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Editorial: The Free Market Myth

A home builders awards program raises questions about the adve sarial relationship between business and government.

There is no myth more routinely repeated in the business press or more blindly worshipped in the board room than that of the free market which, if unimpeded by government, will supposedly supply products for every demand. The housing industry is one area where markets don't work that way.

Last year, I served as a juror in the annual awards program of *Builder* magazine, the magazine of the National Association of Home Builders. Most of the submissions were speculatively built houses in new suburban developments. While they differed in styling or siting, the majority of houses were essentially alike and, it seemed to me, unresponsive to the changing housing needs of this country.

Although families are getting smaller, most of the houses had three or four bedrooms. Although a large sector of our population cannot afford to buy a house, many of the projects featured such essentials as wet bars or whirlpool baths. And although there is a growing diversity of living arrangements – households with single parents, with an elderly parent or grown child living at home, with unmarried or unrelated adults sharing space – almost all of the houses seemed intended for what has become a minority of families: a father who works outside the home and a mother who works in the house, raising children.

Where was the innovation, the daring of the free market? During a break in the judging, I asked that question of another juror, who owned a large home building company, and he said that "anyone who tries to be too innovative in this business loses money, so no one wants to be first."

What was significant about his comment was what he left unsaid. He did not make the circular argument, so often heard from economists, that whatever an industry provides must be, by definition, what people want. In the home building industry, that argument is not credible; there are just too many people who are inadequately housed or, at the other end of the economic scale, who seek out architects for custom-designed residences. What home builders provide is what one segment of the population wants, another may put up with, and a third must do without.

Nor did he take the stance that the free market would meet everyone's housing needs if only the government would stop interfering. It is true that some communities create too many obstacles, often in the form of minimum lot sizes or maximum densities, that discourage more affordable or more diverse housing. (It also is true that banks discourage housing innovation or diversity through their lending practices, although this is more difficult to prove.) Still, it is doubtful whether the home building industry, free of such obstacles, could meet all of our housing needs on its own.

Which takes us back to that builder's comment. What he did not say, but clearly implied, was that the financial risk of innovation must be reduced in some way. Traditionally, that protector role has been played by the government, although that role has changed dramatically in the last decade. The Federal government has pulled back its financial support for housing, and local governments are now widely seen as an impediment rather than an inducement to innovation in the field. There is some reason for that view, as any architect knows who has sought building code or zoning approvals for anything out of the ordinary. But the adversarial relationship between the public and private sector in this country , especially in the area of housing, has hurt more than helped. The free market, unaided by government support or protection, simply cannot meet all of our housing needs, nor should it. Home builders are good at providing a fairly standard commodity for the middle and upper-middle classes. For the poorer population or for those whose housing demands do not fit the standard, more governmental incentives and cooperation are essential.

More input from architects also is needed, especially in terms of what form such housing should take. The general prosperity of the last decade has kept many architects busy designing houses for the rich, among other things, but there remains the responsibility of a profession to those who need but cannot afford its services. Even if the money is not there at the moment to build such housing, thinking about the problem and making proposals are first steps toward a solution. Indeed, market economies seem to work best when there is private/public cooperation combined with active and involved professions, as is the case in countries such as Japan. In trying to solve our housing problems, we should not forget that Adam Smith was, as much as Karl Marx, a maker of myth. **Thomas Fisher**

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If I wait until I completely catch on, I'm afraid I'll miss the boat completely – so here's my entry. Please tell me what I have won, if anything.



PS: My dog, Phideau, wants to know if he would win anything, like maybe an Alpo-filled calzone, if he went out and bit a contest-winning architect right in his own award-winning house. David Clarke, AIA

Carbondale, Illinois [For clues to this one-subscriber contest, see Furthermore, Sep. 1990 P/A, b. 197]

Lament for Giuseppe Zambonini gainst our valueless age, he held clear beliefs. Baring his soul, he called for a reevaluation of values.

In a period of stylistic ex-

cess, he taught strange harmonic laws and the fundamental passions of architecture.

In a time of bleak materialism, Giuseppe took up experiment and a search for a luminous quality in the smallest detail. He will remain a reflection on intentions of being an architect and a teacher today. Steven Holl New York City

[See Obituaries, p. 26 – Editor]

office

attributes.

Pluralistic Interiors?

The editor for your Interiors issue (P/A, Sep. 1990, p. 95) claims that the illustrated projects share "fundamental qualities" of "proportion and form, sensitive use of materials, color and finish, poetry of light, and conscientious construction," rather than any "exclusive architectural doctrine." I was surprised, in light of that claim, to find that the published projects all seemed terribly doctrinaire and firmly wedded to current trends in interior design. To see if I was fooling myself, I made a straightforward comparison of stylistic devices common to many of the projects, illustrated by the following table (see page 12).

In my judgment, the published works more clearly share

(continued on page 12)

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a fundamental adherence to late 1980s aesthetic trends rather than to any fundamental qualities of proportion and form. I am not saying that the works are without merit; rather, I am questioning the imagined pluralism of the issue's editor. Being dogmatic is not a crime as long as one does not pretend to be otherwise. Or, to amplify your own headline, "In today's pluralistic climate, the best a professional journal can do is uphold cer-

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David Greusel, AIA

Kansas City, Missouri [While we appreciate the writer's wit and analytical skills, we maintain that a palette of materials loes not constitute a doctrine. Interiors as diverse as the La Villa Hotel and the Kramer apartment do not represent conformity. – Editors/

Reflections on Priorities

In response to the views expressed in the September 1990 Editorial, (p. 9) "Reflections on a Recession," I am both puzzled and a little incensed that you assert that the architectural profession could raise its stature with the public by confronting the major social ills of our time, and that our failure to do so is the cause of our current economic plight.

Given the expensive nature of building in general, and the profit-oriented concerns of the majority of clients, it is only natural that architects would focus on projects that are not driven by the greatest good of the most people. Architects like the vast majority of professionals (including doctors and lawyers) have little choice but to follow the money flow. When society as a whole gives the matters the attention they c serve, I'm sure that archited will do great things in the public interest. It will not be the altruistic nature of the architect which causes this to happen, it will be the focus on them by people with money.

In the 1970s, architects were quick to respond to the interest and economic incentives offered for alternative energy sources and conservation. It was the drying up of incen ives for this work which caused its demise in the 1980s.

Meanwhile, if you are really so concerned with the failings of Post-Modernism, look at your own editorial policy and the focus on the latest "ism." David C. West, AIA New York, N.Y. (continued on page 15)





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Views (continued from page 12) Gas Station Winner

In our article on the Gateway Gas Station competition (Aug. 1990, p. 29), one of the competitionwinners, Andrew Blanda, was incorrectly identified as Peter Blanda.

Cad Winner

We inadvertently omitted a sixth winner in the AIAS/CAD-KEY Competition (P/A, June 1990, p. 140). A design for a Swansea residence by David C. MacDonall of Roger Williams College was awarded honorable mention.

Franklin Institute Correction

In Donald Prowler's article on the Franklin Institute Futures Center (P/A, Sep. 1990, p. 25), a line was dropped, altering the meaning of the sentence. The second sentence of the fourth paragraph should read: "A nonstructural column, for example, that marks the original entry axis is topped by an arbitrary, canted light scoop, and the main information desk is decidedly less than commanding." P/A regrets the error.

Color Photo Switch

In the Technics Topic article on photography (P/A, Aug. 1990, p. 55) photos 1 and 2 were interchanged. The greenish photo was unfiltered, and photo 1 was exposed with corrective filtration.

Young Architect Credit

In the article on David Hertz (P/A, July 1990, p. 92), the stair shown in photo 2 was designed by Lawrence Scarpa of Gwynne Pugh & Associates and fabricated by Hertz. The Baptistery shown was designed by architects Moore Ruble Yudell.

Computer Clarification

In the profile of CityDesign Collaborative in the Technics Focus on computers (P/A, June 1990, p. 147), we neglected to mention the software used: Accugraph's MountainTop CAD.

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Ellis Island, 1980s Shrine

We can now visit the imposing building in New York Harbor where some 12 million immigrants spent their first anxious hours in America undergoing processing. The stout Classical Revival Main Building on Ellis Island – vacant and neglected since 1954 – has been saved from ruin. The rescue of this 220,000-square-foot structure from its advanced state of decay was a monumental restoration effort, and the building is eminently suitable for us new role as a museum of immigration. But given the \$156 million price tag – said to be the highest ever for a building restoration — it is worth considering just what American philanthropy has bought here.

he excuse to take a ferry ride and enjoy the harbor views almost, in itself, justifies the expenditure. From the boat deck, the refurbished building - built to a competition-winning design by Boring & Tilton in 1900 – looks rather like a Central European palace anchored here to remind the immigrants of home. Arriving at the island, one finds the building scrupulously rehabilitated to its 1918–1924 condition, the period after a third story had been added to its wings (at some cost to its proportions) and a fine Guastavino vault had been constructed over the big central Registry Room (after the original plaster vault was wrecked by the nearby explosion of a munitions ship). Credit for the restoration goes to Beyer Blinder Belle with Notter Finegold + Alexander.

Although the restoration was funded by private

donations, Ellis Island is Federal property, and the museum is operated by the National Park Service. Inevitably, therefore, the work had to follow the Park Service rule on preservation: Any newly built parts of the building must look new; no re-creations allowed.

The results of that rule in some key parts of this restoration are debatable. The first construction one encounters on getting off the ferry is a huge canopy over the entry walk, more or less where one stood in 1918, but the new one had to look like a product of our times; with its minimally detailed glass and steel roof and its not-quite-historical brackets and light fixtures, it presents a typical 1980s compromise between Modernist principles and gestures toward compatibility. Inside, a similar design stand-off can be inferred from the stair up to the Registry Room - a replacement for the notorious (but subsequently destroyed) stair where medics watched immigrants for signs of heavy breathing that might betray a disqualifying illness; the new stair, with dark granite treads and stainless steel balustrades, is undoubtedly more elegant than the original, but its total departure from the character of the building spoils the effect of following the immigrants' path. (The alternative elevator is, of course, now only a few steps away.)

At the top of these stairs, the Registry Room is an ample, rather severely detailed room; among its finer features are elegant chandeliers and oddly festive rows of lights outlining the balconies. White (continued on next page)

News Report

By designing in section, Adèle Naudé Santos turns Tokyo's cramped building lots to advantage. Projects, page 102



Touché! In Perspectives, two theorists respond to a recent essay on the abuse of theory (page 98).

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Ellis Island's restored Registry Room, minus the bustle and drama.

Pencil Points

Top honors in the 1990 Quaternario Biennale International Prize for the Technological Innovation in Architecture has been awarded to Emilio Ambasz & Associates for the San Antonio Botanical Conservatory. Second prize winners were: Arata Isozaki & Associates, Japan; Arkkitehtuuritoimisto Heikkinen, Komonen Oy, Fin-Iand; Murphy/Jahn, United States; and Ran International, Canada.

After 83 years under construction, the Gothic-styled, 873,021square-foot National Cathedral (P/A, Oct. 1989, p. 26) in Washington, D.C., was completed in September with the placement of a 1000-pound block of Indiana limestone atop of its St. Paul tower.

The 1990 William Van Alen Architect Memorial Fellowship was won by Alexey A. Kozyr, Moscow Architectural Institute, USSR, and the Lloyd Warren Fellowship – 77th Paris Prize – was awarded to Zainie Zainul, Columbia University, New York. Both annual student competitions are sponsored by the National Institute for Architectural Education, New York.

Architect/developer John Portman is yet another self-imposed victim of 1980s boomgone-bust. The Wall Street Journal summed up Portman's financial woes: "Mr. Portman gorged on easy credit in the 1980s. In the past five years, he refinanced nearly \$1 billion of mortgages ... and used the proceeds, with more than \$600 million of fresh loans, to finance a building spree." Portman denies insolvency.

Architect Gunnar Birkerts has been chosen as the first Bruce Alonzo Goff Professor of Creative Architecture at the University of Oklahoma. The onesemester professorship will subsequently be held by Joseph Esherick, Fay Jones, Bart Prince, and Ralph Rapson.

Ellis Island (continued from previous page)

tile wainscots here and throughout the building are reminders that the original management wanted to hose down these spaces after the hordes moved through. Seen after restoration, with only a smattering of camera-toting visitors, the room conveys nothing of its earlier bustle and drama.

Exhibits are housed mainly in the two side wings, occupying what were once offices for the immigration bureaucracy. Most of the exhibits (at least the half that were open on an unheralded visit a couple of weeks after the opening) consist of photo blowups and disparate objects in glass cases. A high proportion of them focus, ironically, on the derelict state of the complex before restoration – depicted with moody photos and rusty salvaged equipment. Given the evocative appeal of these displays, the whole building might have been more effective as a stabilized ruin, somewhat on the model of Majestic Theater in nearby Brooklyn (P/A, April 1988, p. 100).

Outside the building, at the water's edge, a bronze band extending hundreds of feet along the seawall lists names of immigrants in alphabetical order. Do not look for your immigrant ancestors here, however, unless you (or your cousin) made a donation linked to that name. One dubious fallout of the private funding here is this paid-admission honor roll. Inside the building, as well, donors names are obvious – in this case corporate donors of exhibitions.

SF MoMA Unveils Botta Design

On September 11, the San Francisco Museum of Modern Art unveiled Mario Botta's design for the museum's new facility. The downtown location at Yerba Buena Center (P/A, Oct. 1989, p. 27), site of a future Visual Arts Center by Fumihiko Maki and the Yerba Buena Theater by James Stewart Polshek & Partners, will put Botta's first U.S. building in an architectural showcase.

The 200,000-square-foot museum building steps back in three tiers from the street and encloses a skylighted central cylinder. At the unveiling, Botta stressed the social function of this light-filled atrium and its role in clarifying the organization of the plan. A grand staircase will permit a dramatic ascent through the atrium to four floors of galleries, some illuminated by carefully designed rooftop skylights.

Designed from the inside out, the plan succeeds admirably in housing the museum's functions. But there are questions as yet unanswered about the exterior cladding and the trees crowning the cylinder. If the walls that compose so much of the exterior are not rich tapestries, the building's tone could be monumental but dry. And how will the trees keep their trim in this windy city? If good answers are found and all else goes well, the museum will celebrate its 60th anniversary in its new home early in 1995. **Sally Woodbridge**



New steel-and-glass canopy at Ellis Island.

Repeatedly here, we are reminded of the values of the 1980s – a period when our government delegated the funding of this national museum (like that of the companion Statue of Liberty) to private philanthropy — and the donors were not discreet about identifying themselves. In any case, Ellis Island represents by no means all Americans, even though an estimated 40 percent of us descend from those admitted here. With rare exceptions, only white immigrants entered here, and minority visitors are rarely seen at this shrine. In its de facto segregation, as well as its privatization of a public property, Ellis Island inadvertently reminds us of imperfections in our Promised Land. John Morris Dixon



Section through Botta's museum shows cylindrical atrium.



Axonometric view of San Francisco MoMA.

News Report

New Federal Reserve Bank in Dallas

Commissions for Federal Reserve banks in recent years often produced decidedly unreserved architecture: Gunnar Birkerts's catenary arch structure (1967) in Minneapolis and Hugh Stubbins's metal-clad tower (1978) in Boston, for example, are "look-at-me" buildings that attempt to dominate their urban precincts.

The new Federal Reserve Bank of Dallas is different. Perhaps because of its site – it will be cut off from downtown by a freeway, and stand between Johnson/Burgee's 1986 Crescent complex and I.M. Pei's 1989 Symphony Center – the Dallas Fed seems content with a background role.

The design for the 764,000-square-foot project (to be completed late next year) is by Kohn Pedersen Fox Associates of New York. Officially, Sikes Jennings, Kelly & Brewer, Inc., of Houston is prime architect for the project, KPF is design architect, John S. Chase of Houston is associate architect, Kohn Pedersen Fox Conway of New Yorx is interior design architect, and the landscape design is by SWA Group of Dallas.

The designer created a tower with a wedgeshaped section and two rectangular volumes, one faced in masonry and the other in glass with a tight grid of mullions that act as sun screens. The tower rises from a podium that covers a city block, with employee parking and the intake facilities for thousands of checks handled each day; this is surmounted by low-rise structures for the Bank's public rooms, set around a landscaped courtyard. In plan, the tower mass is canted to address the bend in Pearl Street as it passes between the symphony center and the Dallas Museum of Art;

Aquarium of the Americas Opens in New Orleans

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Labor Day weekend marked the grand opening for the latest riverfront attraction in New Orleans, the \$40-million Aquarium of the Americas. Central y located in the heart of the CBD and adjacent to the Vieux Carre, the structure is situated in the 16-acre Woldenberg Park overlooking the crescent of the Mississippi River. Architects for the facility were the Bienville Group, a consortium of five local architectural firms.

The administrators of the Audubon Zoo, now the Audubon Institute, began to plan the aquarium over five years ago; they built it with \$25 million in tax reevenues and \$15 million from private contributions.

Optimistically, the Institute recently joined city officials in a proposal for "Riverfront 2000" downriver from the aquarium in the Vieux Carre. This vision of open spaces, natural and maritime history museums, an urban botanic garden, and conservatory calls for the elimination of working port facilities – a source of discontent among some local residents. They complained that they were not consulted during the project's design process.

The aquarium, a three-story, 110,000-squarefoot reinforced concrete building, showcases four major environmental habitats of North, Central, its configuration will preserve views of downtown, visible above the Dallas Arts District. Seen in elevation, the massing of the Dallas Fed has a serene monumentality that is enhanced by the regular rhythm of the windows and Indiana limestone cladding.

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New Dallas Federal Reserve Bank, designed by KPF.

In the past decade, KPF has used imagery from an eclectic variety of sources. But with the Dallas Fed, they seem to have left behind their adaptions of New York's Golden Age and turned to the work of Kenneth Franzheim, Joseph Finger, Wyatt C. Hendrick, and other reluctant Modernists of Texas's midcentury skyscraper boom, when architects' jazzy 1950s sensibility animated the massing and materials held over from the stripped Classical style of the 1930s. Most of the older motorists who will pass the Dallas Fed on the freeway will probably find its image reassuringly familiar. Joel Warren Barna



New Orleans Aquarium; cylinder houses rain forest.

and South America: the Caribbean Reef; the Amazon Rain Forest; the Mississippi River; and the Gulf of Mexico. Exhibits are structured as a sequence of related ecosystems, with supplementary displays about commercial and industrial uses of aquatic life.

Of special interest are the facility's art and music commissions by Louisiana artists; the most visible are John Scott's "Ocean Song" in Woldenberg Park and Ida Kohlmeyer's "Aquatic Colonnade" outside the aquarium. A local musician, (continued on next page) **Obituaries**

The profession has lost several revered members in recent months; P/A looks at their careers in this column.

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Alvin Boyarsky

Architect and educator Alvin Boyarsky died in London on August 6. He was 62. As chairman of the Architectural Association (1971 until his death), Boyarsky deftly cultivated the school's transformation into one of the most respected - some might say radical - architectural institutions in the world. He taught at the University of Oregon (1959-1962), the Bartlett School of Architecture (1962-1963), the AA (1963-1964), and the University of Illinois, Chicago (1965 - 1970).

Norman Richard DeHaan

Architect and interior designer Norman DeHaan, FAIA, died in Chicago on August 24 at age 63. DeHaan, who opened his own firm in Chicago in 1964, was the Founding National President of the American Society of Interior Designers, Chairman of the AIA Interior Architecture Committee, a past president of the Chicago Chapter of the AIA, and a Fellow of the American Society of Interior Designers.

Max Gordon

Architect Max Gordon died on August 24 in London, where he practiced. He worked for Skidmore, Owings & Merrill (1956-1962) - most notably with Gordon Bunshaft on New York's Chase Manhattan Plaza. He designed New Scotland Yard in London (1962-1966) and established his own firm in that city in 1981. Gordon went on to build an international reputation with a series of exhibition spaces, among them the Saatchi Collection in North London - an abandoned industrial structure imbued with an insular grace.

Architect, art director, and editor Paul Grotz of New York died on September 15, at the age of 88. Educated in architecture in his native Stuttgart, Germany, Grotz migrated to New York in 1931, and in 1934 joined the staff of *Architectural*

(continued on next page)

News Report

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Obituaries, (continued from previous page)

Forum. There he became art director, collaborating with Frank Lloyd Wright on some landmark issues, and was later appointed managing editor. In 1972, he was cofounder of the short-lived Architecture Plus. He designed several books and was a consultant for P/A's 1980 redesign.

Richard Stein

Architect Richard G. Stein, FAIA, of New York, a leading advocate of energy conservation as an integral element in building design, died on April 18 at age 73. In the Stein Partnership, established in 1960, he designed significant medical and educational buildings. He published the influential *Architecture and Energy* in 1978 and taught at Cooper Union in New York.

Elliot Willensky

Elliot Willensky died on May 25 at the age of 56. Though trained as an architect, Willensky was perhaps best known as a writer and active member of the New York design community. He coauthored the AIA Guide to New York City with Norval White in 1967 (a third, updated edition was published in 1989); it remains among the most thorough texts on the subject, intertwining the architectural and socio-historic fabric of the city. He served as director of the New York City program for Cornell University College of Architecture, vice chairman of the Landmarks Preservation Commission, and Borough Historian for Brooklyn.

Giuseppe Zambonini

Giuseppe Zambonini, architect and educator, died on July 7 at age 48. Zambonini founded the Open Atelier of Design in New York in 1977, a nonaccredited alternative school where architectural design and construction techniques were taught. He closed the atelier in 1988 when he was appointed director of architecture programs at the Georgia Institute of Technology, a position he held until his death. As a practitioner, Zambonini was noted for his sensitive loft renovations.

Aquarium (continued from previous page)

Steve Dankner, composed 4 hours of computersynthesized music, and Douglas Ferguson assembled 24 hours of nonrepeating nature sounds from the Amazon Rainforest.

After two weeks of operation, aquarium officials say they have exceeded their attendance predictions. However, it is too soon to tell if this

Continuation of Sagrada Familia in Dispute

Certainly the most contentious architectural issue in Spain is the proposed sculptural addition to the Church of the Sagrada Familia in Barcelona, which stands, albeit incomplete, as the artistic culmination of Catalan architect Antoni Gaudí's career. An unprecedented wave of protest from artists, architects, and writers has broadened an already familiar debate in Spain: how to mediate forces of change in historic landmarks.

Work on the privately owned church has continued sporadically since Gaudí's death in 1926, directed by an autonomous group of the church's supporters, although the architect left no further plans. The most recent installation, 100 sculptures by Josep Maria Subirachs, ignited a furor that architect Oriol Bohigas contends has been simmering for decades. Bohigas criticizes all work on the church and calls Subirachs's proposal an "architectural assassination" and "a pernicious joke" perpetrated on the Catalan people. A recent demonstration of some 500 Barcelonans, organized by the editors of the now defunct cultural magazine *Artics*, included a candle-lit reading of criticisms by literary and artistic leaders. The magazine, di-



Detail of religious sculpture by Josep Maria Subriarchs.

Promotions at P/A

Mark Alden Branch has been promoted to the position of Senior Editor of Progressive Architecture. A 1987 graduate of Yale's undergraduate program in architecture, he joined the magazine that year, becoming an Associate Editor in 1988. He will continue to write and edit the News Report, and will write more feature stories. Also,

facility will boost the economy, as its supporters had promised. Restoring people-oriented verues on the riverfront has been the dream of many local planners for decades. With this facility and its adjacent park, one hopes that the dream is becoming a reality. **William Lake Douglas**

The author is public art director of the Arts Council of New Orleans.



"Passion" façade of Sagrada Familia with new sculpture installed.

rected by Vincenc Altaio, called the sculptures "horrible," and while recognizing the artist's right to free expression, questioned exercising this right "on a building that is not his own."

Subirachs' sculptures are proposed for the "Passion" façade of the church, which unlike the "Birth" façade, is not protected as a national monument. Bohigas has called for greater governmental mediation, "a service for protection of artistic patrimony, which would meet periodically to thetorically discuss and judge" similar proposed projects.

But for now, Catalan passions and the ghost of Gaudí highlight this polemic. What does Subirachs, the reluctant center of debate have to say? "I face this danger alone." And regarding the demonstrations: "This is a sad night for me, but tomorrow, I will continue working." For the moment. **C.C. Sullivan**

The author is a freelance writer and artist collaborating with architects in Spain.

Julie Meidinger and Abby Bussel have been promoted to the position of Assistant Editor. Meidinger, a graduate of Columbia's undergraduate architecture program, will increase her responsibilities in the area of Technics and Computers, while Bussel, an NYU graduate, will increase her involvement in our coverage of interiors and Products & Literature

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Vews Report

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Calendar

	Exhibitions	•
Architects in the Capital Through December 2	Washington, D.C. Architects practicing in Washington, D.C., were asked to submit their "most outstanding" project, built or unbuilt, for	
*******	this exhibition. National Building Museum.	
American Arts & Crafts Through January 6, 1991	Los Angeles. This exhibition celebrates the American Arts & Crafts movement with 250 decorative arts pieces from the collection of Mar Palevsky and Jodie Evans and the museum s permanent collection; furniture, glass, cera nics, and metalwork by Greene and Greene, Stickley, Wright, and others are displayed. Los Angeles County Museum of Art.	x ,
Mondo Materialis Through February 24	New York. Collage panels of materials – fro n plastic to recycled crushed glass – generate I by architects and designers in an effort to assess our natural and manmade resources, are supplemented with a display of new materials and finishes developed by manufacturers. "Mondo Materialis" (P/A, May 1990, p. 23) was organized by the Steelcase Design Partners iip and originated at the Murray Feldman Gal ery in Los Angeles. Cooper-Hewitt Museum.	
Britain's Independent Group November 4-January 13, 1991	Los Angeles. Though Britain's Independent Group first banded together in the 1950s in an effort to understand the rise of materialism in mid-century America and its effect on Europe, its members are perhaps best known as originators and arbiters of Pop Art and its offspring. Reyner Banham, Peter and Alise n Smithson, James Stirling, and Colin St. John Wilson were among the architects, artists, and critics in the IG. Museum of Contemporar Art	t.
Wright Designs November 9-January 6, 1991	Norfolk, Virginia. "Frank Lloyd Wright: Facets of Design" is divided into four sections: "Focusing on Wright: 1890–1920" (photographs by Henry Fuermann); "The Wright Chair"; "Pattern in Design" (graphic design); and "The Photographer's Eye: 1920–1950s" (interpretations of Wright's work). The Chrysler Museum.	r
Franco Albini November 14-December 28	New York. While Italian Rationalism was short- lived as a movement, its tenets of powerful unadorned design remain instructive; Albini's work remains an edifying force nearly 60 years later. National Institute for Architectural Education.	
	Competitions	
Evanston Public Library	Fvanston Illinois A notional design	
Registration deadline November 30, submission deadline April 1, 1991	Evanston, Illinois. A national design competition for a new Evanston Public Library is sponsored by the City of Evanston and library board of directors. "Individuals or teams headed by persons holding architectural or engineering licenses" are eligible. Contact Evanston Public Library Competition, 1703 Orrington Averue, Evanston, Illinois 60201 (708) 866-0300.	
Rudy Bruner Award Application deadline November 30	New York. The Rudy Bruner Award of Excellence in the Urban Environment "honors the urban place that most successfully reconciles the aesthetic, economic, and social values that struggle for equilibrium in today's development process." Anyone involved in the planning development, or operation of a project can initiate an application. Contact Rudy Bruner Award for Excellence in the Urban Environment, 244 Fifth Avenue, New York, New York 10001 (212) 889-5366.	s

(continued on page 30)

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MASTER OF ARCHITECTURE - M. ARCH. II Calendar (continued from page 28) FLORENCE Des Plaines, Illinois. The American Architectural **AAMA** Competition Submission deadline Manufacturers Association's 1990 Great American Façades competition program honors "outstanding and imaginative" applications of December 31 residential or commercial fenestration design Projects of five stories or less (new construction or remodeling) are eligible if completed by the contest deadline. Contact AAMA, 2700 Riv Road, Des Plaines, Ill. 60018 (708) 699-73 **Rotch Travelling Scholarship** Boston. A two-stage design competition for Application deadline eight-month traveling scholarship and an January 2, 1991 \$18,500 stipend, the Rotch Travelling Scholarship, has been announced. Applicant must be U.S. citizens under 35 years of age and meet other educational and professional requirements, including schooling or work experience in Massachusetts. Contact Hug Shepley, Rotch Travelling Scholarship, 40 Broad Street, Sixth Floor, Boston 02109. A TWO SEMESTER PROGRAM **Brick in Architecture Awards** Washington, D.C. Residential and commerci in design, including courses in history and buildings completed since January 1, 1985. Entry deadline January 4, 1991, theory, is open to qualified students with a first submission deadline which brick is the dominant material, may be professional degree in architecture. Program February 11, 1991 submitted to the biennial Brick in Archite begins with two weeks in Syracuse, New York Awards Program sponsored by the Brick followed by two semesters in Florence, Italy. Institute of America and the AIA. License architects in the U.S. and Canada are eligible Faculty: Syracuse University faculty and inter-Contact Brick in Architecture Awards, Frimmel nationally renowned critics and historians. Smith, AIA, 1735 New York Avenue, N.W Washington, D.C. 20006 (202) 626-7390 or BIA 11490 Commerce Park Drive, Reston, Virginia For information contact: 22091 (703) 620-0010. SYRACUSE UNIVERSITY **Rancho Mirage** Rancho Mirage, California. The City of Rancho School of Architecture Mirage is holding an open, two-stage Entry deadline January 4 103 Slocum Hall Syracuse, NY 13244-1250 competition to develop a master plan for proposed \$20-million Civic Center. The cert (315) 443-2255 will house government and community facilities. A program will be distributed beginning November 1. Contact William H. Liskamn Competition Advisor, Civic Center Design Competition, c/o Rancho Mirage City Hall, 69-825 Highway 111, Rancho Mirage, Cal. 92270. FUNCTION FOLLOWS FORM Conferences Forum '90 San Francisco. Forum '90, a national archit November 18-25 student symposium sponsored by the AIA "will focus on the critical connection betwe architecture and the environment at both macro and micro levels." The conference held in San Francisco. Contact Carl Costel AIAS, 1735 New York Avenue, N.W Washington, D.C. 20006 (202) 626-7472. **AEC Expo East** New York. The annual AEC Expo East, held at December 4-6 the Jacob Javits Convention Center, will include a trade show of automation, management, and reprographic systems for building design, construction, and facility management and conference for "guidance on computing a management topics." Contact Expoconsul Int'l, 3 Independence Way, Princeton, New Jers 08540 (609) 987-9400 or (800) 766-EXPO Atlanta. The 47th annual National Association of **NAHB** Conference January 18-21 Home Builders convention and exposition will be held at the Georgia World Congress Center in Atlanta. Educational programs, talks by **NIMBU**S industry leaders, and over 1000 product exhibitors are part of the four-day event. THE SEARCH IS OVER! Registration deadline is December 1. Conta Betty Christy, NAHB, 15th and M Streets N.W., Washington, D.C. 20005 (202) 822-8861. THE ORIGINAL CAST LIGHTING ISION OF ART DIRECTIONS, INC. DELMAR BLVD., ST. LOUIS M MO 63112-1204 63-1895 • Fax 863-3278

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Practice

Norman Coplan discusses various definitions of interior designers

for purposes of their licensing.

Law: Defining Interior Design

Interior designers have, over an extended period of time, sought recognition as a profession and to this end have pressed for licensing or certification statutes giving them that status. Architects and engineers have generally opposed these efforts, and the conflict in many states has been bitter and sometimes ugly.

In this atmosphere the American Institute of Architects, the American Society of Interior Designers, the Institute of Business Designers, and the International Society of Interior Designers recently joined in a collaborative effort to achieve a better understanding. In December of 1989, the parties agreed to support title certification statutes for appropriately educated interior designers subject to "a clear definition of interior designer to be developed and agreed upon by the respective parties at state level." As a guide the parties agreed to the following definition: "An interior designer is a design professional who meets criteria of education, experience and testing, as authorized by an authority. In general, an interior designer performs services including preparation of documents relative to nonload-bearing interior construction, furnishings, fixtures and equipment."

Many architects, engineers, and public building officials have taken issue with the suggested definition, arguing that nonstructural construction does not necessarily mean nondangerous or nonlethal construction and that critical building elements may be nonstructural, but nevertheless affect the safety of a project. Some of these are rated refuge area walls, rated horizontal exits, and rated ceiling assemblies. The inadequate placement of interior partitions or ductwork can also lead to hazardous situations. There is strong opinion that to give interior designers legal authority to determine whether or not nonload-bearing construction affects the structural integrity of a building is well outside their expertise and training.

This issue continues to be fought out at the state level. In Maryland, for example, the architects opposed a bill that appeared to permit interior designers to prepare drawings for "nonload-bearing construction." In Illinois, however, a bill has been adopted that provides that interior designers qualified by education, experience, and examination may offer professional service for any interior design project of nonload-bearing structural elements within and surrounding interior spaces of buildings. The bill excludes from its coverage services that relate to the mechanical and electrical systems.

New York is the latest state to adopt a certification statute for interior designers, but as the result of great effort on the part of the architectural profession, the definition of "interior designer" in this statute is highly restrictive and limited. Consequently, this statute affords the public the greatest margin of safety. The New York law does not include nonload-bearing interior construction in its definition of interior design, apparently leaving it solely the responsibility of architects and engineers. The statute defines interior design "as rendering or offering to render services for a fee or other valuable consideration, in the preparation and administration of interior design documents (including drawings, schedules, and specifications) which pertain to the planning and design of interior spaces including furnishings, layouts, fixtures, cabinetry, lighting, finishes, materials, and interior construction not materially related to or materially affecting the building systems, all of which shall comply with applicable laws, codes, regulations and standards."

The statute further excludes from the definition of interior design, services "relating to building systems, including any structural, electrical, plumbing, heating, ventilating, air conditioning or mechanical system" and explicitly provides that an interior designer may not engage in any activity that constitutes the practice of engineering or architecture. Further, the statute provides that "interior design plans . . . are not to be construed as those required to be filed with . . . building departments as required by the state Education Law regulating the practice of architecture and engineering." If the New York statute is followed as a model in other states, it will be less likely that unqualified interior designers will be engaged in activities that infringe upon the provinces of architecture and engineering. Norman Coplan

The author is a partner in the New York Law firm of Bernstein, Weiss, Coplan, Weinstein & Lake.

Practice Points

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Practice Law

Management

Serving as an expert witness? There is a new guide out, entitled Recommended Practices for Design Professionals Engaged as Experts in the Resolution of Construction Industry Disputes, that was developed by the Interprofessional Council on Environmental Design. For a copy, send \$5 to ASFE/8811 Colesville Road/Suite G106/ Silver Spring, MD 20910.

Midsize firms of 30 to 150 employees can compete with larger firms if they control costs and concentrate on high performance and accountability (as well as incentive compensation) for all employees, rather than only for the principals. This is reported in the *Professional Services Management Journal*, (617) 965-0055.

By specifying the right materials and designing energy efficient buildings, architects can have a significant positive effect on the environment. Recognizing this, the AIA is currently compiling an Environmental Resource Guide (ERG), which will be published in sections and updated periodically, based on current industry findings. The publication should be available in several years.

In the meantime, a new newsletter for architects and designers also addresses environmental issues. A one-year subscription costs \$10; write Kurt Raymond/The Green House Bulletin/4711 Springfield Avenue/Philadelphia, PA 19143. 41

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Thomas Kvan of The Coxe Group shows how one firm

got control of its CAD costs.

Management Case Study: Controlling CAD

Background

The principals of this firm recognized that the considerable investments being made in computers year after year were failing to produce the results they expected. From their perspective, the systems represented a considerable financial drain. They spent hours trying to rescue CAD-based projects that ran over budget and were frustrated because the system was a bottleneck. Worse yet, the systems often failed.

The perspective of the staff was, of course, somewhat different. The few individuals who had learned to use the systems spent hours struggling to make them work successfully, as each workstation was slightly different from the others – configured to squeeze the most out of authorized purchase budgets.

To cap it all, it became clear to the staff that, once trained, they were forever "CAD operators" ceasing to be professionals. Not surprisingly, staff no longer volunteered for training, and the CAD contingent felt themselves under siege. A number of the staff planned to leave to escape the situation.

The Issues

The history of CAD use here is similar to that of most firms. Pushed by clients and peers, they started to use CAD reluctantly five years ago. Initially, they worked with a CAD service bureau to satisfy contractual requirements for project delivery, but year by year, the economics changed, and workstations were brought in one at a time, until there were five stations.

The computers were managed retroactively. Managers had not assimilated the use of technology into their understanding of practice, and, consequently, computers were not managed as a component of the practice. Investments were made out of necessity - not because management wanted to do so. The team seemed to lack the understanding that the advent of production technology had shifted the practice from a very flexible, labor-intensive model to one that was somewhat more capital intensive.

The introduction of computers also required a change in attitudes about financial planning, which was misunderstood. Computers cannot be financed through one-time expenses. Each expenditure has to be considered as the next incremental investment but not as the last. A decision to purchase must be made with some thought for the future implications of that investment.

The Actions Taken

Working with a consultant, the management team explored the implications of technology on professional practice and, more directly, came to an understanding of the potential uses for computers in their practice. Some of the fundamental questions posed by the consultant were:

- Are there methods of practice other than those which you have pursued over the past years?
- What are the prospects in coming years for hiring the kind of people you want, and

what can you do to position your practice to attract these people?

 What is a reasonable model of capital investments on which to base a practice?

To obtain answers, the consultant took the principals and key staff on a series of exercises. The questions included:

- How do you see the practice changing over the next five years, both in type of work you will undertake and the staff required to carry out the work, assuming no change in current methods?
- What effect will broader use of computers have on your ability to produce better professional services? How might you direct staff to use these systems better?
- Could you see additional services arise?
- If all went well, to what extent could you see computer technology being used within the practice?
- Indentify the current status and interpolate the investment necessary to reach the goal.
- Once the plan is laid out for five years, extend it to ten to understand the investment implications over a long term. Technology is not a one-time investment. It must be supported with upgrade, replacement, and maintenance budgets.

Summary/Learning

Three fundamental lessons were gleaned from the firm's experiences.

First, instead of investing in one system at a time and squeezing the most out of each purchase order, the firm now makes purchases with an understanding that each is a preparation for the next opportunity.

Second, computers have let the firm expand its scope of capabilities. However, converting to a capital-based practice brings with it a need for a financial management perspective that is fundamentally different from their previous assumptions. Buying computers is not a one-time occurrence but a commitment that requires forethought.

Third, the principals realized that their capital investments had to be supported by active training programs for the staff and by human resource management. Simply bringing in the systems and helping staff members to get going was inadequate.

A profoundly disturbing result of the earlier myopic approach has been that computer users became operators. Good staff were relegated to stare at a screen all day and, inadvertently, the computer became a tool to derail careers. With a change in attitude, management can send out the message that systems are not unusual devices for the secretly-initiated but tools which we will all come to use when appropriate. With that message, reinforced by a long-term financial commitment to remain with the technology, staff recognized that even those who are facile with computer technology are first and foremost professionals and that they too can play a role in other aspects of the business. **Thomas Kvan**

The author is a consultant with the Coxe Group, a consulting organization specializing in the management of architectural and other professional design firms. 43

ractice

"Joe is very availa

T. Graham Bradley is a principal of Bradley Likins Dillow Drayton, AIA, a 60-year-old firm located in Decatur, Illinois. He is a Fellow of the AIA and past director of the national AIA. He is also past president of both the Central Illinois Chapter of the AIA and the Illinois Council of the AIA.

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Lhere's no typical day for Joe Murphy, but at least a couple of days a week you'll find him driving 250 or so miles in several different directions to: spend two hours discussing loss prevention with an architect and helping him fill out a DPIC application, two hours talking about a structural engineer's changing practice and completing a renewal application, another hour talking about project insurance with another architect. and more time with another renewal application. He met Graham on a trip like that about eight years ago. Graham had a problem on his professional liability policy and Joe helped straighten it out.

Joe says, "I don't think you have to come on strong—I think it's just being there when they need you. You finally get to the place where, when they think they have a problem, they call you—they just plain can't think of anyone else to call."

Joe's spent over 20 years in the insurance business, and nearly ten representing DPIC. Today he can hardly remember the days before he knew about professional liability for design professionals: almost 100% of his time is spent with architects and engineers. Because of his expertise and his proximity to the state capitol, he works with Graham and other design professionals to provide input to policymakers. working with government bodies like the state Capital Development Board, which handles all renovations and new buildings for the state. He's a "reference point" for them-their sounding board on what the insurance industry thinks about contractual clauses under discussion with the AIA, ACEC and others. If you're a design professional in central Illinois, you'll see Joe Murphy.

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"Joe's knowledgeable about what we do. He'll come in and talk to the partners about contract review and loss preventionfrom there it's passed along to our staff. When we have a new form of contract that looks like there might be an oddity with it, Joe is the first one we call. Usually when a contract is presented to you, you don't have a lot of time to fool around with it. They expect you to almost get it back in the return mail. And, after all, it's a business arrangement that we're anxious to do. too, so we don't want to sit on it. But we don't want to do anything that negates our insurance, either. Joe's very cooperative and helpful. He'll get back to us right away with an answer. So we really feel that we can proceed without risk or with minimal risk.

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Progressive Architecture

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Rear Elevation, Home Sweet Home by Pacific Associates Planners Architects.

Houses and Construction

Architects – and architecture magazines – frequently contribute to the myth that a successful work of architecture is the result of individual genius. But the success of collaboration among all the parties involved in building almost always separates great buildings from merely great ideas.

With that in mind, we chose to devote part of our houses issue this year – after we had chosen the houses – to a look at the collaboration between architect and contractor; most of the features carry a sidebar story headed "The Construction Process," based on interviews with both parties. In some cases, as in Richard Meier's Grotta House (page 90), we found that "impeccable" drawings were responsible for the cleanness of detail; in others, like William Pedersen's own house (page 85), such precision was achieved through on-site observation. While Stanley Saitowitz (page 64) and others say there was no room for error in their projects, Richard Dalrymple's contractor says that "tacking things up and moving them over" was the norm (page 58).

Architects and contractors work together with varying degrees of formality, especially on projects as small as houses. But in all these projects, the relationships seem to have been good ones; without such relationships, these houses probably would not be here. **Mark Alden Branch** In our annual houses issue,

we consider the interaction between

contractors and architects.

Bringing Up Baby

For Richard Dalrymple, living in and building a P/A awardwinning house has been like watching a child grow.



n his own house in San Diego, architect Richard Dalrymple of Pacific Associates Planners Architects has succeeded in building one of the more delightful, improbable houses that has appeared in the P/A Awards (Jan. 1986, p. 84). Called Home Sweet Home, the house manages to be an accommodating container for living while celebrating, as Awards juror Susana Torre put it, the "desire of architecture to be unfinished."

As a matter of fact, the house is unfinished in these photographs and will remain so for some time to come. Although the Dalrymples moved in two and a half years ago, they are finishing the house slowly. Dalrymple says that when designed, the house was "very much about construction," but that as they watch it move toward a more finished state, other issues such as scale are coming to the fore. He likens the house's development to that of a child, one that has until recently been rather immature and the subject of much doting. Now, he says, the house is in its "teenage years," especially since it is beginning to assimilate "outside influences," such as furniture and art work. The struggle to tame the house's childlike form and make it livable has been and continues to be part of Dalrymple's work.

The aesthetic that Dalrymple used as a jumping-off point for the house is that of the neighborhood that surrounds his tiny lot. His neighbors, too, have gable roofs and clapboard siding, and his appropriation of those forms and materials may seem to be a Deconstructivist parody of our perceptions (gable equals house). But the real motive behind his chipping away of corners and ceilings is not to disquiet, but to invite rumination on the nature of inside and outside in a surprisingly comfortable way. The airy openness of the house is Dalrymple's attempt to take advantage of San Diego's sunny climate and its relatively modest requirements for shelter. Thus windows swing open at corners to create a treehouse effect, and a whole ceiling disappears in the dining room. Another site consideration, the view from the Mission Hill site, led to the decision to put the living spaces at the top, which in turn led to the picket-fended stair that climbs the street facade.

An essential reason that the house, for all its idiosyncracies, does not feel incoherent inside is that the main spaces retain – barely – their integ-(continued on page 63)

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Home Sweet Home is situated on a tiny (35' x 60') lot in San Diego's Mission Hills neighborhood, an area of wood-framed bungalows and other varied house types. The house's street façade (1) is dominated by a false-front gable, a pulley-operated "ventilator," and the picket-fenced stair to the main entrance. The varied treatments of openings (2) serve to dissolve notions of interior and exterior in an effort to take advantage of San Diego's sunny climate.



The Construction Process: Building in Episodes

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Don't let the ad hoc appearance of Home Sweet Home fool you; the house was built almost exactly as drawn by Dalrymple four years ago. At that time, he conceived of it as being "about construction," but the question of building it required some study. In order to make some sense of the complex plans and sections, Dalrymple communicated the design to his contractor, Ron Nau of Nau Builders. as a basic L-shaped frame with a series of episodes attached. He had not designed the house from this concept, but it was an effective way of explaining it.

Nau, who began his career as an independent contractor with this house ("Everything else seems so easy now," he says) remembers that Dalrymple approached him explaining that the house was going to be very difficult to build, and that it would take a long time. They worked out a flexible, non-bid contract suited to the nature of the house and began work, with Dalrymple's framing diagrams.

After the basic framing was in place, the construction took a turn more in line with Dalrymple's concept of the house. Instead of sheathing, roofing, and finishing in the usual chronology, the parts of the house were considered and built one at a time. Dalrymple remembers, for example, the "wonderful couple of days" building the pulleyoperated ventilator in the living room. The specifics of this work were worked out on site or in additional sketches based on problems that developed.

Ron Nau's work on the house is finished, but the house is not, and Nau says he had mixed feelings about leaving the project for Dalrymple's eventual completion: "I was glad to get out of there, but then at the same time I was almost willing to donate time to get it done."

After entering the house from atop the exterior stair, one passes over a seemingly makeshift bridge to the living room (3). At lower right in the photo, the main interior stair descends.



THIRD FLOOR PLAN



SECOND FLOOR PLAN



STUDY 8 KITCHEN 9 DECK 10 ENTRY



FIRST FLOOR PLAN



10'/3m









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Progressive Architecture 11.90





(continued from page 58)

rity as orthogonal, discrete rooms. The dining room, for example, is defined not by its corners, which are whittled away as entrances to the room, but by four planes that stop short of the ceiling. This strategy creates a balance between the psychological need for rooms and the desire for openness and fluidity. It is in the juxtaposition of these spaces, where Dalrymple has filled in the gaps between wall planes with storage and other secondary spaces to achieve a kind of planar poché, that major idiosyncracies of plan occur.

The result is a house based more on a narrative or series of episodes – glimpsed in innumerable ways through windows and other framing devices – than on an overriding concept. Dalrymple delights in telling about Alice-in-Wonderland experiences of scale he has discovered in the house.

What happens next in this house, whose ongoing construction has been so much of its story? Dalrymple says he continues to be pleased with the way it is "growing up; he admits that there will probably come a time when the family outgrows the house, "but to even think about that is painful." **Mark Alden Branch** The living room (4) has two glass walls overlooking the roofs of neighborhood houses. The wall at right between the living room and kitchen is being completed with artist Todd Rinehart. In the kitchen (5), casement windows dematerialize a corner. In the double-height master bedroom (6), which is occupied by the Dalrymples' teenaged daughter, the bed cantilevers over storage and living space. The dining room (7) is defined by planes and is entered from its four corners; the roof is retractable. The study at the rear of the house (8) includes two work areas, one in a tiny houselike appendage (background in photo). Interstitial areas such as the one at right in the study are used informally for storage.

Project: Home Sweet Home, San

Diego, California. Architects: Pacific Associates Planners Architects, Inc., San Diego (Richard Dalrymple, project designer; Mike Herman, designer; Jim Musar, project architect). Clients: Richard, Barbara, and Kelly Dalrymple. Site: 35'x 60' lot in Mission Hills, an older residential neighborhood. Program: 1300-sq-ft single-family house with two bedrooms. Structural system: wood frame. Major materials: wood siding, glass, gypsum board. Mechanical system: forced-air heating. Consultants: Pacific Sun, landscape; John Nicita, structural; Todd Rinehart, artwork. Contractor: Ron Nau. Costs: \$160,000. Photos: David Hewitt.

P/A Awards Update: Home Sweet Home

Critical Mass

A hillside house by Stanley Saitowitz Office gains its authority from architectural fundamentals.



Since the house can only be approached from above, Saitowitz identified the roof (1) as the fifth and perhaps most significant elevation, which he treated as a terraced garden. The guesthouse, nicknamed "the barn," was built on the hillside overlooking the house (2, center). Seen from below, the barn's roof configuration (its steel fascia as yet unpainted) echoes that of the pavilion. Almost one full year of the three spent on the project was devoted to site development and the construction of a steep access road. From the raised garage at the foot of the driveway, a stone stair descends to the entry court (3), which was landscaped as a rock garden. The "wall-like" wings flanking the pavilion are bunkered into the hillside, so that their roof parternes are accessible from above. The ridged rocks of the court reiterate the parti's emphasis on the linear thrust of the promontory.

The DiNapoli residence in Los Gatos is a compelling example of what can happen when the right project falls to the right architect at the right time. The challenges posed by a promontory site with spectacular views, a grand scale, and emptynester clients predisposed to a pared-down Modern aesthetic, required an architect capable of gestures at once bold, generous, and subtle.

Stanley Saitowitz was the right man on several counts: By 1987, when he landed the job, the San Francisco architect had cultivated a discriminating approach to architecture and landscape, developed through several residential commissions on similarly demanding hilly sites. (Saitowitz's striking models of these can be seen in a traveling show entitled "Geological Architecture," which was launched at the Walker Art Center in Minneapolis, and is scheduled to tour California next year.) The residences that had gone before, while not all implemented, contributed to a formal and structural maturing, now evident in the discipline, finesse, and remarkable degree of anticipation brought to the DiNapoli house.

Saitowitz's parti sprang from diverse inspirations, tempered by physical and client-related constraints. "The act of building itself is a violent act in terms of landscape," he says. "My attitude isn't a conservationist one. It's about amplification." The architect's effort to make the landscape "more potent than it was" was shaped, in part, by a Wallace Stevens poem, "Anecdote of the Jar." In it, Stevens describes a jar he placed upon a hill in Tennessee: "It made the slovenly wilderness/ Surround that hill./ The wilderness rose up to it,/ And sprowled around, no longer wild."

The ancient ruins of Machu Picchu in Peru provided further inspiration, "a checklist of n oves on how to inhabit a promontory." Saitowitz surprised the DiNapolis with his basic strategy to eave free the gentle knoll along the spine of the foreland, electing instead to frame and enhance that clearing by building two thickened, inhabitable "walls" along its steep edges, a plan akin to the Incan architecture at Machu Picchu, in which the center served as an open, collective space, edged by dense structure. As built, the walls, containing accommodations and services, are bridged by a lightweight pavilion. The wood-frame wing: (initially conceived as masonry buildings) are finished (continued on page 68)



The Construction Process: A Sum of Parts

The fact that the site could only be reached by a single, very steep road had great impact on the sequence of construction. "You had to put the house together in puzzle pieces," says Larry Christiani, the general contractor who devoted three years exclusively to building this project. Limited space for stockpiling materials or operating large crews made it necessary to begin construction from the outer edge of the promontory and gradually work back toward the hill. Thus, the pool and poolhouse (5) were built first; the two "wall" wings followed, and then the steel frame pavilion was constructed to bridge the wings. Besides complicating the logistics of manpower and materials, building the house incrementally required great accuracy in execution to ensure a "seamless" result.

The roofs alone presented a formidable challenge: Since the roofscape was to form the fifth and perhaps most visible elevation of the house, and to be used as a series of terraces (4), it could not be penetrated by vents and drains. Instead, Saitowitz and Christiani developed several methods to lead the various ducts through the outer, less seen walls of the wings, with outlets set flush with the wall planes, or incorporated into the parapet. The requisite drainage slopes, too, had to be calculated and installed to minimize the thickness of the roof fascia; a permeable layer of gravel laid above the inclines preserved the horizontal appearance of the

roofscape parterres. "I'd say the house was probably one of the more difficult I've ever built," Christiani says. "It had an overwhelming feeling of simplicity to it that made it very difficult to do." For example, the openings have virtually no trim (6). "It was necessary for the walls to come right into the windows and doors looking like they were always meant to be there," the contractor explains. "The doors had to be hung way in advance of the normal construction sequence just to get the finish materials to line up perfectly with the wood, so the jambs became part of the walls. There was no tolerance at all."





FIRST FLOOR PLAN

13

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square-foot residence and a relatively simple program, Satow-

itz stretched the four-foot domestic module he usually uses to a five-foot grid that governs the entire project in all dimensions.

At the brink of the promontory, Saitowitz located a small poolhouse (5) that effectively halts the house's headlong horizantal

CARETAKER'S UNIT

PARKING COURT

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DiNapoli House






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A 15-foot drop is taken up by cascading stairs (7) and tribunes (8) incorporated into the house. A gallery (9, left) lines one side of the pavilion, leading to the roof garden above the dining room (10). The pavilion reveals one of the house's few flaws, as well as some of its most beautiful aspects: The vast space has a somewhat institutional feel, increased by a formal axis between front door and fireplace and by slick elements like the canopy over the hearth. Saitowitz, however, had originally located the fireplace to one side; The DiNapolis objected. "The knoll seemed to be the place where you would build a fire and look at the valley," Jennifer explains. Other qualities more than compensate: The thoughtful balance between solid and glazed panels promotes a sense of enclosure and creates wonderful effects as light tracks through the room; the views, purposely limited, are enhanced.

(continued from page 64)

with stucco or stone cladding; the steel-framed pavilion is enclosed by glass and wood panels.

The massing creates three courts of different character: a hard-edged entry court at the foot of the access road; the light-washed public hub of the pavilion; and the manicured "outdoor room" on the knoll overlooking the horizon, contained by structure on three sides. The disposition of the house's parts was determined also by a requirement of the city of Los Gatos to preserve existing native oak trees on the site. One such cluster occupies one side of the garden court. Others line the stuccoed outer perimeters of the wall-like wings. Jennifer and Philip DiNapoli imposed their own restraints, mainly in the form of a preference for rectilinear geometry: Some months into design development Saitowitz had completed a model that embodied the agreed-upon parti with an array of parallelograms, which the clients rejected as too dynamic.

Back at the drawing board, Saitowitz, finding himself in "a position to explore a restrictive language," drew on architectural legacies. An earlier visit to the reconstructed Barcelona Pavilion had already engendered an appreciation for the "power of a very simple planar architecture, made of three elements, the platform, the wall, and the roof." The DiNapolis' interest in Barragan was answered by Saitowitz's own absorption with Mies's unbuilt Brick Country House of 1924, which advanced Wright's open plan through an abstracted configuration of freestanding walls, itself owing much to Theo van Doesburg's 1918 paining, Rhythm of a Russian Dance. John Hejduk's wall houses offered latter-day variations on similar themes. "I suppose there's always the Wrightian connection," Saitowitz acknowledges. "In his later work, following Fallingwater, there's a reworking of de Stijl, [which was] inspired by Wright, formalized in Europe, then reabsorbed into Wright." Certainly, the DiNapoli house recalls Wright and Mies with its sweeping horizontal lines and deep eaves, its pavilion's play of opaque and transparent, its serenity and rootedness in the landscape.

At a time when "artistic" invention carries quite a premium among architects and audience alike, it is rewarding to find a house so informed by architectural ideas. It reaffirms the validity of our building culture. **Ziva Freiman**

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Project: DiNapoli residence, Los Gatos, California.

Architects: Stanley Saitowitz Office, San Francisco. (Stanley Saitowitz, principal; Ulysses Lim, project architect; John Winder, Ivan Kadey, Dwight Long, Johannes Florian, design team.)

Client: Jennifer and Philip DiNapoli. Site: 13 acres of sloping land.

Site: 13 acres of sloping land. **Program:** residence and guest house, total 14,000 sq ft.

Structural system: 2 x 8 stud wood frame; tube steel frame.

Major materials: steel, wood, stone, stucco (see Building Materials, p. 156).

Consultants: Rafferty Engineering, structural; Architectural Lighting Services, lighting; Design Focus, Saratoga, landscape; Al Duarte, interiors.

General contractor: Christiani Construction, Larry Christiani. **Costs:** withheld at client's request. **Photos:** Richard Barnes.

Haunted House

In this Fishers Island vacation house, Mark Simon and Leonard Wyeth of Centerbrook

explore the darker side of the American Gothic vernacular.



Haunted houses are not just the stuff of pulp fiction. They embody a truth about architecture: that buildings have humanlike features – expressive faces, gesturing forms, glassy eyes. The Gothic fascination with animating the inanimate has a long history in our art, from the stories of Edgar Allan Poe to the paintings of Charles Burchfield to the cartoons of Charles Addams. But rarely has this idea been pursued in architecture as thoroughly and as inventively as in this house by Mark Simon and Leonard Wyeth of Centerbrook.

Designed as a vacation retreat for a woman who required many bedrooms for visiting friends, the shingled house fits comfortably in its Olmsteddesigned community. The building's Alice-in-Wonderland quality first becomes apparent in the entrance court, where there are shifts in scale (the storage shed that looks like a miniature garage), Gothic allusions (the porch brackets that recall the crazed pattern of some Victorian gingerbread), and anthropomorphic features (the entry canopy that resembles, as Simon puts it, "a cow going into the barn," and the courtyard's fence, whose staggering vertical boards appear drunk).

In the house itself, there are conscious efforts to

unsettle the visitor, to force people "to constantly readjust," says Simon. The façade, for example, has windows that vary in size and height, making it difficult to ascertain the building's floor locations or scale. But the real surprise lies within. The simple, gabled form of the house contains a series of round, oval, and rectangular rooms that jostle about in the square plan. "It's like a geometry lesson on drugs," says the owner Charlotte McKim. The round entry foyer leads to a recessed, oval living room set at an angle. An adjacent rectangular dining room is also skewed to align with the water view. Upstairs, another round hallway, reached via a winding stair, gives access to an oval master bedroom and three small guest hedrooms, one of which is slightly shifted in plan,

There is ample wit in this house. To take but one example, the three-dimensional stickwork that forms a frieze in the living room resembles a railroad track after a train wreck, which is ust what the plan of the house looks like. Behind such whimsy, however, lies a serious intent. The allusion to backwoods Carpenter Gothic is a barb at Post-Modern historicism, which Mark Simon sees as having become "a series of clichés. You are

courtyard and a covered walkway to the storage sheds (2). The pattern of staggered uprights in the courtyard's fence is repeated, in a reverse figure-ground, in the outdoor shower enclosure off the side of the house. An even more subtle game is played with the fenestration of the main façade, where pointed windows of different sizes and heights obscure the house's true scale. Where it faces the water, the house has stickwork porches, both attached and freestanding, that give access to a broad deck (1). Throughout the house, there is a playfulness -"a knowing misuse of vernacular sources," says Mark Simon combined with a brooding, Gothic darkness.

The porte-cochère at the McKim

house forms a gate into the gravel



The Construction Process:

On-Site Innovation

By training, if not by temperament, architects and contractors rarely see a project in the same light, especially with a plan as seemingly complicated as this one. Architect Leonard Wyeth points out the essential clarity of the structure. "We kept the outer box simple, putting the complex geometry inside. The curved interior walls stiffen the building, which is often exposed to 60- and 70-mileper-hour winds." "And where we wanted a higher space," adds Mark Simon, "we dropped the first floor rather than cut into the second floor framing." But Anthony Marshall, the general contractor, sees things somewhat differently. "It was an interesting job," says Marshall, "but difficult to build. Constructing oval rooms and rectangular rooms on the bias took more time and used more materials. It was especially tricky on the second floor, where the intersection of the sloped roof and the curved walls demanded that each stud be a different length and that the top plate be custom made."

The differences between architect and contractor were most apparent in their treatment of the house's irregular stickwork. The architects pushed the Ruskinian idea of the builder being free to improvise on site. "The drawings," says Wyeth, "called for the architect and contractor to locate the sticks in the field. But we made the mistake of drawing a pattern, which the contractor used for every one." The stickwork had to be selectively altered after it was completed to achieve the desired irregularity (3). What this episode suggests is that, given the construction industry's system of divided responsibilities, adversarial relationships, and formal communication through contract documents, the ideal of on-site innovation is an elusive goal.

Still, there was some cooperative creativity between architect and contractor that did occur at the site. The second-floor windows under the eaves, says Marshall, "were Andersen casements made to open like awning windows, since Andersen's stock awnings were not the size we wanted. We had to alter the window but it worked out well."



TYPICAL CANOPY STRUCTURE

The inside of the house is lighter and sweeter than the shingled exterior (3) but no less complex. The round entrance hall, for example, gives access to a winding stair, a crooked hallway leading to the living room, a flared kitchen entrance, and a small closet (5). The slumpedglass wall sconces were designed by the architects. In the living room, a custom-designed mantel and frieze dominate the oval space, while the rectangular dining room directs one's view out to the water (4).







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allowed to draw from only a few vernaculars, when in fact," he says, "there are hundreds of vernaculars from which to choose."

The quirkiness of this house also is a reminder of the endearing awkwardness of most vernacular buildings and of their origin in a "craft tradition that," says Simon, "most architects have become separated from." Whether this carefully planned house – or any building designed by an architect today – can truly recapture the unselfconsciousness of vernacular architecture is another matter. The world is too much with us now, and perhaps the best we can do, as Simon and Wyeth have done here, is to comment upon that fact.

What is most compelling about this house, however, is not just its reference to a Gothic vernacular, but its feel for the storm and stress of Romanticism. As in the writing of Melville and Poe, this house creates an inner world that is unsettling and at times disorienting; its plan is that of the French $h\hat{o}tels$ of the 18th-Century Enlightenment gone slightly mad. This is no simpleminded historical pastiche. This is a house that seems haunted by the craziness and absurdity of our own dark age. **Thomas Fisher** Project: McKim House, Fishers Island, New York. Architects: Mark Simon and Leonard Wyeth, Centerbrook Architects & Planners, Essex, Connecticut. Client: Charlotte McKim. Site: 2¹/2-acre north-facing hillside overlooking Fishers Island Sound. Program: 4-bedroom, 21/2-bath house (2650 gross square feet). Major materials: wood framing, cedar shingle siding, asphalt single roof, Southern pine floors (see Building Materials, p. 156). Mechanical system: oil-fired, forced hot-air system. Consultants: Lester Collins, landscape; Besier Gibble Norden, structural. General contractor: Bouton Services. Costs: not available.



An Arizona house by William Bruder frames mountainous vistas with an evocative structure of masonry and metal. **S**een from an approaching car, the Murray residence looks like a latter-day Sphinx: an abstract yet animal-like form that reposes before Gavilon Peak, the extinct volcano that dominates its desert environs. The house is a man-made complement to the heroically-scaled setting, where more conventional domestic forms would be overwhelmed by the rugged, open terrain.

The house's compact masonry massing, like the desert's primeval aura, is misleading: The residence actually comprises a rambling pair of wings stretched across the building lot, which will inevitably be flanked by neighboring houses. This home for a retired couple, the 38th house of Bruder's 15-year career, accommodates the paradoxically rugged, yet fragile desert landscape: Every component of the building envelope – from the metal hood that rises above the masonry walls, to the strategically-placed windows – follows the contours of the land and exploits those vistas that will not be obscured by future development.

Bruder let the drama of the landscape determine the orientation of the plan, an approach promoted by Frank Lloyd Wright, another aficionado of the Sonoran Desert. Bruder's house, however, is not simply a latter-day version of Wright's aesthetics, which called for a thorough synthesis of every architectural element. Instead, the Murray residence is a composite of strongly contrasting parts. Bruder's energetic style is refreshing and forthright, but one occasionally finds incidents that would benefit from more refinement. Consider, for example, the metal hood above the corner window of the Murray residence; while it is visually impressive, some indication of its cantilevered beams would have made it more structurally lucid. In general, Bruder's detailing is creative and well resolved, but here his fascination with geometric forms won the upper hand.

The layered masonry walls, a protective perimeter around the Murray house, are a counterpoint to the metal and glass walls that open the interior to views of the desert. Both the thick and thin walls form an enclosing envelope that is folded and incised to frame views of nature – at the glazed corner of the dining area, for instance, or at the glass wall of the master bedroom, which faces the façade of the living area, below Gavilon Peak. In both instances, the apertures in the walls contrast the domestic realm with the uninhabitable desert: Nature is brought into focus, but its grandeur remains inviolate. **Philip Arcidi**





A broad metal hood glimmers in contrast to the concrete block en-closure of the Murray residence (1); its profile matches the slope of the site, while furnishing a Mod-ern residential image. In the rear (2), the house's sprawling wings wrap around the core, sheathed in metal and glass.

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. **The Construction Process:** An Allowance for Invention

The desert is a liberating place for the architectural handyman. To William Bruder, it has been an open laboratory where he can try new ways of giving materials unorthodox applications. Galvanized metal, sandblasted concrete block, and rusted steel joists have been part of his oeuvre for 15 years, as have standard aluminum frames modified into pivot-swing doors, like the one at the Murray residence.

Bruder's experience as a sculptor undoubtedly fostered his hands-on approach with mundane materials; perhaps his preference for unpainted materials likewise originated in the art studio. In the Murray residence, as in most of his structures, color is integral to the building materials - from the aggregate of the roof, which matches the color of the earth, to the red particles mixed into the concrete aggregate of the masonry walls, and the pale tone of the maple cabinetry inside.

Bruder did not rely on drawings to realize his experiments at the Murray house: His office served as the construction manager, and the client's son assembled the subcontractors from his circle of friends. Together, they tried new solutions throughout the building process - from ventilating ducts integrated into the cabinetry wall, to reveals that create a penumbra of light beneath the ceiling of the master bedroom.

The reflective metal cladding on the broad hood was the dividend of a budget cut. Bruder's drawings originally specified copper, but the cheaper galvanized surface is more brilliant, and its corrugated surface accentuates the incline of the roof. The casement windows are likewise adapted from industrial materials: They have deadbolt fasteners tooled from aluminum extrusions, and their screens are perforated panels that act as scrims. From the inside these screens are transparent, but from outdoors they are reflective and glow with the hues of the desert at sunset.



SECTION A-A









Project: Murray Residence, New River, Arizona.

Architects: William P. Bruder Architect, New River (Design team: William Bruder, principal in charge, Robert Adams, Wendell Burnette).

Site: sloping 9.5-acre site on the north face of an extinct volcano. **Program:** 2365-sq-ft house with two bedrooms and garage.

Structural system: wood frame, structural steel beams, and concrete block walls.

Major materials: sand-blasted red aggregate concrete block, galvanized sheet metal, maple-veneered plywood (See Building Materials, p. 156). Mechanical system: heat pump. Consultants: Jack Trummer, J.T. Engineering, structural; Roy T. Otterbein, mechanical; Roger Smith, Lighting Dynamics, lighting. General contractor: owner; William P. Bruder Architect, construction manager. Costs: not available. Photos: Timothy Hursley.

Texas Breeze

Lake/Flato Architects deliver grand scale on an economy budget

in a climatically-attuned weekend house



The client's budget (small) and number of friends (large) dominated the discussion when architect Ted Flato met contractor Jimmie Penshorn at the site of what would become the Salge house on Canyon Lake (about 30 miles from San Antonio). Flato, A principal in the San Antonio firm of Lake/Flato Architects, sketched possible configurations on a scrap of paper while they talked. "I'd ask him: 'Can you build this within the budget? How about this?' "Flato recalls. The final form of the house, constructed in stucco over wood-framed panels, was refined from the diagram made that afternoon.

The main space of the house is described by the architects as a single room that "works simultaneously as entry hall, screened pavilion, and livingdining-kitchen space"; it rises nearly 25 feet from the stained concrete floor to the cupola, with its electrically-operable, square clerestory windows. The east and west walls have no openings into the house's main space; most of the windows are on the north wall, with its conventional-sized glass doors, and the south wall, which has four windows and 12-foot-tall glass doors.

In warm weather, the clerestory windows work

with the tall lake-facing doors to circulate breezes from the lake (there is also an air-conditioning system); in winter, the glass doors on the southern exposure admit sunlight that warms the concrete floor, while the house's low northern profile helps protect it from cold winds. An efficient shallow fireplace is set in an alcove in the east wall (beneath a plywood box truss that forms part of the floor structure of the private area above).

Lake/Flato integrated the sleeping and storage spaces and bathrooms needed for the house by placing them in volumes around the main room that the architects call "thick walls." Maximum efficiency is squeezed from every inch of these spaces. One passes, with surprising informality, through the narrow second-floor bath, to reach the master bedroom. It, like the others, is barely wider than the bed it holds. The sensation is like going below deck on a family-size sailboat.

By manipulating lightweight, low-cost materials, Lake/Flato has created a wholly illusory sense of mass and solidity in the Salge house. The pleasures of a lofty living space and efficient planning, however, are no illusion - they are products of good design. Joel Warren Barna

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The main entry (1) opens onto a landing midway between the upper and lower floors. Canyon Lake is visible in the axial view through the front door. The bedrooms (2) are cross-ventilated with exterior windows and interior shutters that open into a space that is nearly 25' high (to the base of the cupola). The entry stair (3) down to the living room is cast concrete. A cupola with motoroperated awning windows (4) and 12-foot-high doors to the screened porch promote natural ventilation.







GROUND LEVEL PLAN



Project: Salge Lakehouse, Canyon Lake, Texas. Architects: Lake/Flato Architects, Inc., San Antonio, Texas (Ted Flato, David Lake, John Grable). Client: Debra Salge Site: an approximately 66' x 180' sloping lakefront lot. Program: a 1000-sq-ft weekend house to accommodate overnight guests. Structural system: wood frame on concrete slab.

Major materials: stucco interior and exterior walls, sealed concrete and painted plywood floors, $1 \ge 6 T \mathcal{C} G$ pine ceiling, corrugated metal roofing, wood casement windows, masonry fireplace (see Building Materials, p.156). Mechanical system: electric heat pump and natural ventilation. Consultants: Reynolds/Schlattner & Chetter, structural. **General contractor:** Penshorn Construction, Inc. Cost: \$76,000 Photos: Greg Hursley, except as noted.

Rising to the Occasion

Through the intervention of Robert A.M. Stern Architects,

a dowdy house on a prime hilltop site is given order and panache.



In the many new houses he has designed, Robert A.M. Stern has contributed significantly to contemporary American eclectism. In this house commission, he faced the thornier challenge of remodeling a historic building in a situation with daunting limitations.

The formal enrichment that Stern and his late associate, Alan Gerber, gave to this shingled vernacular house is much like that developed in the 1890s by such San Francisco architects as Bernard Maybeck, Ernest Coxhead, and Willis Polk, who combined the informal brown-shingled vernacular with Classical elements as an adaptation to the special climate and topography of the Bay Area. Ironically, Polk himself lived in this house for a while and might have made similar changes if he had proceeded beyond some interior alterations.

Built in 1865 as a simple two-story farmhouse, the structure was later acquired – along with most of its hilltop – by Horatio Livermore. He rented it out to two young designers, Willis Polk and Addison Mizner, who remodeled the ground floor. About 1890, the Livermores decided to move into the house themselves and added the third floor.

But despite the Classical moldings and paneling

that Polk added to the interior, the exterior remained a styleless box. In the 1930s, William Wilson Wurster remodeled the interior, stripping the major top-floor rooms of their beamed ce lings and other Classical detail to make them "honest," a term then much in vogue. In any case, honesty and simplicity had long been the watchwords of this hilltop bastion of Arts and Crafts Bohemia ism, whose residents shunned formalism in architecture as in life.

By the late 20th Century, artists and writers had departed from the hilltop; the simple life was symbolic – only shingle-skin deep. But drastic change was impossible, as the area had become hallowed as a wellspring of Bay Area regionalism.

Stern's clients, art dealers John and Greichen Berggruen, bought the much-remodeled house because they liked the idea of living in a brownshingled house on Russian Hill, with its intimate views of downtown and the bay. The Berggruens had no wish to transform the house. But since it had been converted to two apartments, it was not suitable for a family of five. Nor was it hospitable to the Berggruens' private art collection; although (continued on page 84)





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The distinctive capped chimneys of the Berggruen house enhance the silhouette of Russian Hill (1), where a cluster of houses survived the 1906 fire. The new front of the house (2) was originally the back; random projections were removed and a corner entrance tower added. New details recall the turn-of-the-century Free Classical style, locally called Queen Anne. Molded brick steps and walls add to a sense of understated refinement. The main entry is reached by a roundabout route that enters the arched and vaulted tower porch from the side (4), then climbs a lattice-enclosed stair (3) to the actual door.

The Contruction Process: Vaulted Ceiling

One of the challenges the

architects faced in transforming this house was to capture some height for the living room on the top floor. Raising the roof to gain ceiling height was ruled out by the opposition of neighbors, who could have held up or prevented city approval to protect their views.

Stern's strategy for getting appropriate height for the 34foot-long main room was to raise a vaulted ceiling into the old attic space. To bring natural light into this gained volume, two dormer openings were punched through the the long vault at the centerline of the room. The opening on the inner side of the room is lighted indirectly from a skylight at the roof ridge (see building section), which also illuminates skylights over the hallway, the stairwell, and the lavatory. The opening on the outer side of the vault is lighted by a small dormer, which the neighbors were persuaded to accept. (On the working drawings, this feature is labeled "pending approval.")

The curve of the living room ceiling was adjusted on site to the maximum the existing framing would allow. In some cases, joists were shaved up to an inch, which had no significant effect on the strength of the framing. Shaping the vault to rise in

shaping the valit to rise in two stages not only helped fit it within the roof volume, but provided an architecturally integral location for the track lighting over the owners' art works. The dimension of this springing line from the walls was correlated with the photometrics of the specified lighting.

To build the curved plaster "vault," transverse plywood fins were nailed to joists, their lower edges delineating the curve. With these fins as templates, furring ribs and wire mesh were suspended as a base for the plastering. Of the other plaster vaults used in the house, the three-dimensional ellipsoid vault in the master bedroom (photo, page 84) required the most intensive collaboration between the architects and the contractor.







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FIRST FLOOR PLAN

THIRD FLOOR PLAN



SECOND FLOOR PLAN

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AMILY ROOM	10	MASTER BEDROOM
ITCHEN	11	MASTER BATH
IBRARY	12	LAUNDRY
IVING ROOM	13	WINE CELLAR
INING ROOM	14	STAFF
ECK	15	GUEST SUITE
NTRY PORCH	16	PARKING
NTRY VESTIBULE	17	GARAGE
EDBOOM		





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The house's elaborate succession of stairs and landings (plans, facing page) builds up to the main living spaces on the top floor. The 34foot-long living room (5) offers the finest view of the city and the bay through full-height windows. The vaulted ceiling and lunette windows lighting it (sections and sidebar, facing page) add to the feeling of spaciousness. The neu-tral room surfaces and richly colored furnishings recall old private museums; the windows do not compete with the paintings, as photos may suggest. Track lighting for the owners' art is carefully integrated with the architecture, but the fixtures themselves are distracting. On the opposite side of this floor, projecting into the greenery of the entry garden, is the expansive kitchen/family room (6); exposed rafters and ample windows give the sitting portion the relaxed feeling of an old sleeping porch.





The circulation hub of the house is the entry vestibule (8) at a level between the second and third stories. From here, a skylighted stair (10) proceeds up to the main living spaces, its curved walls displaying the Australian lacewood seen earlier in the vestibule. The octagonal study has a window overlooking this stairwell. A few steps below the vestibule -byeither of two secluded stairways is the family bedroom level. The master bath (7) has handsome cabinetry of mixed exotic woods and an ample view. The cozy master bedroom (9) is flanked by a sitting room (background) and a dressing room, all offering broad panoramas.

(continued from page 80)

they did not want to live in a gallery, they did want their collection to look at home.

Since the terms of the sale prohibited raising the roofline, the low ceilings of the top floor – where major rooms took advantage of views – presented a serious problem. The long rectangle of the living room felt like a bowling alley. Another problem was that the house lacked any entrance that could be called "main." What's more, the house was virtually at the lot lines on three sides and could not be extended much on the street side without sacrificing the entrance garden.

The architects solved the height problem in the top-floor rooms by pushing the ceiling up into the attic to form a curved vault; the addition of two dormer windows – one that gets direct light and one that borrows light from a ridgeline skylight – made the vaulted space light and airy.

The need for a proper entrance was deftly met by adding a tower element to the street side, which receives a flight of steps from the garden. The handsomely detailed tower porch is a gracious stop in an entry sequence that proceeds along the north side of the house to the actual main door. Inside, the upward movement continues from the entry vestibule – on a newly inserted level between the second and third floors – up the stairs to the main living spaces on the third floor. At the top of the final flight, the difficulty of fitting a formal hall into a space constricted by existing elements becomes apparent. The final toplic hted stairwell successfully uses the mannerist device of curved walls to create an illusion of greater space, but the hall that is its destination is too confined to fulfill the spatial expectations generated in the preceding sequence.

Elsewhere, the tower and the stylistic flourishes introduced by the architects – the oval windows, the oriel, the eyebrow dormer, the carefully studied fenestration and dormers – truly succeed in giving the house a new grandeur, without totally departing from its original vernacular character. A less skillful hand could not have produced such a polished result. **Sally Woodbridge**

The author, P/A's Bay Area correspondent, is now at work on a book about Bernard Maybeck.

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Project: Berggruen Residence, San Francisco

Architects: Robert A.M. Stern Architects, New York (Alan J. Gerber, associate in charge; Kristin McMahon, project associate; Ken McIntyre-Horito, assistant; Elizabeth Thompson, project associate). Associated architect: Richard Hannum Associates, San Francisco.

Client: Gretchen and John Berggruen.

Site: lot of 0.178 acres on hilltop. Program: remodeling of a muchaltered house for a family with a significant art collection; 7500 sq ft.

Structure: existing wood frame, with steel seismic reinforcing. Major materials: red cedar shingles with painted wood trim (see Building Material, p. 156). Mechanical system: gas-fired boiler; fan-coil heating units; no a/c. Consultants: Mai K. Arbegast, landscape; Randolph Arczynski, interiors; GFDS Engineers, structural; Design Engineering Services, mechanical; Cline, Bettridge, Bernstein Lighting Design, lighting.

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General contractor: Ryan Associates. Costs: withheld.

Photos: [©]Mark Darley/Esto, except as noted.

Formal Axis in Weekend Clothes

In his Shelter Island home and studio, William Pedersen renders

a surprisingly rigorous parti in comfortable materials.



When William and Elizabeth Pedersen bought an 80-year-old house on Shelter Island, a small island off New York's Long Island, in 1977, they didn't exactly have grand plans for it. They planned to use the house as their weekend retreat until they built a new place of Pedersen's design on another piece of property on the island. But when a toilet fell through the floor into the basement, they decided the old house needed some attention. What started out as minor repairs soon became an elaborate architectural exercise for Pedersen, one that was completed recently with the addition of a studio/guest house at the back of the property.

Pedersen, a principal of Kohn Pedersen Fox, New York, is most proud of the studio, which was built from scratch according to his design, but his work on the main house deserves note as well. In it, he managed to look at this modest house and "discover" a formal, cross-axial plan that he exploited to great effect. The axes cross in a central dining room with a Wrightian dining table. At the rear of the house, he added – off axis – an octagonal dining porch with a steep roof.

The interiors are executed with a remarkable rigor. The formality that results seems incongru-

ous with traditional notions of the country house and could be off-putting to some. The Pedersens, though, insist that the spare, lovingly detailed house suits their needs.

Pedersen conceived the studio as a continuation of the main axis through the house. Set at the back of the lot, the studio is the fanciful conclusion to a changing interpretation of the shingled cottage. The plan of the terrace and the similar section through the studio itself seem to suggest a boat shape. The tall pyramidal porch roof mirrors – more quirkily – the dining porch, and in the garage, a portion of the roof is raised and gabled to allow storage of taller items.

Together, the house and studio sit on a figid axis, but they are not physically connected at a l. In fact, they seem to float in a sea of green grass; there are no foundation plantings, only a rejentless one-foot band of gravel that edges the foundations of both buildings. The effect is fascinating; by denying the viewer a path or some other physical manifestation of the undeniable diagrammatic link between the houses, Pedersen forces us to complete the picture and causes a surprising tension. Mark Alden Branch

The Pedersens added an octagonal dining porch to the 80-yearold main house that they bought and rehabilitated (1), then built a studio building (2) with a contrapuntal square porch. The studio itself is on the upper floor; below the terrace is a sauna and hot tub, and below the studio is a garage. The eccentric forms that make up the studio are inspired partly by nautical imagery. The raised, gabled portion of the garage at right is for storing tall items.



The Construction Process: Squaring Up, Trying Out

William Pedersen's house was a weekend affair not only in its function, but also in design and construction; he drew up plans and supervised construction during weekend visits to the house. He went through one unsuccessful relationship with a contractor - Pedersen says he was too slow - before finding Kelley & Kelley of North Haven, Long Island, who joined the project after demolition had already taken place at the original house. "We wanted to give him 110 percent," says Mike Kelley of Pedersen, and in some cases that seems to have been required. The 80-year-old house needed a lot of "squaring up" to carry off Pedersen's rigorous geometries; Kelley says there was "no room for error." For Pedersen, who is used to working on a larger scale and in a more detached way at Kohn Pedersen Fox Associates, the opportunity to manipulate changes on site was a pleasure.

Much of the work on the original house was devised by Pedersen as the project went along. When he decided to remove a furred ceiling on the second floor of the house, he compensated for the lost structural members by adding semicircular moment plates and cable ties with stainless steel marine turnbuckles. This system, inspired by Pedersen's affection for boats and his visits to a nearby hardware store, was used again in the studio (see section at right and photo 3).

The studio was meant to be left with its stud walls exposed, so the Kelleys had to conform to Pedersen's exacting instructions on stud placement. In the end, though, this work was hidden behind gypsum board. Another experiment on the house was the shingling of the shallowpitched (11/2/12) porch roofs, which Pedersen wanted for aesthetic reasons - to see the underside of shingles while on the porch. After one rain, he decided to cover the shingles with lead-coated copper, but he still got the look he wanted underneath.







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STUDIO-FIRST FLOOR PLAN

STUDIO—SECOND FLOOR PLAN







The studio (3) displays structural structural bracing with marine hardware, similar to that which Pedersen used to retrofit the upstairs bedroom of the main house. The desk in the studio, with mattresses placed on top, becomes a bed for guests. In the main house, Pedersen "discovered" a crossaxial plan; the studio is lined up along one axis (4) through the living and dining areas. The cross-axis, also through the dining room, is closed at each end by chimneys (5). The rigid axiality, which is carried through in the placement of the spare furnishings, is more comfortable because smaller in scale - than photographs suggest.

Pedersen House and Studio

Project: Pedersen House and Studio, Shelter Island, New York. Architect: William Pedersen, New York. **Client:** William and Elizabeth Pedersen. Site: 11/4-acre rural plot on Shelter Island, off Long Island. Program: rehabilitation of an 80year-old one-story house and construction of a studio and guest house with garage, hot tub, and sauna. Structural system: wood frame. Major materials: shingled exterior walls, gypsum board interior walls, wood floors (see Building Materials, page 156. Mechanical system: forced-air heating. Contractor: Kelley & Kelley, North Haven, New York. Costs: withheld.

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Photos: Chuck Choi.



For friends in New Jersey, Richard Meier designs a house

to go with the clients' interests in the crafts.

What happens when you combine sophisticated clients with a very high profile architect? Then add to that an almost lifelong friendship between them and a long acquaintance with the builder. Clearly, this could be the scenario for either an ideal project, or the opposite. With minor detours, the Grotta Residence comes close to the former.

Located in an idyllic rural section of northern New Jersey, the 5000-square-foot house for Louis and Sandy Grotta is not atypical for Richard Meier; Lou admits that he was not completely certain that he was prepared to live in a house designed by his nearly lifelong friend. However, he and Sandy, both connoisseurs of arts and crafts, had very high standards and a wide knowledge of architects and their work; they decided to go for it. Part of a large, open piece of land, the 7-acre property sloped gently but insistently down to a valley road parallel to a brook. Three sides of the property are wooded, and the house is located in the highest corner, taking advantage of the views across the site and into the valley. Sculpted into distinct terraces, the land now cascades to a plateau where the house is placed. From there, the land reverts to meadow rolling on down the slope. The precise terracing cradles the house in an echo of the configuration of surrounding trees.

In plan, the house is formally a circle intersecting with two rectangles, with an adjoining recangular bar comprising kitchen, bath, and sleeping areas. The high living area is the main feature in the circular element, along with the second-floor study and part of the master bedroom and diving areas. Two strong axes intersect at the center of the circle, highlighted by skylights. The primary north-south axis, beginning beside the detached garage, forms a circulation spine through to the yard exit on the south end. The secondary eastwest axis bisects the circle, passing through and up to a second-level bridge out to the yard to the rear (continued on page 94)





On the east side, facing down the long slope toward the valley (1), the curved two-story living area plays off against the two rectangles and the entry arcade leading from the detached garage. From the southeast (2), the major materials are all evident, including porcelain-enameled metal panels, ground-face concrete block, stucco infill, and glass, both curved and flat. The sculptural element, a bent of porcelain panels, serves to terminate the major axis at its south end. The client enjoys the Magritte-like images of landscape and sky that are created by the curved glazing. A roof deck with access from the second-level study is located over the den. Steel pipe railings were cut back from the original proposal because the owners wanted to avoid what they felt might be an institutional feel.

The Construction Process: Stick-Built Precision

Stick-Built Precision

Because the Grotta residence is no ordinary house, it proved too much for the original contractor, and Meier and the Grottas called in another one, Drill Construction, with commercial experience. Larry Drill, another Meier acquaintance and one with an architectural education, says the major difference between this and other residences was the precision and close tolerances required by the Meier office. Yet because it was mostly wood construction, with some steel in the roof framing and columns, it was difficult to make it comply with the precision demands. "It is basically a 'stickbuilt' house," says Larry Drill, "and lumber just doesn't hold to 1/4 inch and 1//8 inch tolerances."

At last count, Drill recalls "over 300" sheets of drawings on this project, many more than most jobs he has dealt with. The construction drawings are as impeccably done as a Meier house might suggest, with very careful delineation of such things as insulation, gravel fill, and earth below grade. The materials with the closest tolerances were the porcelain-enameled exterior panels (1/4 inch) and the cleft slate (butt-jointed) that runs from the outside terrace into the living areas.

For the panels, the supplier provided site personnel to assist in installation, which appears flawless. The slate, however beautiful, has weather difficulties where butt joints must perform out of doors; indoors, they are fine. The other minor annoyance is in the ground-face concrete block lower walls, which are efflorescing, as block walls are wont to do, for a while.



From the entry (3), the major axis slices completely through the first floor to the yard on the south; the secondary axis bisects the living room, passes up the main stairway to a bridge into the rear yard (4). The west façade on the lower right side of the bridge incorporates glass block in the kitchen wall, but the client preferred not to see it on the inside, so it is screened by translucent sheets, emitting a soft glow behind the countertop. The living room fireplace (5) terminates the east-west axis. Views down into the living areas are provided from the study on the second level (left) and the roof deck outside it.





FIRST FLOOR PLAN

Grotta House



Like the rest of the house, the kitchen (6) is elegantly simple, with custom cabinetry and German appliances. Consistent with their outlook, the Grottas even cook, serve, and eat on crafted plates and dishes. The master bedroom (7) overlooks the living area to the east, and has high windows on the south. Looking southwest, a platform five steps above the living room (8) makes the dining area more intimate while being out of the line of vision from the master bedroom above it. In every space, the Grottas live with artifacts that attest to their love of arts and crafts.





(continued from page 90)

of the house (where a planned pool area was dropped from the project).

Spatially, the most intricate aspects are concentrated around the stair to the second floor, and on views between levels and out to the valley. A two-story slot at the stair serves visually to interlock the levels, (articulated again by skylights). Both the master bedroom and the study areas allow views over the valley and across the two-story living space. (The curved glazing in this dominant element, with its natural reflective focus on the interior, inhabitants, and activities, was initially visually disturbing to the owners, but now they find the images entertaining.) The overall feeling in these areas is of light, spatial flow, and visual richness. The Grottas have delighted in natural occurrences such as thunderstorms and snowstorms, experiencing these, via the house, as events.

As might be expected of Richard Meier, the detailing of the house is rigorous and meticulously executed. Cabinetry throughout is custom made and flawlessly simple; custom door hardware, with handles designed in the Meier office, adorns all major doors; a retired craftsman was brought back to create the main stair; and pipe railings, reduced in quantity because the Grottas feared institutional tendencies, continue a Meier tradition. (See sidebar for further details.)

One of the most striking characteristics of the project is the interaction of the architecture with the clients and the artwork and crafts they love. Given Richard Meier's long and close affiliation with the art world, this symbiosis will not surprise many, but it is distinctive, nevertheless. While the Grottas admit that Meier does not love every artifact in their impressive collection (those are pointedly missing from the photos), they do find the house quite sympathetic to their way of living. The house is always in immaculate order, and Lou Grotta notes that he might not always have been quite so restrained. But he now supports Sandy's unsolicited comment when a visitor enters: We actually live like this." Jim Murphy

Project: Grotta Residence, Northern New Jersey. Architects: Richard Meier & Part-

Methodes: Kithara Meter & Fahners, New York (Richard Meier, Michael Palladino, partners in charge; David Ling, associate in charge; Ralph Stern, Charles Crowley, Christian Hubert, Lucy Kelly, design team).

Client: Mr. and Mrs. Louis Grotta, Jr. **Site:** A gently sloping seven-acre site in a rural part of New Jersey. **Program:** a 5500-square-foot, threebedroom residence and garage. **Structural System:** Concrete block foundation walls, reinforced concrete slab on grade, wood frame roof with steel, steel pipe columns, wood

frame floors and exterior walls. **Major Materials:** porcelain-enameled panels, ground-face concrete block, stucco, aluminum frame/steel frame windows with clear insulating glass, glass block, interior walls/ceiling, GWB on wood framing, natural cleft finish slate, quarry tile, American white oak strip floors, solid core wood doors in wood frames.

Mechanical system: gas-fired furnace, three zone central a/c with humidification and dehumidification, water softening, forced air distribution.

Consultants: Severud Associates, structural; John Altieri, mechanical; Quennel Rothschild/Torsillieri, landscape.

General contractor: Drill Construction. **Costs:** withheld at client's request. **Photos:** © Scott Frances/Esto.



Perspectives

Ettore Sottsass talks about his own vision of Italian Westerns.

Interview: Ettore Sottsass

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P/A: How many houses are in this project? **Sottsass:** There are eleven houses. The story is that Mr. Daniel Wolf, the client of the big house that we did [in Ridgeway, Colorado] has land around there and so he was saying, "Why don't we try to build a resort village, where the houses are not sold as speculation houses, but the way you buy a painting, or a sculpture," [although] it's too much to call the houses works of art. **P/A:** The effect of such a premise on the design

is opposite to that of spec houses; they don't have to be so anonymous.

Sottsass: Exactly. Today houses by Frank Lloyd Wright are sold by the square foot; nobody cares that it is his. While if you buy a painting, you are concentrated on the author of the painting. **P/A:** Can you tell me a little about the process and the ideas that attended the design? **Sottsass:** The first thing we were thinking about was what the general plan could be, be-

cause normally houses are scattered around. In some ways because it is Colorado, [we were influenced by Western] movies with Main Street, which I think is very nice. The Main Street substitutes for the Italian piazza, where everything is happening [in the Westerns]. You have duels there, bandits assaulting the bank. . . We thought, why don't we line all the houses on the main street, with a small difference: because it's a resort, houses could have some privacy toward the street. After a while problems arose, because Main Street had a saloon, a bank, but for the resort there was not the idea of building public buildings. That is why the village is not yet built. **P/A:** So it's in a kind of limbo now.

Sottsass: It's a very fragile idea to build a village like that – economically and also socially. If you have a group of intellectuals who buy the houses, these are usually introverted people. . . We ran into a problem [of imagining what kind] of a society it could be, which kind of tribe. Wolf had friends – a movie actor, an art collector – what could such a group have in common? The main approach to the whole project, is [that it is] an



The Wolf House, Ridgeway, Colorado. Ettore Sottsass with Johanna Grawunder, completed in 1990.

"The whole project is a beginning. You have to take [it] like notes about certain possibilities." experimental project, just the beginning. **P/A:** Without taking this too far, you could say that a similar problem of the program exists for many urban design projects, where it is hard to imagine what people are going to do together. **Sottsass:** Yes, exactly. Old societies were much more compact socially; people had much more elementary desires. Today everybody has very complex desires.

P/A: What about the houses themselves? **Sottsass:** There is some nostalgia for the old idea of the American house, so the houses are not

presumptuous; they are simple, made out of very simple malerials. Sometimes you recogn ze elements from the American tradition, sometimes mixed with the Mediterranean tradition, particularly the fact that the gardens are enclosed, [Unlike houses I've seen] in Palo Alto or Los Angeles, where there is the house, and in front of the house you have the garden. In Italy it is the opposite. It is very much a Mediterranean or Middle Eastern idea to

have a certain privacy in the garden. I am lock ing for some way to give life a certain kind of happy image – not too much organization, not too much control – [where] you have a house like a child has a toy, [and you can] enjoy the colors, the walls, in a very simple way.

For instance, Daniel Wolf's parents had a wooden house that was built around 1910 typical house, a cube with roof, windows, porch, sort of a serious catalogue house. And becau they had built a road nearby, [his parents] de cided to take the house to another place in th hills. The house is a box. You put wheels under it as a toy; it's not a monument. Houses like these have no architectural presumptions at all P/A: Which materials were you considering? Sottsass: Mostly wood, plaster. The whole project is a beginning. You have to take [it] like note about certain possibilities. I would like very much to build this village. [It represents] the desire... to go back to the real meaning of architecture, to leave the idea of monumentality and intellectual sophistication. Maybe that's . . . real sophistication.

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Perspectives



In 1989, architect and furniture designer Ettore Sottsass (one of the founders of the Memphis group), in collaboration with Johanna Grawunder of Sottsass Associati in Milan, began work on a small village to be founded on Log Hill Mesa, Colorado. The site plan reveals the beginnings of a town, with houses lining both sides of a short street. P/A editor Ziva Freiman questioned Sottsass on the ideas underlying his design.





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leave the idea of

sophistication."

Series of drawings for village on Log Hill Mesa, Colorado.





Rebuttal: Theory Used and Abused

I would be more than content to ignore Dr. Sylvia Lavin's ponderous tilt against some windmill she terms "architectural critical theory" were it not for the possibility that someone might confuse her subject matter with contemporary architectural theory. Because of that possibility, however slight, I find myself compelled to respond.

It is disappointing to find that Lavin's polemic relies so heavily on a rhetoric of persuasion, declaration, and myth to make its case. Yet, as we delve into her text, we will find that this rhetoric is not innocent, that it perpetrates a well-known and insidious violence. Ironically, this violence is not directed at current architectural theory, as at first glance it might appear, but rather at the heart of the discipline of architecture, debasing it in all of its aspirations and practices.

To be fair, it is possible that what Lavin is most concerned to rail against is not so much a frenzy of theory but a proliferation of spurious, "name brand" validation. It is true that in some settings an immature arrogance of superior intentions has empowered certain names such as Derrida and Foucault, and certain terms such as "theoretical" and "critical" to ratify one practice or another.

Unfortunately, rather than limit herself to this or any other specific issue concerning contemporary theory, Lavin chooses to couch her concerns in the broadest terms. She identifies two issues she sees as the problem with architectural theory today: a fundamental and irresolvable conflict between architecture and theory, and architecture's seduction by literary theory's megalomania. Let us begin with the first point.

"One cannot condemn theory for being theoretical, for being concerned with conceptual principle, nor does it belittle architecture to be architectural, and concerned with actual form. Right or wrong, it is in the nature of these respective beasts to be what they are."(emphasis added)

Leaving aside the question of the intellectual force of such reasoning, underlying it is an oppositional structure that pits "conceptual principle" against "actual form," an opposition that in various manifestations underwrites Lavin's entire effort to establish the basic conflict between architecture and theory. Throughout her essay, she relies on similar strategies to support her "Because of the inordinate demands of clients and costs, of programs, codes, and community councils... the profession is always at risk of losing its artistic and intellectual vigor – in short, at risk of becoming a profession of appeasement."

In companion essays, Jeffrey Kipnis and Michael Hays respond to

Sylvia Lavin's critique of contemporary architectural theory,

published in these pages in August.

conclusions, opposing intuition to intellect, thenking to making, and subjectivity to objectivity, to cite a few. Despite her efforts to avoid them, Lavin cannot escape the irreconcilable contractictions to which her line of thought must lead.

Theorists today hold a deep suspicion of any argument that relies on such simple dialectical pairs. In general, this suspicion stems from the fact that the categorical oppositions invoked by these arguments do not exist. Of course there are important distinctions between conceptual principle and actual form, but these do not amount to the categorical difference required by Lavin's argument. In every case where Lavin aspires to distinguish architectural theory from other, more purely "intellectual" pursuits, such as literary theory, she only reinvokes their inextricable ties.

"However conceptual in principle and intention architectural theory may be and however indebted to literary theory it has been, architectural theory has always distinguished itself by remaining firmly grounded in the thoughtful process of making."

Where is the distinction? When one seriously considers that architectural theory has always been grounded in an indissoluble system of intellectual, aesthetic and material processes, one realizes how fragile the framework of Lavin's rcasoning is. Today we are beginning to understand just how much every practice, from literature to law, from music to medicine, from architecture to philosophy, is, in a sense, grounded in the thoughtful process of making. Therefore, though the differences among practices are significant and worthy of study, they are political, economic, and cultural, not categorical.

Lavin's argument that architecture is fundamentally restricted from true theoretical speculation is therefore nothing other than a political position, a conservative agenda for architectural design. She argues as though "technology, economics and physical matter," and "pedestrian functions and mundane concerns" were the fetters that prevented architecture from having intellectual and artistic aspirations rather than the very conditions that demand of architecture a deeper intellection – scientific, aesthetic, cultural, and philosophical – than that required of many other disciplines. It is true that the stakes are very high in architecture. It may even be true that therefore architectural speculation should be

Perspectives

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"Lavin's argument that architecture is fundamentally restricted from true theoretical speculation is...

nothing other than a political position, a conservative agenda for architectural design."

conservative. It is not true, however, that limitations of architecture are constitutional. Such an argument trivializes the discipline.

As Lavin turns her attention to the second of her concerns, "critical architectural theory," her sobr quet for contemporary architectural theory as it responds to current developments in literary theory and philosophy, her debasement of architecture becomes more explicit.

"In might even be said that [the production of archite ture] demands a 'personal inconsistency,' and not of intellection but of intuition and inspiration. Thus, although critical theory can aspire to the philosophical, the practical roots of architectural theory set it antagonistically apart from philosophy. On some peculiar level, the very concept of 'critical architectural theory' is an oxymoron."

Relying again on untenable categorical oppositions, Lavin argues as though advances in theory did not fundamentally depend on intuition and architecture did not require a rigorous intellectual foundation to make its intuitions possible.

This trivialization reaches its most disingenuous pitch when Lavin contends that "critical theory appears to offer the radical weaponry once offered by a flat roof and a little exposed concrete." Surely she does not imagine that the Modernist idiom was achieved without intellectual struggle, that it met no cultural or political resistance, that nothing was at stake in it besides shapes and materials? The significance of and commitment to the flat roof and exposed concrete was only achieved by virtue of ideology. Moreover, only by virtue of critical theory were the errors and limitations of that idiom exposed and its grip on the profession loosened.

Nost would agree with Lavin that Venturi's Complexity and Contradiction was central to stimulating the profession's move away from Modernism. Thus her particular vitriol against literary theory is all the more curious considering her accolades for this book. Though she fails to mention it, that work was entirely adumbrated in the literary theories of such writers as T.S. Eliot and Will am Empson, as Venturi himself acknowledges. How was this success possible if "critical architectural theory" is an oxymoron? One begins to wonder if the agenda underlying Lavin's essay is not actually a concern for style. As long as literary theory leads to an architecture she supports, it is properly used; when it leads to an "It is [architecture's] moral and professional duty to draw from every resource – whether philosophy or literature, technology or science, theology or politics."

"Insofar as today's architectural discourse has failed to communicate with the profession, Lavin's criticism is well taken."

architecture she does not support, it is abused.

The most unfortunate aspect of Lavin's essay is that her account of contemporary theory is so replete with error and misstatement and so sweeping in its generalizations that it amounts to little more than demagoguery. Without drawing the slightest distinction among the many and varied positions to be found in contemporary discourse, indeed, without discussing the specifics of a single aspect of contemporary thought, she is content to indict the entire effort *en masse*.

Lavin pays no attention to gender studies, she offers no comment on the debate over deconstruction, she does not even acknowledge the variety and range of ideas now being discoursed, from the program for cultural movement offered by philosoper Gilles Deleuze and psychoanalyst Felix Guattari to R.M. Unger's economic and social theories. She is silent on the question of design as translation, on the structure/ornament debate, on nonlinguistic models of architectural meaning or any of the other topics that one would run across in journals like *Assemblage* or *Revisions*. All of these bear on the practice of architecture and deserve attention.

In fact, Lavin thoroughly misrepresents contemporary discourse. For example, notwithstanding its entertainment value, her you-are-whatyou-eat fable (in which critical theory became all-powerful by "ingesting" other disciplines and architecture becomes all-powerful by "ingesting" critical theory) entirely misconstrues the circumstance to which it refers.

The extension of interpretive techniques beyond the traditional subject matter of literary and philosophical texts is not motivated by some vague disciplinary megalomania, as Lavin would have it. Rather, underlying this activity is the obligation felt today by every discipline, including architecture, to recognize the mechanisms of enfranchisement and disfranchisement – political and social of course, but even extending to shapes and materials, as the latter have been dictated by industry. Fundamental to such endeavors is an analysis of disciplinary boundaries and the exchanges that define them.

Despite the often difficult terminology and abstruse constructions employed in those discussions, they are not hermetic exercises in arcane academic self-indulgence. Rather, they aspire to (continued on page 158)

"The recognition that the various so-called contexts of an object

are not mere surrounds but are embedded in the very form and medium of architecture is perhaps

contemporary theory's most concrete contribution of all."

Rebuttal: Theory as a Mediating Practice

Sylvia Lavin's essay, "The Uses and Abuses of Theory," stands as proof of its own thesis: a little theory, even if wrong, is *not* better than no theory at all. We can let pass the logic of non sequitur and the elisions in the little theory Lavin offers. But if she is to speak to architectural theory, the burden is hers to get at least its main ambitions roughly correct, which she does not.

"To be identifiably theoretical can quickly become a burdensome intrusion into one's freedom to do what one wants to do," she attests. Indeed. Lavin's characterization of the architect perpetuates an anachronistic, romanticizing conception of aesthetic intuition and inspiration which valorizes personal artistic freedom and masks such overarching factors as class, gender, ideology, and historicity – those factors that critical theory has thematized and tried to make as practically ineludible as they are intellectually demanding. What she describes as theory's greed for "outside intellectual influence" is in fact fundamental to its vocation as a *mediating* practice.

Contrary to what Lavin would have us believe, architecture does not make architecture by itself, but rather is enabled, coerced, and constrained by complex historical determinants and ideological apparatuses that operate beyond the horizon of the individual designer's "freedom." An analysis of the preconceptions of the discipline, the "external" socio-historical impingements on design, and the authorities and value structures implied by architectural projects is what critical theory intends. But further, theory does not accept disciplinary canons and conventions or cultural values as given, but rather understands them as *constructions* and thus open to possible challenge and change, albeit at a symbolic level.

Critical theory is a response to the realization that what used to be called the cultural context of architectural production as well as the object produced are both themselves texts in the sense that we cannot approach them separately and directly, as distinct things-in-themselves, but only through their prior differentiation, interpretation, and transmutation, all of which is not innocent but shot through with ideological motivation. The recognition that the various so-called contexts of an object are not mere surrounds but are embedded in the very form and medium of "Architecture does not make architecture by itself, but rather is enabled, coerced, and constrained by complex historical determinants and ideological apparatuses that operate beyond the horizon of the individual designer's 'freedom'."

The author is an associate professor of architecture, teaching theory and design, at Harvard and editor of Assemblage, a journal of architectural theory published by MIT Press architecture is perhaps contemporary theory most concrete contribution of all. Following rom this realization is the imperative to critically produce or (re)invent relationships among the architectural fact and the social, historical, and ideological subtexts from which it was never real separate to begin with. In practice, this unavoidably entails a certain amount of provisional bracketing and qualification, slippage, overstatement, technical shorthand, partisanship, and long-winded pursuit of tangents, all of it necessarily counterintuitive and at odds with our desire for what is "proper" or "relevant" or "internal" to architecture. But the same imperative has also prompted an increasingly rich literature which addresses itself to a whole range of "practical" and experiential issues - the role of the unconscious, the gendered body, the ecological, the politics of programmatic relations - which partisans of hermetic architecture regard as an "exclusion of the field's original object." In any case, resistance or subversion on what Lavin calls "the more substantive level of elemental stru ture" cannot progress until the subtle ways in which ideology inscribes itself in the very forms of architecture are understood.

Lavin's convenient distinction between a consideration of objects from a purely formal or technical perspective ("architecture being architectural") and the writing in of conceptual, historical, and political parameters of artifacts ("theory being theoretical") should be seen as something worse than error: namely, first, a symptom and reinforecement of the specialization of disciplines into discrete categories that has a paralyzing effect on our thinking about possible change (not just disciplinary change, but by extension, genuine social change), and second, a reconfirmation of the experiential gap between the protected, private magisterial performance of the designer, as Lavin would have it, and the public, social, collective lifeworld and knowledge that architecture is. This gap is one of the worst attributes of contemporary life, and Lavin's perpetuation of it is just one more example of the tedious binary oppositions - such as Modernism vs. Post-Modernism, East Coast eggheads vs. West Coast rene gades, theory vs. practice, critical objectivity vs inspired creation, etc. - which readers of P/A have unfortunately come to expect under the label of theory. K. Michael Hays

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Books: Structural Crusaders

Robert Mark, like Viollet-le-Duc a century ago,

faults architects' abuse of building technology.

Structural honesty, according to Eugène-Emmanuel Viollet-le-Duc (1814–1868), is the substance of great architecture – the public buildings of the Ancient Greeks and Romans, the Gothic cathedrals of France, and, he predicted, the structures of the Modern age. Today Robert Mark writes that these century-old prophecies remain unfulfilled. In Light, Wind, and Structure he contends that modern building technology supplies many architects with the image but not the rationale for their designs. He writes, "Modern architects often based their forms on the notion of a 'machine aesthetic'.... More recently, [it] ... has been manifested in buildings that appear to be structural tours de force but are in fact merely expensive displays of structural elaboration..."

Mark fears that architects' search for novel images too often calls for structural contrivance. He criticizes today's "form-givers," for they create an unbalanced picture of the profession, and might induce others to categorize architects as artists who don't understand the science of building technology. He echoes Viollet-le-Duc, who wrote in 1873 that "Architects ... have acquired the habit of concerning themselves only with appearances, and no longer trying [sic] to make these harmonize with the necessities of structure." The parallels between these two writers are ironic: Modernism, adumbrated by Viollet-le-Duc and supposedly purified of the inconsistencies ascribed to 19th-Century architecture, can be as imagedriven as historical eclecticism. But today, Mark implies, it is not miscast historical forms, but structural technology (intended as the basis of an honest Modern architecture) that suffers abuse.

Mark considers history's great works of architecture to be intelligent solutions that advance the evolution of building technology, rather than mystically inspired (and perhaps structurally inelegand design concepts. In Light, Wind, and Structure he develops this argument with an approach that reverses Viollet-le-Duc's, whose Dictionnaire raisonne and other writings charted a teleological course for Modernism. Mark scrutinizes the shortcomings of some familiar Modern icons and then analyzes the construction of Ancient, Gothic, and Classical buildings, without attempting to forge the cross-cultural bonds that Viollet-le-Duc envisioned. He shows that builders and architects throughout history were essentially problem-solvers; he believes that they did not subject their work



Light, Wind, and Structure: The Mystery of the Master Builders by Robert Mark, MIT Press, Cambridge, Mass., 1990, 232 pp., illus., \$19.95.

to any overriding intellectual concept, nor did they envision their work a medium for forging radically new concepts, regardless of the revolutions and movements we perceive in hindsight.

While Viollet-le-Duc infused his compelling prose with assertions, Mark's approach is more scientific, with extensive research and batteries of tests on photoelastic and computer models. His writing is spare and lucid; students of architecture and the history of art, as well as architects, can benefit from this book — one of the most objective historical accounts of structure and form we are likely to find.

Mark's expertise in Gothic structure makes the chapter on six French cathedrals from Notre-Dame de Paris to Beauvais the most synthetic one in his new volume. It builds upon *Experiments in Gothic Structure* (1982), where he corrected Violletle-Duc's claims that structural rationalism governed the design of France's great cathedrals. In his new book Mark traces the likely ways master builders experimented with quadripartite and sex-(continued on page 152)

Books of Note

Filippo Brunelleschi: The Early Works and the Medieval Tradition by Heinrich Klotz, Rizzoli, 1990, 172 pp., illus., \$45.00. Klotz describes Brunelleschi's shift from the Florentine Gothic to his own systematic Classicism as the deliberate creation of a new style.

Frank Lloyd Wright Drawings by Bruce Brooks Pfeiffer, Harry N. Abrams, New York, 1990, 304 pp., illus., \$65.00, paper. Published in conjunction with an exhibition at the Phoenix Art Museum, this is a celebration of Wright's rendering skills, a rich sampling of his seven-decade career.

Ron Arad: Restless Furniture by Deyan Sudjic, Rizzoli, New York, 1989, 112 pp., illus., \$19.95, paper. One of a series of appealingly

compact Blueprint Monographs on current design cognoscenti, this volume traces Arad's academic and pragmatic development within England's often tumultuous design climate.

Spanish Contemporary Architecture 1975/1990 by Richard C. Levene, Fernando Marquez Cecilia, Antonio Ruiz Barbarin, El Croquis Editorial, Madrid, Spain, 1989, 812 pp., illus., \$221.95. This ample two volume anthology documents 75 buildings that have contributed to Spain's refined Modern eclecticism, with crisp photography, plans, and bilingual text. Books

Projects: Adèle Naudé Santos in Tokyo

When sunlight and space are scarce, they become

newly discovered media for building an urban oasis.

If one could assign a monetary value to daylight in Tokyo, it might be as valuable as the square footage for building sites there: Both come in precious quantities, and are not to be squandered. Adèle Naudé Santos turns the city's constricted building sites to advantage: In each of the following three Tokyo projects, as in her American commissions, she developed a sectiondriven *parti*, and rendered the building a sanctuary that supersedes its cramped setting.

.

In Santos's Japanese projects, the garden and the stair assume an importance rare in the United States; they are channels for sunlight and circulation as well as devices for visually expanding the rooms they adjoin. As a vestige of the natural realm, the garden implies an oasis in the city, and stairways act as interior avenues oriented to the garden. Together these elements furnish the framework for understanding the entire building.

The daunting constraints in Tokyo - seismic codes compound the challenges of accommodating strict floor-area ratios - make functionalism no mere buzzword; Santos's associates note that simply fitting the requisite spaces on the site often steers a building's spatial configuration. On the other hand, the Modernist precept that the program governs a design solution does not prevail here: Often, Santos's clients decide after design development to designate a residential program for part of a public building. She anticipates these requests (as well as the changes that subsequent owners would make) with a balance of enclosed and open spaces that could be designated for retail, commercial, or residential use.

Santos's projects bespeak the work of several precursors: She cites Alvar Aalto's sense of light



1 FANTASIA OFFICE BUILDING, TOKYO. SERVICE CORE IS BEHIND MASONRY WALL, NEXT TO SIDE STREET.



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as a medium for modeling space and forms. Like him, she designs in a way that is more intuitive than cerebral, and notes that "the experiential aspect of the thing precedes its formal resolution." Just as Finland's high latitude makes sunlight a precious commodity, Japan's dense cities have heightened her sensitivity to light and nature, which can be connoted by a patch of sky or a row of hanging plants. While Santos does not mention Adolf Loos's Raumplan - a method of designing in section to yield spaces proportioned to their function - one could say that she has advanced his principles: Santos manipulates interior volumes as deftly as Loos, without segregating rooms and stairs into discrete entities as he did.

An office building designed for downtown Tokyo, the Fantasia (fig. 1) has a double-duty atrium: It juxtaposes an upper, private court with a public one at street level, without relegating the latter to second-rate status. At the client's request, the first floor of the eight-story lobby will be open for pedestrians to pass between the streets that bound the site. Inside, they'll see that the public lobby, triangular in profile, is complemented by the employees' atrium, which rises from a narrow area on the second floor, and widens with each successive level. A generously proportioned stairway divides the public and private lobbies as it rises with a series of switchbacks from the second floor to the roof. It is a promenade and gathering area for the building's tenants, with a glazed wall that forms an inclined, transparent roof over the public lobby.

The Harajuku Illuminacion (fig. 2) adapts the Maison Citrohan to a tight corner lot in Tokyo. Like Le Corbusier, Santos set a double-height space at the front of the building, and positioned the stair outside the cubic building; the street façade curves inward toward the corner where these stairs begin. A tilted column that supports a threetiered awning extends from this corner; it is a fabric-and-frame structure that complements the flat stucco walls.

The two-story area behind this brise-soleil is a piano nobile overlooking another doubleheight space (at street level) that 103

Projects

is lighted by skylights in the rear. This floor, in turn, overlooks a two-story volume on the basement level. The underground space, the broadest in the building, will be lighted by a grade-level skylight and the ambient light that filters from the tiers above.

Because the building comprises a single large room on each floor, Santos was able to open the interior so that light flows across staggered shelves of space. From the lower levels, one senses the tiers and light sources above, and the envelope of the entire building is the consistent frame of reference.

In a two family house in Tokyo, (fig. 3), the layering of private space is more intricate; the structure is a duplex for a young couple and their in-laws, an arrangement common in Japan. The two suites, while independent, are interlocked in a single structure, centered about a stairwrapped atrium, which serves as a recessed front yard for both families. It receives sunlight through the planted lanai above and offers guests a view to an inclined wall of shrubbery, set below the private garden to the rear.

The older couple's public rooms overlook trees in the front of the lot, while those of the younger household above are oriented to the family garden. In this way, the two generations are dispersed on opposite sides of the house. Each couple has its own secluded outdoor "rooms": The in-laws' garden and lanai are removed from the center of activity; the upper apartment has a third floor lanai overlooking the street, and paired terraces next to their top floor studies.

In this house, Santos's spatial strategy yields results that complement those of her public buildings. Here, she divides the volume into a network of retreats that seem more remote from each other than they really are: A voided center is a caesura between two households. Nevertheless, the spatial dividends match those in Santos's public buildings: She renders the interior an exceptional sequence of layered volumes, where Nature is encountered within an urban refuge. Philip Arcidi



3 TWO-FAMILY HOUSE, TOKYO; STREET ELEVATION









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Technics Focus: Lighting

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Four researchers and consultants discuss design tools, field performance of a building much touted for



its integrated natural and electric lighting design, mental

task performance under different fluorescent lamp types,

and the art of neon.

Neon never fulfilled its promise as a general lighting source. Although it enjoyed renewed popularity as a decorative device, even that role is threatened by technology. Shown here is the campanile at the Piazza d'Italia, New Orleans, Charles Moore with UIG and August Perez Associates, 1978. See page 132 for a report on the history and future of neon in architecture.





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Successfully Daylighting a Large Commercial Building: A Case Study of Lockheed Building 157

Lawrence Berkeley Laboratory researchers Charles C. Benton and Marc Fountain

report on the fine-tuning of an office building celebrated for its lighting design.

Each year, new technology adds to the complexity of 1 ghting design for large buildings. An expanding palette of light sources, microprocessor-based contros, and advanced materials are available for planning a balanced lighting solution. Renewed interest in day lighting has led to increased activity in the design of architectural features, supplemental electric lighting systems, and lighting control systems that take advar age of natural light as well as our current technolog cal prowess. These are relatively new developments, and the techniques involved are often unproven. Buildings that do incorporate state-of-the-art design ideas and technology are of special interest for what we can learn from their successes and failures.

Background

Building 157 on the Lockheed Missiles and Space Corporation campus in Sunnyvale, California, is a 5story, 600,000-square-foot daylighted office building integrating architectural features with a continuously din mable lighting control system. Our research occurred in two phases and focused on the interaction between available daylight, architectural features designed to admit daylight, and the electric lighting control system. As one of the few major daylighted structures produced in the last decade, Building 157 offers valuable lessons and raises important questions. Did the occupants realize the benefits envisioned by the architects? Does the building admit daylight deep into interior spaces without glare problems? Does the lighting control system dim the fluorescent lights appropriately in response to available daylight?

In 1979, the Lockheed Corporation began the development of a generic five-story office building with a 480' x 240' rectangular footprint. During an unexpected building moratorium in Sunnyvale, the San Francisco office of Leo A. Daly proposed a redesign of the project that would "potentially save 50 percent of energy costs" through architectural features for admitting daylight. Encouraged by the owner, the architects assembled a research team to work out the technical details of how daylight would reach all zones of the building during different seasons.

1 "1 itetrium" of Lockheed Building 157 in Sunnydale, Cal fornia. The building represented the state-of-the-art of day ighting design and electronic control systems when it was oper ed 1983 by the architects Leo A. Daly Company.

2 The distance from the "litetrium" walls to the exterior wals is 90 feet, and each litetrium is 60 feet wide.







3 For clear-sky summer conditions, the interior zone shows a reasonable daylighting component during midday, offering the promise of substantial dimming. The morning shoulder of diffuse-sky-driven daylight is clearly visible. Interior illuminance at 33 feet from the exterior wall remains above the target of 350 lux throughout the day, and in the afternoon exceeds the target by a factor of two.

.

4 Unfortunately, the electric lighting circuit fails to show appreciable dimming. Sharp drops in electric power consumption occur in the evening after 6:00 PM because of sub-circuit switching.

5 Typical floor section: illuminance is measured at the top of interior partitions (5"-8" above finished floor).

6 Modifications to the control system: The exterior-zone photosensors were relocated to the ceiling above the light shelf.

7 The photometric sensitivity of the photosensors was changed from a forward-biased pattern to a hemispherical pattern and signal attenuators were added to the circuit.













4 Electric light dimming (33 feet from exterior wall)

Lighting System Design

The design team built and tested scale models under real and artificial skies to evaluate the performance of several daylighting strategies. Computers in ulations provided predictions of reduced energy consumption. The final design combines interior and exterior light shelves on the perimeter with a central atrium. In plan, the building remained rectangular, but instead of a service core, the center contains a light-admitting atrium (extending the full height of the structure and roofed with glazing). An 18-foot floor-to-floor height increases penetration of dayl.ght from the exterior façade and the atrium.

On the south façade, exterior light shelves operate as sunshades as well as reflectors for bouncing light onto the interior ceiling from the high summer sun. In the winter, the interior light shelves diffuse reflected light and reduce glare during lower winter sun angles. The design separates ambient and task lighting, with daylight supplying most of the ambient lighting and task lighting fixtures supplementing each workstation. The task/ambient split allowed ambient lighting energy to be reduced to less than one watt per square foot. For further energy savings, the designers provided a continuously dimmable, automatically controlled fluorescent lighting system to supplement daylight. On each floor, sixteen separate lighting zones are individually controlled by a dimmer/photoser spr combination, which operates in an open-loop propertional control mode to maintain a target illuminance of 350 lux. The control photosensors are located in groups near the window and the atrium edge.

Performance Studies

Building 157 opened in early 1983. It was reported in the architectural press as an unprecedented experiment in daylighting and appears in William Lam's book, Sunlighting. Post-occupancy evaluation seemed a natural next step, and Lawrence Berkeley Laboratory (LBL) undertook a two-phase evaluation of system performance funded by the Pacific Gas and Electric Company. The first phase (completed 1987) focused on gauging the effectiveness of the architectural leatures in admitting daylight and evaluating the overall success of the scheme. The second phase (completed 1989) involved a specific retrofit to address problems found during the first phase and subsequent monitoring to evaluate the success of the retrofit. Both phases compared lighting power consumption with illuminance in the space and used micro-datalogger-based instrumentation packages for data collection and

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reduction. Each package consisted of a self-contained battery-powered micro-datalogger connected to strategically placed photometers and watt transducers. The monitoring system provided a continuous record of system performance.

Data from our initial measurements demonstrated that the architectural features worked as intended by the designers. The building admits ample daylight to the interior zone – no small feat for a building of this size. The general qualitative assessment is positive; building occupants appreciate and value the quality of light provided. Spot checks show that the system can dim properly under manual operation, but the control system failed to dim most lighting circuits even though available daylight regularly exceeded the target illumin ance of 350 lux. Monitored data also indicated the original control photosensor location under the light shelf provided a signal poorly related to the illuminance at fixture locations in the building.

n 1989, we returned to the building and spent a morning modifying the control system in a single 25, 00-square-foot test zone. Our earlier data indicated a linear relationship between the brightness of the upper surface of the light shelf and the daylight component of illuminance at most interior locations. This suggested a better location for the photosensors (that is, on the ceiling looking down at the light shelf). Following sensor relocation, we carried out the dimmer manufacturer's recommended method of calibratipn and monitored the illuminance and power consumption for fixture locations within the test zone. While performance decidedly improved, many circuits failed to reach maximum dimming despite adequate daylight. To address this problem, we devised an empirical method of calibration based on the target illuminance concept. To account for variations in available daylight across the width of the building, we carefully fine-tuned each circuit according to the daylight component of illuminance at its location.

Performance of Retrofit Controls

The graphs profile interior illuminance for 24 hours at a location 33 feet from the southern facade and concurrent electric power consumption for the overhead fixture at that location. The graphs compare three sets of data: the original data (3,4), after the hardware changes (8,9), and after careful fine-tuning (also 8,9). The original data show interior illuminance far exceeding the target value, and almost no reduction in power consumption by the dimming system. After the photosensor relocation and the first calibration, performance improved substantially, yielding impressive reductions in electric power consumption while maintaining target illuminance. Finally, finetuning the control system captures additional savings with almost no change in interior illuminance.

In Building 157, control system commissioning occurred during the handoff from designer/contractor to owner. The complexity of the system and the hectic pace of contruction's final stages contributed to the problems found in the dimming system. Clearly, the designer's ambitious daylighting goals were achieved. Properly designed architectural features can admit a significant amount of daylight and provide a pleasant working environment while offsetting lighting energy costs. For contemporary buildings where daylighting supplements electric lighting, our experience in Building 157 underscores the necessity of careful commissioning and follow-up. Ensuring proper sensor location and appropriate system calibration is particularly crucial for maximum energy savings.

Lockheed has adopted our retrofit and has implemented it throughout the entire building at a minimal cost per zone. With a small investment in time and materials, the retrofit should yield a threefold increase in savings of energy and demand charges. **Charles C. Benton and Marc Fountain**

Charles C. Benton is an associate professor of architecture in the Department of Architecture at the University of California, Berkeley and a faculty research associate at Lawrence Berkeley Laboratory. Marc Fountain is a graduate student in the Department of Architecture at the University of California, Berkeley and a researcher at Lawrence Berkeley Laboratory.

Recommended Reading

Sunlighting as a Formgiver for Architecture, W.C. Lam, Van Nostrand Reinhold, New York, 1986.

Concepts and Practice of Architectural Daylighting, F. Moore, Van Nostrand Reinhold, New York, 1985.

Daylighting Design and Analysis, C.C. Robbins, Van Nostrand Reinhold, New York, 1986.

"Daylighting Cuts Energy Use to 19,600 Btu per Square Foot per Year," J.B. Gardner, Architectural Record, January 1984.

Acknowledgments

The authors would like to acknowledge the support of the Department of Energy and Pacific Gas and Electric Company. James Jewell and Stephen Selkowitz merit special thanks for their contributions to the excellent organization of the project.



8,9 Figures 8 and 9 reveal several relationships between available daylight and electric lighting in the building's interior at a distance of ten meters from the exterior wall:

a The 1985 data (base case data reproduced from 3 and 4) indicate excessive mid-day illuminance due to unnecessary electric lighting.

b Compared to the inconsequential dimming of the base case, the manufacturer's calibration provides impressive reductions in lighting energy expenditure, while maintaining the target illuminance.

c The LBL calibration, when compared to the manufacturer's calibration, provides even greater dimming of the lighting circuit, with almost no change in interior illuminance.

d The circuit shows slightly over 30 percent of full power consumed during 24 hours a day in 1988 as a portion of the circuit that has been converted to emergency lighting.

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7 Primary Colors

Lighting as a Source of Positive Affect

Dr. Robert A. Baron of Renssealear Polytechnic Institute discusses the effect of different fluorescent lamp types and

lighting levels on behavior and cognition.

growing body of evidence in psychology and related fields points to the conclusion that the way people feel strongly influences the way they think and the ways in which they behave. Indeed, even relatively small shifts in positive affect or positive, pleasant feelings have been found to be capable of altering key aspects of behavior and cognition. With respect to overt behavior, modest increments in positive affect (induced through procedures such as providing individuals with a small gift or favorable feedback on their work) have been shown to 1 increase individuals' willingness to help others, 2 reduce their tendencies to engage in various forms of aggression, and 3 increase concession-making during negotiations. Turning to cognition, systematic studies indicate that positive affect can influence several aspects of the ways in which we think and reason, including memory, decision-making, risk-taking, and creative problem-solving.

nother and closely related body of research indicates that temperature, humidity, air quality, noise, and crowding exert strong effects on individuals' moods or affective states. For example, excessively high or low temperatures and unpredictable and irritating noise induce negative feelings (affect) among the persons exposed to them, while more comfortable environmental conditions induce positive feelings. When these two lines of research are combined, the possibility is suggested that lighting conditions may influence individuals' affective states, and hence their performance on a wide range of tasks.

Hypothesis and Method

Previous research concerned with the impact of lighting on work performance has focused mainly on tasks that can be described as being primarily visual in nature — assembly tasks requiring fine eye-hand coordination and visual identification of products, for example. In contrast, relatively little attention has been directed to the impact of lighting on mood, and through such effects, on behavior and cognition. Several of us at Rensselaer have recently examined this issue through studies conducted at RPI's Lighting Research Center. In particular, we have sought to investigate the hypothesis that lighting conditions inducing increments in positive affect (positive feelings) will influence individuals' cognitive processes and behavior in a manner consistent with the findings of previous research in which such positive affect has been induced through other means. In other words, we predicted that lighting conditions that induce positive feelings and reactions among the persons exposed to them will influence their behavior and cognition in several important ways.

We investigated this hypothesis through a series of laboratory studies in which subjects performed a wide range of work-related tasks under several different lighting conditions. These conditions were based on the systematic variation of two aspects of lighting: illuminance (light density) and spectral distribution (the distribution of energy at different wavelengths). Practically speaking, these two factors were varied by exposing subjects to high (1500 lux) or low (150 lux) levels of illuminance produced by cool white, warm white, Natural White[™], and Design 50[™] fluorescent lamps. In both studies, subjects were exposed to only one lighting condition, that is, one combination of illuminance and spectral distribution; they performed all tasks in the presence of this single condition. In order to determine whether the different lighting conditions influenced behavior and cognition, we then compared performance, on several different tasks, of subjects exposed to each combination of illuminance and spectral distribution. More than one hundred and fifty individuals participated in the research, so sizable numbers were exposed to each lighting condition.

The tasks performed by participants were designed to represent a wide range of activities carried out by employees in diverse work settings. One task involved evaluating the performance of a fictitious employee from information provided in a personnel file. The information was carefully designed to be as neutral in nature as possible. Another task measured subjects' willingness to take risks. In this task, subjects indicated how much they would spend to insure items of different monetary values; the more they were willing to spend for insurance, the lower their risk-taking tendencies. A third task assessed the extent to which subjects included various words within specific categories. Some of the words were central to these categories, while others were much more peripheral, for example: To what extent are automobiles, trains, and elevators types of vehicles? Obviously, automobiles and trains are better exemplars of the category vehicle than elevators. This task provided an index of the tendency to think expansively - to view a wide range of objects or items as being somehow related to one another. Finally, subjects completed a widely used questionnaire designed to assess their preferences for resolving interpersonal conflicts through several different strategies - compromise, avoidance, accommodation (surrender), collaboration, and competition.



1 Scientific research indicates that feelings influence behavior, mood (affect) influences decision-making, $and \, environmental \, conditions \, influence$ mood. Lighting - as one condition of the environment - can influence mood, which may then influence thought and action.

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5 Conflict resolution vs. lamp type and

Lighting condition

illuminance levels

2 Subjects consistently gave higher performance ratings to fictional employees when reviewing personnel files under 150 lux rather than under 1500 lux illuminance levels.

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3 Subjects scored lower (more poor exemplars) in word categorization – an index of expansive thinking – under the lower illuminance level.

4 Subjects were willing to pay less for insurance – thereby assuming higher risks – under warm white than other lamp types.

5 Subjects' responses to a questionnaire revealed a stronger tendency to resolve conflicts through collaboration, and a weaker tendency to resolve them through avoidance, under low lux warm white than high lux warm white, or either low or high lux cool white lamps.



Findings

Results offered strong support for the hypothesis that variations in lighting conditions would indeed influence performance on all these tasks. Effects were generally more consistent for illuminance than for different lamp types, but both significantly influenced at least some aspects of subjects' performance. Taking each of the tasks mentioned above in turn, major findings can be summarized as follows. First, as expected, subjects assigned higher performance appraisal ratings to a fictitious employee under low illuminance (2). Turning to the word categorization task, subjects exposed to low illuminance included more poor exemplars within the various categories than subjects exposed to high illuminance (3). Risk-taking, too, was affected by lighting conditions. Subjects exposed to low illuminance showed reduced risk-taking tendencies relative to those under high illuminance. However, subjects exposed to warm white light actually showed greater risk-taking than those exposed to any other lamp type (4). This latter finding suggests that lighting conditions may influence arousal or activation as well as mood (affect). Presumably, warm white light increased arousal or activation as well as positive affect, and so increased risk-taking. Finally, as anticipated, subjects also showed stronger tendencies to resolve conflicts with others through collaboration and a weaker tendency to resolve such conflicts through avoidance, when exposed to the combination of low illuminance-warm white than when exposed to any other lighting condition (5). Additional findings indicated that in general, subjects also reported the most positive moods (affective states) in this condition.

Practical Implications

These findings have important implications for lighting design in work settings. First, and most generally, they suggest that lighting conditions can indeed influence individuals' affective states and hence their performance on a wide range of tasks. Moreover, such effects are not restricted to tasks requiring visual processing; rather, they appear to extend to ones that can be described as primarily cognitive and involve decision-making, or *behavioral* — such as dealing with interpersonal conflict — in nature.

Does this imply that lighting designers should always attempt to maximize positive affect among employees? Not necessarily. For example, if certain lighting conditions increase the likelihood that employees will take risks, this may be a "plus" in some contexts — like a small, entrepreneurial firm — but a

"minus" in others — like a bank or other financial institution. Similarly, if specific lighting conditions raise the average level of performance appraisals assigned to employees, this may or may not prove beneficial to an organization, depending on existing conditions. If, at present, evaluations are unduly low, and increased favorable feedback is needed, then installing low-illumination (warm white) lighting may prove beneficial. If, instead, the organization currently suffers from "evaluation inflation," installing such low-illumination lighting may not be beneficial. In short, our research indicates that lighting conditions can play an important role in the performance of employees and in the overall productivity of organizations. However, the potential impact of lighting conditions must be assessed in terms of the specific goals that an organization wishes to attain, including increased or reduced risk-taking, higher or lower performance appraisals, increased or reduced expansive thinking. Only after such issues are given careful consideration should specific lighting recommendations be proposed. **Robert A. Baron**

The author is a professor and chairman of the Department of Psychology, and a professor of management at Rensselaer Polytechnic Institute in Troy, New York. He is the author or co-author of 21 books on various aspects of psychology and management. One of his continuing research interests is the effect of the physical environment on behavior in work settings.

Recommended Readings

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Computer Aided Lighting



1 Sample graphic output from Kinectic Software's Daylite. The wireframe curve shown indicates the intensity of sunlight entering a building through a window with an overhang.

e Corbusier probably was not thinking of cybernetic simulation when he spoke of the "masterly, correct, and magnificent play of masses brought together in light." Although somewhat short on poetic potential, desktop computers are now widely used in lighting design because they can quickly predict precise levels of illumination on a printed page or calculate the brightness of a speck on any surface in any space. And computer workstations are now used to confirm and compare design decisions by creating photorealistic images of lighting designs in complex spaces.

Photometric data in a standard IES (Illuminating Engineering Society) format is available from most electric lighting manufacturers on floppy diskette. This makes it easy to compare the performance of different lighting configurations in little time. Some lighting manufacturers provide their own utilitarian lighting software free of charge to qualified specifiers and designers. These programs determine the footcandles received on a horizontal surface. The data are displayed in tabular form or as iso-footcandle curves superimposed on a simple floor plan. More powerful, proprietary, number-crunching programs for the dedicated user can be purchased for \$500 and up. Most programs can predict indoor horizontal and vertical illumination and brightness of surfaces in complex spaces. Only a few desktop programs have three-dimensional output capabilities.

In addition to the ubiquitous programs for numerical analysis, ray-tracing software is available for simulation of the visual character of alternate lighting designs, resulting in stunning photographic realism and precision. With ray-tracing, it is possible to compare the technical performance of lighting as well as its visual qualities. Most of today's desktop lighting analysis software works on the IBM PC and compatibles under MS DOS. Visual simulation software requires greater processing capacity and is run on multitasking engineering workstations, such as Mac II's under A/UX or other UNIX machines.

Only a few programs can calculate daylighing; most are capable only of electric lighting analysis. Almost none of today's programs offers an integrated analysis of electric lighting and daylighting, but that is a likely next direction. While there is not room here to describe all lighting software, descriptions of a few representative examples are offered below.

Daylighting Software

Superlite and Daylite perform daylighting calculations. Superlite, developed by Lawrence Berkeley Laboratory (LBL), can analyze complex room and light source geometries with great precision. Superlite models the effects of both direct and diffuse or reflected sunlight. Running time varies with the complexity of the room and external obstructions. Operation of the program is not for the faint-hearted computer novice: Entries must be made item-by-item with a text editor, and the results are a tabular display of numbers. It is useful primarily to researchers and to lighting designers who need detailed daylighting analyses.

Daylite from Kinetic Software graphs daylighting values in a wireframe model of the design. Davlite determines the lighting effect of interior and exterior elements. It allows the user to specify window height, room depth, surface reflectance, overhangs, fins, light shelves, roof monitors, light wells and skylights. Daylight illumination is predicted for any time of day. Daylite also determines heat gain from daylighting and electric lighting and calculates a power budget. The program resides on four floppy diskettes for either IBM-compatibles or the Macintosh and comes with a 100-page manual. It is complemented by a remarkable book, Daylighting: Design and Analysis. There is a version (Continued on page 128)



2AR a diance simulation of a

conference room. The image, modeled by Anat Grynberg at Lawrence Berkeley Laboratory (LBL), required

Berkeley Laboratory (LBL), required 8 hours generation time on a Sun-4 SparcStation. Radiance is public domain software funded by the Department of Energy, available through LBL (see page 130).

 $3A \, photograph \, of the \, same \, conference$

room.



4 CALA visual display of indoor lighting analysis.

5 CALA visual display of outdoor lighting design showing lamp standards (yellow) and iso-footcandle distribution curves (red).

(Continued from page 126)

of Daylite for either the PC or the Macintosh.

The Hypermedia Electronic Daylighting Design Tool is an interactive video package under development at LBL. When complete, it will combine a primer on the principles of daylighting with an extensive data base of case studies. The tool uses a two-screen working environment; the program running on a Macintosh computer drives an optical disc player that simultaneously brings appropriate images to a video monitor.

Electric Lighting Software

Outdoor lighting is calculated with a simple, pointby-point procedure that can be performed for uncomplicated lighting arrangements with a hand-held calculator, or with a mathematics utility program, such as MathCad. However, there are also many single-purpose lighting software programs that will give quick and easy results for the frequent user. For instance, Gardco's LUX88, available for the asking, is a friendly and unadorned program that plots horizontal footcandle distribution on a grid for outdoor lighting layouts, like parking lot lighting. More capable is Thomas Outdoor Lighting's Lux-TI, which can calculate both horizontal and vertical illuminances for roadway lighting or for floodlighting of outdoor sports facilities.

Economic analysis of lighting alternatives can be performed by software available from major lamp manufacturers. General Electric's LEAP program (Lighting Economic Analysis Package), similar to Sylvania's SYLVIA/pc (SYLVania Information Analysis) software, will compare life-cycle costs of different new or replacement high-efficiency lamp lighting systems for indoor or outdoor applications and will help determine the lowest annual cost maintenance plan for cleaning and relamping. GE Lighting also provides DATA*LIGHT II for quartz-halogen lamps; it plots candlepower curves and illuminance on either horizontal or vertical surfaces. DATA*LIGHT III is a similar program available for the Macintosh.

CALA (Computer Aided Lighting Analysis), an electric-lighting program by Holophane, is distinguished by the fact that it can link up with AutoCAD drawings. This permits easy integration and coordination of electrical lighting design with architectural design on



separate layers in a common drawing database, the importance of which cannot be overemphasized. The results of light fixture placement and illumination level calculations, displayed as iso-footcandle curves, can be viewed in three dimensions in AutoCAD. CALA is used for both indoor and outdoor lighting analysis, and accepts photometric data from any lighting manufacturer. CALA was used to trim the number of required lights and to maximize lighting coverage in the design of a large outdoor lighting project, AmeriFlora '92, for Columbus, Ohio. Digital DWG and DXF files served as the interface between lighting designer, electrical engineer, and landscape architect.

Daylighting and Electric Lighting Combined

Lumen-Micro by Lighting Technologies is a robust and capable program that has been used for many years. The latest version performs a complete daylighting analysis interactively with indoor electric lighting calculations, making it possible to arrange lighting fixture layouts in conjunction with daylighting through windows and skylights. It is capable of high-resolution color perspective graphics and the results can also be output in a DXF file, making it compatible with CAD packages. The eventual goal of Lighting Technology is for their lighting software to reside on the CAD menu. Lighting Technologies also wrote the computer code for the lighting module of IBM's Architecture nd Engineering Series (AES), a high-end integrated software package developed by Skidmore Owings & Merrill that runs on the IBM RT computer. One of eight discipline-specific applications, the lighting module of AES performs both daylighting and electric lighting calculations. The visual effects of sunlighting and the casting of shadows (the program contains a calendar and a clock; the user inputs the latitude and longitude) may be studied with the rendering module using data from the lighting analysis. IBM recently announced that two modules of the eight applications modules, graphics and rendering, will run on the PS/2.

While not intended for lighting design, some energy analysis software will assist the designer in evaluating lighting strategies. For example, DOE 2.1D, one of the most powerful energy programs, will calculate the air-conditioning implications of using direct or





reflected daylight to displace electric lighting. The simple and inexpensive energy calculation program, SCM (Simplified Calculation Method), determines compliance with California's building energy efficiency star clards. With SCM, the designer can compare daylighting or electric lighting alternatives with the bottom-line energy figure.

Visualization

In addition to numerical results given by most of the programs described above, architects are especially interested in subjective and aesthetic values that can be evaluated by either building physical models or by photorealistic computer simulation. Desktop perspective rendering programs, such as AutoShade, Big-D and Dynaperspective, are well known, but they give a coarse and sometimes misleading picture of the relative brightness of surfaces. Brightness, or luminance, is what the eye actually sees and it is this value that is required for a photorealistic simulation.

ay-tracing software begins with a description of the patial geometry and the characteristics of materials and light sources. The path of each light ray is followed as it interacts with each surface it encounters. The brightness of each surface in the scene is collected in a perspective map. At present, the manual entry of data is laborious and the computation takes several hours to complete for a scene of average complexity. A working prototype of ray-tracing software, called Radiance, has been developed at LBL, and has been validated by comparing computer simulations with real spaces. A Radiance simulation of a conference room (5) and a photograph of the actual room (6) are shown. Although the software is available at no charge, Radiance is still awkward to set up; but LBL is working on a translator that will prepare AutoCad DXF and Architrion drawing files for ray tracing, which should extend the usefulness of Radiance for practitioners.

Virtual Reality

The future and the promise of lighting software lies not only in the advent of rapid photorealistic computer simulations, but also in the exploration of spaces in virtual reality. Used mostly for flight simulation until recently, virtual reality systems simulate real-world sights and sounds for the user. It may soon be possible for the designer and client to "step into" an unbuilt space and interactively control ambient light by moving light sources or dimming them, or to watch the effects of daylight over a period of time on a proposed building design.

Virtual reality research has been based mostly on powerful mainframe or workstation platforms, but Autodesk is developing a "cyberspace" CAD system that can run on 80386 IBM PCs. Using more powerful computing equipment, dynamic and interactive architectural walk-throughs have been achieved at the University of North Carolina, Chapel Hill. During the walk-through, the user wears a head-mounted display and walks on a treadmill, steering through the space with handlebars. Even the sound of footsteps on various materials is simulated. Perhaps a "magnificent play of masses brought together in light" is just around the next corner. **David Lord**

The author is a professor of architecture at Cal Poly, San Luis Obispo, California, and a daylighting consultant. He wishes to thank Jennifer Schuman and Gregory Ward, Lawrence Berkeley Laboratory, for contributing to this article.

Recommended Reading

"Visualization," Gregory J. Ward, Lighting Design and Application (IES), June 1990, pp. 4-19.

Daylighting: Design and Analysis, C. L. Robbins, Van Nostrand Reinhold, (800)926-BOOK, 1986.

IES Lighting Handbook: 1987 Application Volume, and 1984 Reference Volume, Illuminating Engineering Society of North America, (212) 705-7925.

[For more information on software mentioned in this article, see Computer Products, p. 154 - Editors.]

6A sample visual display from Lighting Technologies' Lumen-Micro demonstrates how interactive menus allows the user to calculate illumination levels of either daylight or electrical light.

.

7 Thomas Outdoor Lighting's LUX program "plots" horizontal footcandles on a dot matrix printer. This output describes one quadrant of outdoor illuminance for polemounted luminaires on 120 ' centers. An isolux diagram can be hand-drawn over the numerical data by connecting values of equal illuminance (like sketching a topographic map from spot elevations). The example assumes luminaires with an initial output of 40,000 lumens and a maintenance factor of 0.75.

MACK Architects exercises the state-of-the-art

lighting simulation for the design of a theater.

Photographing Computer Screens

Photography is often the most expedient means of recording and presenting computer-generated images. The following practices are recommended for 35mm cameras by Eastman Kodak Company. • Use a slow daylight film, ISO 25 to 100.

Use a tripod and shutter speeds between ¹/₂ and 1 second (no less than ¹/₈ second).
Stop down to at least f8, to compensate for screen curvature.

• Use either a macro or short telephoto (100mm) lens, or a tele-converter or screw-in closeup adaptor over a normal lens. • Adjust monitor brightness so that no scan lines show on a

black screen (turn off auto brightness control if it has one). • Reduce screen contrast to just below normal setting.

Darken the room completely, or make a black tent around the monitor (do not use flash).
Set up the photo so that through-the-lens meters read the entire screen image (and bracket liberally).

Some color correction may be necessary to compensate for mismatches between the film dyes and monitor phospors. Try CC10 to CC40 red with transparency films, and CC20 blue with color negative films (see P/A August 1990 for more about CC filters). **Kenneth Labs** Photorealistic images can be generated using Radiance: view from stage, right, and view towards the front, below.



A lighting simulation for a multiuse theater by MACK Architects, San Francisco, was prepared by redrawing the main interior space on CAD software. The CAD drawing, along with a description of surface reflectivities and manually entered photometric data were used by Radiance software to perform the lighting simulation. The analysis was limited to a determination of the brightness of surfaces and light sources in the visual field — what the eye would see.

Initial simulations of the theater interior showed an unwanted scalloped light pattern on the walls, leading to a redesign that moved lights closer together and closer to the walls. Pendant house lights were also lowered to avoid highlighting the surrounding catwalks. A small percentage of uplighting was added to illuminate the ceiling and proscenium arch. Uplighting also emphasized the forms of the acoustical shapes on the ceiling, and resulted in a space that was judged to be uplifting rather than oppressive.

The project designers, working in traditional pen and ink, were astonished at the realism portrayed by the computer simulations. It was likened to having a photograph of the building before working drawings were finished. The value of using Radiance simulation software in this project was not in saving time but rather in expanding the scope of analysis and visualization tools available to the architect. Equally important, the simulations serve as a valuable method for promoting the project. **David Lord** **Project:** 15,500 sq.ft. multiuse theas in and support spaces with outdoor performing area.

Design Team: Mark Mack, principal; Christine Macy, project architect. Charles Ehrlich, 3-D computer modeling and lighting analysis, performed on the McDonnell Douglas GDS (Graphical Design System) using Radiance* lighting simulation software. Client: Department of Parks and Recreation, State of California.

*Radiance software was developed at the Lawrence Berkeley Laboratory; for information and availability contact Jennifer Schuman, LBL, 1 Cyclotron Road, Berkeley, California 94720, (415) 486-4092.



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Drawing With Light

Consultant Harvey Bryan describes neon lighting and what designers need to know about using it.



1 Neon provided Times Square with what art critic William Wilson once described as: "The magic wind that gave downtown its boogie-woogie spirit." Shown above is a view of the worldfamous neon-lit boulevard in 1963.

nspired by the demand for more energy efficient products, the lighting industry over the last several years has been at the forefront of innovation. During this period, lamp manufacturers have introduced an impressive list of new products, including compact fluorescents, MR-16s, and color improved low-wattage HIDs. Designers were also busy coming up with exciting applications for these new products and reviving several lighting technologies that were nearly abandoned by the industry. Of these, neon has had the strongest resurgence.

Historical Perspective

Neon uses essentially the same technology today as it did when it was invented by the Frenchman Georges Claude in 1910. Then as now, a skilled glass bender would hand-shape a thin glass tube, fit an electrode or cathode to each end, evacuate the tube and fill it with neon or argon gas. Then connecting a high-voltage current to each electrode would cause the tube to emit a steady glow of light.

Claude envisioned that neon would quickly supplant incandescent lighting for general interior illumination. However, despite neon's higher efficiency, longer life, infinite color, and creative possibilities, it was unable to displace the less costly incandescent lamp. Neon flourished throughout the 1920s and 1930s, reaching its peak just prior to World War II. During this time the application of neon varied from spectacular animated billboards that gave Times Square its once glamorous atmosphere to indirect cove lighting that was used to accent the streamlines of art deco.

Outside a few locations like Las Vegas, neon was in sharp decline by the late 1950s because of the introduction of fluorescent backlighted plastic signage. The labor-intensive neon industry just could not compete with mass produced, vacuum-formed plastic lettering and translucent plastic sheeting.

Recognizing that a folk craft was being lost, during the mid-1960s several young artists started to revive neon by using it in their own work. Chryssa nd Stephen Antonakos began to incorporate elements of vernacular neon signage into large-scale luminous sculptures. Other artists, such as Lili Lakich, learning the craft by apprenticing at sign companies, started to use neon as expressive undulating lines of light to create a very personal and reflective type of art.

Architecture also began to acquire a new respect for the vernacular. In Learning from Las Vegas, architects Robert Venturi and Denise Scott Brown helped to popularize neon by discussing how it aided in the

Technics Focus: Lighting

coran Gallery of Art, Washington, D.C

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2 In this 1967 neon sculpture, Clytemnestra, Chryssa – like other artists at the time – explored neon as an expressive medium. 3 Charles Moore helbed to explore the use of neon as an active

3 Charles Moore helped to explore the use of neon as an active design element in the Piazza d'Italia (1978).

4 Murphy/Jahn in collaboration with neon artist Michael Hayden, created a spatially kinetic neon sculpture that is synchronized to futuristic music at Chicago's O'Hare Terminal (1989).

creation of the symbolic landscape of Las Vegas. During the 1970s, architects increasingly used neon: Venturi used suspended cold cathode — a type of neon that uses a larger diameter tube and a higher current — to light the sanctuary in his renovation of St. Francis de Sales Church in 1970 (the Church later removed it). Similarly, Charles Moore experimented with neon on several projects, of which Piazza d'Italia (1978) is probably the most noted.

By the early 1980s, the requirements for innovative lighting, sparked by an unprecedented number of new cates, restaurants, boutiques, and discos, created a constant demand for neon. To serve this demand, art and trade schools began to offer neon courses and workshops, neon studios opened to provide complete design services, and the once endangered neon fabricators started to increase in numbers and to shift their product emphasis away from signage. The neon renaissance was in full swing.

Working with the Material

While neon offers exciting design possibilities it can also offer the first-time user a host of problems. Neon fabrication is one of the last of the custom crafts. It is a trade still dominated by small firms that have historically dealt with knowledgeable end users and prefer to work from templates and direct contact with the designer rather than with plans, specifications and shop drawings. A design firm with no previous neon experience wanting to use it in a large project will almost certainly need to retain a consultant. In smaller projects the consultant can be avoided if someone in the firm is willing to learn about the subject.

For most projects, the design firm wanting to use neon would approach a sign company to inquire about design parameters, price, and installation. Although not all sign companies fabricate neon, most have workarrangements with glass benders, and the sign in npany does the necessary mounting and wiring. An co alt rnative for design firms in larger cities is to use one of he growing number of neon studios that are beginning to appear. Neon studios differ from sign companies in that they are usually operated by individuals with a design arts background, which makes them better able to provide comprehensive design services. No matter which operation is chosen, it should be local. Oving to the custom nature of neon, it is critical that the fabricator knows the local electrical codes and on regulations concerning wiring and installation. ur When the design is completed (in the form of a full-

size sketch) the designer returns to the fabricator for







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5 In this San Diego clock tower (1989)

Delawie/Bretton/Wilkes Associates, in

collaboration with lighting designer

Keith Thompson, pioneered the use of

fiberoptic tubing for exterior lighting.

5



a discussion with the layout maker. The layout maker transfers the full-size sketch to a heat-resistant cloth or paper template that includes – for each tube – type, size and length, gaseous mixture, and pressure. The layout maker will specify on a scaled drawing the size and location of transformers, diagram the wiring layout, and prepare installation instructions.

The template is then given to the glass bender who heats and shapes the tubes. After the tubes are shaped, electrodes are spliced into each end. Then a vacuum pump evacuates the tube and impurities are removed during a process of heating by means of passing a highvoltage current through it. Finally, the tube is charged with the appropriate amount of neon or argon and tested to see if any flaws develop.

Once tested, the tubes are usually placed on a metal or plastic mounting board. The tubing is separated on the front side by a series of glass posts tied to both the tubing and the mounting board. The down-turned electrodes at each end of the tubing pass through holes in the mounting board to the back where the wiring and transformer are located. Small neon designs are usually completely finished in the shop, whereas larger designs require considerable on-site installation. For either size, the designer must be particularly cautious about the detailing of connections; since traditional neon fabricators are accustomed to having their work viewed from long distances, they do not pay much attention to such matters. In an on-site installation, careful attention must also be given to the wiring and placement of transformers. Generally, high-voltage leads should be kept short, which suggests that the transformer be located close to the tubing. Although it is possible to conceal the transformer, this can result in increased heat build-up, transformer burn out, and the potential for fire (and careful review by any building inspector). Such concerns are the main reason many designers leave the transformer exposed.

Although neon is the most expensive source of light to manufacture, it provides a level of design freedom that no other source can match. Once fabricated and installed, it is the most economical light source to operate and maintain. Neon typically operates at three to six watts per linear foot, is easily dimmable, and can last for more than 25,000 hours. Even after the tubes burn out, they can be easily rejuvenated by replacing the electrodes and regassing the tubes.

The Future May Not Be That Bright

The energetic individuals who have begun to get involved in design, fabrication and installation of r con have created an atmosphere that has not been seen since the days of Georges Claude. The last several years have generated an impressive list of innovations, including programmable microprocessors for an imation, miniaturized transformers, and a host of new colors. This has led to a general optimism about the future of neon.

However, this optimism may be short-lived. One non-neon innovation that has the field in quite a stir is fiberoptic tubing, which creates a lighting effect s milar to neon. The concept uses densely packed filters encircled by a pliable plastic tube that can be as long as 200 feet. Each end of the tube is illuminated by a 150W HID lamp to create an even glow throughout the entire length of the tube. 3M and Fiberstars, two of the leaders in fibrotic lighting, feel their products have all the advantages and none of the disadvantages of neon. They see fiberoptic tubing as superior to neon in three areas: 1 It is unbreakable, thus it can be used in damage-prone locations; 2 the tubing is non electrified and the lamps use line voltage, so there are no electrical safety problems (the tubing can even be placed underwater); and 3 colors can be changed instantly by placing a color wheel in the lamp housing.

Although fiberoptic tubing is too new a technology to predict the direction it will take, designers who have worked with the material have found themselves conceptualizing the design in much the same manner as they did with neon. On the other hand, many purists see fiberoptic tubing as a continuation of the assault on neon by plastics — that is, another form of backligt ted plastic signage. **Harvey Bryan**

The author is an architect, researcher, and frequent contributor to P/A in the area of building technology. He is an associate professor at Harvard's Graduate School of Design, where he teaches a course on lighting.



Manufacturers Directory

- Interior Lighting (includes decorative lighting, interior architectural luminaires)
- Exterior Lighting (includes mounting devices, exterior architectural)
- Controls/Accessories (includes ballasts, control systems, fixture components/accessories)
- Lamps
- Miscellaneous (includes miscellaneous luminaires, additional products)

Alkco O 11500 W. Melrose Street Franklin Park, IL 60131

A.L.P. ■ 6333 Cross Point Road Niles, IL 60648

American Glass Light Company 49 West 27th Street New York, NY 10001

Appleton ■▲○ Lamplighter P.O. Box 1434 Appleton, WI 54913

Architectural Area Lighting Inc. ■▲○ 14249 Artesia Boulevard P.O. Box 1869 La Mirada, CA 90637

Architectural Lighting Systems Inc. 30 Sherwood Drive Taunton, MA 02780

Art Directions 6120 Delmar Boulevard St. Louis, MO 63112

Artemide Inc. ■ 1980 New Highway Farmingdale, NY 11735

Atelier International 30/20 Thomson Avenue, BFL Long Island City, NY 11101

Baldinger Architectural Lighting 1902 Steinway Street Astoria, NY 11105

Beghelli Inc. O P.O. Box 8053 Jacksonville, FL 32216

BEGA/FS ■▲ P.O. Box 50442 Santa Barbara, CA 93150 **Boyd Lighting Company** ■ 56 12th Street San Francisco, CA 94103

Canterbury International O P.O. Box 5730 Sherman Oaks, CA 91413

Capri Lighting ■ 6430 East Slauson Avenue Los Angeles, CA 90040

CEW Lighting Inc. ●▼O 4337 Beltwood Parkway South Dallas, TX 75244

Chloride Systems ●○ Mallard Lane North Haven, CT 06473

Coil Anodizers Inc. O 1960 South Roberts Muskegon, MI 49443

Columbia Lighting ■▲ P.O. Box 2787 Spokane, WA 99220-2787

Cooper Lighting ■▲○ 400 Busse Road Elk Grove Village, IL 60007

ConTech Lighting ■ 130 North Waukegan Road Deerfield, IL 60015

CSL Lighting Mfg. Inc. ■ 25070 Avenue Tibbetts Valencia, CA 91355

Devine Lighting ■▲○ One Design Drive North Kansas City, MO 64116

Edison Price Lighting C 409 East 60th Street New York, NY 10022

ELA Company ■▲ 17891 Arenth Avenue City of Industry, CA 91748 Elliptipar Inc. AO 145 Orange Avenue West Haven, CT 06516

Fiberstars ■▲○ 47338 Fremont Boulevard Fremont, CA 94538

FailSafe Lighting O 4501 South Tripp Chicago, IL 60632

Flos USA Inc. ■ 200 McKay Road Huntington Station, NY 11746

Gardco Lighting 2661 Alvarado San Leandro, CA 94577

General Electric Company MAOV Lighting Information Center Nela Park Cleveland, OH 44112

Greenlee Landscaping ▲ Lighting Mfg. 1510 Capitol Parkway Suite 200 Carrollton, TX 75006

GTE Sylvania Lighting ▲▼ 100 Endicott Street Danvers, MA 01923

Guth Lighting ■▲ 2615 Washington Boulevard St. Louis, MO 63103

Hadco A 100 Craftway P.O. Box 128 Littletown, PA 17340

Hanover Lantern 470 High Street Hanover, PA 17331

Holophane Company ■▲●○ 214 Oakwood Avenue Newark, OH 43055 Hubbell ■▲●○ 2000 Electric Way Christiansburg, VA 24073

Hydrel ▲ 12881 Bradley Avenue Sylmar, CA 91342

Imperial Bronzlite ▲ P.O. Box 606 San Marcos, TX 78666

Joselyn Mfg. & Supply Company AO 4000 East 116th Street Cleveland, OH 44105

JW Lighting Inc. 750 Almeda Genoa, Houston, TX 77045

Kichler Lighting 541 East 38th Street Cleveland, OH 44114

Kim Lighting () 16555 East Gale Avenue P.O. Box 1275 City of Industry, CA 91749

Koch & Lowy ■ 2124 39th Avenue Long Island City, NY 11101

George Kovacs Lighting Inc. ■ 24 West 40th Street New York, NY 10018

KSH Inc. ■O 10091 Manchester Road St. Louis, MO 63122

LAM Lighting ■ P.O. Box 111 Wakefield, MA 01880

Leviton Mfg. Company ● 5925 Little Neck Parkway Little Neck, NY 11362

(Continued on page 138)

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(Continued from page 136) Lighting Bug Ltd. ■○ 320 West 202nd Street Chicago Heights, IL 60411

Lighting Services Inc. **ID**O Industrial Park, Route 9W Stony Point, NY 10980

Lightolier Inc. A 100 Lighting Way Secaucus, NJ 07094

Litecontrol P.O. Box 100100 Hawks Avenue Hanson, MA 02341

LiteTouch Inc. • 3783 South 500 West, #7 Salt Lake City, UT 84115

Lithonia Lighting ■▲● P.O. Box A Conyers, GA 30207-0067

Loran Inc. ▲ 1705 East Coulton Avenue Redlands, CA 92373

Lucifer Lighting Company ■● P.O. Box 370375 Miami, FL 33137

Lumec ▲ 618 Cure Boivin Boisbriand, Quebec CANADA J7G 2A7

Lutron Electronics Company Inc. 205 Suter Road Coopersburg, PA 18036-1299

Mark Lighting 25 Knickerbocker Road Moonachie, NJ 07074-1693

Microflector ■▲ 40 Bayview Avenue Inwood, NY 11696 Nobert Belfer Lighting ■○ 1703 Valley Road P.O. Box 2079 Ocean City, NJ 07712

NeoRay ■ 537 Johnson Avenue Brooklyn, NY 11237

NLCorporation ■ 14901 Broadway Cleveland, OH 44137

Osram Corp. ●▼ 110 Bracken Road Montgomery, NJ 12549

Pass & Seymour
P.O. Box 4822
Syracuse, NY 13221

Peerless Lighting Corp. ■ P.O. Box 255 6747 Bancroft Way Berkeley, CA 94702

Philips Lighting Company ▼● 200 Franklin Square Drive Somerset, NJ 08875

Poulsen Lighting Inc. ■▲ 5407 N.W. 163rd Street Miami, FL 330146130

Progress Lighting ■▲○ G Street & Erie Avenue Philadelphia, PA 19134

Rambusch Contract Rambusch Row York, NY 10011

Reggiani USA Inc. ■ P.O. Box 42 7065 River Road New Windsor, NY 12550

Rejuvenation Lamp & Fixture 901 North Skidmore Portland, OR 97217 **Roberts** ■▲○ 4501 North Western Avenue Oklahoma City, OK 73118

Ron Rezek Lighting ■ 4200 Sepulveda Boulevard Culver City, CA 90230

Ruud Lighting ■▲○ Washington Avenue Racine, WI 53406

SPI Lighting Inc. ■O 10400 North Enterprise Drive Mequon, WI 53092

Sentry Electric Corp. ■▲ 185 Buffalo Avenue Freeport, NY 11520

SRB Technologies ▼O 2580 Landmark Drive Winston Salem, NC 27114-5267

Spaulding Lighting Inc.■▲ 1736 Dreman Avenue Cincinnati, OH 45223

Sperro Electric ■ 18222 Lanken Avenue Cleveland, OH 44119

Spring City Electrical Mfg. ■▲ Hall & Main Streets P.O. Box Drawer A Spring City, PA 19475-0030

Staff Lighting ■▲ P.O. Box 1020 Route 9W North Highland, NY 12528

Starbrite Lighting Ltd ■▲○ 145 Saw Mill River Road Yonkers, NY 10701

Sternberg Lanterns ■▲▼ 5801 North Tripp Avenue Chicago, IL 60646 Sun Valley Lighting ■▲ 7900 Clybourn Avenue Sun Valley, CA 91352

TIR Systems ■▲ 3935 Second Avenue Burnaby, BC CANADA V5C 3W9

Targetti Inc. ■ 625 Broadway New York, NY 10012

Thomas Industries MAOO 4360 Brownsboro Road Suite 300 Louisville, KY 40207

Valmont Industries ▲● West Highway 275 Valley, NE 68064

Visa Lighting ■▲ 8600 West Bradley Road Milwaukee, WI 53223

Wendelighting ■▼ 2445 N. Naomi Street Burbank, CA 91504

H. E. Williams Inc. ■O 831 West Fairview Avenue P.O. Box 837 Carthage, MO 648360837

WoodForm Inc. ▲ 9705 N.E. Colfax Street Portland, OR 97220

Zumtobel Lighting Inc. ■ 141 Lanza Avenue Building 16D Garfield, NJ 07026
Lighting Products Literature



Alkco's new 24-page catalogue displays new task-optimized models with such features as adjustable light levels, lensing and louvers for brightness and glare control, accent lighting modes, designs for indirect over-cabinet lighting and decorative fascia incandescents in custom lengths and decorator finishes. **Alkco.** Circle No. 384



Manufacturers and distributors of quality, architectural lighting products. CLIK-STR P . . . a low voltage, high lumen, flexible linear light system; ATOMIS . . . bendable track with futuristic LV spots; DIS CUS . . . ultra slim recessed or surfacmounted halogen with lens; WACO . . . hi-tech plugjack halogen spots. Ardeo Lighting. Circle No. 383



PRA CTICA BELLA is an emergency light, aest etically appealing, very appropriate for installations in offices, banks, restaurants, hotels, and every area in which design and appearance are important. Thanks to a patented "plug-in" connection system, PRACTICA BELLA is very easy to install and maintain. **Beghelli.** Circle No. 380



Four-page color brochure available from BEGA shows the specially designed driveover/walkover luminaires. Full data and installation details along with four-color photos of this versatile product line. Includes indicator luminaires, floodlights/ uplights, ground illuminators, illuminated "speed bumps". **BEGA/FS.** Circle No. 382



The complete range of MR-16's available from any manufacturer. We offer 20, 35, 42, 50, 65, and 75 watts in a variety of beam spreads in both lensed and open units. All our lamps from 35 watts through 75 watts are rated at 4000 hours life with the lensed unit providing increased lumen levels over the open unit. **C.E.W. Lighting.** Circle No. 378



Eight-page brochure available from BEGA shows the specially designed Low Voltage line of lighting. Designed by BEGA/FS and Ron Rezek, these small-scale garden, pathway, and landscape luminaires consist of beacons, stakemounts, floods, floodlights, and bollards. With the exclusive Power Output Distribution System. **BEGA/FS.** Circle No. 381



Designed to easily replace most reflector type incandescent lamps, the UL listed Daylux-50 adaptor, complete with a 50 watt white HPS lamp and reflector, will cut energy consumption by 60 percent (50 watts vs. 150 watts). Light levels will be increased with the same incandescent color being manufactured. Perfect for almost all recessed lighting applications. **C.E.W. Lighting.** Circle No. 379

Advertising



The "TASKMASTERS" Collection is the most comprehensive source of tasklighting for desk top and open-planned office environments. Space-saving models allow for attachment to office screens. Other mountings include "bolt-thru," clamp, or weight base. Fixtures are equipped for energy saving lamps and are available in 20 colors. **C.L.S. Contract Lighting.** Circle No. 377



Classic Illumination Inc., is pleased to offer this unique collection of handmade lighting. Offered are reproductions of Victorian, Art Deco, Craftsman, and contemporary designs. Each fixture is made to your specifications in the finish and dimensions to suit your needs. Custom designs are also welcome. **Classic Illumination.** Circle No. 376



Edison Price Lighting has introduced its Design Guide. It is a brochure which helps specifiers quickly perform lighting calculations and easily select appropriate models and layouts when choosing compact fluorescent fixtures. It will save your most precious commodity: Time.

Edison Price Lighting. Circle No. 375





Hubbell Lighting Division is proud to present its Architectural Downlight catalogue. This catalogue includes our complete line of incandescent, compact fluorescent, and low voltage recessed downlights. Encompassing fixtures with configurations for open, lensed, wallwash, ellipsodial, adjustable and low profile usage. **Hubbell**[®]. Circle No. 374



Morris Kurtzon, Inc., the nation's leading supplier of stainless steel indirect and semidirect lighting systems for indoor pool areas. Our experienced in-house Design Department will supply you with a customized lighting layout for your pool. An independent lighting lamp can provide a computer printout for your pool if required. **Morris Kurtzon.** Circle No. 371



Intermatic Professional Landscape Lighting Products. There is no more dramatic approach to enhancing the beauty of commercial or residential architecture than the addition of outdoor lighting. Advanced Intermatic low voltage Professional Landscape Lighting products help architects design with light for a distinctive touch. **Intermatic.** Circle No. 373



Leviton offers brochure on its expanded touch dimmer line. Leviton has expanded its line of Touch Dimmers to include new color-Plate models. The new Color-Plate versions have touch plates that perfectly match their ivory, black, and gray frames and wallplates. Touch dimmers provide full range dimming in a low-profile design. **Leviton.** Circle No. 370



Kichler Lighting manufactures a broad range of decorative and residential lighting products with pricing for every budge. In our full-color Catalogue #789 you'll find imaginative uses of materials. **Kichler Lighting.** Circle No. 372



Lighting Sciences Inc., the industry's leading independent research and development laboratory, offers a wide range of technical resources to the lighting industry. Luninaire design and analysis, software, photometry, quality control test equipment, and prototyping services are available. **Lighting Sciences.** Circle No. 369

Advertising



RibbonLite is the ideal, indirect light source for inside cabinets and showcases. RibbonLite also excels as ambient lighting, uplighting ceilings from cove to niches, or as task lighting, downlighting countertops from beneath overhanging surfaces. And, weat reproof RibbonLite makes a striking statement as an exposed fixture. Light vorks[®]. Circle No. 368



Nova T[®] Selection Guide and Specification Guide. Nova T[®] Lighting Controls are thin-profile lighting controls and accessories for residential and commercial applications. Featured products are preset dimmers, infrared wireless dimming systems, switches, fan-speed controls, receptacles, telephone jacks, and cable TV jacks. Lutro: Electronics Co. Circle No. 282



A bridge between neon and fluorescent with features not available in any other lighting. Lighting conforms to architectural design. Continuous line of light – no shadows. Excellent uniform dimming. Long life approaches a permanent light source. Transformer or ballast operation. National Cathode Corp. Circle No. 279



LiteTouch 2000 is an innovative, microprocessor-based control system capable of multi-point switching and dimming for various lamp and load types. The system includes advanced features such as masters and scene presets, telephone interface, a built-in time clock and will interface with security systems, photo cells, motion sensors, etc. **Lite Touch.** Circle No. 284



Four-page, full-color brochure explains the new federal law establishing minimum energy efficiency standards for fluorescent lamp ballasts and shows you how MagneTek ballasts make compliance automatic. For your copy, write MagneTek, PO Box 3028, Paterson, New Jersey 07509 or call (800)-BALLAST. **MagneTek.** Circle No. 281



THE ORIGINAL CAST TM LIGHTING, a division of Art Directions Inc., introduces its new and expanded line for 1991 in a 24-page, four-color catalogue. Fixture series include an unlimited variety of hanging systems, finishes, and lamping options, as well as wall sconces and flush mount units, making them appropriate for every application. **Art Directions.** Circle No. 278



Incandescent strip lighting comes of age. Series 2000 offers the architect and designer flexibility of form, light, and power. UL Class I listed. Easily installed on curved and irregular surfaces. Offered with 3, 5, or 10 watt incandescent lamps and optional halogen inserts.

Lucifer Lighting Company. Circle No. 283



Specialist in the manufacturing of low voltage lighting: miniature recessed, single and multiple lamp, fixed and adjustable, and an internationally patented plug-in system utilizing a family of interchangeable fixtures. Each fixture mechanically secured and electrically energized in a variety of contact devices.

Modular International Inc. Circle No. 280



Paramount's Product Guide is a sampling of luminaires available for such areas as Clean Room, Marine, Hazardous Location, Booth, NSF and Wet Locations. Paramount has the expertise to modify its luminaires to accommodate special applications. Custom designs are always welcome. **Paramount.** Circle No. 277

Advertising



SPI Lighting announces its new full-color capabilities brochure, which includes 50 photographs of SPI fixtures at work in diverse interior environments. Among the broad applications categories are office settings, public spaces, recreational and educational interiors, and merchandising area. **SPI Lighting.** Circle No. 276



Emergency exit signs. L.E.D. technology is the basis of new low energy, no maintenance, long-life signs that exceed NFPA101 + UL924. Fully-illuminated ³/4-inch stroke, anodized aluminum frame, universal mounting hardware, lexan faceplate. (800) 777-9399 or (914) 592-8230.

Self-Powered Lighting. Circle No. 274



Triad's LP-2000 Series Lighting Control provides the capability for automated control of 277 V 20 amp lighting circuits by interfacing to existing EMS or HVAC control systems. Features low cost, flashes lights prior to turning off, telephone override, and modular expansion. **Triad Technologies.** Circle No. 272



This four-page color brochure shows photographs, specifications, and available colors on The Ziggurat Series of porcelain wall sconces. The Ziggurats are made with louvered construction for use with incandescent or compact fluorescent lamping. These fixtures are offered in 19 styles and 10 standard colors. Painted finishes may be applied to the natural clay surface. **Saxe-Patterson.** Circle No. 275



This six-page, full-color brochure illustrates and describes the line of beautiful, cast iron lighting posts from SPRING CITY ELECTRICAL MFG., CO., Spring City, Pennsylvania, the leader in ornamental lighting posts.

Spring City Electrical. Circle No. 273



ENERGY SAVING LIGHTING CON-TROLS. The Watt Watcher manufactures a complete line of energy saving lighting and HVAC control occupancy sensors. Included in the product line are Automatic Light Switches that simply replace existing light switches, ceiling mounted infrared and ultrasonic occupancy sensors etc. **The Watt Watcher.** Circle No. 271



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ighting Products Literature





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*Source: Building Research Bureau's Independent Architectural Survey March 1989



New Products and Literature

New Products and Literature

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Expanded Line, Flos Incorporated

Expanded Line is an integrated track lighting system capable of answering diverse requirements with an array of incandescent, fluorescent, and low-voltage halogen fixtures, which can be employed simultaneously within the system. The diversity extends also to lighting effects: Various fixtures can function as pendant task lights, while others are better suited for display lighting, or, equipped with diffusers, to provide ambient illumination.

The multifunctional capacity of the system is enabled by tracks, or "channels," which may be suspended at any height or fixed to wall or ceiling. These interconnectable tubular base elements accept various Expanded Line fixture heads and carry 120 volts. The standard line voltage can be reduced via attachable electronic transformers to the 12 volts required by halogen lamps.

Designed in 1983 by Perry King and Santiago Miranda, and manufactured in Italy by Arteluce, the line was first introduced in the U.S. in 1988. In the intervening years it has grown to include over 30 components, and continues to expand. The versatility inherent in the family of Expanded Line products is responsive to the changes occurring in the workplace, mainly in its ability to satisfy a need for greater flexibility. Its components also have a strong potential (and suitable aesthetic) for residential applications. Ziva Freiman Circle 100 on reader service card







Fixtures include Tor (1), a directlight lamp for 50W bulb with dichroic reflector; Halo (2), a halogen lamp; Olé (3), a halogen lamp with acid-etched translucent glass shade. The 36W fluorescent fixtures are awaiting UL listing and will be available with transformer and optical aluminum reflectors (4). Flexible channel "joints" enable angular track configurations (5).





Holiday Designs



Architectural Mailboxes Architects Michael Graves, Clifford Selbert, Stanley Tigerman, and Robert Venturi (mailbox above) have each designed mailboxes reflecting their own design aesthetics. Sizes vary and steel is the predominant material. Contact The Markuse Corporation, 10 Wheeling Avenue, Woburn, Mass. 01801 (617) 932-9444. Cost: \$50–450.00.



Magnifying Glasses

Magnifying glasses, with brushed aluminum, anodized aluminum, and natural leather handles, each have a magnification power of three. Contact Diane Reiss, Mark Weisbeck Design, 436 Potomac Avenue, Buffalo, New York 14213 (716) 884-5180. Cost: \$36-44.00.



Book of Tools

A clothbound book cover houses pencils, a pencil sharpener, eraser, paper, paper clips, a ruler, rubber bands, and breath mints in "A Mystery." The book comes in a slipcover and is $7^{3}\!\!/4'' \times 10'' \times$ 7^{8} "; end papers have quotes from Jefferson, Hemingway, Sartre, and others relating to the book's contents. Contact Wade Surovik, M&Co., 50 West 17th Street, New York 10011 (212) 243-0082. Cost: \$75.00.



Structural Puzzle

Buckminister Fuller's principle of tensegrity (tension and compression) is the basis for "Tensegritoy." The kit includes: 30 hardwood dowels, 32 elastic cords, 64 vinyl caps, numbered labels, and instructions for building 100 different shapes. Red, yellow, blue, and black components are available. Contact Tensegrity Systems Corporation, R.D. 1, Route 9, Box 270, Tivoli, New York 12583 (800) 227-2316. Cost: \$29.95.

Eames's House of Cards

A deck of 54 playing-size cards, from the Office of Charles and Ray Eames (1952), is called the "House of Cards." Each card has a gold asterisk on one side and photos of "things old and new" from the animal, mineral, and vegetable groups on the other side; each has six slots for construction purposes. Contact Museum of Modern Art, 11 West 53rd Street, New York, 10019 (800) 447-6662 (ask for item #1671). Cost: \$16.50.



Paper Architectural Models

St. Basil's Cathedral (above), the Villa Rotonda and the Arch of Constantine are among buildings available in the "Domus Editoriale Paper Architectural Models" collection, designed by Jesus Moctezuma. Contact Silver Visions Publishing, P.0. Box 49, Newton Highlands, Massachusetts 02161 (617) 244-9504. Cost: \$15–29.95.



Small-scale Zen Garden

Designed after the Ryoan-ji garden in Kyoto, this Zen garden has a cherry wood frame $(8^{1/4''} \times 15^{1/2''})$. Contact Arango, 7519 Dadeland Mall, Miami, Florida, 33156–7872 (305) 661-4229. Cost: \$40. New Products and Literature



Computer Table

The Power Wagon has a tubular steel frame, anodized aluminum shelves, and an adjustable keyboard surface. Black antistatic matts are available. The table is 30 inches wide, 32 inches deep, and 45 inches high. Automatic Inc. *Circle 101 on reader service card*



Washstation System

A new washstation system called "Sanifount[®]" is activated electronically with an infrared sensor. It is appropriate for commercial and institutional use; the synthetic polymer bowl comes in vulcan red, pearl black, and misty gray. Intersan. *Circle 102 on reader service card* (continued on page 148)

New Products and Literature

Smart Moves.



John B. Hynes Veterans Memorial Convention Center, Boston, MA

Modernfold Makes Room for the Future.

Nothing ever stays exactly the same. At least not for very long. That's why Modernfold has been developing innovative wall systems for more than 50 years. For flexibility to keep pace with the inevitability of change. Gracefully. And without sacrificing beauty, convenience or budget.

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For every facility—from convention center to classrooms to corporate offices to churches—Modernfold offers a complete line of sophisticated and aesthetically appealing wall systems that provide flexibility, privacy and noise reduction. And with 50 years of experience and the Modernfold quality pledge, buying Modernfold is an investment in the future.

For more information on Modernfold movable wall systems and the name of your local distributor, call 1-800-869-9685.



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Circle No. 356 on Reader Service Card

(continued from page 146)

Synthetic Slate Roof Tiles Produced from "100 percent" quarried slate particles bonded with a resin called "Modar", "BritSlates" are $20'' \times 10''$ and can be cut, drilled, and sawed. BritSlate North America. Circle 103 on reader service card

Bent Glass Windows

Exterior aluminum-clad wood windows are now available with bent glass in any custom size or bent glass radius. New Morning Windows.

Touch Your Imagination!

Bedrm Pool Entry

Dining Cove Jacuzzi

Master Art Gallery

Circle 104 on reader service card



Tufted Sofa

The "Spirit Sofa," part of the Enchanted Collection, is fully upholstered and is $90'' \times 38'' \times$ 38". Donghia. Circle 105 on reader service card

Handmade Ceramic Tile

The "Chameleon Collection" of handmade coordinating ceramic floor and wall tile comes in 13 colors. Floor tiles are offered in 15 sizes and shapes; wall tiles are $4'' \times 4''$ only. Epro. Circle 106 on reader service card

Floor Lamp

The Franceschina floor lamp was designed by Umberto Riva and produced by Fontana Arte. It is 69 inches high. Modern Age.

Circle 107 on reader service card

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Free-standing Storage System "Inbox" is a flexible office storage system constructed of steel sheet panel shelves and siding and plastic cross-joint Doors, drawers, filing frames and roofs are among the optional components. The system is in black or silver with black, silver, white, blue, rec yellow, kelly green, and ligh gray components. Palazzetti Circle 108 on reader service card



Ceramic Granite Tile

The "Precious Stones" collection of ceramic granite tile is available in three neutral colors with a polished, "natural stone" finish; $16'' \times 16''$ tiles are standard. GranitiFiandre. Circle 109 on reader service card

Porcelain Sconce

The "Ziggurat Wall Sconce uses incandescent or compact fluorescent lamp sources and is available in 19 styles and 10 matte ceramic colors. Saxe Patterson.

Circle 110 on reader service card (continued on page 150)

New Products and Literature



The TCS roof. elegant simplistic adaptive

There is, in the remarkably simple lines of a TCS standing seam roof, an expression of architectural character unmatched by other types of roof forms. As it serves its essential function of providing shelter, TCS, ternecoated stainless steel, gives the Hult Center for the Performing Arts a bearing of elegance. And, under most atmospheric conditions, TCS will weather to an attractive, warm gray.

TCS is readily adaptable to all types of structures and allows maximum creative latitude to the designer at relatively modest cost.

Aesthetics aside, however, TCS has outstanding functional characteristics—great tensile strength combined with light weight and a low coefficient of expansion; exceptional resistance to corrosive attack and a durability measured in generations rather than years.

We will be happy to send you substantiating evidence. Call us at 800/624-6906.

Hult Center for the Performing Arts, Eugene, Oregon. Architects: Hardy, Holzman, Pfeiffer Associates, New York, NY. Roofer: Acme Roofing, Eugene, Oregon. Photograph by Timothy Hursley.

TCS is available in Europe and in the Pacific Rim. For more information, see our catalog in Sweets

FOLLANSBEE FOLLANSBEE STEEL • FOLLANSBEE, WV 26037 FAX 304-527-1269



(continued from page 148) **Split System Air Conditioners**

Decentralized air conditioning and heat pump systems are described in a new brochure. Interior and exterior units, straight cool, heat pump, air-toair or water-to-air systems, electric or hydronic heat options, fan coils, and custom designed systems for new or retrofit residential or commercial projects are available. Enviro Master International.

Circle 111 on reader service card



Dining Table

An ash and African wenge dining table called "Dovetail" has a ³/₄-inch-thick glass top with flat polished or beveled edge. It is $60'' \times 22'' \times 28^{1/4''}$. Nick Berman Design. Circle 112 on reader service card

Plaza Deck Insulation

"Styrofoam[™] Thermadry[™] Brand Insulating Drainage Panels" for plaza deck construction have a matrix of horizontal and vertical channels covered with "Spunbound" filtration fabric, eliminating the need for separate insulating and drainage layers. Concrete can be poured directly onto the fabric surface. Dow Chemical Company.

Circle 113 on reader service card



Foldable Woven Wood Screen A 51/2-foot-tall screen with a solid maple frame houses panels of 1³/4-inch-wide maple strips. Screens are available with three to six panels. Brickel. Circle 114 on reader service card



Porcelain Mosaic Tile

A new porcelain mosaic tile Bisazza Mosaico's "Silex," is "frostproof, waterproof" product suitable for commercial or residential interior or exterior projects on floors o walls. Tile Group Italia. Circle 115 on reader service card

Tile Catalog

This 1991 product catalog on the full line of glazed and unglazed ceramic tiles includes detailed drawings, technical information, color palette representation, and installation photography. Buchtal Corporation. Circle 116 on reader service card (continued on page 154)

DORMA HS Series Surface-Applied Door Closers

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Circle No. 316 on Reader Service Card

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Circle No. 346 on Reader Service Card

CHADSWORTH COLUMNS

Books

partite vaults, intermediate and flying buttresses, and pinnacles to build cathedrals that were successively taller and more amply glazed. With succinct analyses of structural forces and a few basic equations, Mark shows that builders resolved wind loads and the tensile stress of ceiling vaults through trial and error. They modified designs over building campaigns that lasted decades, and regularly inspected cathedrals (during and after the construction process), looking for faults and innovations in building technology. Because they had no tools for structural analysis, their engineering solutions were variously elegant, awkward, or superfluous.

Mark's discussion of Christopher Wren's Cathedral of St. Paul (1675-1710) best supports his argument that architects would design better buildings if they were less dogmatic and selfconsciously original. He finds St. Paul's, a hybrid structure, to be more impure but in many ways more impressive than an uncompromising and structurally explicit design. In plan, St. Paul's is modeled on a medieval basilica with flying buttresses, but it has two-story Renaissance façades (the upper windows are false) that are more massive than they need be; the top floor simply screens the Gothic clerestory and buttresses.

Mark does not dismiss St. Paul's as an unrigorous work; instead, he praises the structural expediency of Wren's innovative dome: Its exterior shell of leadsheathed timber is one of three layers - the ceiling inside is a masonry dome, set beneath a brick conical shell. The outer dome is lighter than it appears, and its load is shared with a more efficient structure inside. Thus, Wren did not have to resolve the daunting problem of tensile stresses in a self-supporting masonry dome.

The Sydney Opera House, like St. Paul's, is frequently cited as a landmark of a city and an epoch; to Mark it is an architectural *bête-noire*, a symbol of a convoluted design process. It

cost \$130 million - 13 times its original estimate - largely because it began as a formal concept that no one knew how to build. Mark says that the architect, Jorn Utzon, and the engineers, Ove Arup & Partners, should not have insisted that the peaked roof forms – an image inspired by sails on the harbor be self-supporting. This was an extravagance, rather than a defensible claim to technological morality. Hidden trusses, while not as structurally pure as the pre-stressed concrete forms that were eventually engineered, would have been a simpler and cheaper way to support the vaulted forms. The Opera House could have become a counterpart to Wren's solution for the dome at St. Paul's.

Mark's concerns are well argued and justified, but it is not clear to this reviewer that is possible or even desirable to preclude the extravagant, and sometimes faulty, buildings that are inevitable in our liberated architectural milieu. No single design methodology comes with a guaranteed level of architectural quality. Moreover, architecture is an exploratory field that entails risks: Challeng ng buildings, with all their faults and inconsistencies, are fundamental lessons for the profession at large.

The quandary that Mark describes can be traced to changes in our Modernist perspective. As Alan Colquhoun has observed, we continue to give priority to creative (not to mention iconoclastic) architecture, without iting ourselves to the structural determinism propagated by Miollet-le-Duc. Classical canons, once a universal standard for good architecture, are at best an option today. Thus, we are left with two contravening bases for design - the objective, gradual refinement of building technology, and an artistic, form-giving impulse. Is it any wonder hat the buildings we see (or nd published in magazines) allernate from the serene but dictable to the brilliant but d fficult? Philip Arcidi

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Circle No. 001 on Reader Service Card

(continued from page 150)

Computer Products: Lighting Software

For more product comparisons see "Computer-Aided Lighting Design," pp. 117–136.

AutoCAD Link

Computer-Aided Lighting Design (CALA) creates a lighting analysis file that can be used with AutoCAD, DXF, and DWG formats. Holophane. *Circle 121 on reader service card*

Daylighting Analysis

Wire-frame models of sunlight, electrical light, and heat loss can be created with Daylite, running on either a PC or Macintosh system. Kinectic Software. *Circle 122 on reader service card*

Unique Features

The latest release of Lumen-Micro can calculate lighting around vertical partitions and horizontal planes as well as a pre-analysis run that will suggest optimal lighting configurations. Lighting Technologies. *Circle 123 on reader service card.*

Multiple Models

Sylvania/PC offers lighting life cycle, maintenance, energy, return on investment, and economic analysis models that run on any IBM-compatible PC. Data can be accessed from the 400-lamp database or can be input by users. Sylvania/GTE. *Circle 124 on reader service card*

Outdoor Lighting

LUX88 charts two-dimensional footcandle distribution for outdoor lighting, and Lux-TI, provides vertical and horizontal calculations. Gardco/Thomas. *Circle 125 on reader service card* (continued on page 156)

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Employee cafeteria, Computer Associates International, Inc., Las Colinas, TX. Design by Scou Strasser, CRS/Sirrine, Inc. Dallas.

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(continued from page 154) Video Lighting Library

With a Macintosh and an optical disk player, the Hypermedia Electronic Daylight Design Tool can access both lighting reference information and digital photographs of lighting case studies. Lawrence Berkeley Laboratory.

Circle 126 on reader service card

Lighting Databases

GE provides the lighting and efficiency figures for its lamp types in two databases that can be used to do analysis on lighting designs: LEAP for high-efficiency-lamp lighting systems, and DATA * LIGHT II for quartzhalogen lamps. General Electric. *Circle 127 on reader service card*

Energy Guidelines

Simplified Calculation Method (SCM) allows designers to compare lighting efficiency figures against California energy standards. California Energy Commission.

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Sunlight Models

Direct, diffuse, and/or reflected sunlight can be modeled for any kind of room with Superlite. Arizona State University. *Circle 129 on reader service card*

-
- **Building Materials**

Major materials suppliers for buildings that are featured this month as they were furnished to P/A by the architects.

DiNapoli House, Los Gatos, Cali-

fornia (p. 68). Architects: Stanley Saitowitz Office, San Francisco. Walls: Arizona flagstone, Jacaranda granite, stucco, cement plaster. Windows: African oak, Record Windows, Germany. Hollow steel doors. Floors: marble, maple, cork. Paving: limestone, Cluny, France. Fir ceiling surfacing. Roofing: gravel. Limestone roof and deck drainage. Hardware: Schlage. Kitchen ovens, range: Gaggenau. Sub Zero refrigerator. Lightolier track lighting. Plumbing: American Standard, Kohler.

McKim House, Fishers Island, New York (p. 70). Architects: Centerbrook Architects & Planners, Essex, Connecticut. Foundation: concrete. Structure: wood framing. Cladding: cedar shingles. Awning/ casement windows: Andersen. Doors: Morgan. Exterior paving: peastone. Interior flooring: wide board Southern pine. Asphalt single roofing: GAF. Fiberglass insulation: Owens Corning. Exterior and interior paint: Masury. Stainless steel hardware: Ives. Exterior lighting: Stonco.

Murray House, New River, Arizona

(p. 74). Architects: William P. Bruder Architect, New River. Windows: "Solex" glass. Doors: Custom glass pivot. Roofing: Three-ply built-up roofing. Waterproofing: Chem Stop. Insulation: Owens Corning. Kitchen and laundry equipment: Maytag. Water closets: American Standard. Ten-ton heat pump: Ruud.

Salge Lakehouse, Canyon Lake, Texas (p. 78). Architects: Lake/ Flato Architects, San Antonio, Texas. Wood windows: Marvin. Hinges: Stanley. Locksets: Schlage.

Berggruen House, San Francisco (p. 80). Architects: Robert A.M Stern Architects, New York. W dows, double-hung and fixed: Sebastopol Window Co. Sky lights, interior: Sebastopol Window Co. Skylights, exterior: O'Keefe's. Doors, wood: Sebastopol Window Co. Molded brick pavers: Victor Cushwa & Sons. Asphalt roof shingles, "Timberline", GAF Building Materials. Foundation water proofing, "Bithuthene": W. Grace. Flat deck waterproofing, "Dex-O-Tex": Crossfield Products. Insulation: OCF. Paint and stain: Benjamin Moore Hinges, interior: McKinney Hinges, exterior: Baldwin. Locksets: Baldwin. Locksets. pocket doors: Merit Metal (continued on page 160)

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Circle No. 325

(continued from page 99)

a direct and formative discourse with design and professional practice. Insofar as today's architectural discourse has failed to communicate with the profession, Lavin's criticism is well taken.

Architecture, because of its functional and tectonic requirements, because it makes large demands on scarce resources and because it inevitably invades the public domain, is fundamentally a profession of negotiation. Because of the inordinate demands of clients and costs, of programs, codes, and community councils, each of which properly operates as a conservative force, the profession is always at risk of losing its artistic and intellectual vigor - in short, at risk of becoming a profession of appeasement. It is against that risk, more than any other issue, that contemporary architectural theory is directed.

Thus, theorizing is not a matter of merely offering the

profession the "allure of the radical," but a matter of the discipline's responsibility to its tasks. No ethical, intellectual, or cultural grounds exist for artificially limiting architecture's obligation to investigate all possibilities for occupying material form. On the contrary, it is its moral and professional duty to draw from every resource – whether philosophy or literature, technology or science, theology or politics.

This is not to say that every architect must be an expert in every aspect of culture or that every architect must challenge custom at every turn. Rather, it means that the architect, in good faith, represents a discipline committed to exploring its potential as thoroughly as possible. No discipline, particularly architecture, can survive complacency.

This is why, as Lavin reports, "journals, symposia and other architectural events are as likely to invite discussions of any number of theoretical strategies - feminism, structuralism, deconstructionism - as they are to focus on design history, process, or even on designs themselves." Today's theorists would reject Lavin's notion of "design itself," on the grounds that the concept serves to isolate architectural design from the implications and consequences of its links to other aspects of culture. Most astonishing is Lavin's implicit suggestion that feminism is irrelevant to "design itself." In this, she perpetuates the tradition in which architecture was taken to be a profession "naturally" dominated by men.

In three millennia, Western architecture has accumulated a great deal of knowledge and wisdom. Though unlikely, it is conceivable that, for all its pretensions and novel techniques, contemporary theory may not revise one single canon of the architectural tradition. However, unless that tradition is tested, unless its vitality is affirmed again and again by the most dedicated scrutiny each generation can bring to bear, it will certainly atrophy. That is the use of theory.

On the other hand, from her naïve notion of theory's threat to "the freedom to de what one wants to do," to her assault on the value of a discourse of which she is so cor spicuously uninformed, Lavin presumes to know which pur suits are useful for architecture, and which are not. Though she may aspire in good faith to protect architecture from se duction and coercion, in the end her positions only isolate it from cultural life. That is the abuse of theory. Jeffrey Kipnis

The author is an assistant professor of architecture at Ohio State University, and a writer and lecturer on conter porary theory and design. His forthcorning book, A Choral Work, treats the design collaboration between Peter Evenman and Jacques Derrida.



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Pedersen House and Studio, Shelter Island, New York (p. 86). Architect: William Pedersen, New York. Windows: Marvin. Exterior stain: Cabot. Interior paint: Benjamin Moore. Door hardware: Baldwin. Kitchen: Caginean. Plumbing fixtures: Kohler.

Grotta House, Northern New Jersey (p. 90). Architects: Richard Meier & Partners, New York. Porcelain-enameled wall panels: American Porcelain (Appco, contractor). Ground-face concrete block: Plasticrete. Aluminum frame/steel frame insulated glazing (clear): National Glass (Appco, contractor). Solid core wood (PTD): Tuck Ent. Natural cleft slate: Virginia Buckingham. White latex paint: Benjamin Moore. Hardware: Stanley. Custom lever handles: Accurate Lock. Kitchen: Kroin (fixtures) and Gaggenau (appliances). Plumbing: Kohler and American Standard.

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Furthermore . . .

It is a bitter irony, but the fact is that we were too busy working on our December inquiry article on religious buildings to make the September 16 dedication of Philip Johnson's bell tower at the Crystal Cathedral in Garden Grove, California. According to an ad in the *los Angeles Times*, we missed quite a show. Not only would we have seen Mr. Johnson and televangelist/patron Robert Schuller, not only would we have heard the 236-foot tower's 52-bell carillon for the first time, but we also could have witnessed, as the ribbon was cut, 20 sky-divers plunging 12,000 feet and forming, "for the first time ever a "living, floating cross in the sky." But alas, duty called.



Frank Lloyd Wright: from Oak Park to the operatic stage, as a lyric baritone.

Our news and calendar editors have just about had it up to here with Frank Lloyd Wright. It's not that we don't appreciate the man's genius and his importance, but the various exhibitions, publications, and preservation controversies are threatening to overwhelm us. We documented the merchandising mania surrounding the lord of Taliesin back in November 1987 (page 118), and it seems to have only gotten bigger. Meanwhile, the state of Arizona has devoted the entire year to a celebration of Wright, and despite pizza magnate Tom Monaghan's apparently waning interest in architecture and Wright, his exhibition of Wright artifacts seems to have been cast out on tour indefinitely, like a curatorial Voyager space probe. We warily await a Wright TV docudrama or an FLW action figure for the kids (wives sold separately). So the last thing we'd be likely to do on this page is devote still more space to the current Frankophilia.

That is, until we talked to Daron Aric Hagen. The 28-yearold composer, a native of Milwaukee, recently received a \$40,000 commission from the Madison (Wisconsin) Opera to write an opera based on Wright's life. What art form could be

"The last thing we'd be likely to do on this page is devote still more space to the current Frankophilia."

better for depicting the melodramatic personal life that always threatened to overshadow Wright's achievements? Hagen says the opera will begin with the construction of the Cheney House, which will go up on stage in Act I, and end with the 1914 fire at Taliesin. Mr. Wright will be a lyric baritone, the tragic Louis Sullivan an "Irish tenor," clients Ed and Mamah Cheney a bass and mezzo soprano, respectively, and Catherine Wright a lyric coloratura.

Hagen, whose work has received the blessing of the Frank

Lloyd Wright Foundation, says campaigns of the

O'Leary Terasawa's winning LA sandcastle from the summer.

that composing is not all that dissimilar from architecture: "You're working with something not yet built and there are lots of subcontractors." The opera will open in Madison in 1992, the 125th anniversary of Wright's birth. Asked if the relatively short time span suggested a possible trilogy, Hagen first offered an emphatic "No," but then considered the possibilities of a Miriam Noel character. "Can you imagine the arias she could have? Talk about Queen of the Night!"

Another architectural proverb has been blown away — it's no longer true that foundations have to be built of stone (or concrete). Sandcastling is emerging as an architectural subculture with rewards more gratifying, albeit more short-lived, than structures built on terra firma.

We just received a new reference for granulated construction — *The Art of Sandcastling* by Ted Siebert (\$12.95, direct from Romar Books in Seattle, 206 368-8157), and were impressed with the sophisticated building



Independent of Siebert's book, we recently got word of this year's top sculpture at the AIA/Los Angeles Sandcastle Competition, "Baby Realizes He Wants to be an Architect" (above) built by O'Leary Terasawa Architects of L.A. The entry could rank as one of our profession's most potent recruitment tools — think of all those preschool beachcombers who beheld this child-scaled Mount Rushmore, at least until it crumbled away.

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