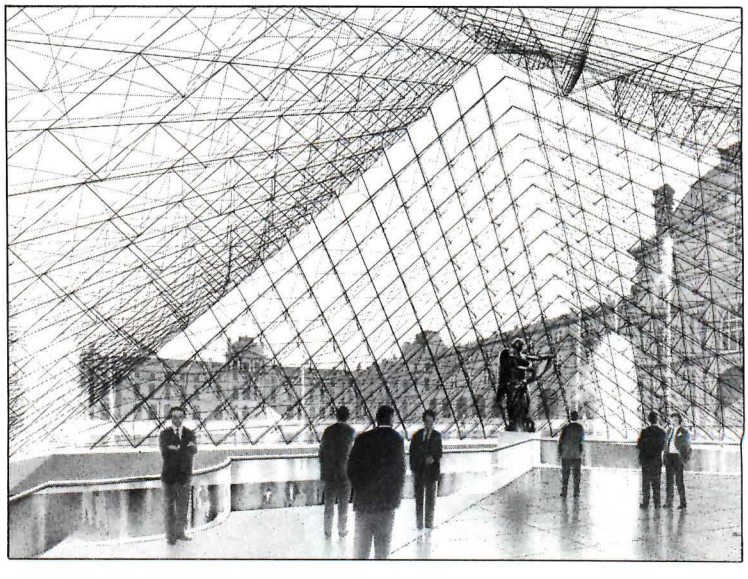
Space frame supports must be located at nodal points, either at the top (roof) or at the lower (ceiling) plane. Support locations may be randomly placed to suit the design of a layout. Support locations significantly affect the structural efficiency of the space grid, so that those systems with symmetry about two or three axes are preferred. Systems with cantilevers have less chord material and less overall material, but they do not change the size of web members. The transfer of loads from the space grid to the supporting structure can be achieved by making the structure continuous with the space grid or by placing a pin connection at the junction between the space grid and the vertical support. It is usually not necessary to make supports continuous with the space grid for the purpose of reducing deflections, because space grids are deep and many times stiffer than their vertical supports. The lateral loads can be resisted by vertical supports with fixed bases. The problem of support perimeter can be solved, regardless of continuity, by using shear-head-type connectors at the junction of the vertical support and the space grid.

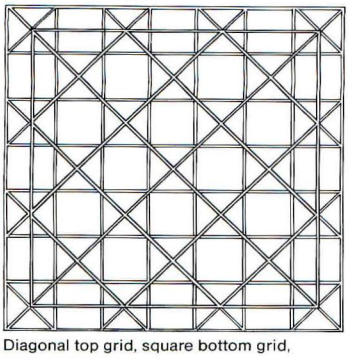
Courtesy of Mero Structures Inc.



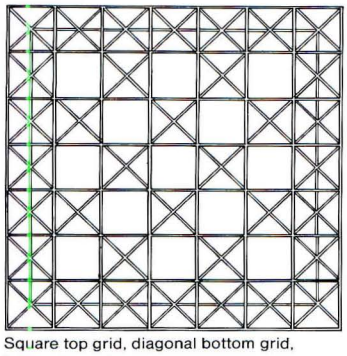
Courtesy of Mero Structures Inc.

Top, a nodal point. Above, fabric-covered atrium roof, Hyatt Regency Hotel, Burlington, Calif., by Hornberger, Worstell & Associates. Below, space frame glass pyramid tops I.M. Pei's Le Grand Louvre three-story underground addition.





Diagonal top grid, square bottom grid, internal openings



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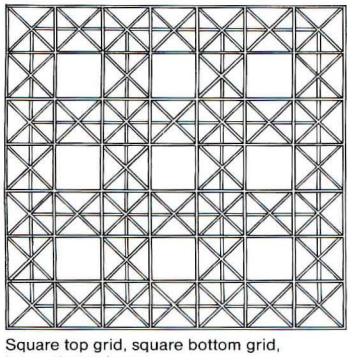
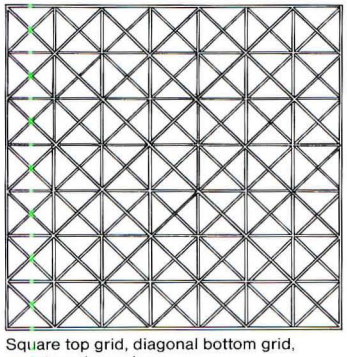
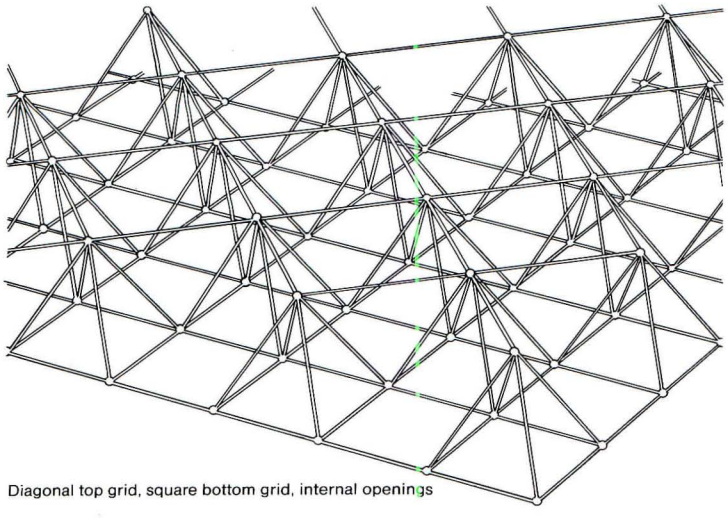


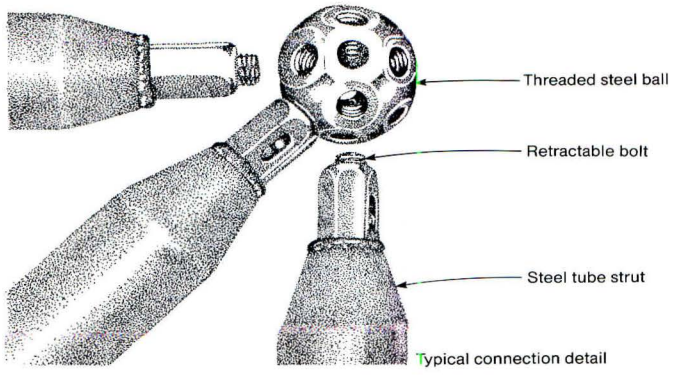
Square top grid, square bottom grid, internal openings



Square top grid, diagonal bottom grid, no internal openings



Diagonal top grid, square bottom grid, internal openings



Typical connection detail

Sun Chien Hsiao, an architect, engineer, and head of Unistrut Systems' space structure division, has grouped the various methods of forming the space frame nodal connections under seven general types:

- Connector plate—flat, dished, or bent plate with holes that match the adjoining members.
- Hollow section—spherical, hexagonal, or square box with holes that match the adjoining members.
- Hollow ring section—circular, hexagonal, or square ring section with holes that accept the adjoining members.
- Solid section—spherical or cubical section with tapped holes for bolted connection to the adjoining members.
- Extruded section—round section with slots or square section with tags to receive adjoining members.
- Members with ears, tags, or other devices for connection to adjoining members.
- Welded, gusseted fittings with holes that match adjoining members.

Space frame connectors and nodes are made from hot rolled steel sections, hot forging, cast steel, aluminum alloys, etc. Space frame members are made from steel or aluminum materials but in theory can be fabricated from any material that can meet the structural requirements. The joint fabrication, to be economical, must consider the type and size of the members, their geometric relationships, desired appearance, and connecting techniques (bolting, welding, or special connectors). Tubular members, structural tees, angles, and wide-flange members each imply a special connection discipline. For instance, the advantage of the welding connection is that it eliminates extra connection material and connection devices. On the other hand, bolted connections require joints that extend out of the members, increasing the connection cost.

Space frames come of age

Not only are space frames different today from what they were 20 years ago, but they also enclose a different kind of space. Most of the discussion then was about the possibilities of horizontal spanning. Today, space frames usually enclose or cap off atriums, especially in vertical buildings. Atriums may well have a significance for our time that gives us a hint of why space frames are important to us. From 1959 to 1984, buildings containing atriums won national AIA honor awards in 18 of the 25 years. As to why atrium buildings and their space frame crowns have been so universally accepted, Halverson offers an analogy: "An automobile magazine wrote an equation for beauty. It said types of cars that had a great deal of complexity but could be understood in a short period of time were found to be the most beautiful. Car designs that were complex but hard to understand or those that were very simple and easily understood were not considered as attractive. People thought things were beautiful when they were complex and repeated many times, and they could begin to understand them. I think that's also true about space frames."

In addition, space frames of today offer greater design flexibility. Hsiao says, "The first Unistrut system, now marketed as System No. 1 [the so-called Model T], would only span 30 or 40 feet and had a limited geometry. To make it do more things, more parts had to be added. But by then the 'Model T' no longer was economical, so one might as well buy a Camaro."

So far, space frames have a good safety record. "The per-

formance information center [AEPIC] has found no special problems with space frames in relation to building failures," Loss says. "However, the area in which I have reservations is with multistory atriums and the issue of fire. We presume that if we wash water down the glass it will dissipate the heat generated by the fire. But there are structural elements that are, perhaps, not considered."

Levy adds, "Space frames do not usually fail because they are so highly indeterminate. A joint may yield or a strut may crush, but there is a tremendous amount of redundancy." Levy also feels that space frames will continue to have a "big building" image. "Space frame applications most recently in the headlines were the Crystal Cathedral and Javits Center—generally the most visible space frames spanning the largest spaces. They create architectural images." He also thinks that the main reason the space frame did not make it as a device for housing is that it is not necessarily a cheap way of building. "The Javits Center [for which Weidlinger Associates acted as a structural engineer] was not the cheapest solution for that roof. Roof trusses and one-way joists would have been a lot more economical. The space frame solved other space problems as well as structuring space—the image is very appropriate. When a space frame gives you both structure and an architectural image for your money, it becomes economically competitive. But considered as structure alone, it is an expensive building system. Future development will be in the joints. The cost is there, and if more economical joints can be made, then space frames will become more competitively viable."

Finally, one must not underplay the importance of the computer for space frames. Loss says, "Space frames are infinitely dependent on calculations, and they could not be done with the facility that they are today without computers."

"We will probably see an increasing use of space structures generally—not just space frames, but fabric structures and other ingenious devices. Space frames will be used more frequently now that we are secure with the computer. Their use will be a function of learning the checks and balances for space frames."

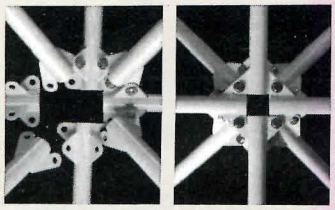
According to Peter Pearce, author and president of Pearce Structures in California, space structures are not so much an idea whose time has come as an idea that the times have finally begun to catch up with but still lag far behind. "What happened is, as our knowledge of space frames evolved, the avant-garde of the '50s, the guys now turning 50, my generation, are running the offices today. They had always thought that some day it would be nice to do a space frame, and now they feel comfortable with the idea," Pearce says. "There is something wholesome and all-American about space frames. The energy crisis made natural light in the center of the building popular. A sensitivity to the earth-sun geometry developed. The analytical tools for properly realizing calculations became available. NASA inspired the mathematical community to develop computer techniques and rigorous structural analysis.

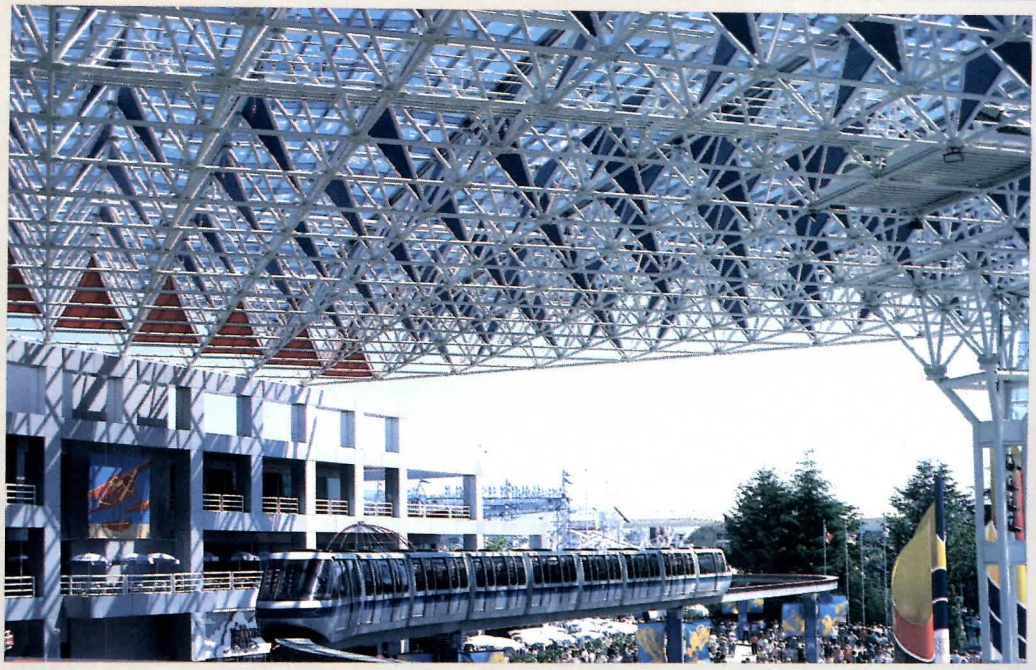
"The missed opportunities with space frames drive us slightly crazy," Pearce continues. "There are so many possibilities for architectural breakthroughs. All kinds of building forms and forces are now possible to analyze. An entire vocabulary of form language for the building arts can be generated. We are trying to address these possibilities here. That is really, ultimately, where it is going. We are only seeing the beginning." □

Renaissance Tower, under construction in Dallas. Space frame by Skidmore, Owings & Merrill will cover retail and food court.

Courtesy of Skidmore Owings and Merrill Architects

POST BEAM ARCHITECTURE





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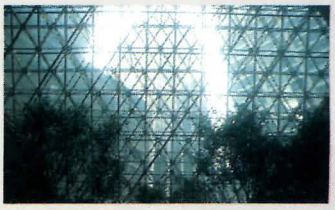

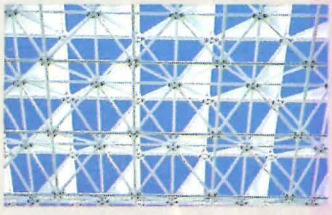

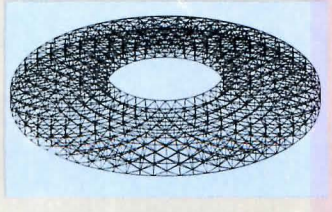

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The Expanding Scope of Liability

Some relatively recent areas of risk.
By Barry B. LePatner Esq.

Illustration by Brian McCall

As architects, engineers, and other design professionals have expanded their roles in the marketplace, they have created a host of new areas in which claims may be brought against them. As in most professions (including my own), the trend in the design profession toward specialization has created new roles for such specialists as computer room designers, lighting designers, and graphics designers, to name only a few. Along with this specialization, design professionals are required to cope with and make productive use of increasingly complex technologies. This has contributed markedly to the expanding scope of liability now facing the design professions.

The proliferation of design services has, of course, been generated by the increased demands of owners on their architects and engineers to provide a more comprehensive package of services. As these requests become more frequent, the performance of these services becomes a routine part of the designer's established repertoire. However, while the learning curve for these novel services is becoming shorter, the potential for liability rises geometrically.

Hence, the architect who designs numerous glass curtain wall buildings may easily see an opportunity to design specialized window-washing rigs to clean the unconventional shapes of the buildings. Unfortunately, if a problem with this new cleaning system occurs, whether it be an injured workman or deflections in the steel rails the rig runs on, lawyers are going to be asking a host of questions about prior experience and drawing inferences from the answers.

Unlikely as it may seem, a key area of emerging liability for design professionals is products liability. This has come about in two ways. The first arises quite naturally as architects, interior designers, and other professionals turn their hands to designing everything from furniture and tableware to wall coverings and carpeting. It is only a matter of time before those of us who represent the designers of these products see the inevitable lawsuits that confront every company that introduces consumer products into our nation's stream of commerce.

The second way in which products liability has imposed itself upon design professionals was, perhaps, less predictable and is certainly less welcome. Manufacturers are constantly developing and marketing new products. In most cases the moving force behind such product development is either new technology, lower cost, or both. Any savings, of course, accrue to the benefit of the project owner, not to the architect or engineer who may specify the product. Nevertheless, it has become increasingly likely that, when a new product fails, despite the best efforts of the manufacturer, the architect or engineer who specified the product will be either named or joined in the ensuing lawsuit along with the manufacturer. If a loss occurs, clearly someone must bear that loss, and owners and developers are not shy about seeking to shift a portion of the loss to their architect or engineer.

The legal issue, of course, is how thoroughly a design professional must investigate a new product or building system before either specifying its use in a project or recommending it to the client. What constitutes a reasonable investigation of a new product by a design professional has not yet been made clear by the courts. At a minimum, an architect or engineer should make a serious effort to obtain all available literature and test reports on a product. It may be prudent to interview prior users of the product to see what their experience has been. Needless to say, the design professional must bring his or her own experience to bear when considering the suitability of a new product.

Several years ago, I represented an architect in a series of cases involving a new roofing product. The product was not a great success since it had to be applied to the roof in liquid form, and then covered over while wet, with vents added to help it dry. The problem was it never dried; and the leaks in the building on sunny days didn't make sense.

Everyone involved in the project would be sued and, of course, the architect's defense was that he had specified a reputable manufacturer's product. Fortunately, I was the only one who, in private, asked my client if he had researched trade publications on this product before he recommended its use. He said no. I then found several articles discussing roofing failures resulting from this same product in the year before its use on my client's project. Had the attorneys for the other side asked the architect the question I did, we would have been in big trouble. That was 10 years ago. I have no illusions; the right questions would be asked today.

It is important to note that if a new product or building system should fail, the design professional may find that the consequential damage claims of third parties, such as tenants, owners of adjoining properties, and members of the public, may

Mr. LePatner is a partner in the New York City law firm of LePatner, Gainen & Block, which has acted as business and legal adviser to more than 250 design firms. He also is a professional affiliate of the New York City Chapter AIA.

far exceed the property damage claim of the owner. Even when an owner insists upon the use of a new or untried product and agrees to release the architect from any claims concerning that product, liability to third parties still poses a danger.

Architects who astutely suggest an indemnity and hold-harmless agreement in favor of the architect are correct, but a growing number of states now prohibit by statute the indemnifying of design professionals for their own negligence.

Perhaps the area of most serious potential concern to architects and engineers is that of indoor pollution. As our knowledge increases about the dangers to health that may be imposed by various forms of indoor pollution, the design professional will be held to an ever-increasing standard in guarding against health hazards to all building occupants.

Increasingly the press is reporting problems associated with radon, urea formaldehyde, particulates, and bacterial and fungal contamination. Preliminary scientific studies have begun to link various afflictions with mechanical systems that have been the industrywide standard for years. Just look at the statistics: the average American spends up to 20 hours per day indoors. According to the Consumer Federation of America, indoor air pollution is responsible for approximately 50 percent of the illness in the United States, costing $100 billion per year in medical expenses and lost productivity. Against this backdrop, an extremely serious potential liability for the design professional is obviously looming on the horizon.

In the last year, our firm has begun recommending to our architect and engineer clients that they urge owners to commit the resources necessary to protect against indoor pollution. Of course, owners and property managers are not always willing to bear the expense. For example, we have all seen on rooftops the cooling tanks and fans that serve the airconditioning systems that cool our buildings. Open to the air, especially in urban areas, these systems can harbor pollutants and infectious organic agents. The systems can be sealed and effectively filtered with highly efficient equipment now available. But this introduces a significant increase in cost that few owners are willing to bear.

We also have encouraged our clients (where appropriate) to go on record recommending the retention of an air-quality consultant to a project and recommending monitoring systems for indoor pollutants that are designed to function over the useful life of a building. Even if the building owner rejects such recommendations, they will serve the design professional well in the event a claim for damages resulting from indoor pollution or contamination is made.

Of course, the most dramatic example of a dangerous pollutant present in many occupied buildings is asbestos. The liability problems for architects and engineers that arise from the need to remove or encapsulate asbestos are particularly vexing because the overwhelming majority of design professionals have no specialized training or experience in this area. We should note that liability insurance for asbestos-related risks is generally unobtainable. Building owners are routinely refusing to indemnify or release their design professionals from asbestos-related liability.

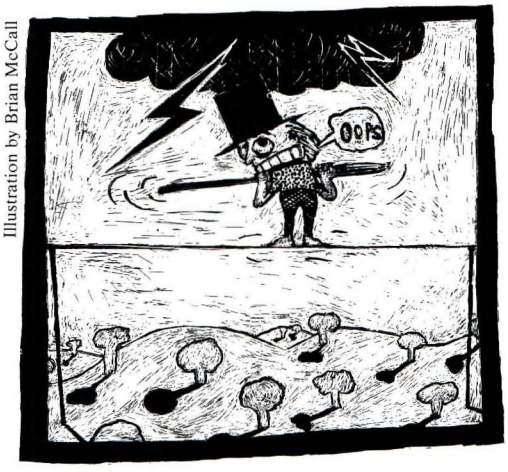


Illustration by Brian McCall

Moreover, rapidly advancing technology may one day render obsolete today's recommended procedures for dealing with asbestos.

Another emerging area of liability for design professionals, which also has developed from the aging of our national building stock, arises from building facade inspection laws such as New York's Local Law 10. More and more jurisdictions are requiring that buildings beyond a certain age and height have their exterior cladding inspected periodically by licensed architects or engineers for public safety reasons. From a public policy standpoint, these laws serve a salutory purpose. From the standpoint of the design professional asked to provide the inspections, there is very little to be gained from this type of work and potentially a great deal to be lost.

Typically, an architect or engineer receives only a nominal fee for an inspection report on a building facade. The fee, of course, is wholly out of proportion to the liability faced by the design professional should a piece of mortar fall off the building and onto an unsuspecting passerby. Without thorough analysis of the area immediately behind a facade, no design professional could confidently certify the structural integrity of the entire building.

Most inspection legislation also requires not only that the design professional call out dangerous conditions observed during the inspection, but also that the resulting report list recommended repairs. In effect, upon filing such a report the design professional inherently assumes the role of architect or engineer of record for a building's exterior with the full panoply of liabilities that follow such an "honor."

In much the same vein, architects increasingly are being required by their clients and by new forms of legislation to give certifications and issue reports that have the effect of creating a warranty or guarantee either that construction work is in compliance with the plans and specifications or that certain properties are worthy of development. For example, various states require that plans and prospectuses for condominium and cooperative apartments include an architect's or engineer's certificate that, on its face, has the design professional warranting things he or she could not possibly know. When problems subsequently have developed on a project, we have seen lenders, owners, tenants, and subsequent purchasers separately look to these certificates as the basis for advancing claims against the design team.

The liability a design professional faces for giving what later turns out to be an inaccurate cost estimate also has recently come to the fore. We have seen an increasing number of claims by owners and developers against architects and engineers for their failure to predict accurately the costs of construction. Moreover, the courts have exhibited little sympathy for the architect in these cases.

In litigation over cost estimates, some attorneys have advanced the contention that, where the lowest construction bid exceeds the design professional's cost estimate by 15 to 25 percent, this can constitute *prima facie* evidence of negligence on the part of the design professional. Compounding the problem is the fact that the typical malpractice policy excludes coverage for claims of inaccurate cost estimates. □

Amortizing the Cost Of CADD

Charge the client directly for its use?
By Elena Marcheso Moreno

Back when CADD equipment nearly filled a room and cost a small fortune, firms investing in it found what they thought was a relatively painless way to amortize its cost: bill clients for its use on an hourly basis.

Now these firms are finding themselves at a competitive disadvantage with respect to others that have more recently bought smaller, less expensive equipment and can thus charge less for its use. So today some firms are seeking alternative means of amortizing their early CADD investment.

One such firm is Heery Architects and Engineers of Atlanta, which found its billing rates for CADD fell once the low-cost sytems were readily available. To recoup the costs incurred when the firm obtained its system in 1983, Heery had been charging $45 per hour for the use of the machine, but after little more than a year had to lower the price. Now, however, the rates are starting to go back up, says Scott Braley, AIA, managing principal, and are based more on value than an approach to amortizing.

"Ours is an industry based on the recovering of costs," says Braley, "and it is also very price sensitive. The approach is, 'If I can charge less—for design time, for CADD time—I should be able to bring in more work.'" Now, for CADD at least, that concept is beginning to change.

Design firms are coming to realize that CADD is a valuable service, which means that even if CADD costs are recovered at $25 per hour the service has a much greater worth. "Clients are not buying software," Braley says. "They are buying my approach and expertise as a designer." Whether the designer uses a drawing board or a machine is irrelevant.

That philosophy is on the rise as more clients argue that with CADD a project can be designed in less time and consequently the clients ought to pay for less time. With negotiations resulting in fewer paid hours, value pricing will take over, predicts Braley, and will put CADD back into the range of $40 to $50 per hour.

As a medium-sized firm, Jenkins-Peer of Charlotte, N.C., decided to invest in a CADD system and expected to recover its costs within three years. Upon receipt of its CADD in 1985, the firm conducted a financial analysis at a variety of billing rates before it decided on $45 per hour, which was a little lower than the industry standard. Then when the PC-CADDs flooded the industry, Jenkins-Peer, like Heery, was forced to lower its billing rate to remain competitive. The rate has bottomed out at about $25, but the projected payback time has been lengthened considerably.

Brad Gianulis, head of Jenkins-Peer's computer operations, says the firm has been using the CADD mostly on spec office building projects. Because these tend to be jobs with tight budgets, the firm cannot charge as much for computer time as it would like.

Gianulis says that the firm's productivity has increased more than 100 percent for the portions of the projects where designers use CADD. If he had it to do over again, Gianulis says, he would have waited until the new 32-bit desktop CADD workstations were available. He thinks the new PCs are about as good as the system the firm now owns and believes that working on them would not affect overall productivity. And with these less expensive systems, billing rates would not be such a critical issue.

Gianulis also sees an increase in billing rates for CADD time appearing in the industry right now and agrees that value pricing is the way to go. A determination of value should be based on productivity gains, the cost of the person working, and the ability to provide more design. The potential profitability of CADD, regardless of its size, is based on its ability to speed production. Gianulis says that productivity is altered by the ease of data entry, the management of individual projects and personnel, the opportunity to write and customize software, and, perhaps most important, the option to use CADD only on projects where it can be effective.

Increased productivity and profits from CADD have contributed significantly to the rapid growth of the Toledo, Ohio, design firm SSOE. A CADD minicomputer was purchased in 1979 and—despite the fact that the original system is obsolete, that the hardware and equipment must be completely replaced every three years, and that the software needs continual updating—it has paid off handsomely, according to Arvind Shah, head of the firm's computer division.

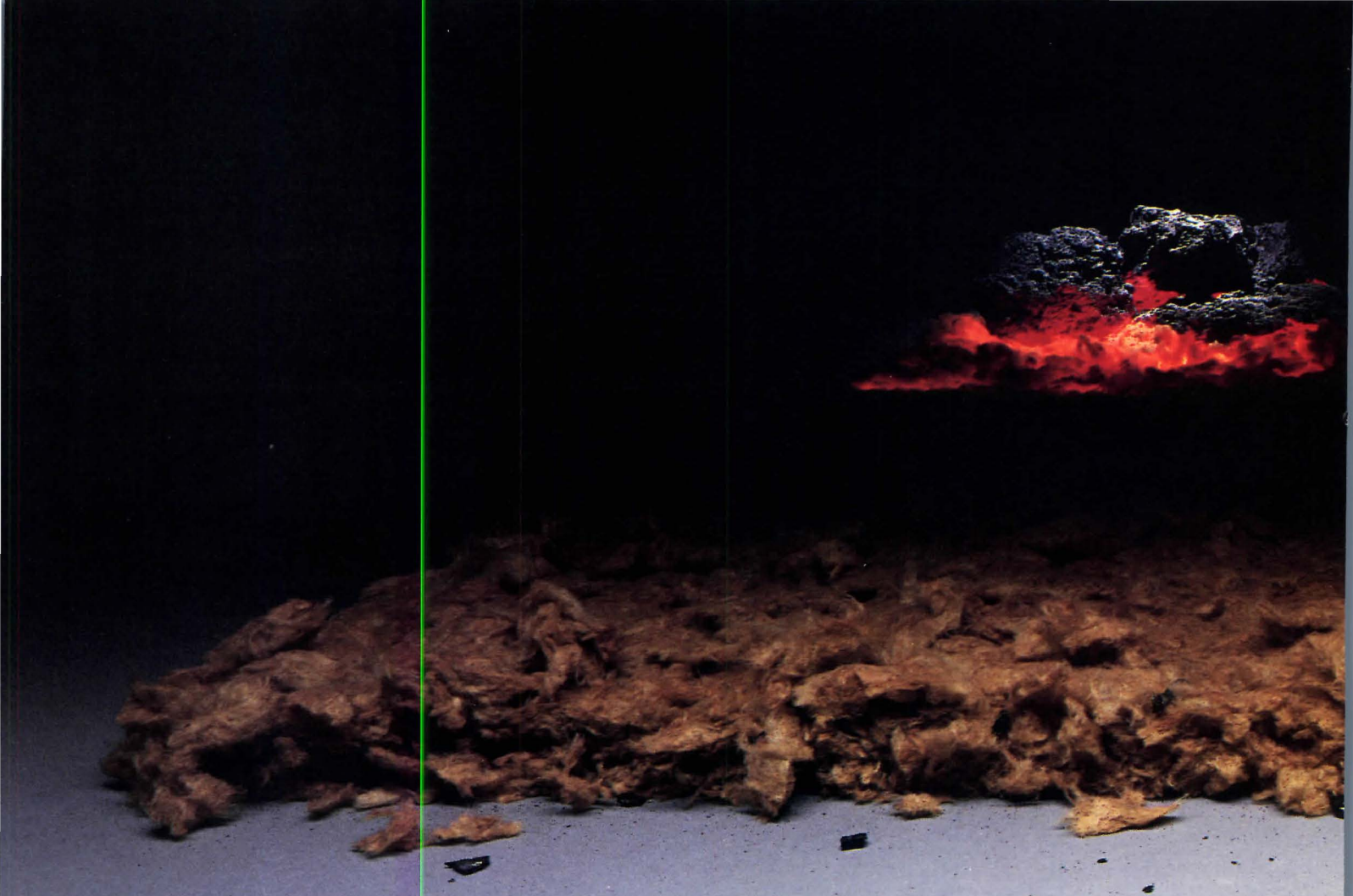
Since 1979 the firm's size has grown about 25 percent to its present 280 employees. In the same period, the use of CADD has grown 600 percent.

Shah says the CADD system helps them bring in more work, and almost everything is done by computer. Projects that used to take the firm six to eight months to complete now take two months. As a result, the firm is rapidly recovering its equipment and software expenses. Shah says that SSOE's next CADD purchase will be in 1988, and in his estimate the machines will be paid off long before their third-year retirement.

Shah says he prices CADD time according to the job, depending on how many terminals are needed and thus cannot be used for another job, the cost of the designers' time, and a number of other factors. Whenever possible, SSOE negotiates a fixed-fee contract. That way the value of CADD, rather than the hours of its use, can be charged.

Frank Stasiowski, editor of Professional Services Management Journal, believes that trying to pay off a CADD system by billing it out at an hourly rate is a mistake. The whole concept of CADD is to reduce the hours spent on design and production, he says. CADD should be looked at as just another design tool, which implies, according to Stasiowski, that use of the computer should be an integral part of the design process used by the whole firm, not only a distinct group of CADD operators.

The average price for CADD reimbursables has dropped from $67 per hour in 1985 to $25 per hour in 1987. Firms with the large systems cannot pay for their computers at these prices. On top of that, says Stasiowski, productivity has risen to a point where a sheet is completed in 11 hours, versus 40 for manual execution. The answer is not to avoid using CADD but instead to charge for the value of the work, and the best way to do that is by lump-sum, or fixed-price, fees. □



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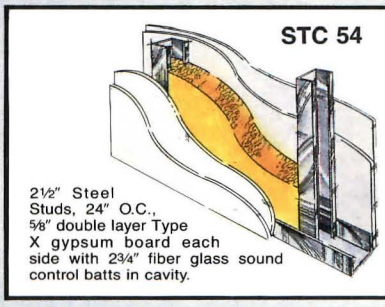

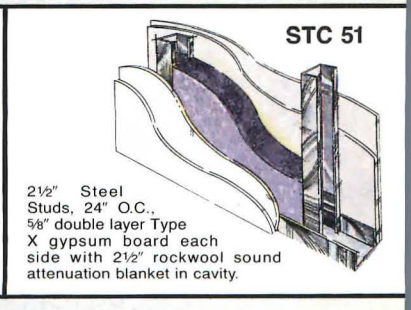

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Manville Sound Control Batts effectively reduce sound transmission through steel stud wall constructions. In the examples shown above, fiber glass batts offer equal or even improved STC ratings even though the density of the rockwool is significantly more.

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Specifying a Ceramic Tile System

Last fall, the entryway steps in front of my apartment building were freshly paved with ceramic tile. During the winter, water seeped in, froze, expanded, and forced some of the facing tile off one of the risers. It didn't take long for the neighborhood kids to discover the loose tile. By "popping a wheelie" up to the step and crashing down hard with the front wheels of their bikes, they broke off more and more tile.

The miniature Evel Knievels aggravated the problem, but the water had seeped in in the first place because a nosing hadn't been installed. The entryway tile were simply lapped over the top edges of the riser tile, and thus were provided no strength or support at a critical point. Additionally, these thin tile, even though they were set in a thick bed of mortar, were asked to do the job of thicker, heavier tile. Both the tile and the mortar worked fine on their own; the problem was that the entryway paving wasn't designed as a system.

A properly specified tile system works best as an integration of proper substrate, mortar bed, tile type, and grout. The architect should begin the process of selecting an integrated tile system by asking several basic questions:

- Is the intended location of the installation indoors or outdoors? Indoor installations often needn't be slip- and frost-resistant, whereas outdoor tile usually needs to be.
- What are the expected traffic patterns? These should include more than just the number and route of people and vehicles. It's important for the architect to consider the expected load and its distribution and to look carefully at areas where high impact is expected.
- Will the building occupancy present any special considerations that the architect needs to address? Hospitals, labs, and commercial kitchens require tile systems that cater to their particular needs. For example, a tile system using an organic adhesive is often adequate for residential kitchens but will come apart in a commercial kitchen because it is not designed to resist the heat, moisture, and cleaning solvents used in commercial kitchens.
- What is the maintenance schedule for the application? Not all tile are created equal, and some are easier to maintain than others. The architect should consult the tile manufacturer about maintenance of the particular tile system under consideration and, if possible, visit a site where that type of tile has been in service for several years.

Floors and walls as substrates

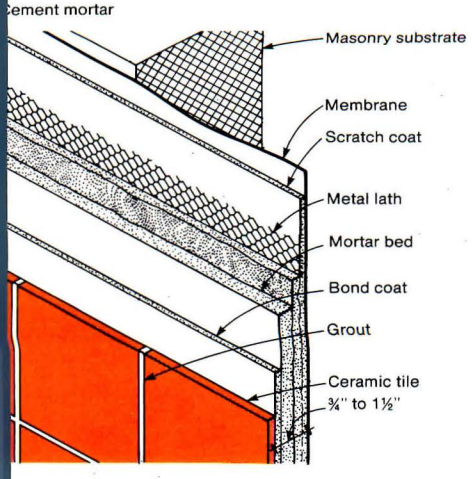
The type of substrate, along with its physical and structural condition, has a lot to do with the selection of a tile system. The architect should look carefully at the existing structure, the stiffness of the structure, and the surface condition of the substrate.

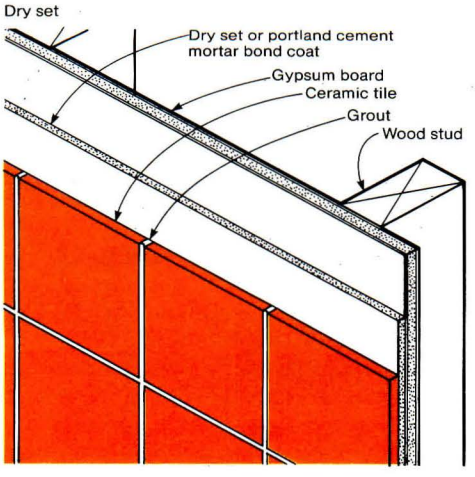
Structural loading may be the determining factor in choosing the depth of the mortar bed, which can vary from ¾ to 1¼ inches in thickness. Careful analysis of the structure will help avoid excess deflection caused by too heavy a tile flooring system.

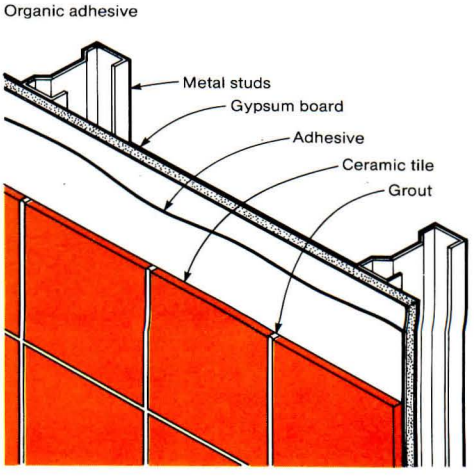
In most cases, thick-bed installations are preferred where no limitations are imposed by the structure, because they allow for accurately sloped or level finished surfaces. Thick-bed installations are especially welcome when the substrate has defects or isn't quite level. In existing buildings, however, the architect must be especially careful that the structure accommodates the additional loading imposed by the tile and a mortar bed.

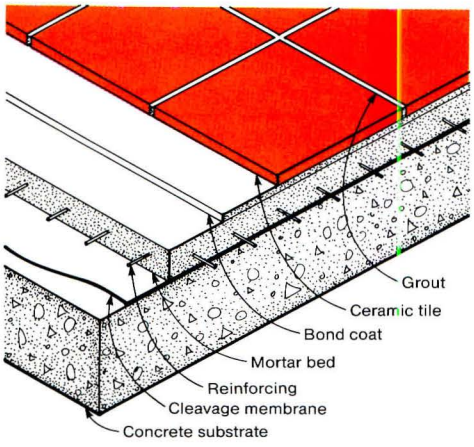
Floor stiffness is another important consideration, especially when the structure is wood or a long-span steel joist system. The flexural movement of the structural systems may govern the selection of materials and size of tile, along with the location and number of control joints and expansion joints. Small tile, up to four inches square, can be ideal when set over a flexible floor, but larger tile may crack when the floor flexes.

If large tile are specified over a flexible floor, they should be laid over a thick bed

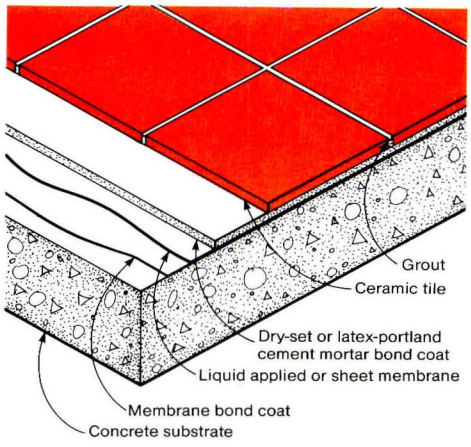




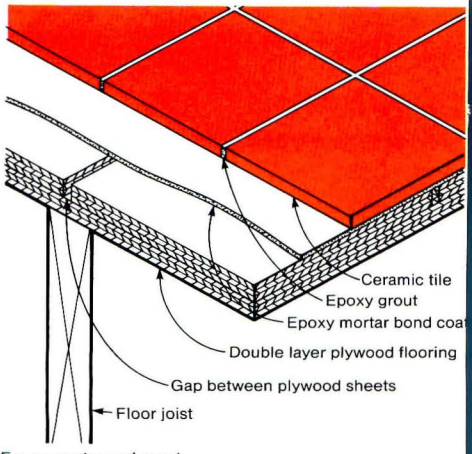




Cement mortar



Thin set



Epoxy mortar and grout

of mortar that has been installed with a cleavage membrane between the mortar and the substrate. Another alternative is to use a flexible grout. If control joints are located at regular intervals, (approximately every 400 to 600 square feet) the floor is able to flex without cracking the tile.

Surface conditions of the substrate also will greatly affect the finish of the tile. In fact, the most frequent cause of failures and resulting maintenance problems is poorly prepared substrates. The architect should inspect the substrate for any extensive or running cracks that could eventually work through to the tile surface. Additionally, the contractor should be required to patch the substrate surface before installation of the tile floor. Loose cement should be patched and the surface cleaned and cleared of any contaminants. Existing painted plaster should be scarified so that moisture can pass the paint film to provide a proper bonding surface for the tile. In order to get a true surface in existing buildings, it may be necessary for the contractor to remove the badly damaged existing substrate and replace it with water-resistant gypsum board.

When walls serve as the substrate, the architect must consider not only structural loading, stiffness, and the surface conditions, but also the structure on which the wall rests. Non-load-bearing walls may be unable to accommodate the additional weight of some tile systems. An eight-foot wall finished with a thick-bed mortar and tile system adds 150 pounds per linear foot, while the same wall using a thin-set tile system adds about 40 pounds per linear foot. Even if the non-load-bearing wall is engineered to support the weight of a thick-bed system, the architect should carefully check its location relative to the structure in the floor below. Extra supports under tiled walls may be required to prevent the wall from sagging, cracking, or developing joint problems.

Mortar application

Application of the mortar bed over the substrate is the next step in the construction sequence. Portland cement mortar is applied ¾-inch to 1-inch thick on walls, and ¾-inch to 1¼-inch thick over floors, making it useful for leveling or sloping existing substrates. For wall installations, portland cement mortar is applied, usually over a membrane, and finished in the same way that plaster is—a metal lath is firmly attached to the substrate, and a scratch coat and a bond coat are then applied. For floor installations, portland cement mortar can be reinforced.

For dry-set mortar installations, the substrate must be plumb and true because the mortar bed can be as thin as 3/32 inch. Latex/portland cement mortars have many of the same properties as dry-set mortars and offer the additional benefit of water resistance. The major drawback of latex/portland cement mortars is that after installation they require a dry-out time—usually 14 to 60 days, depending on climate.

Epoxy mortars offer chemical resistance, high bond strength, and impact resistance. Modified epoxy emulsion mortars, on the other hand, are recommended for light-duty or residential use. They're not particularly resistant to chemicals, but they tend to shrink less than most other mortars.

While epoxy mortars combine a portland cement and silica with a resin and hardener, epoxy adhesives are a combination of resin and hardener only. Epoxy adhesives are thin-set and provide a high bond strength system. The bond strength of organic adhesives varies greatly depending on the manufacturer. Both epoxy and organic adhesives are recommended for residential construction only.

Furan mortars do well in high-impact and heavy-use commercial applications. They are particularly useful in areas where chemical resistance is required, and they can be applied over a variety of substrates including steel plate and existing ceramic tile.

Grouting the tile

Grout fills the joints between the tile, helping to bond them together to produce a continuous flooring. The grout should be selected and specified in conjunction with the mortar and by the same criteria. Like the mortar, grout is either portland cement-based or based on epoxies, furan or silicone. Portland cement-based grouts often require that the installation be kept wet for days—a process called "damp curing." Epoxies, furan grouts, mastics, and silicone grouts, on the other hand, require no damp curing, have a high bond strength and are resistant to chemicals.

Joint size varies according to the type of installation, tile, and grout. The architect should consult the manufacturer's literature before specifying joint size.

Further information concerning tile and its installation can be obtained from the Tile Council Of America Inc., P.O. Box 326, Princeton, N.J. 08542-0326.

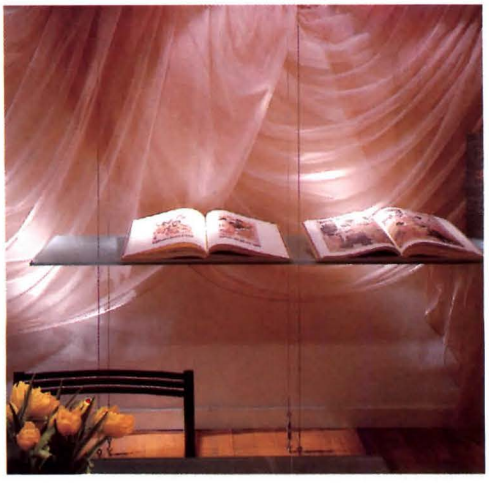
—Timothy B. McDonald

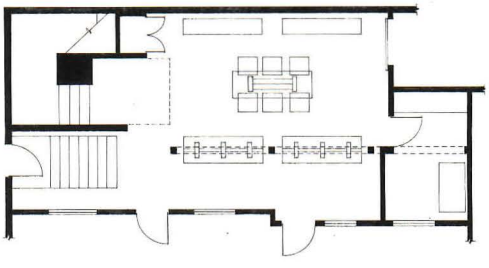
Interiors

At Viz Communications, what you see is not what you get. As agents for Japan's largest publishers, Viz displays in its showroom a line of limited-edition, slipcased, glossy art books that sell in the range of $200-$300. Seated in this elegant setting, buyers watch a TV monitor showing animated comics translated into English; the actual work of purchasing the product goes on in the back room. In Japan, as long as you display something of quality you have respectability in the marketplace, however you might make your bread and butter.

With only a $13,000 budget—too small even to be called modest—Jay Adams, a young, San Francisco-based designer who studied architecture at the University of Virginia, created a background befitting the books. His strategy was to draw on a simple palette of materials—all selected to contrast with the already refinished wood floors and wood-beam ceiling of the space—combined with some unusual detailing to achieve the desired effect.

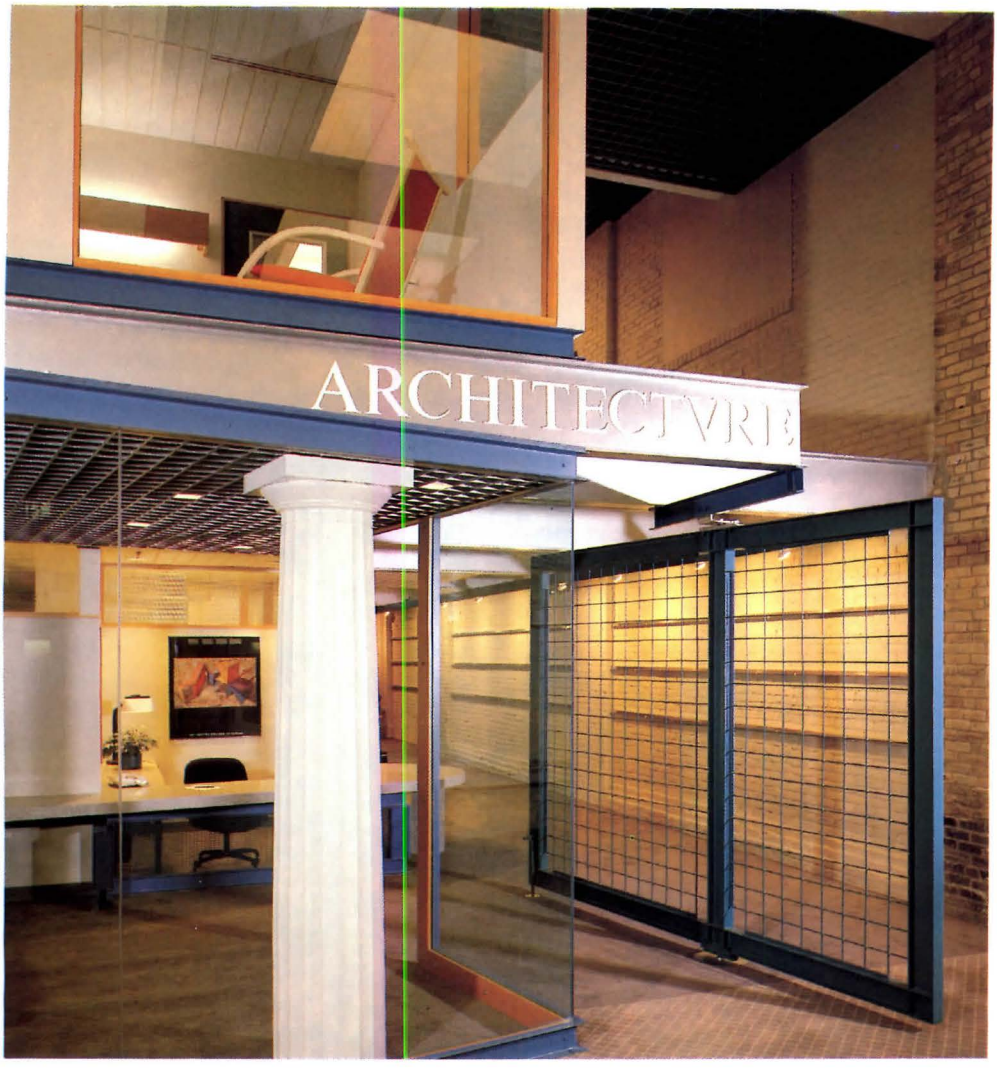
Sandblasted glass shelves are suspended on 1/16-inch steel cable with a copper crimp to hold them in position. The same glass is used for the tabletop, as well as for another set of shelves, and both are held up by cast concrete dyed yellow. Adams conceived and fabricated the tabletop and shelves for this installation.





The lighting is a low-voltage system of copper wire held under tension by a turnbuckle with MR-16 bulbs clipped on in any location. The company logo, a concrete circle with copper inlay, is lit by a green fluorescent fixture, another of Adams's inventions. In contrast to the glass and concrete, the soft folds of the 10-foot-wide fabric appear like a classical backdrop for open pages of the books floating in the suspended shelves.

An admirer of contemporary Japanese interiors, Adams has blended the best of both Oriental and Western craftsmanship. Working with such a limited budget and such rigorous esthetic ideals, Adams had to act as general contractor as well as designer to realize his ideas. By fabricating most of the fixtures and furniture, he made sure that, in the end, what he saw was what he got.—Sharon Lee Ryder



The sign on the front facade says "Architecture." Rendered in large Roman capital letters across the steel beam, the word is visually reinforced by a white Doric column, lest a passerby mistake the space for one of the furniture showrooms in the same building. Although both symbols convey a precise meaning about what you see, neither tells you what the space actually is: the offices of the Minneapolis Society/American Institute of Architects.

It is no simple problem to design an AIA chapter headquarters. When calls for entries went out to almost 200 member firms, only 12 responded with proposals. Clearly, the majority had the same reaction: Who needed 199 critics? Five firms were interviewed, and from that short list the team of Ralph Rapson & Associates and the Stageberg Partners was chosen for a collaborative design. The two firms had collaborated on several projects in recent years. "It keeps us all honest," says Bill Beyer, AIA, project architect for the Stageberg Partners.

The space available at the Minneapolis Market Square, a privately developed and recently opened design center, was well suited to the chapter's objectives. It was located near the entrance, so all pedestrian movement into the main atrium and other showrooms had to pass by the MS/AIA offices, virtually ensuring that "Architecture" would become a much talked-about word. But the major asset of the space was its two-story height—the only one in the entire complex of turn-of-the-century warehouses that make up this development. There was, in fact, no space there at all before MS/AIA signed the lease. Its offices are the former loading docks, an outdoor space between two of the buildings, one facade of which is still visible in the gallery. Says Beyer of the scheme, "It was a little like a condo site—two parallel walls with a front door and a back door at either end."

Functionally, the program wasn't large enough to be very complex, but the limited amount of space and the demands of the MS/AIA staff made for a tight and compact solution. As they were moving from a mansion in a residential area of the city, where many were housed in a ballroom, the staff wanted privacy for individuals working separately and independently. At the same time, the chapter wanted a space that would invite people in and could house public functions and exhibitions as well.

With only 3,000 square feet available in an area 28 feet wide and 75 feet deep, the architects organized the space in a straightforward manner: they devoted almost half to a circulation/gallery/public area along one side and stacked two stories of offices, conference rooms, storage, and workroom along the other. Although many of the offices are internal, there is a sense of spaciousness and natural light throughout—a feat accomplished simply by the use of interior windows, which maintain maximum privacy while permitting natural light to flow from the skylight in the circulation spaces into the smaller offices. The design also has enough inherent visual interest to occupy the eye: contrasting window trim and neon arches add to the textural play of the surfaces, making any lack of daylight less apparent.

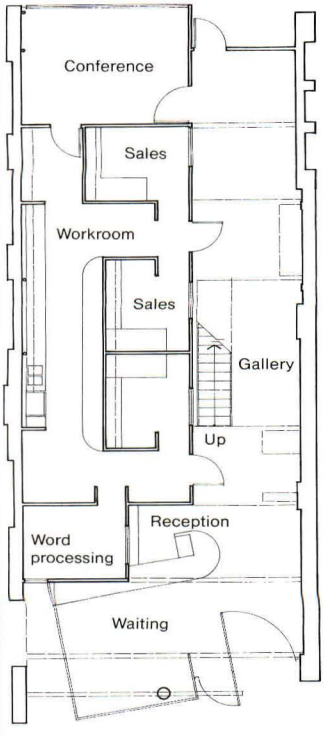
The constraints of the "site" and the program yielded an esthetic result that implies an entire building rather than just an interior. Its facade is almost transparent with the single exception of a white cube enclosing the director's office. The gallery/circulation space becomes an extension of the building's own public spaces, inviting the public in. A steel mesh gate, drawn only at night, is the only barrier.

Paramount in the minds of both client and architects was the dilemma of style—not too trendy, not too overstated, not too Miesian, not too postmodern, not too far out, not too restrained. The result was not too anything, but a homogenous blend of materials (literally—some were donated by local suppliers and contractors) and esthetic influences that produced a highly original design.

The new steel beams spanning the space and supporting the new second story are the major esthetic element from which all other materials consistently take their cue—an industrial pipe railing and metal ceiling grid set off by plush carpet and softly colored paint. What is surprising about the design of the space is that it is not of a style predictable from either architecture firm, but it is clearly the product of a good collaboration. Although partner James Stageberg, FAIA, refuses to give the style a label, this design can definitely be called "Architecture."

—Sharon Lee Ryder


ARCHITECTVRE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University of Virginia *from page 47*

precious for the principle, deals with issues in their complexity and wholeness, and has as much to do with development as restoration. "Preservation is essentially a form of urbanism, not a branch of architectural history; it means *doing* something and looking ahead—not putting chains and locks on intentions."

This past semester, the school embarked on a project with Strasburg, a historic northern Virginia town seeking to establish its identity, preserve values, and control growing development pressures. The project's several components included a study by the Main Street program of the National Trust for Historic Preservation (a program Valmarana considers excessively narrow). Within the school, an undergraduate studio and a graduate studio worked on design proposals for the downtown and outlying areas, into which development would move. The graduate students developed exemplary projects for the outlying sites, ranging from crafts villages to city halls, hotels, schools, and housing. Preservation was introduced in the studio as a set of values—a way to consider architectural history in the process of designing, and a means for evaluating a town and understanding the role of places and buildings. In this sense, the studio used preservation as an element of urbanism.

Academic freedom is an important concept at Jefferson's university, but the architecture school does exhibit a decisive attitude about teaching design. While there are exceptions, the school is remarkable, sometimes to a fault, for its consistency, coherence, and definition. Students and faculty talk about the coherence as something positive; people know what they are doing. But there are hints of unrest around the edges.

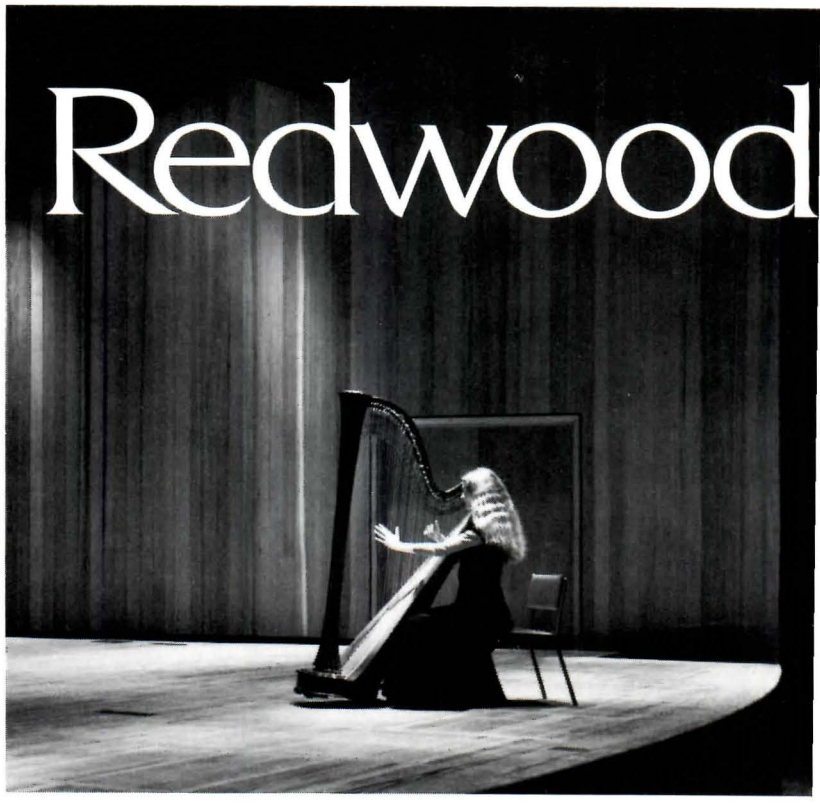
Students are aware that they know a lot more about Roman and Palladian architecture than about Frank Gehry's; the school talks about one set of issues while the professional journals show others. A second-year student had already picked up that, if you want to learn about free plans, you'll probably have to do it on your own.

The faculty are themselves being critical to make sure the school does not become smug. And sometimes an outsider's comment can give pause. At a recent jury, architect Julie Eisenberg protested, "There seems to be a bias toward designing buildings that are typologically correct, and I don't buy it. It's not always an architect's job to be liked. People only like what they already know."

A young faculty member worries that there is too much "flaccid classicism" showing up around the third year. Meder seeks more poetic concepts of composition—"the green silence of fields, not the silence of green fields." He is concerned that students are too constrained in their explorations and too accepting of the conventional wisdom. He challenges the idea that the four disciplines should work together. "Look at the great urban spaces," he says. "They were not done by committee. There was a person with an idea so cogent that people must have it, must *do* it." His assertions offer challenges for debate.

Valmarana says, "It is time to take off the dirty shirt and put on some new clothes. We should look ahead and try to *be* ahead—not always following. I tell my colleagues this. We may be too complacent. This is why I push forward this urbanism."

There is growing consensus that the school needs to look critically within, but whether it should change very much is less clear. Not every architecture school need be like all the others, and this is a model of one alternative, with history on its side. □



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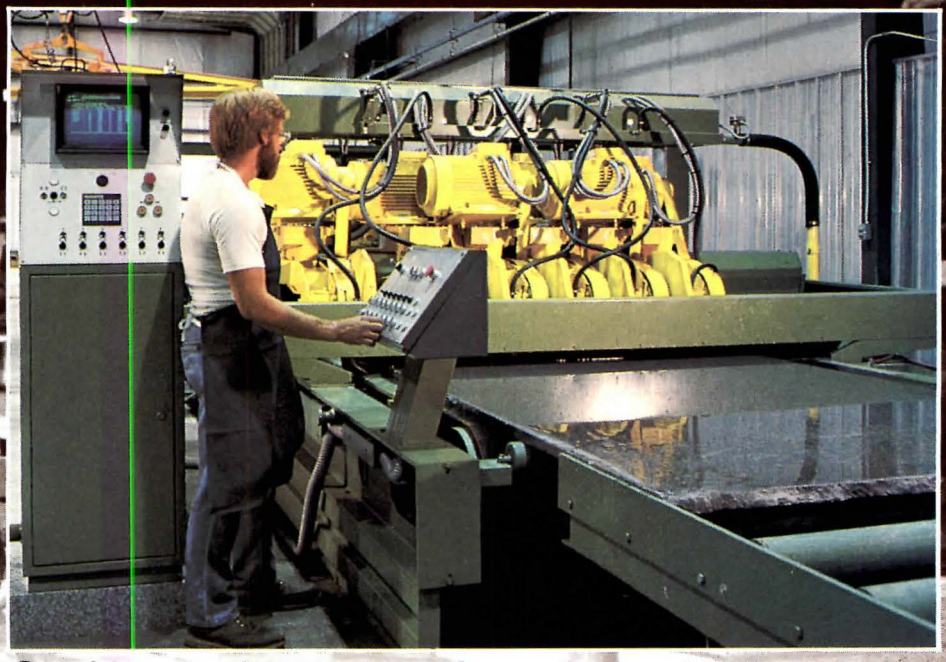

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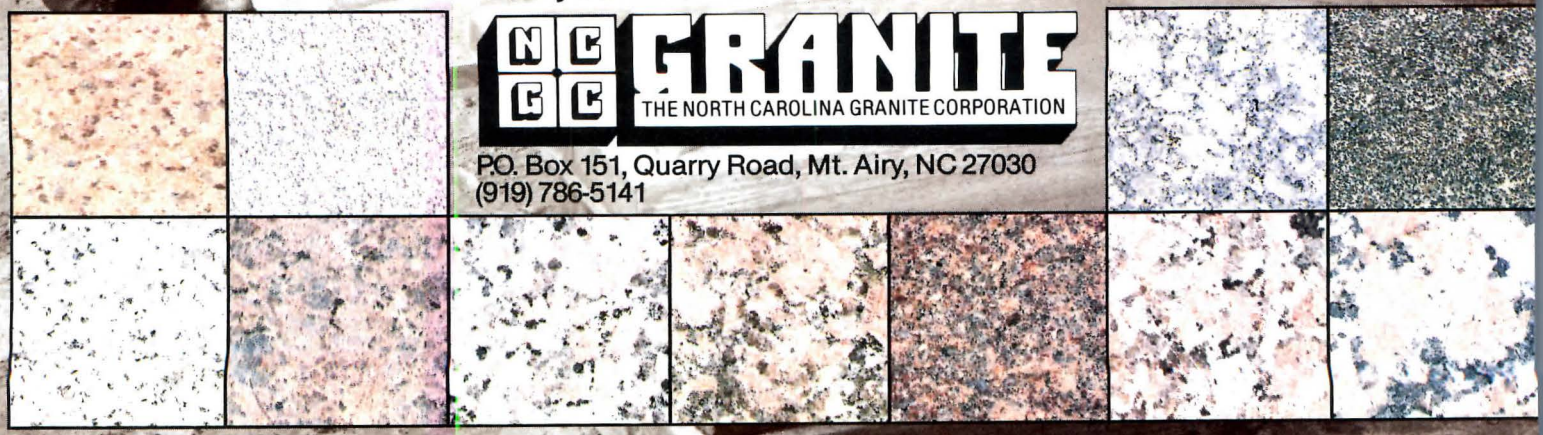

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BOOKS

The U.S. as the World's First Suburban Nation—and the Last

Crabgrass Frontier: The Suburbanization of the United States. Kenneth T. Jackson. (Oxford University Press, $21.95.)

The abundant literature on suburbia is often characterized by shrill, uninformed polemics or mesmerizing avalanches of social scientific data. Its sheer volume is inversely proportional to its ability to instruct. Occasionally, outstanding studies have appeared, such as Herbert Gans's *The Levittowners,* that clarify issues, provide historical perspective, correct misjudgments, and channel inquiry in new and promising directions.

Kenneth T. Jackson, professor of history at Columbia University, has produced such a work. *Crabgrass Frontier* is the first *comprehensive* history of suburbanization in America. Jackson's approach is cross-cultural, interdisciplinary, and historical. He draws upon an enormous range of pertinent source materials and interprets them lucidly and persuasively.

His point of departure is the marked differences between American cities and those of the rest of the industrialized world—low residential density, lack of clear boundaries between city and countryside, strong penchant for homeownership, core poverty and suburban affluence, and relatively long commuting distances to work. Jackson accounts for these variations in a series of closely argued chapters that trace the development of American urban form chronologically from the 18th century to the present. He carefully investigates such influences as developments in transportation and building technology, government housing policy, cheap land and energy, population growth, racial prejudice, and an American intellectual tradition of anti-urbanism. His treatment of the effects of governmental housing policy and the automobile on residential decentralization is particularly outstanding. The *leitmotiv* for his comprehensive analysis is the predominance of economic factors in the shaping of American preferences for dwellings on the periphery of cities.

In 1922, road building signals new growth in Westwood, a suburb of Los Angeles.

In the final chapter, Jackson prophesies a substantial change in American urban patterns by the year 2020. Rapid decentralization will give way to a "spatial equilibrium" between suburbs and central urban core. Again, economic factors are a major impetus for such change, namely rising costs of fuel and land, coupled with substantial changes in federal economic policy and alterations in the traditional American family structure. He contends that "the United States is not only the world's first suburban nation, but it will also be its last," for the other nations of the world have even more limited economic resources and are subject to the same trends. Yet he concludes, "For better or for worse, the American suburb is a remarkable and probably lasting achievement."

The book is not without minor blemishes. Jackson's criticism of the design work of individual 19th-century architects is somewhat cavalier. For example, Calvert Vaux, who co-designed two of the world's finest urban parks, is labeled "only an average designer." The final chapter on future trends should have provided a more detailed account of Jackson's prognostications of 21st-century urban form. Illustrations could be more abundant and better produced.

However, this is the definitive history of the development of American suburbia. It is a major resource for anyone involved with the design or governing of American cities.—Reuben M. Rainey

Mr. Rainey is chairman of the landscape architecture program at the University of Virginia.

Googie: Fifties Coffee Shop Architecture. Alan Hess. (Chronicle Books, $12.95.)

Cold, boring, aloof, and sterile are terms many associate with modernism. Robert Venturi advocated adding didactic symbolism and irony to modernism to enkindle some vigor and passion. The application of historic references is endorsed by others as a means of achieving the same purpose. Alan Hess's book, *Googie: Fifties Coffee Shop Architecture,* challenges these viewpoints by presenting a facet of modernism that was friendly, vibrant, nonelitist, and even sexy.

continued on page 108

Books *from page 107*

Prompted by a fondness for and identification with the 1950s California strip architecture and a dedication to its preservation, Hess describes the background, context, and development of the roadside eatery from the streamline moderne style of the 1930s through its franchisement and spread across America. Composed of glowing volumes of plate glass, stainless steel, and gravity-defying roofs, the '50s coffee shop combined the technological and organic modernist schools, thereby suggesting both the space age of George Jetson and the stone age of Fred Flintstone. Hess believes that the heritage of these buildings is traceable to the optimistic futurism of such flamboyant designers as Eero Saarinen, Frank Lloyd Wright, Oscar Niemeyer, Norman Bel Geddes, and Harley Earl. Concepts these men developed in their architectural and industrial design studios and presented in prestigious applications were assimilated into the popular culture in the '50s coffee shop. Hess points out that this popular modernism remains largely unrecognized despite the involvement of such prominent architects as John Launtner.

The labeling of this architecture as "Googie" has its origin in an article written for *House and Home* by Douglas Haskell in 1952. Just as historians and critics try to define the differences among the various facets of Renaissance architecture in its early, high, mannerist, baroque, and rococo phases, so it appears Hess is attempting to establish a stylistic subclass, the Googie style, within modernism.

This book does have some minor problems. The coordination of text and photographs is often distracting, and the abundance of street addresses within the text, instead of a few maps in an appendix, impedes the flow of the book. Also, no explanation is given of the nature of the relationship between the diner as presented in J. S. Gutman's and Elliott Kaufman's *American Diner* and the '50s coffee shop. These factors aside, this book is an exciting expansion of the understanding of modernism and an interesting reflection of the changing American outlook on life.

—Matthew E. Gallegos

Mr. Gallegos is an architect studying architectural history at the University of Virginia.

Orange Roofs, Golden Arches: The Architecture of American Chain Restaurants. Philip Langdon. (Knopf, $19.95.)

In the last year or so there has been a spate of books dealing with the history and evolution of American commercial architecture. These range from Alan Hess's detailed analysis of California coffee shops of the 1940s and '50s in *Googie* (reviewed above) to Chester Lieb's encyclopedic history of anything and everything along the highway in *Miracle Mile*. Now we have Philip Langdon's history of the chain restaurant, *Orange Roofs, Golden Arches.*

Thirty years ago, J. B. Jackson (and 10 years later, Venturi, Scott Brown, and I in *Learning From Las Vegas)* looked at motels and gas stations, Main Street, and the highway in a straightforward and elegant way and said, in effect, here is what's out there—it isn't all great, but it tells us something basic and poignant about everyday America, who we are, and how we use our landscapes. Some of the recent books continue the older tradition of critical appreciation, but a more muckraking countertrend has evolved that sees commercial environments and buildings as representative of the crass underbelly of American commercialism.

In *Orange Roofs, Golden Arches*, Langdon, a practicing journalist who specializes in writing about the built environment, tells the complex story of the interactions between economic opportunity and the entrepreneurial spirit that gave us our commercial landscape. His ability to describe colorful personalities, social context, and the economic imperatives of site and transportation results in a far more highly textured and enjoyable history than the standard architectural monograph.

However, Langdon takes a judgmental stand toward much of commercial architecture. In describing the history of the chain restaurant from Harvey House to Big Macs and beyond, he is strongly in favor of good taste in architecture, if not always in food. In taking this stance he has a lot of company—from AIA to your friendly fine arts commission—who attempt to legislate "good taste." The taste they promulgate is middle-of-the-road. It doesn't take risks and cannot evolve. When taste is institutionalized, there is a loss of vitality and cultural richness. Fine-arts taste ("good taste") inhibits personal idiosyncrasies and the rich variety of a pluralistic society, which inevitably must include the good, the bad, and the ugly.

The history of commercial architecture is the history of rapid change and is fundamentally contradictory to the notion of esthetic absolutes. J. B. Jackson and others understood this and were able to teach us to look at the ordinary with sympathetic understanding. This is a fragile knowledge, but powerful, because it allows us to change our everyday environment with a light touch that avoids the destruction of the good along with the bad. It does mean that we'll have to learn to live with some schlock (the other guy's taste), but the alternative is earth tones, mansard roofs, and the deadly dull—from sea to shining sea.—Steven Izenour

Mr. Izenour is a senior associate with Venturi, Rauch & Scott Brown.

On Route 12 north of Binghamton, N.Y., the owners in front of a Dairy Treat stand, a simple design characteristic of its era.

Ceramic Tile: New Developments In One of Our Oldest Materials

Ceramic tile has been used and appreciated as a building material for centuries—Egyptian examples of inlaying ceramic tile can be found from as far back as 1200 B.C.

The basic definition of ceramic tile is a mixture of clays that have been shaped and fired at high temperatures, resulting in a hardened slab that may be glazed and decorated or left untreated. Until recently, glazed tile was available only for wall or counter use, but because of improved production technology glazes with enough resistance to the wear and tear of floor use have been developed. Today's ceramic tile is distinguished by its primary composition, method of production, physical and structural characteristics, mechanical strength, surface finish, dimensions, and color.

Tile will not burn, scorch, or blister, and is unaffected by light exposure. Tile's surface is designed to be corrosion-resistant. Tile tends not to retain liquids or absorb fumes, odors, or smoke. Tile also will not hold or conduct an electrical charge and is an excellent insulator or passive solar collector.

Two keys to successful installation are proper tile selection for the job required and proper use of installation materials.

The American National Standards Institute and the Accredited Standards Committee A108 on Ceramic Tile, along with various industry associations, companies, and government agencies, have formed a committee to revise and update the "American National Standard Specifications for the Installation of Ceramic Tile," a guide originally published by the Tile Council of America Inc. in 1976.

The 56-page, illustrated reference contains a total of 16 standards. It lists and details sampling and testing procedures used to determine whether the material specifications are met, and contains sections on electrically conductive mortar for conductive ceramic tile, latex-portland cement mortar, dry-set portland cement mortar, and organic adhesives.

Tile Council of America Inc.
Circle 241 on information card

Products *is written by Amy Gray Light.*

Floor and Wall Tile

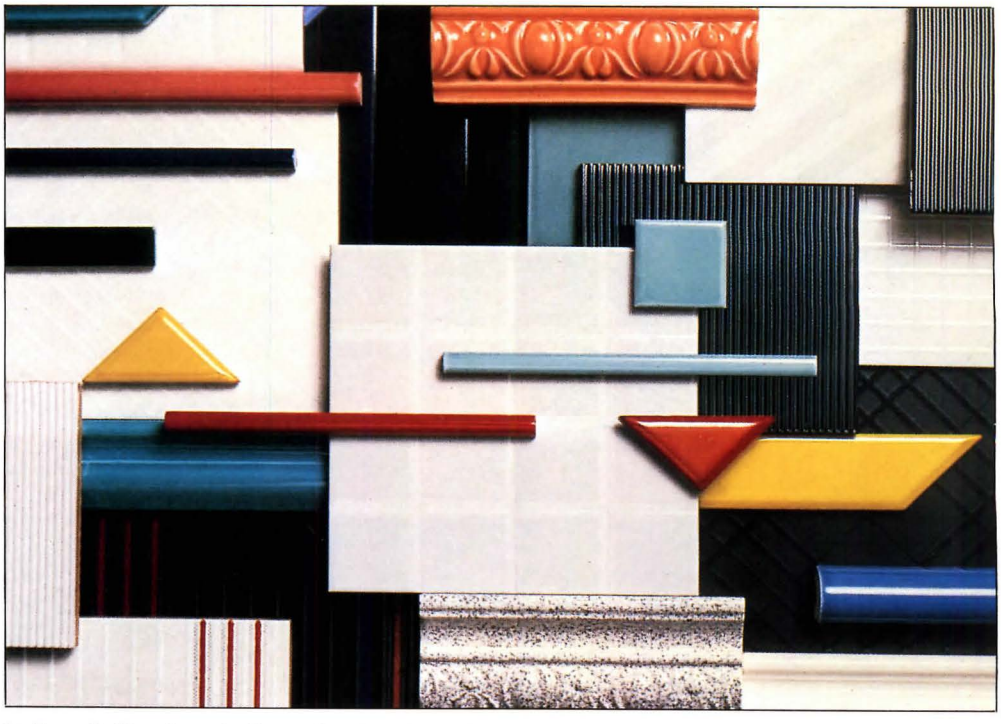
FourPlus heavy-duty, slip-resistant ceramic tile is manufactured by Latco for heavy commercial use, such as patios, shopping malls, hotel lobbys, and more. A frost-proof bisque strengthens it for use for exterior walls and floors exposed to the weather. The tile is also suitable for heavy-use counters. Brushed-on pigments rather than glazes create a two-toned, natural stonelike appearance. FourPlus comes in nine shades and in 8½x8½-inch or 12x12-inch sizes. Other sizes and shapes are available by special order. Trims and accessories for the line include a cove base, stair treads, surface bullnose, and finger cove.

"Impressions" ceramic floor tile by Wenczel Tile, for light-duty commercial and residential installations, coordinates with existing Wenczel lines for walls, backsplashes, and counters in 42 color combinations. The tile comes in six colors and has a 4x8-inch trim that can be used as a baseboard, threshold, or wainscot.

A high-gloss designer line of tile for walls and flooring in both residential and commercial applications is Arabesque by Ballack Corp. Recommended by the manufacturer for use where temperatures and moisture conditions vary, the 8x8-inch, frost-proof, flat-back tile is ⅜ inches thick, rated at a glaze hardness factor of four, and designed to be highly resistant to acids, stains, and crazing. The line is offered in four colors and in alternating patterns with matching bullnose trim.

New Distinctions glazed ceramic floor tile, by American Olean Tile, is distinguished by its coordinated color gradations. Fresh midtone green, blue, rose, and taupe are each "let down" to a lighter shade, creating interesting designs. Floor borders and patterns use light and dark shades of the same color. Eight color gradations are available, plus white and almond. The tile is rated for moderate-duty commercial floor use and features a high breaking strength. A semimatte glaze provides a smooth surface with good traction. The

continued on page 112



Italian Collection A tile collection introduced this fall from the Italian Tile Center features bold patterns on solid black, white, or gray tile, contrasted against brightly accented trim, border, and accent tile. The tile, shown above, can be further enhanced with a play of matte against glossy, or with incised and embossed surfaces.

Italian Tile Center. Circle 261 on information card.

Products *from page 111*

tile is craze- and stain-resistant, comes in an 8x8-inch nominal size, and is 5/16 inches thick with modified cushion edges and matching bullnose and cove base trims. The manufacturer recommends the New Distinction line for use in malls, offices, retail stores, hospitals, and restaurants.

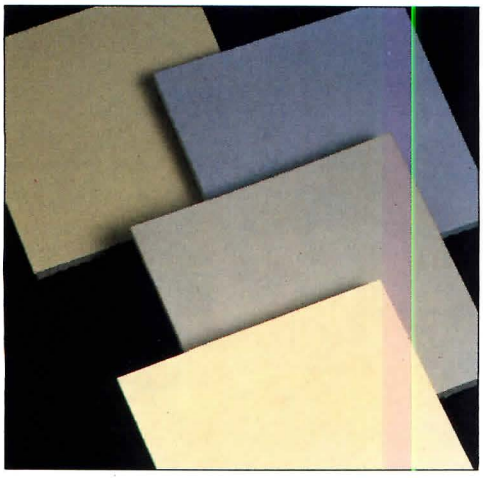
Natural, unglazed ceramic tile for both floor and wall use either indoors or out is Ironrock and Metro tile, both from Metropolitan Ceramics. Both types are designed to be abrasion- and slip-resistant and easy to maintain. They do not require sealing and are formulated to resist staining. They are available in 15 colors and four modular sizes.

Steenbok America, division of Latco
Circle 242 on information card
Wenczel Tile Company
Circle 243 on information card
Ballack Corporation
Circle 244 on information card
American Olean Tile
Circle 245 on information card
Metropolitan Ceramics
Circle 246 on information card

New Line of Quarry Tile

Four new colors have been added to Summitville's Quarry Tile line, shown below, in addition to nine other earthtone colors. The tile is available in 6x6x½-inch and 4x8x½-inch sizes, and comes in smooth or abrasive surfaces and in seven contoured shapes and trim units. The tile can be used in exterior or interior installations and is resistant to acids, greases, oils, and chemical detergents.

Summitville Tiles Inc.
Circle 260 on information card



Specialty Tile

Glazed Mini-Brick from Huntington/Pacific Ceramics comes in 3⅝x7⅝ inches and in several custom sizes. The ceramic brick is wire-cut to 7/16 inches thin and can be applied to virtually any sound substrate, causing no depth problems around existing doors and windows. A brochure featuring the Mini-Brick gives information on bullnose trim, tolerances, skid resistance, coverage, installation, and packaging.

An assortment of tile from Villeroy & Boch comes in many colors, patterns, and sizes to coordinate with the manufacturer's line of luxury plumbing products. Some of the more notable of these tile are: Pan, an unglazed vitreous tile that is an addition to the stain-resistant Super Ceram Collection; Belcanto, an anti-slip tile as well as a base in 4x8-inch size and a strip in 2x9-inch size; and a new line of "presplit" tile called Polychrome. Polychrome tile comes with predetermined breaking points, which can be broken into triangles or strips. The pieces can be used by themselves or with whole tile to create checkerboard patterns, geometrics, "beaded" borders, and other patterns. They are nonvitreous and come in six colors.

Huntington Pacific Ceramics
Circle 247 on information card
Villeroy & Boch U.S.A.
Circle 248 on information card

Handmade Tile

One-of-a-kind tile hand-pressed into different shapes and sizes vary slightly in size, color, texture, and character, adding to the tile's distinction.

Handcrafted floor tile from Tiles de Santa Fe Inc. have flat backs, so they can be installed by the thin-set or the conventional method. The tile are sealed and polished, and are delivered with enough extra sealer for workers to coat an entire floor when they finish laying the tile, including the grout area. A color brochure is available.

Epro Inc. uses shale clay for its handcrafted ceramic tile. After the clay is handpressed into flat tile and hand-trimmed, the tile are dried eight hours. A thick coating of glaze is then applied, unless the tile have been specified to be unglazed, and the tile are fired in a kiln at 2,000 degrees Fahrenheit for 18 hours to harden the finish.

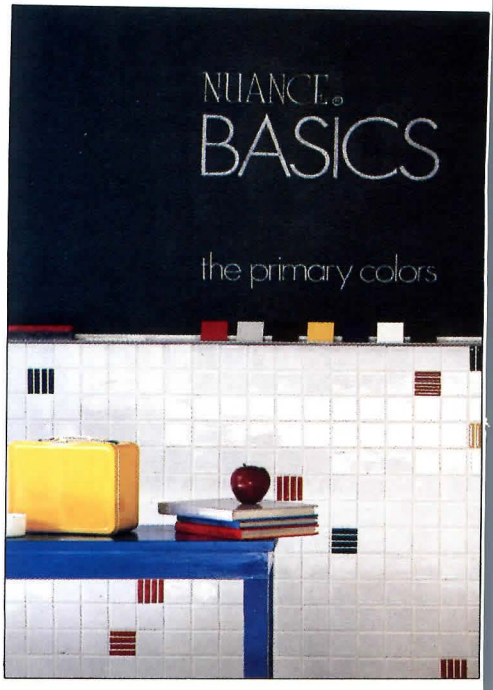
Tiles de Santa Fe Inc.
Circle 249 on information card
Epro Inc.
Circle 250 on information card

Floor Seal and Stripper

The SL-80 Acrylic Floor Seal and SL-85 Floor Stripper are used in conjunction to protect unglazed quarry, tile, slate, brick pavers, and portland cement products from stains and to provide floors with the "wet look."

The SL-85 ammoniated floor stripper/cleaner prepares floors to be sealed by removing acrylic-type floor sealers and waxes, and by cleaning floor grease and grime. The SL-80 water-based acrylic floor seal is reputedly unaffected by hot cooking oils, making it acceptable for use in kitchens. SL-80 should not be used in areas subjected to frequent or prolonged wetting. Both formulas are applied with a lambs' wool applicator, mop, or soft brush; they do not need buffing and can be cleaned with a damp mop.

Summitville Tiles Inc.
Circle 254 on information card



New Line of Ceramic Tile

Latco's newest ceramic tile series, "Nuance Basics," shown above, features 2x2-inch field tile, ½x2-inch fiddlesticks, 2x6-inch classic molding, and 1x6-inch classic railing, in seven primary colors. All pieces are modular to each other and to Latco's Nuance and Accents series. The tile has slightly rounded edges and a smooth, glossy texture. The Basics line is suggested for residential and commercial applications.

Latco, Los Angeles Tile Company
Circle 259 on information card

Unbaked Ceramics

A technology that produces ceramic tile without baking features raw material flexibility and is said to be extremely low in energy consumption. The tile consists of light metal alloys, lime, and furnace slag with about 20 percent water. After mixing, the mixture is poured into molds for six to 12 hours, enabling the tile to harden. The tile can be as big or as small as needed, depending upon the mold size, and, since they are not baked, their exact dimensions will not change. Other advantages of the nonbaking process are that the color of the tile will not change (as it can when baked), and, since a broad range of materials can be used to produce the tile, raw waste materials such as blast furnace slag, paper waste, and sawdust can be used. The properties of the tile are influenced by the type of raw materials used, but generally the tile are said to withstand temperatures up to 1,300 degrees Celsius.

Thomas Ceramics
Circle 255 on information card

Ceramic Wall Systems

Stark's Millenium Collection for monolithic exteriors features masonry units 8x8 inches and 8x16 inches with 4-inch bed depths. The collection is suitable for traditional

continued on page 115

Products *from page 112*
built-in-place erection or steel-reinforced panelization. The Millenium Collection has a glossy, high-tech or rich-textured surface that is less expensive than granite or marble. The tile wall systems are designed to remain unaffected by sun or acid rain, are UL-listed for zero flame and smoke spread, can be precisely sized, and resist fading or peeling.
Stark Ceramics Inc.
Circle 256 on information card

Backerboard/Underlayment Panels
Wonder-Board panels provide a permanent base for ceramic tile, waterproofed walls, and exterior finishes. The lightweight, 7/16-inch-thick panels can be easily scored and snapped, then fastened using nails or screws. Composed of portland cement, expanded ceramic aggregate, and coated glass fiber mesh, the backerboard/underlayment panels are designed to remain unaffected by water, moisture, and steam, and will not decay, warp, or soften. Wonder-Board is also a UL-listed floor protector and heat shield for solid fuel stoves. The nontoxic board is designed to become harder and stronger with age.
Gold Bond Building Products
Circle 253 on information card

Stain-free Tile
Quantum II Stain Shield unglazed ceramic tile features virtually no water absorption, which enables the tile to repel tough stains on its surface. This process is achieved by an advanced firing process and manufacturing technology designed to create "total surface particle fusion." The tile reputedly resists tough stains such as motor oil, acid, red wine, felt markers, and shoe polish. To demonstrate this stain resistance a free "stain kit" is offered.
Buchtal Corporation
Circle 257 on information card

Tile Protection Systems
Two products designed to protect tile and marble from cracks and water are Laticrete's Crack Suppression Kit and Noble Co.'s sheet membrane waterproofing system for thin-bed tile.

The Crack Suppression Kit consists of a liquid rubber and a reinforcing fabric that is applied at room temperature over visible cracks in floor tile. The treatment cures to a thin (20 mm) membrane that is designed to provide 30 percent elongation. Tile and marble can be thin-set directly over it. The water- and chemical-resistant material is ASTM C-627 rated.

NobleSeal TS solves the problem of waterproofing expansion, control, or cold joints under thin-set ceramic or marble tile by bonding the rolls to the horizontal or vertical substrates by chemical fusion. With a bonding agent recommended by the Tile Council of America for the type of tile used in that particular application, the rolls are joined together in a watertight seam by wetting the factory-prepared lap seam with Nobleweld; chemistry does the bonding.
Latricrete International Inc.
Circle 251 on information card
Noble Co.
Circle 252 on information card

CREDITS

Village at the Red Inn, Provincetown, Mass. (page 60). *Architect: Ahearn-Schopfer & Associates, Boston.* Co-developer: Patrick J. Ahearn, AIA, with St. James Properties. Structural engineer: James MacDonald Associates. Mechanical and electrical engineer: Fales, Letendre & Ziobro. Landscape architect: William Pressley Associates. General contractor: St. James Properties. Field supervisor: Frank Sardone. Project coordinator: William Reny.

Naismith Memorial Basketball Hall of Fame, Cambridge, Mass. (page 63). *Architect: Cambridge Seven Associates Inc., Cambridge, Mass.* Structural engineer: Weidlinger Associates. Mechanical and electrical engineer: Cosentini Associates. Landscape architect: Sasaki Associates. Civil engineer: Sasaki Associates. General contractor: Joseph Francese.

R. Greg Hursley Studio, Austin, Tex. (page 66). *Architect: J. H. Eccleston Johnston, Jr., AIA, Baltimore.* □

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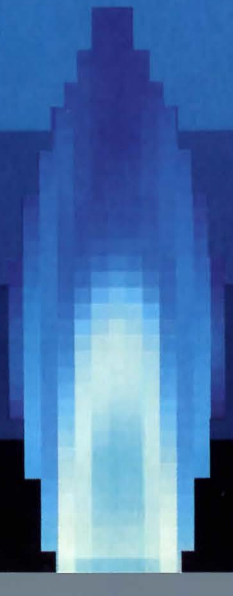

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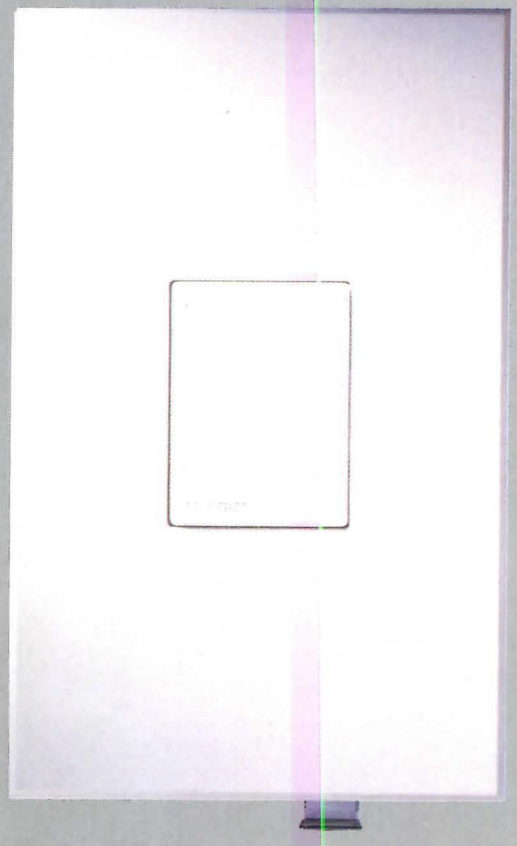


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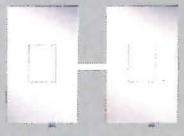
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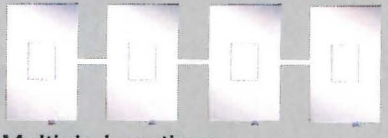
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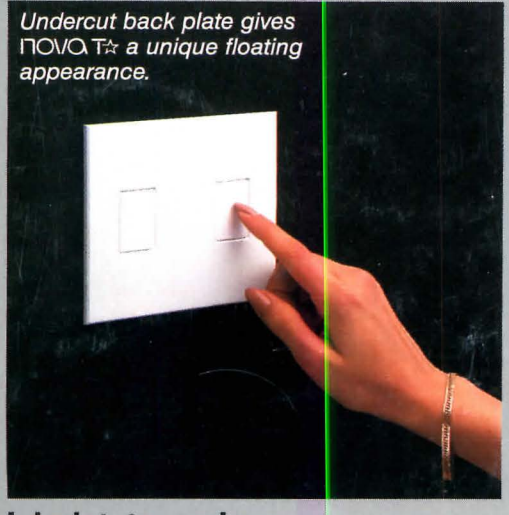
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