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Back to the future . . .



ast times call for change. So the management gurus tell us, and who dares doubt them? The landscape is littered with the bleached bones of companies that... well, you know the rest. But some change turns out to be just so much small change. You see it in the company that becomes a chameleon, shifting restlessly with every shadow glimpsed in the crystal ball, putting a new spin on methods from one day to the next. Dealing with

chameleons isn't much fun. What seems like forward movement can often be little more than agitation, with nothing gained and the crucial loss of a company's history and identity. For change to make sense, origins and evolution must intelligently mesh.

But shall we cut to the chase?



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Editorial Credit Due

Architecture is accomplished through the contributions of a myriad of people, most of them unsung.

Now that the champagne toasts celebrating this year's award-winning architects have ended, perhaps it is time to consider the warped view of architectural achievement that most awards programs perpetuate. The AIA Gold Medal and the national AIA Honor Awards, in particular, foster a view of the architect as a lone genius, a person of individual achievement, whose accomplishments are attained almost single-handedly. It's a familiar and comforting image for most of us, whose professional passions may have first been aroused by the exploits of our pyrotechnic hero Howard Roark, who, in Ayn Rand's *The Fountainhead*, dynamited his own buildings rather than allow them to stand with the design imprint of anyone but himself.

The "real world" is a bit more complicated. Architecture grows from the work of many people – the architect, surely, but also the client, the banker, the various engineers and consultants involved, specification writers, renderers, model makers, the users (if they've been consulted), the general contractor, material suppliers, construction workers, building inspectors, and the mayor who cuts the ribbon. Yet our awards continue to support the myth that the architect creates alone and, if anything, in defiance of the aforementioned parties.

There are many reasons for the perpetuation of this myth. In architecture school, the seed of the lone genius is planted and nurtured. Design studio projects are individual efforts, emphasizing highly personal formal expression, guided by one-on-one critiques between student and studio critic. Architectural historians likewise recount the achievements of individual architects as harbingers of stylistic changes. The great architects are portrayed as pivotal figures, capable of creating entire movements by the sheer force of their creative will. The completed buildings are often presented as the inevitable result of a developing personal style, objects that spring to life without the benefit of clients, builders, or dutiful young disciples.

The name architect's own in-house staff is mostly overlooked. While the great architects are celebrated, it is the crew back in the office that is most attentive to actually deciphering the great one's scribbles, developing the details to keep the water out, fielding the phone calls from clients and consultants, attending the project meetings, and making the site visits. Yet, the completed building is celebrated as an individual achievement.

Architectural journalists share some of the

blame for this. It's easier, after all, to get all your information from a single source – the name architect. The contributions of others are nearly impossible to ferret out if the architect is not forthcoming about such influences. Architectural magazines have traditionally been sort of super-hero comic books for design professionals, where the architect single-handedly perseveres over budget, schedule, and clients to deliver a building that is absolutely true to his or her vision.

We architects should celebrate the work of our fellow practitioners as a collaborative accomplishment, made possible by everyone from the principal to the draftsperson – especially by those who toil for the love of architecture for long hours and low pay. Their dedication can easily be sustained by recognizing their contributions to an award-winning project. This recognition must extend beyond the mere listing of the person's name in a project credit roster. Architects must acknowledge the influences on a project's design that are just as likely to come from the person sitting next to them as they are from a long-dead master.

Schools can raise the student's awareness of the complexity of architecture's fruition by organizing design studio projects as team efforts, with team members role-playing not only as architects, but as clients and users. A good model is Yale's first-year building project, where a team-designed project is actually constructed by the entire class. Most important, the architect's education should be balanced to reflect the fact that design is only one of many activities necessary to accomplish a work of architecture.

Architectural historians and journalists can work harder to portray architecture as the culmination of the efforts of many people. P/A has for years included project team credits, and the recent changes at the magazine as outlined in the past few months are part of a new commitment on our part to present architecture in all its messy complexity, including the views of those non-architects involved in the building process. The Young Architects issue we are planning for July will not focus exclusively on those recent graduates who can claim top billing for a project.

The institutions that bestow awards should broaden their recognition of architectural excellence as the product of more than just the architect's vision. AIA's Firm Award and Institute Honors, which recognize the collaboration of other professionals and the patronage of clients, are good models that should be expanded. Perhaps soon we can honor all those involved. **Michael J. Crosbie**



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The Best P/A Ever

I'm putting down the latest issue of P/A [February 1993] just long enough to write you this letter. In my humble estimation this is the best issue of P/A magazine I have ever read (not just looked at the pictures).

I believe you have hit the intended mark, " ... to align P/A more closely with the tasks and interests of the profession." It seems like the popular trend in the architectural profession is to sell the sizzle and not the steak, to the point that all some architects are selling is sizzle. This issue of P/A is selling a great steak, something I can bite into and chew on. On top of that it is nourishing my architectural awareness.

You have tapped into the silent majority. All of the architects that I speak with, including the man on the cover of this issue, have expressed a desire to see the profession regain its integrity and dignity. It is time to honor the silent heros.

Having worked as an art director for a publishing company while I was going to school to become an architect, and having changed the format and editorial style of two magazines for the medical and film industries, I know first hand what you, your staff and your production companies went through. All I can say is thank you very much for having the enthusiasm, courage and foresight to produce a superb periodical for the profession. Congratulations on a great issue! John Siebel, AIA

John Siebel Associates Architects Los Angeles

Accessible Hotel Rooms

Re Febuary 1993 P/A Technics (p. 40): In both the retrofit plan and the the Freedom Room plan, are not the entrance doors inaccessible without the 18-inch clearance on the strike side? Is there a 5'-0" turning radius (or a T-shaped space) in the retrofit bath? Are either of the bath doors accessible from outside the bath (42" minimum "hall" width)? Mark Holsinger, AIA Tanner Stone & Company, Architects Portsmouth, Ohio

The author replies: Both retrofit and Freedom Room plans were existing rooms. Only the one interior wall was moved by the owner. 1. Entrance door: In both cases, the entrance door could not be changed. With no space or very little space "readily achievable" on the latch side of the door, a double hook device with an adjustable nylon strap between is used to allow the wheelchair user to pull open the door. This "freedom opener" is shown on the Freedom Room plan as a wiggle line with a small circle on the end, but not labeled.

2. When free turning space is not available, but access can be attained, we in wheelchairs take what we have and make the most of the situation. We sometimes have to remove our footplates.

Views

3. The item labeled 2 on the Freedom Room plan is a towel bar, not a grab bar.

4. The desk and the dresser in the Freedom Room are hung off the floor, with 9" clearance.

Police Training Facility Credits

The architectural design team for the New York Police Training Facility (Feb. 1993, p. 24) is a joint venture between Ellerbe Becket and Michael Fieldman & Partners. Credit for this commission is shared equally.

Holocaust Photo Credits

The two photographs of the Holocaust Memorial (P/A, Feb. 1993, p. 75) at Maidanek were taken by Ira Nowinski.

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Norman Foster's Reichstag entry, one of three winners.

Berlin Struggles to Accommodate a Capital

After the fall of the Wall, the most important event to affect the future of this city was the decision, in June, 1990, to move the capital of Germany from Bonn back to Berlin. There, housing, commercial space, transportation systems, ministries, and offices must be built immediately to accommodate the government. Critics charge that bureaucrats in Bonn are unenthusiastic about relocation and would rather stay ensconced in their comfortable homes on the Rhine. Meanwhile, Germany's mounting economic problems suggest that Berlin's latest transformation will require sizable investment at a time when this nation can sorely afford it.

Two recent competitions were intended to reaffirm the seriousness of Berlin's status as capital city by showing the contours the capital will acquire. Three foreigners were awarded first prize in the contest to redesign the Reichstag (the seat of the German parliament from 1882 to 1933); a German team won a planning competition for a government center in the same vicinity.

The latter competition addressed a site known as the Spreebogen in central Berlin, slightly to the north and west of the Reichstag and bordered by a bend in Berlin's river, the Spree. The overwhelming interest the competition generated was unexpected: 1,900 architects requested the program and 835 (from 44 countries) submitted entries. Judging was extended from November to February to accommodate the volume of competitors.

The winning scheme, by Berlin architect Axel Schultes with Charlotte Frank, is a simple east-west bar that extends the competition boundaries to include sites in what were once East and West Berlin. The proposal orders the landscape into a series of layers: the Tiergarten to the south; a great

^{4.93} News Report

P.21 At Philadelphia's ICA, a theoretical retrospective on Venturi Scott Brown & Associates.



P.22 Architects and organizations -P/A among them - wrestle with Colorado's ban on gay- and lesbian-rights laws.

> P.23 The FDIC dismantles a legendary interior space in the PSFS Building.

P.24 In Projects: an Eisenman skyscraper in Berlin that takes its inspiration from the Möbius strip.

Pencil Points

A survey conducted by the AIA in February concluded that "a stronger economy, a greater number of business opportunities, and increased hiring of architects point to a slow, yet steady recovery in the architectural profession and building industry." The survey of 300 firm principals from all 50 states and the District of Columbia also showed that while architectural firms on the East Coast are beginning to see signs of growth, those on the West Coast are still feeling the recession's effects.

The winners of the International San Francisco Embarcadero Waterfront Competition have been announced. They are Evans Heintges, New York; Keith G. Moskow, Boston; Jill Stoner, Bolinas, California; Mark Topetcher, San Francisco. An exhibition of selected entries is at the Ferry Building, Embarcadero and Market streets, from April 19–May 7. The ideas competition was sponsored by CfCA/2AES and other organizations in San Francisco.

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News Report

Two national community development support corporations, Local Initiatives Support Corporation and The Enterprise Foundation, have announced a \$403million private investment fund to support affordable housing and community renewal initiatives. The announcement was made at a Capitol Hill press conference last month, where the two organizations urged Congress to restore and make permanent the Low Income Housing Tax Credit (a federal incentive program that expired last June and that spurred corporate investment in the community).

I.M. Pei of Pei Cobb Freed & Partners, New York, was one of ten people awarded the Medal of Freedom (the government's highest honor for civilians) by President Bush last December.





Spreebogen winner by Schultes and Frank (top); Reichstag entries by de Bruijn (above left) and Calatrava (above right).

lawn between the Reichstag and the Bundesrat (federal assembly); and a bar of buildings housing the chancellor's offices, a rail station, and meeting rooms for committees and factions. A park, bordered by the Spree to the north, ends the sequence. Second prize was awarded to Miroslav Volf of Saarbrücken, and the firm of Gartemann Werren Jöhrl of Bern received the third prize.

The concurrent competition for the redesign of the Reichstag was open to German architects and 14 invited foreigners. The task was to reorder the building (which had been burned in the 1930s and modestly renovated in the 1960s) for use by the German Bundestag, or parliament. This competition had a significant problem: excessive spatial requirements forced architects who were true to the program to add extensions to the Reichstag. Thus, entrants were faced with a Catch-22 situation: whatever one proposed could potentially disagree with the urban design of the adjacent government center.

In contrast to the Spreebogen, the three winners are non-German, enjoy international reputations, and offered solutions that were decidedly radical. Sir Norman Foster of London placed the bulk of the program on top of the Reichstag and covered the whole construction with a giant glass roof. Pi de Bruijn of Amsterdam placed the most significant space, the plenary chamber, outside of the Reichstag. Santiago Calatrava of Zurich proposed a dramatic interior transformation of the structure, culminating in a new dome.

Critics have noted that only Calatrava's proposal can be built next to the Schultes/Frank design, that the winners are too expensive (costs for each are estimated at 500 million deutschmark – roughly \$333 million), and that Bonn was insincere in issuing an unworkable program and undertaking the competition at the same time as the Spreebogen.

As to why the two competitions were held simultaneously, officials noted that the goal was to generate ideas. Yet the result – three equally ranked first prizes and a myriad of problems not easily solved – has inflamed the debate as to the Reichstag's future and casts a questionable light on the government's plans to make the relocation "fast and economical."

Ironically, the single concept that has begun to gather support has been Christo's ongoing attempt to wrap the Reichstag. The Bundestag's president, Rita Süssmuth, has supported the project, noting that it will garner international attention and "will bring distinction to the German Parliament." By this summer, Christo hopes to wrap the Reichstag, and Bonn's politicians intend to reach a decision concerning the building's future. Smaller building competitions for the various parts of the Spreebogen will be issued before the close of 1993. Mary Pepchinski

The author is an architect in Berlin and a professor at the Hochschule fur Technik und Wirtschaft in Dresden.



VSBA exhibit, with iconic coffee cup and antenna.

VSBA in Text-Driven Philadelphia Exhibit

Those familiar with the work of Robert Venturi and Denise Scott Brown will find little new in their exhibition, "About Architecture: An Installation by Venturi, Scott Brown & Associates," which opened at the Institute of Contemporary Art in Philadelphia last month. And that is precisely the point. The work of the firm has long emphasized the need for the architect to be evolutionary rather than revolutionary.

The show, which runs through April 18, is clearly intended as a theoretical retrospective in light of three decades of practice. As you enter the exhibit, you are confronted with full-scale three-dimensional replicas of a giant coffee cup made in 1962 for Grand's Restaurant (razed in 1976) and an aluminum TV antenna that briefly crowned the central

Columbus Convention Center Opens

Cities used to be built on rivers and seaports to take advantage of trade opportunities. In this age of interstate highways and electronic communications, however, land-locked Columbus, Ohio, has been designated the only North American "Info-Port" by the United Nations, making it the center of all computerized transactions that chart the movement of goods and services across international boundaries.

The designation comes just in time for the opening of Columbus's largest information age building, the Greater Columbus Convention Center, designed by Eisenman Architects and Richard Trott & Partners. The commission, which the firms won in a 1989 competition (P/A, June 1989, p. 21), represents Eisenman's largest building to date (580,000 square feet) and his first civic commission.

The building's plan looks much like a computer diagram of the flow of information; Eisenman says it represents strands of fiber optic and copper cables or highways. The building is made up of bays of curving, steel-sided and rubber-roofed bars, each colored in vivid pastel shades of pink, blue, yellow, and green, plus gray. Conceived to be seen as visitors approach from the air or the highway, the center is best viewed from above, where it appears to be a strange cartoon inserted in the gray Columbus landscape. On the street, the end of each of the ribbons is terminated with a facade that mimics the

façade of the Guild House.

Enveloping and dwarfing these objects are walls and panels filled with aphorisms and short didactic statements by Venturi and Scott Brown. Perhaps most entertaining are two panels (one pro and one con) that contain quotes from critics around the world on the firm's new Sainsbury Wing of the National Gallery in London (P/A, Aug. 1991, p. 80). The rest of the exhibit includes a multiple-projector slide show of the firm's work projected onto a 70-foot screen and a series of wonderfully vital early drawings and studies by Robert Venturi. These include the widely published 1967 collage of the College Football Hall of Fame and sketches for projects at Oberlin and Princeton.

What is unusual about the exhibition is its emphasis on the rhetorical underpinnings of VSBA rather than on its built work. By emphasizing text over architecture, Venturi and Scott Brown inadvertently support those critics who argue that their writings - Complexity and Contradiction in Architecture and Learning from Las Vegas - rather than their architecture, represent their greatest legacy.

But in the undifferentiated, gym-like confines of the ICA's principal exhibition space, there is little context from which to learn. The messy ambiguities of recent popular culture and mass taste have not been allowed to intrude, and the references to the strip are, by now, refined and familiar. The result is a compelling but oddly self-referential show that seems reluctant to acknowledge the newly emerging contradictions of recent popular culture or architectural practice. Donald Prowler



Main interior space of convention center.

scale and articulation of old brick buildings across the street, except that each façade is skewed oddly and is colored in Pantone shades.

Given the Center's alien appearance, as well as a (continued on next page)

Washington Report

Among the many demands facing the still-transitioning Federal government are issues about the health and influence of the U.S. design industry. Surely there are more important agenda items, but it is an indication of the breadth of this President's concerns that his transition staff considered such questions.

Having sought advice from a hand-picked roundtable of some 35 designers, architects, planners and industrialists at a late-1992 meeting in Little Rock, the President has now received sweeping proposals for a national "strategic design initiative."

Authors of a report from the meeting included Chee Pearlman, editor of ID, and architect/writer Michael Sorkin. Among participants in the Little Rock session were architects Laurinda Spear, Mava Lin, David Lee, and Max Bond.

The group's proposals include launching a national civic construction program on the scale of the Depression-era WPA, and creating ten visionary new cities on abandoned military sites.

Proposing that the Department of Housing and Urban Development be changed to Housing and Urban Design, the group urged that HUD promote visionary urban strategies; as an urban research laboratory it could involve and educate. The group presented design as vital to creating an "inclusive" democracy in which the diversity of the population is celebrated and the less fortunate are better able to participate.

One of the group's smaller ideas is to establish a national design council, modeled after the British Design Council, to identify good design and to improve prospects for export of U.S. products and design services. They also urged recognition of "environmentally friendly" design, said government should become a model client, and called for 1994 to be declared "the year of design in America."

But it remains unclear to those who had closest contact with the transition team just what, if anything, the White House plans to do about the recommendations. (continued on next page)

Washington Report

Some people inside the Beltway are less than sanguine about the designers' agenda. Said one member of a long-established building industry advisory body in Washington: "Every time the government seeks outside advice on an issue, it gets the same thing: we need a big recognition program, a major initiative, more research funding, pilot projects, better inter-agency coordination, a clearing-house for information and a blue-ribbon private-sector commission to oversee it all."

He and others believe the White House has already announced its major new policy initiatives and that, with budgetcutting sights set on disbanding hundreds of other advisory commissions, it cannot now be expected to create new ones.

Still, in the belief that the Federal government can make a crucial difference, many are encouraged to see the design community mobilized. For too long - when not plainly hostile to causes held dear by architects and other design professionals - the Federal government has seemed at the least slow, inept, or uncaring.

One Federal official, drawing on almost 20 years of advocacy for design excellence, said: "Outside advisory groups can be poorly informed about what's actually been done. The government does take action and it is rare for ideas not to receive a full, fair and - if they merit it - sympathetic hearing."

One case in point: early in 1992 the Federal Design Improvement Program of the National Endowment for the Arts started planning a conference for U.S. officials on the many ways in which foreign governments subsidize and reward good design. NEA's Design Arts Program is also researching foreign design council programs to ready recommendations of its own for the White House.

Seeking advice from interest groups can yield the conundrum now facing this Administration: what to do with the advice (some very good, some not, some wishful, naïve or self-interested) it has received? Thomas Vonier





Columbus Convention Center seen from the air (left) and from the street (above).

Columbus (continued from previous page)

one-year delay in construction during a dispute with a contractor over the steel, it is not surprising that it has provoked strong public reaction. But people seem to like it much better when they have a chance to go inside. The same pastel palette is carried over in the interior, where it becomes a wayfinding device, giving each bay a distinctive color identity. The main space inside is a corridor that cuts perpendicularly through the bays, so that colors - as well as ceiling heights - change as pedestrians walk through it. The variation gives the center a sense of liveliness unusual in monotonous convention centers, yet the gentleness of the colors and clarity of the overall diagram - exhibition hall to one side and meeting rooms to the other - makes the center surprisingly inviting and friendly.

In this time of instant communication, it is curious that convention centers are still called for. But as technology increasingly turns the workings of the economy into global, rather than local, functions, great meeting spaces like this one are needed more than ever to bring people together. Julie M. Trelstad

The author is Associate Editor of ID, the magazine of international design, and a former Assistant Editor of P/A.



Douglas Cardinal's Canadian Museum of Civilization.

Design Team Announced for Indian Museum

A building by Geddes Brecher Qualls Cunningham (GBQC), Philadelphia, and Douglas Cardinal, Ottawa, will fill the last remaining site on the Mall in Washington, D.C., the Smithsonian Institution has announced. The structure will house the

Architects Protest Discrimination Law in Colorado

The architectural profession (including P/A) is currently struggling to resolve its position on the law passed in Colorado last November that prohibits anti-discrimination protection for homosexuals. Although a court injunction and a lawsuit (filed by three cities, Denver, Aspen, and Boulder, each having anti-discrimination ordinances) are keeping National Museum of the American Indian, scheduled for completion in 2001.

GBQC has experience in museum design, including a recent addition to the Franklin Institute in Philadelphia (P/A, Sep. 1990, p. 25). The firm also has a reputation for sensitivity to context, which will surely be an issue on this site. Cardinal, a Blackfoot Indian, will be the museum's principal designer. He is known for a more organic approach to design, as seen in his Canadian Museum of Civilization in Hull, Quebec (P/A, Sep. 1989, p. 21). Native American John Paul Jones of Jones & Jones, Seattle, will serve as a design consultant.

The Mall building is one of three facilities in the works for the museum: The U.S. Custom House in New York is being renovated by Ehrenkrantz & Eckstut as the museum's George Gustav Heye Center, and a Cultural Resources Center in Suitland, Maryland, is being designed by James Stewart Polshek & Partners, New York, Metcalf Tobey & Partners, Reston, Virginia, and the Native American Design Collaborative, Albuquerque, New Mexico.

the amendment's enforcement at bay, a boycott of Colorado is quickly gaining momentum. Many opponents of Amendment Two believe, however, that it is more effective to direct their energies toward challenging the law in court.

Organizers of the 43rd annual International Design Conference in Aspen have decided to hold their conference as scheduled this June. They are currently exploring ways to address Amendment Two through the theme, announced last fall, of "Reconstruction Ahead." A different strategy has been taken by two groups of lesbian and gay architects, from the AIA Seattle Chapter and the Organization of Lesbian and Gay Architects and Designers (OLGAD) of New York: both are lobbying the AIA to cancel all its meetings scheduled for locations in Colorado. Dan Lansner, a member of OLGAD, argues that the AIA is honor-bound to join the boycott because of its Code of Ethics discrimination rule (R.2.501) that includes sexual orientation.

AIA Denver's Board of Directors, while opposing the boycott, is asking its members to write their own anti-discrimination policies based on the Denver City Ordinance. "If national AIA were to cancel their events here we would not be happy. We believe national should have a pro-active campaign," says Dennis Humphries, past president of AIA Denver. The agenda of a national AIA Board of Directors meeting held in Miami last month was to include establishing an institute policy on boycotts.

The editors of P/A were also compelled to consider joining the boycott: the touring schedule of P/A's "New Public Realm" exhibition, which predated the passage of Amendment Two, includes a stop in Denver this month. After much discussion, it was decided that the show and a related symposium, where discussion of the law is strongly encouraged, would be held. (See Calendar for details.) A statement posted in the exhibition explains the magazine's position: "The dialogue the show was designed to initiate offers a powerful means to voice our opposition to this law; to pull out of Colorado would only silence our message of a 'New Public Realm.' Furthermore, we hope that by speaking out, we may support those citizens of Colorado who strive to reverse the tide of prejudice." Abby Bussel

FDIC Strips Classic PSFS Interior

One of the great masterpieces of 20th-Century American Modernism has been dismembered. The 33rd floor of the PSFS Building in Philadelphia has been systematically stripped of its classic interior furniture and fittings by the Federal Deposit Insurance Corporation (FDIC) and is being prepared for public auction.

Designed by George Howe and William Lescaze and completed in 1932, the PSFS Building brought the principles of European Modernism to the American skyscraper for the first time and was one of the few American buildings included in Hitchcock and Johnson's seminal *The International Style*. Hovering above the skyline of Philadelphia, PSFS's glowing neon sign quickly became an icon of Modern design and a symbol of the city. The building has been designated a National Historic Landmark.

Howe and Lescaze also designed furniture and interiors for the bank building, ranging from classic chrome and leather chairs to stainless steel wastebaskets, doorknobs, and clocks. They paid particular attention to the 33rd-floor penthouse, which contains a boardroom, executive dining room, and solarium. In his biography of Howe, Robert A.M. Stern called the executive floor "the most lavish and detailed set of rooms ever executed in a Modern commercial building."

The FDIC gained control of the structure and its contents when Meritor, the former parent company of PSFS, became insolvent. While most of PSFS's assets were sold to Mellon Bank prior to the bankruptcy, the PSFS Building itself was not part of the sale and was seized by the FDIC. In mid-March,

P/A Names Associate Publisher

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Gloria S. Adams has been appointed to the newly created post of Associate Publisher of *Progressive Architecture*. Adams will take over the responsibilities of Sales Manager Charles B. Selden, who is retiring.

Adams came to Penton Publishing, P/A's corporate parent, in 1972. She has held various circula-



PSFS boardroom before removal of furniture.

with no prior warning or public announcement, liquidators at the FDIC ordered the 33rd floor's contents to be placed in storage in anticipation of a public sale.

Alan Rouse, FDIC's liquidator in charge of Meritor, expressed surprise at the uproar created in the architecture and preservation community by the removal. "It looks like we stepped on a land mine," he told the Philadelphia Inquirer, adding that "we have done nothing that is irreparable."

At press time, efforts were actively under way to reverse the FDIC decision and restore the 33rd floor interior, but it is not at all clear that these efforts will succeed. Nor is it clear that, if they do, the rooms can be preserved for very long unless a sympathetic building tenant can be found quickly. **Donald Prowler**

tion management positions, and was named Vice President of Circulation in 1987. In 1989, her job was expanded to include the oversight of other publishing support services. In 1991, she was named Publisher of *Chemical Engineering Catalog*.

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Adams has also been named Publisher of *Building Renovation*, P/A's newly launched sister publication.

AIA Urban Design Awards

Six projects have been selected for recognition in the AIA's second annual Urban Design Awards of Excellence. The awards "recognize the achievements of collaborations between the public and architects in urban design, city planning, and community development."

Jury chairman was John Kriken of Skidmore Owings & Merrill, San Francisco. Also on the jury were Harvey Gantt of Gantt Huberman Architects, Charlotte, North Carolina; and Theodore Liebman of the Liebman Melting Partnership, New York. Winners are:

- Back of the Hill Rowhouses, Boston, by William Rawn Associates, Boston;
- Urban Design Plan for the Charles River Crossing-Interchange, Central Artery/Tunnel Project, Boston, by Wallace Floyd Associates, Boston;
- California Museum of Science and Industry/Exposition Park Master Plan, Los Angeles, by Zimmer Gunsul Frasca, Newport Beach, Cali fornia, and landscape architects Peter Walker, William Johnson & Partners, San Francisco;
- San Francisco Urban Design Internship Program, sponsored by the Department of Architecture, College of Architecture and Environmental Design, California Polytechnic State University, San Luis Obispo;
- Landmark Lighting Master Plan for Milwaukee's Central Business District by Kahler Slater Architects, Milwaukee, and Claude Engle Lighting, Washington, D.C.;
- Mianus River Watershed
 Bioregional Planning Project, Westchester County,
 New York, and Fairfield
 County, Connecticut, by
 Meridian Design Associates,
 New York.

Projects

Max Reinhardt Haus

Among the more remarkable proposals for reunified Berlin (see News Report, p. 19) is Max Reinhardt Haus, a one-millionsquare-foot, 34-story multiuse project by Eisenman Architects, New York. The scheme, initiated by a Frankfurt developer, includes theaters, a hotel, office space, and a host of other recreational and entertainment facilities.

The building is to be located on the north bank of the Spree River, on the site where famed theatrical producer Max Reinhardt once had his "Great Playhouse." It would stand at the intersection of two major streets, Friedrichstrasse and Unter den Linden Strasse, and across the Spree from the site of Mies van der Rohe's famous unbuilt glass skyscraper project (recently re-proposed with his nephew Dirk Lohan as architect).

Eisenman says that the inspiration for the building's form comes from the Möbius strip, "an unending three-dimensional form with only a single surface. That strip lacks the hierarchy of 'inside' and 'outside,' of private and public. By twisting on itself, the Möbius strip talks about a blurring of distinctions."

The audacious plan has yet to be approved by German authorities, who must grant a variance from existing height regulations.



100'/30m







PERSPECTIVE FROM EAST





SITE PLAN

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MODEL FROM NORTH

Columbia Gorge Interpretive Center

The Portland, Oregon, firm of Fletcher Farr Ayotte Architects uses a curving, sculpted concrete wall as a metaphor for the nearby Columbia River Gorge in this \$10 million, 22,000-square-foot cultural center near Stevenson, Washington.

Contrasting with the wall's organic curves are two rectangular, glass-enclosed pavilions, the first housing a lobby, the second a large exhibition space. The center's exhibits, on two floors, tell the history of the Gorge and its inhabitants from early Indian cultures to the area's timber industry. At the end of the sequence, the wall turns on itself to enclose a mezzaninelevel theater.

The interpretive center, along with a hotel/convention center, is intended to bring jobs and tourists to this area, which has been hard hit by diminished logging activity. Construction will begin this summer.

Hôtel du Département

This competition-winning scheme for government offices for the Haute Garonne area of Toulouse deals with the need for both repetitive office units and monumental civic forms. Designed by Venturi, Scott Brown & Associates, Anderson/ Schwartz Architects, and Hermet, Blanc, La Gausie, Mommens Architectes, the complex is ordered around a streetlike mid-block passage and a crescent-shaped public space.

The "street" begins at the Canal du Midi bridge, a historic entrance to the city. At this entrance, the architects have placed a a gateway set in a brick wall with limestone trim: a Post-Modern interpretation of a Toulouse tradition.

The outward-facing facades are predominantly limestone with brick trim; on the inner facades, the pattern is reversed. Curtain walls denote the collective or public spaces, while offices have punched windows.

P/A PLANS Call For Submissions

P/A Plans

Material for the August issue of P/A Plans is being collected now, for the supplement in which we will address long-term care facilities. The projects will comprise those buildings that include living units for elderly people and medical facilities serving the residents. This can include a range from nursing homes, sanitariums, and psychiatric facilities to medical hotels and retirement homes with in-house clinics. Not included are traditional apartment complexes and standard hospitals. Submissions are requested as soon as possible, but should be in our offices by April 30, 1993.

Because that deadline is close at hand, and because we want to select projects as soon as we can, it may be quicker for readers to send the written part of the material and prints of the plans and graphic images (where possible) via fax to: P/A Plans, fax number (203) 348-4023.

The following material will be required, in addition to any information transmitted by fax:

- Clear, unlabeled, black and white floor plan PMTs (or K-5s, stats, or however they are known in your locality), with graphic scales and north arrows. Room names can be supplied on an accompanying photocopy.
- Two or three clear photos, in any form, of the building, model, or rendering. It is helpful if the direction from which the view is taken is supplied.
- Data as shown in the last issue of Plans (March), to include: Project name and location Architect's name and location (with credits for team); Client's name; Brief program description; Building area (net and gross); Cost per gross square foot, and year of construction; Brief list of major materials; List of consultants; Whether project was (or is) CAD-developed.
- **4.** A brief architect's statement about the project (see the last issue for appropriate length).

If items 3 and 4 are transmitted to us, completed, by fax, resubmission with these other materials is optional. The above should be sent to P/A Plans, Penton Publishing, 600 Summer Street, P.O. Box 1361, Stamford, CT 06904.



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Calendar (continued from page 28)

and construction research) and a \$10,000 grant. A cover letter, résumé, and work samples are requested. Contact Renzo Piano Building Workshop, Piazza San Matteo 15, 16123 Genoa, Italy.

Washington, D.C. The Seventh Annual Excellence on the Waterfront awards program has been announced; completed projects and approved waterfront plans may be entered. Contact Waterfront Center, 1536 44th St., NW, Washington, DC 20007 (202) 337-0356 or FAX (202) 625-1654.

Rancho Cucamonga, California. This two-stage competition calls for a 200-unit family housing development, forty percent of which will be "affordable." Second-stage finalists must have California architectural licenses or be associated with architects who are licensed there. Contact Lynda Thompson, Rancho Cucamonga Affordable Housing Design Competition, P.O. Box 807, Rancho Cucamonga, CA 91729 (714) 989-1851 ext.2153.

Conferences

Milan, Italy. This enormous international fair will also include Eurocucina (April 19–25). Contact Cosmit, Corso Magenta 96, 20123 Milano, Italy 2/48008716 or FAX 2/4813580.

Washington, D.C. "Solar Emerging: The Reality" is the umbrella title for three solar energy conferences to be held jointly at the Grand Hyatt Hotel. Conference sponsors include the American Solar Energy Society, the Solar Energy Industries Association, and the American Society of Mechanical Engineering. Contact ASES (303) 443-3130, ASME (212) 705-7054, or SEIA (202) 408-0660.

Cambridge, Massachusetts. "The Environment, Sustainable Development and Design" will cover a range of sustainable design issues. Amory Lovins is the keynote speaker. Contact External Relations Office, Harvard University Graduate School of Design, 48 Quincy St., Cambridge, MA 02138 (617) 495-4315.

New York. The second Eco-Tec International Forum is designed to "encourage a new symbiosis between ecology and technology as a means of shaping a more diverse and equitable world." Contact Shirin Neshat, Storefront for Art and Architecture, 97 Kenmare St., New York, NY 10012 (212) 431-5795 or FAX (212) 431-5755.

Chicago. The theme of the American Planning Association's annual conference is "Agenda for America's Communities: Social and Economic Equity." Contact Margot Morrison, APA, 1313 E. 60th St., Chicago, IL 60637 (312) 955-9100.

San Francisco. Lightfair is an international conference and trade show. Contact AMC Tradeshows, 240 Peachtree St., NW, Ste. 2200, Atlanta, GA 30303 (404) 220-2115 or FAX (404) 220-2136.

New York. Independent furniture designers, small companies, and contract furniture manufacturers are among those who will share the floor at this year's International Contemporary Furniture Fair. Contact Marianne McNamara, George Little Management, 2 Park Ave., Ste. 1100, New York, NY 10016-5748 (212) 686-6070 or (800) 272-SHOW.

Chicago. "Architecture at the Crossroads: Designing for a Sustainable Future" is the theme of the World Congress of Architects, an event that includes the AIA's 125th annual national convention and the XVIII Congress of the International Union of Architects. Contact World Congress of Architects, (202) 626-7395 or FAX (202) 626-7518. Fanning/Howey Associates, Inc.



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Technics Focus: Cladding



If it is true, as Mies said, that God is in the details, then the devil cannot be too far away. This collection of articles focuses on the details of cladding, in the hope of keeping the devil at bay. Details are a cladding system's weakest points, whatever the system type. The articles' authors – design professionals with firsthand field experience – give solid and practical advice on how to avoid a variety of cladding problems; how to design and specify sealants for a variety of cladding types; how to get the best performance from Exterior Insulation Finish Systems; and how to use the appropriate adhesives with thin stone veneers.

Each of these articles begins with a new feature for P/A Technics: an Abstract that provides a brief overview of the article's contents and will help you file this information for future reference. It's part of P/A's continuing efforts to help architects build their knowledge base so as to serve their clients and the built environment better. **Michael J. Crosbie**

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Technics Focus | Specifying Weather Sealants

Architect Thomas F. O'Connor provides information for specifying sealants.

Abstract

Well-designed and well executed weather sealants are an important part of any cladding system's defense against the elements. Because of the complexity of most cladding systems, sealant joints should be designed and coordinated by the architect. Industry standards for specification terminology, sealant materials, accessories, primers, backing, drain tubes, and their installation should be followed. Submittals of sample sealant materials from manufacturers also should be requested and should meet required ASTM standards. Architects should verify qualifications of sealant installers, and should participate in development of sealant joint standards.

The integrity of a building's exterior envelope is vital to the fulfillment of its design intent and durability. That integrity can be weakest at the cladding system's sealant joints. All too often the necessary attention to detail is not given to ensure weathertight performance of these joints. Sealant joints that have been incorrectly specified, improperly designed, or improperly installed can result in cladding failures, sealant joint repair costs, and costly correction of associated water damage.

This article describes areas where improvement can be made in the sealant specification section. Appropriate terminology; referenced standards; quality assurance; product delivery, storage, and handling; and product specification can result in increased exterior envelope sealant joint durability. I will discuss the design of sealant joints for movement and tolerances, but will not address interior



Testing of sealants for adhesion to a metal panel finish and verification of a lack of adhesion to several bond breaker tapes.

sealants or sealant installation.

Sealant Joint Design

When there is no single material supplier – such as a metal and glass curtain wall manufacturer – for the building cladding system, it is usually not prudent to delegate sealant joint design responsibility to the cladding construction team. To do so is to invite miscoordination of the cladding system's components and sealant joints. For example, in a multistory building, with a stone and punched window facade, stone support trusses at spandrel and column areas are manufactured by one subcontractor and shipped to the stone subcontractor, who then installs the stone and delivers and erects the completed assembly. Windows are manufactured and preglazed by a third subcontractor and delivered to the construction site to be installed by a fourth subcontractor. Sealant joints between stone panels and panels and windows are then provided by a fifth subcontractor.

In this case, who should be responsible for the design of the sealant joints? One of the subcontractors, the building contractor who has coordination responsibility, or the architect? Logically, joint design should be the responsibility of the architect, who has the most comprehensive knowledge of the building. If the architect does not design the joints, somebody else will, and often the design will not be comprehensive or adequate. The resulting sealant joints can have insufficient provisions for movement and, especially in this example, inadequate coordination of building component construction tolerances.

Weather sealants have to be designed for movement, the properties and tolerances of the materials being sealed, fabrication and erection tolerances, and structural effects such as frame shortening. Sealant-joint design information can be found in the publications listed in the references.

Specification Terminology

Incorrect or improper specification terminology can lead to misunderstanding and inappropriate or incorrect material references. Sealant terminology has been developed by ASTM Committee C24 on Building Seals and Sealants, as listed in ASTM Terminology C717. Unfortunately, some architects still refer to some materials, for example "sealant backing," with inappropriate terms such as rope, packing, and filler. Correct terminology should be used in specifications to preclude confusion and misunderstanding.

Referenced Standards

Sealants. All weather-sealant materials are not created equal. Sealants for exterior use should meet the minimum requirements of ASTM Specification C920. This specification, the standard for elastomeric sealants since 1979, currently describes minimum properties for silicone-, polyurethane-, and polysulfidebased single and multicomponent elastomeric sealants.

Without an adequate sealant specification, products of unknown or differing performance requirements can be submitted for approval with no common basis for comparison of properties to determine acceptability. Occasionally, a sealant manufacturer will indicate that its product complies with C920. However, when indicating conformance to the various tests in C920, the manufacturer may not describe, or may describe different test parameters from those listed in C920. For a sealant to qualify for use, it must meet at least the minimum unaltered requirements of C920. Therefore, the architect should conduct more than a cursory

conduct more than a cursory review of sealant properties when they are submitted for approval.

Sealant accessories. Currently there is no consensus specification for sealant backing, bond breakers, or other accessories. ASTM Committee C24 is developing a specification for sealant backing, and until it is available, the specifier should reference materials and products of known past performance.

Sealant installation. Sealant installation should be specified to meet at least the requirements of ASTM Guide C1193. The guide was compiled by various representatives of the construction industry and represents their collective judgment for the recommended practices for the design, handling, and installation of sealants and accessories. The guide can also be the basis for rejection of unacceptable installation.

Submittals

Product information. Architects should request submittals of product information for the various sealants as well as for the sealant backing, bond breaker, and any other accessory materials to determine compliance with specified references. Also, samples of the cured sealant in the color desired, of the sealant backing materials, of the bond breaker, and any drain (weep) tubes that may be required should be submitted. The samples can be used to determine color acceptability and material quality, and as a reference to compare with materials supplied at the construction site.

Quality control. The architect should request quality control statements from the sealant manufacturer. The statements should be on the manufacturer's letterhead, signed by a responsible company representative, and should be dated no earlier than one year prior to submittal. Required testing should be performed in conformance to ASTM Practice C1021. Test data more than one year old may be acceptable, provided the manufacturer states that the sealant hasn't changed in formula or manufacture sufficiently to produce different test results. The following verifications should be included in the quality control statements:

• The sealant meets ASTM Specification C920 and other referenced specification requirements.

• The sealant is compatible with specified sealant backing materials as determined by ASTM Test Method C1087.

• The sealant is compatible with and does not adhere to the specified bond breaker as determined by ASTM Test Method C1087.

• The sealant is compatible with and has been tested for adequate adhesion to each respective substrate by ASTM Test Method C794.

The statement should also include identification of any special substrate cleaning process and required adhesion promoter or primer.

Sealant adhesion must be verified for the cladding substrates and, in some cases, for adhesion to other sealants. Also, lack of adhesion to the bond beaker should be verified. Samples of the specified materials are shipped by the sealant contractor to the sealant manufacturer for laboratory adhesion testing. For example, sealant product literature may indicate that a particular sealant will adhere to face brick; however, that does not necessarily mean that it will adhere to a particular face brick.

Our firm was confronted with this problem on a recent project during the submittal process, where the specified silicone sealant would not adequately adhere (even with a primer) to the face brick. Another similar product from the same manufacturer did adhere without a primer. The manufacturer's product literature for both sealants indicated face brick adhesion.

On another project, also during the submittal process, the specified sealant was found to adhere to the proposed bond breaker. This necessitated testing several different bond breaker tapes to determine those that did not permit sealant adhesion.

The above examples emphasize that sealant adhesion testing should be performed during the submission process, well in advance of construction, so as not to delay or stop progress at the construction site if a problem occurs.

Compatibility of the sealant with the substrate, sealant backing, and bond breaker can be determined in the laboratory by the sealant manufacturer, with material samples submitted by the sealant contractor. The sealant should not harm, stain, or discolor the substrate, and the substrate should not harm, stain, or discolor the sealant as determined by ASTM Test Method C510 (1, 2). This method will soon be supplemented with a





1 Sealant contributing to the staining of a metal panel cladding system.

 An unusual example of a component of the sealant that has been absorbed into the softer brick in the wall along the joint line, retarding brick discoloration from environmental exposure.
Two different sealant colors after two years of urban exposure show little color difference.

more comprehensive one for stain assessment, which is currently in the ASTM balloting and approval process. The sealant backing and the bond breaker must also be compatible with the sealant by not causing or contributing to detrimental changes in sealant properties.

Incompatibility usually results from a chemical reaction (usually accelerated by heat, ultraviolet radiation, water, or various combinations of these) between the sealant and other materials that it contacts. Incompatibility may result in staining or discoloration of the sealant or other materials, lessened durability because of physical change in sealant properties, or loss of sealant adhesion to the substrate. As for adhesion, sealant manufacturers publish information that indicates known material incompatibilities for each sealant type. This information should be consulted to avoid specification of a sealant and accessory combination that are known to be incompatible. As for sealant adhesion, compatibility must be proved by testing the particular project materials.

Quality Assurance

Qualifications. Sealant installers should be required to have at least five years of experience similar to the proposed work. A preinstallation conference with the sealant manufacturer, the architect, and the sealant installer should be scheduled at least two weeks prior to installation to review procedures and products.

The architect should specify

that, before the meeting, the sealant installer apply the sealant, per the approved procedures, on the surface of project substrate samples. The samples should then be allowed to cure and, prior to the meeting, delivered to the construction site to be immersed in tap water for 24 hours. At the meeting the samples should be removed from the water and a simple peel test performed to identify any adhesion problems that may have developed. Occasionally, manufacturing variations in a substrate material may result in adhesion loss after the laboratory tests have been performed. This simple test at the construction site has proved to be useful in identifying adhesion problems before the start of sealant installation.

Storage. At the construction site, specify sealant storage at a temperature between 40 F and 80 F. Storage at elevated temperature can result in shortened shelf-life and changes in sealant properties; some sealants stored at low temperatures become stiff and difficult to install. Dry storage for sealant backing, bond breaker, and other accessories should be specified as well. Accessories exposed to moisture or frost could adversely affect the sealant's physical properties and its adhesion to the substrate, especially if they are installed in those conditions.

Products

Sealant materials. Specify sealant products to accord with their anticipated use. For example, a listing for a sealant for vertical or non-traffic surfaces can be typically described as follows: "Sealant A: Single-component, elastomeric sealant complying with ASTM C920, Type S, Grade NS, Class 25, Use NT, a silicone material: Dow Corning, 790, 791, 795; General Electric, Silpruf 2000; Pecora, 895; or as approved."

The above description establishes a minimum quality level by referencing ASTM Specification C920 and also indicates that the sealant is a single-component (Type S), non-sag (Grade NS) silicone material for use in non-traffic joints (Use NT). The sealant also has a minimum capability to extend or compress in the joint opening at least plus-or-minus 25 percent (Class 25) of the designed joint width. The above sealant description is necessary to properly specify a sealant using ASTM Specification C920.

Statements can be written for other sealant types and uses. For example: Sealant B for multicomponent sealants (Type M); Sealant C for traffic joints (Use T) using, for example, a pourable or self-leveling (Grade P) polyurethane sealant; and Sealant D, also for traffic joints (Use T), using a non-sag sealant (Grade NS).

In the installation section of the specification the sealant type should be referenced to those areas where it will be used.

Sealant color. A statement referencing the manufacturer's standard color range, the manufacturer's custom color range, or a color matching a color chip in the architect's office should be made. When specifying sealant color the following issues should be considered.

Sealants, regardless of polymer type, will change color with environmental exposure. The degree of change depends on the sealant polymer type and chemical composition; degree of sealant cure; sealant exposure (vertical or sloped orientation; protection by other building elements, etc.); the local context (industrial, urban, suburban); and types of airborne pollution (soot, hydrocarbons, etc.).

Choosing colors other than black may be an exercise in futility, depending on the type of exposure. Specifying custom or special colors at extra cost, which may retain their specified color for a very short period of time (3), should be carefully considered. Also, custom and special colors can have a minimum order requirement that may exceed the quantity required for the project. Well ahead of sealant specification each manufacturer should be consulted for its custom or special color ordering and minimum quantities.

Accessories. Accessory materials, such as solvents, primers, sealant backing, bond breaker, and drain (weep) tubes require their own specification statements.

Solvents. Cleaning solvents should be specified to be oil-free and of the particular type recommended by the sealant manufacturer. For example, some solvents may be harmful to certain painted finishes, such as methyl ethyl ketone which may cause dulling and softening of some factoryapplied organic coatings such as polyvinylidene fluoride (PVF) if improperly used. Some building code jurisdictions may have volatile organic content (VOC) restrictions that preclude the use of certain cleaners, depending on solvent content and other requirements.

Primers. No attempt should be made to specify particular primers. A simple statement should be included that, where required, a non-staining product recommended by the sealant manufacturer should be used. This would be determined by the previously described preconstruction testing. As is true for solvents, some local building codes may restrict VOCs, precluding the use of some primers, depending on primer solvent content and other requirements.

Sealant backing. Each type of backing should be described, usually open or closed cell rods or shapes and foam tapes.

An open-cell polyurethane foam shape is usually preferred where a joint opening is variable in width; thus, a single size can be installed since it can be compressed into the smallest portion of the joint opening. Compression in the opening should be specified at a minimum of 25 percent of its dimension at the time of installation. Adequate compression is necessary so that the shape will stay in the opening and not be dislodged or moved by sealant installation.

A closed-cell polyethylene foam shape has limits for compressibility in the joint opening, usually 25 to 33 percent of its dimension at the time of installation. A closed-cell shape is more appropriate for a joint opening that is relatively uniform in width, since the shape cannot be easily compressed beyond the upper limit without harming the shape and, consequently, sealant performance.

Self-adhesive foam tapes are occasionally used depending on

project details. The type (openor closed-cell), shape (rectangular, square, etc.), and size should be described, as well as sources for the tapes.

Bond breaker. Specify as a minimum 11-mil-thick, colored, polyethylene or Teflon, self-adhesive tape as recommended by the sealant manufacturer, based on the previously described preconstruction adhesion testing. The 11-mil thickness resists tearing during installation and the color aids in determining if it has been installed. Liquid-applied bond breakers should not be permitted since contamination of the adhesion surfaces is possible during installation.

Drain (weep) tubes. Depending on detailing, drain tubes may be required through the sealant joint to drain moisture from horizontal legs of flashing assemblies, for example. The tubes need to be of sufficient size, usually a minimum of 1/4 inch inside diameter (ID), to drain adequately and they must also develop adequate adhesion to the sealant. Matching tube size to joint size is also important. A 1/4 inch ID tube will have an outside diameter of at least 3/8 inch. Therefore, the minimum sealant joint width that can accommodate the tube would be 5/8 inch, allowing for 1/8 inch of sealant between the tube and the substrates.

The tube should be specified to resist environmental effects such as exposure to ozone and ultraviolet radiation for at least the life of the sealant. Some tubes arrive at the construction site with talc or other surface materials from the manufacturing process. Removal of these materials should be specified so that adequate sealant adhesion will develop. For silicone sealants, drain tubes meeting ASTM Specification C1115 have been found suitable. For other sealant polymers the sealant manufacturer can recommend materials that will develop adhesion to the

sealant. However, adequate environmental exposure characteristics must still be verified.

Conclusion

A clear specification description for products and procedures is the first step in the process of obtaining a durable weather sealant joint installation. Specification knowledge as well as knowledge of typical sealant problem areas can be gained from publications listed in the references, from guide specifications such as the AIA's Masterspec (which includes extensive evaluation and editing instructions), and through participation in professional societies such as ASTM Committee C24, which has over 75 standards related to building seals and sealants. Committee C24 presently has 275 members, of whom unfortunately only five are architects; of that total, four are from a single firm. The participation of architects is important to the development of standards, and the architects, in turn, can benefit from participation by learning a great deal from committee colleagues about sealed joint technology. Thomas F. O'Connor

The author is a vice president and consulting architect of Smith, Hinchman & Grylls Associates in Detroit, and chairs ASTM's Committee C24 on Building Seals and Sealants. He is also involved in the technical development of exterior closure systems including curtain walls, skylights, and glazing and joint seals.

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The following standards are found in Volume 04.07 of the Annual Book of Standards available from ASTM, (215) 299-5585:

C510 Standard Test Method for Staining and Color Change of Single- or Multicomponent Joint Sealants.

C717 Standard Terminology of Building Seals and Sealants.

C794 Standard Test Method for Adhesion-in-Peel of Elas-

tomeric Joint Sealants. C920 Standard Specification

for Elastomeric Sealants.

C1021 Standard Practice for Laboratories Engaged in the Testing of Building Sealants.

C1087 Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems.

C1115 Standard Specification for Dense Elastomeric Silicone Rubber Gaskets and Accessories.

C1193 Standard Guide for Use of Joint Sealants.

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Technics Focus Ensuring Good EIFS Performance

Building envelope consultants **Mark Williams** and **Barbara Lamp Williams** survey this popular cladding's pitfalls, and how to avoid them.

Abstract

Five of the most prevalent failures of Exterior Insulation Finish Systems are discussed: Cracking, Surface Degradation, Impact Damage, Inadequate Closure, and System Detachment. Among the causes of Cracking in the exterior surface are deficiencies in the insulation board's manufacture or installation, articulation of the cladding in surface grooves or alignment at openings, board layout and reinforcing at doors and windows, control and expansion joint detailing and execution. Factors contributing to Surface Degradation are improperly mixed or applied base and finish coats; poorly prepared substrates; exposure to moisture and ultraviolet light. Impact damage is exacerbated by thin coatings and/or poor embedment of the reinforcing mesh. Inadequate Closure of the cladding can occur at through-wall openings and terminations of the cladding at roof and base, and at sealant joints. System detachment most frequently occurs with bonding failures between the insulation and the substrate or with failure of mechanical attachment. Proper detailing and installation are keys to good EIFS performance.

The performance and durability of Exterior Insulation and Finish Systems (EIFS) continue to be topics worthy of discussion because of the material's widespread use. EIFS has become a popular cladding material over the last two decades for many reasons. First costs have proven attractive compared to other cladding systems, and EIFS also offers design flexibility combined with the advantages of locating insulation on the exterior of the building envelope.

EIFS consists of an inner layer



of rigid insulation and an outer layer of polymer modified coatings with reinforcement. The outer layer is called the lamina. EIFS are broadly categorized as Class PB and Class PM systems. Class PB systems have thinner, more flexible laminas, and may be adhesively or mechanically attached to the substrate. Class PM systems have thicker laminas, generally use denser insulation, and are mechanically attached.

Significant numbers of EIFS applications continue to perform without fault; however, EIFS problems have been reported in different parts of North America. In the Pacific Northwest, building officials are taking a closer look at EIFS installation and inspection procedures to help attain expected performance levels. In the Southeast, the Dade County Florida office for the Department of Housing and Urban Development is examining damage caused by Hurricane Andrew on HUD-financed projects. In the Northeast, the Massachusetts Executive Office of **Communities and Development** commissioned a study evaluating numerous state buildings clad with EIFS that have performed below expectations. With specific emphasis in the Midwest and the East, the U.S. Army Corps of Engineers Construction and **Engineering Research** Laboratory (USACERL) has studied various EIFS-clad military buildings to determine what problems have occurred, why they have developed, and how to be "smart buyers" of these systems.

The material in this article is summarized from a technical manual that we wrote on EIFS design, application/inspection, and maintenance/repair, which will be published by the American Society for Testing and Materials later this year. The material is based on our investigations of several hundred EIFS-clad buildings for various clients, including USACERL and several non-government and quasi-government agencies. The most common EIFS problems are discussed, and we hope the manual will help the design professional recognize potential issues inherent in EIFS use.

It is impractical to include every problem in this brief article. Consequently, only highlights of the most significant issues have been included. The summary chart on page 46 outlines the topic areas, most of which are briefly addressed in the text. We have opted to classify common EIFS problems by describing:

• "Failure Mode" – What is the visible problem?

• "Area of Origin" – Where has the problem occurred?

• "Contributing Factors" – What has caused the problem?

This is a layered approach to EIFS assessment whereby observable signs and symptoms provide clues to underlying problems in the system's material layers. The five visible signs or symptoms associated with common EIFS cladding problems are as follows: • Cracking

- Surface Degradation
- Impact Damage
- Inadequate Closure
- System Detachment

Cracking

A crack is a break in the lamina, the protective outer skin of EIFS claddings. It is one of the most common types of EIFS failure. Cracks are detrimental to system performance since they allow moisture to penetrate the system's outer barrier, which causes deterioration.

The underlying cause for cracking may originate in many of the system component layers or in the substrate.

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Insulation boards. The insulation board provides a monolithic substrate for system coatings and reinforcement. This is especially important in PB systems where the base coat and embedded mesh bond directly to the insulation board surface.

Depending on the manufacturer's production methods and quality control procedures, board dimensions can vary in length, width, thickness, squareness, planar flatness, and bead fusion. Boards with dimensional inconsistencies are difficult if not impossible to abut. Out-of-square boards or those of varying thickness are likely to cause lamina cracks. EPS bead fusion influences the ability of this material to resist the passage of water.

Insulation boards must be tightly butted to avoid gaps between boards. Gaps cause cracking of the lamina along board lines (1); this breaching of the barrier in turn allows moisture to intrude, and the outline of board gaps can be detected through the finish coat at the system's outer surface, which detracts from the building's appearance.

If gaps between insulation boards are created during system installation, they should be filled with slivers of insulation. The omission of insulation slivers is one of the most common reasons for lamina cracking.

Backwrapping with glass fiber mesh is typically required in PB systems at all exposed edges of the insulation board. If accessories are not used, board edges at system terminations should be backwrapped. This procedure is sometimes not thoroughly executed, creating openings into the EIFS. Another factor leading to cracking is adhesive that extends beyond board edges. If applied improperly, excess adhesive can overrun the perimeter of insulation boards. Adhesive that remains on board edges during application obstructs tight abutment. Manufacturers recommend that board edges be scraped clean of excess adhesive prior to installation.

During system installation, insulation boards should be applied in a running bond pattern with staggered vertical joints. Boards should not be installed in a stacked pattern such that the vertical edges of boards are in line with one another. This creates continuous vertical joints that can precipitate lamina cracking along joint lines. Where there is a sheathing substrate, EPS boards should be staggered in relation to the underlying sheathing joints (2).

System articulations. System articulations include aesthetic joints and special insulation board shapes intended to enhance building design and character. The placement of these articulations relative to insulation board joints, however, requires special consideration. The lamina loses continuity when it changes direction following the articulation in the insulation surface. The risk of uneven base coat application and incomplete mesh embedment is also usually heightened in these areas because of limited working space, resulting in cracking.

Unlike control or expansion joints, aesthetic joints are purely surface details. Typically insulation board is removed to create U- and V-groove shaped joints, which diminishes system integri-

Failure Mode	Area of Origin	Contributing Factors Fi	igure No
Cracking	Insulation boards	Failure to abut boards	
		Omission of insulation slivers	
		Incorrect backwrapping	
		Adhesive beyond board edges	
		Varying quality insulation board	
		Failure to interlock corners	
		Improper application pattern	
	System articulations	Configuration	
		Installation	
		Alignment with openings	
		Articulation corresponds to board joints	S
	Window and door corners	Omission of corner reinforcement	
		Improper board installation at windows	
		Excessive deflection of jambs	
	Control joints	Omission of control joints in Class PM	
		Poor joint design	
		Poor control joint installation	
		Premature joint termination	
		Accessories failure	
	Frhansian joints	Failure to provide as needed	
	LApansion joinis	Poor joint installation	
Surface Degradation	Rase coat	Excessively thin/thick application	
ournate Degradation	Dase cout	Improper mixing of costings	13 - TO
		Materials deterioration	
		Inappropriate substrate	
	Finish anat	Ending	
	rinish coat	Mildow	-
		non spots	
Impact Damage	External influences	Thin, poorly applied lamina	
		Improper mesh selection and	-
		embedment	10
		Mesh deterioration	
Inadequate Closure	Through-wall openings	Inadequate seal	11
		Inadequate maintenance/repair	
	EIFS terminations	Poor detailing at roof line	
		Poor detailing at ground	
		Improper backwrapping	12
	Sealant joints	Improper joint configuration	
	Station Journe	Improper installation	
		Cohesive FIES Jamina failure	13
		Cohesive sealant failure	10
		Adhesive sealant failure	
	1. 1	All stands and	
System Detachment	Insulation/substrate	Adhesive attachment	14
		Mechanical attachment	1.
		Unsound substrate	15
		Lamina and insulation	

ty. Also, mesh in recessed or protruding articulations changes plane, which reduces its tensile strength. Finally, the mesh can be inadvertently cut with tools during installation. This interrupts system reinforcement and results in cracking of the lamina.

The alignment of aesthetic joints with heads, jambs, or sills can also cause cracking (3) since these are areas of high stress concentration. Preferably, aesthetic joints should be isolated from



1 Failure to tightly abut EPS boards.

2 Improper alignment of EPS board edges with sheathing edges.

3 Alignment of aesthetic joint with window jamb.

4 Diagonal crack at corner opening.

5 Failure of control joint accessory.

6 Excessively thin application with poor mesh embedment in base coat.7 Mildew at base of wall.

8 Iron spot impurity in finish coat.

9 Thin, poorly applied lamina at corner.

10 Mesh improperty embedded in base coat.

11 Inadequate closure and seal around pipes.

12 Improper mesh embedment at backwrapping precludes water-tight seal.

13 Cohesive EIFS lamina failure at jamb.

14 Adhesive attachment failure.15 Deteriorated gypsum sheathing substrate.

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these areas. The alignment of system articulations with underlying joints between EPS boards further weakens this particular area, and can lead to cracking.

Window and door corners. The placement of insulation boards around doors, windows, figures, and other wall penetrations requires proper layout and special reinforcing procedures. Mishandling of recommended installation procedures at these conditions will result in cracking of the lamina.

Because the corners of openings are points of concentrated stress, and the strength of the reinforcement is significantly less in the mesh's diagonal direction, additional reinforcement is necessary. Mesh placed on a diagonal is also required at the corners of all EIFS openings such as windows and doors. The omission of diagonal mesh at such locations (4) leads to cracking.

Boards with L- or saddle-shapes should be installed around all openings to diminish the number of board joints at corners. Insulation boards should also not be installed around wall openings so that board joints align with heads, sills, and jambs, which can lead to cracking.

Control joints. Properly designed and installed control joints are critical to satisfactory Class PM cladding performance. Cracks inevitably appear on claddings with control-joint deficiencies. Control joints are required in PM systems to relieve the stresses that would otherwise cause horizontal, vertical, or diagonal cracking. For PM systems, control joints should be placed between areas that are in a length to width ratio no greater than 2.5 to 1, with a maximum of 150 square feet (14 square meters).

Numerous application factors contribute to poor control joint installation. One of the most significant is the failure to remove lamina material from inside control joint profiles. If allowed to

remain, this material can limit the joint's capacity to accommodate movement. Cracking will most likely result.

PM systems typically utilize accessories at joints, such as metal or vinyl casing beads or control joints. Successful installation depends on the material composition of accessories as well as on proper installation. Vinyl accessories appear more likely to result in broken or failed joints (5) than metal accessories.

Expansion joints. Expansion joints cross through EIFS components to the underlying building structure, and in some cases through the structure itself. These joints accommodate differential movement by providing for a complete separation between building segments. If provisions are inadequate, internal movement stresses will result in the formation of cracks in the lamina.

The omission or inadequate provision of necessary expansion joints on EIFS installations can cause cracking. Poor joint installation because of improper joint dimensions, incorrect use of materials, or incorrect finishing also leads to cracking. Proper application and tooling of the sealant material are essential in expansion joints to prevent cracking.

Surface Degradation

Surface degradation originates either within the lamina or on the surface of the finish coat. Among its several functions, the lamina prevents the migration of moisture into the wall assembly. As a composite layer of integrated materials, the installation and detailing of the finish and base coats are critical for lamina integrity. The step-by-step application of lamina materials presents numerous opportunities for improper or faulty application techniques. Lamina deficiencies can manifest as inadequate barrier coatings.

Base coat. Coatings must be

applied to the manufacturer's specified thickness. A base coat that is incorrectly applied is likely to crack. A thin base coat cannot adequately provide protection against water intrusion or protect the glass fiber mesh (6) against deterioration because of moisture or alkali attack.

Because base coats are typically mixed on site, adherence to the manufacturer's recommended ratio of ingredients is essential. If the amount of cement in the base mix is increased, the resulting material will be stiff and prone to spalling and cracking. Excessive water added to the mix reduces the base coat's functional properties.

Finish coat. The finish coat brings color, texture, and detail to building exteriors. Color and texture should remain fairly true to the original installation; wall surfaces should be monolithic and unmarred in appearance. Degradation of the finish coat can occur on any installation, and there are several common types of degradation, such as fading, mildew, and iron spots.

Finish coat fading because of sun or moisture exposure can occur over time. Fading is more noticeable on dark-colored EIFS facades. Moisture-induced fading is often seen in conjunction with finish coat cracking; since microcracks can allow water into the lamina and cause the color to fade.

The continuous exposure of EIFS finish coats to moisture can facilitate the growth of mildew (7) and micro-organisms on EIFS façades. Poor drainage of water at ground level can promote mildew formation at the building's base. Where possible, EIFS claddings should terminate above grade to avoid prolonged contact with moist conditions.

Finally, impurities contained in the finish coat can oxidize and appear as rust colored spots, known as iron spots, on the cladding surface (8). Unless these impurities are removed,

iron spots may bleed through remedial coatings.

Impact Damage

Punctures or breaks in the EIFS barrier produced by external forces or objects are common causes of impact damage. Any break in the EIFS lamina will provide a route for moisture entry that can eventually lead to component deterioration.

External Influences. Inumerable external influences can damage EIFS claddings. We have seen claddings damaged by heavy hail storms as well as by errant golf balls. These cases underscore the importance of assessing the building program in light of the potential for impact damage. Accurate assessment and the informed selection of an appropriate EIFS material assembly are highly dependent on design judgment.

Proper application procedures are also important. Application errors can diminish the capacity of the lamina to resist external forces. Coating thicknesses are specified by the manufacturer to achieve optimal durability as well as lamina integrity. Thinly applied coatings or those varying in thickness lack durability. A thin or inconsistent lamina (9) is less likely to sustain impact without damage.

Reinforcing glass fiber mesh must be carefully selected and fully embedded in the base coat during PB system application. The wrong mesh type or partially embedded mesh (10) weakens the impact resistance of EIFS cladding.

Deterioration of the mesh itself also diminishes the system's resistance to impact. Moisture and alkali attack are the prime causes of mesh deterioration. When mesh is not adequately coated during the manufacturing, process, or not fully encapsulated in the PB base coat, exposure to outside moisture and alkali can cause system deterioration.

Inadequate Closure

Inadequate closure – incomplete sealing of EIFS cladding occurs at grooves, through-wall openings, EIFS terminations, and sealant joints. To exclude the passage of moisture, air, and other environmental factors, openings between different components of the building envelope must be fully sealed.

Through-wall openings. The juncture of features such as windows, fixtures, doors, pipes, and ducts with the EIFS cladding are potential areas of moisture intrusion (11). Fully intact sealant joints are required at throughwall openings to prevent moisture intrusion.

Incorrect maintenance and repair procedures can also shorten the life of EIFS claddings. Patching of damaged lamina should adhere to recognized manufacturer's repair procedures and shortsighted or haphazard methods will result in more costly repairs at a later time.

EIFS terminations. EIFS terminations are areas where the system starts or stops, such as at the roof and grade lines. Complete system closure at these locations is essential. If design detailing and construction fail to provide full closure, moisture is likely to enter behind the system assembly. Moisture intrusion at these locations can go undetected for long periods of time, causing extensive system damage.

Roof line detailing is important. The use of EIFS to cap parapets should be minimized. Where caps are required, EIFS parapets should have adequate provisions for water drainage. An insufficient parapet slope allows moisture to collect on the EIFS surface, and finish coat softening and moisture penetration can result. Gutters and downspouts that carry water from the roof to the ground must be properly detailed and maintained.

Backwrapping is typically required at all exposed edges of

EIFS. Boards without thorough backwrapping to complete system terminations (12) impede proper application and functioning of sealant.

Sealant joints. Good sealant joints are essential to maintaining system closure. Deficiencies in the cladding's sealant system caused by errors in material selection, joint width, depth, or location, can have devastating consequences. Informed design decisions and skilled workmanship are critical to successful sealant joints.

Proper joint dimensions are critical to successful joint design. Narrow joints may be insufficient to accommodate movement. Unfortunately, only minimal data are supplied by manufacturers regarding EIFS coefficient of thermal linear expansion (a necessary component in calculating the expected movement in a joint).

Moisture tightness is the prime goal of sealant installation, and any condition or practice that detracts from this goal should be avoided. Sealant substrates should be clean, dry, and sound. Backer rods should have a closed-cell construction; openedcell rods retain moisture. Improperly mixed sealant or poorly tooled joints facilitate moisture intrusion.

Cohesive EIFS lamina failure can occur in PB systems at sealant joints. Certain PB finish coats tend to soften with extended exposure to moisture and to delaminate from base coats (13). Softening, in combination with the practice of sealing to the finish coat, leads to cohesive EIFS lamina failure. Sealing to the base coat or to accessories are alternatives to sealing to the finish coat. Low modulus sealants to minimize stress on the sealant bond line should be used.

System Detachment

System detachment is a failure of the bond between the EIFS

and the substrate or the lamina and the insulation.

Insulation and substrate. Problems originating in this part of the system carry the most serious consequences for cladding longevity. This alarming failure is most common on adhesively attached (PB) systems, but can occur with mechanically attached (PM) claddings. Various conditions at the juncture of the insulation and the substrate can threaten cladding attachment; extensive and costly repairs are usually required to correct deficiencies affecting the integrity of system attachment.

System detachment is often related to improper adhesive quantity (14) or distribution or the deterioration of substrate materials. System detachment is likely if improperly prepared or non-approved substrates are used. Most industry references recommend use of a notched trowel to apply the adhesive to sheathing substrates. This method provides a continuous layer of adhesive for some additional protection of the substrate in the event of moisture infiltration.

Improper use, placement, or length of mechanical fasteners can result in system detachment. In general, fasteners should be sized to resist the dead, live, and wind loads to which EIFS cladding is subjected.

Substrates in marginal or poor condition can lead to system detachment if adhesive alone is used. Moreover, an initially sound substrate can deteriorate in the presence of moisture. A good example is paper-faced gypsum sheathing. When exposed to prolonged moisture, the paper facing that covers gypsum board sheathing separates from its core (15), causing system detachment to occur in adhesively secured assemblies. Paper-faced gypsum sheathing has proved to be an unsound substrate if moisture penetrates the EIFS barrier and accumulates at the gypsum

sheathing face.

Lamina and insulation. Correct board preparation ensures a good bond between the lamina and insulation board. Poor preparation of insulation board surfaces in PB systems can result in a delamination of the lamina and can lead to spalling or cracking. Site dirt, ultraviolet light degradation, and unevenness should be removed by abrading the EPS board surfaces with a rasping tool prior to base coat application.

Conclusion

All building materials and systems have strengths and limitations; EIFS cladding systems are no different. The question arises, how best to accomplish a durable cladding? Sound product formulation and appropriate system selection and detailing are important, but the most significant factor is proper application.

To achieve this end, however, the architect is typically limited to periodic field observations. Depending upon project conditions, additional field services may be warranted. Periodic thirdparty inspections can offer further support, but it is typically impossible to continuously review all aspects of application. The most practical solution recognizes the importance of a conscientious contractor and a welltrained applicator who carefully install the system to ensure good EIFS performance. Mark Williams and Barbara Lamp Williams

The authors are principals of Williams Building Diagnostics Inc., Maple Glen, Pennsylvania, a consulting diagnostic firm that specializes in the building envelope.

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Circle No. 374 on Reader Service Card

Architect George L. Maness outlines the limitations of adhesives for stone cladding.

Abstract

There are serious limitations in the use of adhesives on exterior stone cladding. These adhesives have been developed in response to thin stone veneer and other types of cladding systems. The two predominant types of adhesives are polyester and epoxy resins, the latter being the most common in the construction industry. Both types exhibit failures from exposure to temperature extremes, ultraviolet light, and breakdown in the integrity of the materials being adhered. Building codes limit the use of some adhesives, and independent testing of the adhesive's performance is strongly advised. Architects should not rely on the adhesive manufacturer's asserted product performances or expected warranties.

Exterior cladding with natural dimensional stone gives architects the opportunity to create inventive and enduring designs. Stone symbolizes permanence and durability. However, architects are now employing a technique of securing stone that is incapable of performing as intended: the use of adhesives as a structural fastening, whether to attach the stone panel to the building frame, to provide a mitered corner between panels, or to repair damaged stone. Moreover, thin stone panels are often glued together to create special shapes or to achieve an impression of thicker blocks. Problematic installations employing these adhesives raise serious concerns regarding short and long-term performance. To understand the problem, one must understand the materials.

Thin Stone Veneers

Stone is a natural product taken from its original formation, sawn into slabs, and finished for use on curtain walls as a thin veneer. In general, stone is composed of one or several minerals, each of which possesses its own crystalline shape and cleavage planes. Stones contain various weak planes and rifts - the directions in which they split most easily. They also contain inclusions, which are naturally occurring pockets of weaker material that, when exposed after quarrying, will break apart. Fabrication, transportation, and installation procedures can cause microfractures, cracks along natural cleavages and inclusions, cracks, chips, and breakage.

The anchorage of thin stone veneers of less than 2 inches remains a developing technology. Not all aspects of the veneers' inservice behavior are completely understood, and the variety of stones available further complicates assessment. Thin pieces of stone are most vulnerable to failure. These pieces become even thinner at the edges of mitered corners and kerfs. Moreover, when anchor holes are drilled at acute angles, they weaken the stone around them, and microfractures most often occur near these holes.

All exterior building materials require routine repair and replacement; if left unattended they will decompose. Historically, the predominant criterion for choice of enclosure materials of permanent structures is their ability to resist their greatest and most constant adversary, the weather. Architects expect the stone façades they design to survive many years. But how well will the adhesives hold up?

The proliferation of epoxy and polyester adhesives for exterior assemblies parallels the development of thin veneer curtain walls of stone, metal, and tile systems. Methods employing epoxies for attaching, anchoring, and repairing stone are becoming commonplace. A comprehensive knowledge of the product's chemistry, examination of the performance capabilities when subjected to heating and cooling, and review of in-service failures indicate that adhesives for thin stone veneers should be investigated and, where not justified, avoided completely.

Increasingly, project specifications incorporate adhesives and adopt the manufacturer's application procedures without challenging or investigating the material's actual performance record. Specifications rarely, if ever, call for appropriate testing to determine the performance limits and the protracted behavior of polyester and epoxy adhesives as structural components of the exterior assembly.

Manufacturers' technical representatives have stated that adhesives will last the life of the building. Their projections are often measured by the expected aging of the adhesives, 25 to 40 years, or by an implied replacement period for the exterior wall. Yet manufacturers' technical specifications often include disclaimers that invalidate the product's use for curtain walls with limited warranties. The technical data sheets for one adhesive manufacturer reveal that the product is for interior use only. Another segment of this manufacturer's product specifications indicates that the product warranty may be







 Adhesive failure as evidenced on anchoring hardware: epoxy delamination and anchor pull-out (a); unstable anchor due to brittle polymeric material (b); delamination of red paint from steel structure (c).
Dynamic structural forces combined with climatic conditions caused epoxy to fail at this critical joint and pull apart. Epoxy delamination at the mitered corner developed after five years.

3 Stone plug added during original installation to repair stone/anchor damage. The plug was placed in the opening and sealed with epoxy to conceal the new anchor. After ten years, the plug has cracked due to wind and thermal forces applied at the pin anchor. limited to one year. Moreover, the manufacturer provides no warranty for the product's exterior use. Specific product data information and appropriate testing will enable designers to make more informed choices about the materials they select and the construction methods employed, but only actual in-service performance can demonstrate the product's reliability.

Adhesive Types

Adhesives are special organicbased compounds, chemically formulated to achieve specific performance requirements. The most common types of adhesives available for use on exterior curtain-wall assemblies are polyesters and epoxies.

Polyester resins were first used as a fastening adhesive for anchors embedded in concrete. They provided an immediate, strong, and short-term anchor where moisture was not a factor. However, the introduction of polyester resins as a permanent anchor or adhesive jointing material for building façades has produced questionable results, including cracking and loosening of the stone. Examination of some physical properties of polyester resins reveals a product with significant limitations:

• Polyester resins most likely contain acrylic or vinyl and may react chemically with the alkalinity of concrete to form a soapy compound that can cause anchorage slippage.

• The formulated compound solution that makes the material fluid may result in adhesive shrinkage of at least 10 to 15 percent.

• The catalyst used in the formulated system has been reported to decay at 70 F. At 90 F the decay rate becomes extreme.

• Proper adhesion to surface materials requires thorough wetting for bonding. The gritty texture of polyesters does not provide the most desirable flow characteristic for wetting.

Epoxy resins have become the most commonly used adhesive for jointing and fastening applications in the construction indus-

try. The versatile formulation capabilities and the materials' superior adhesive properties have been most notable for securing metals, glass, and ceramic substrates. There is a wide choice of resins, hardeners, modifiers, and fillers to develop bonding for a variety of exposures and substrates. They can be formulated to give mixes of low viscosity for improved wetting and penetrating action. Commercial adhesives are available as one- or two-component systems. But the limits of epoxies are considerable:

• The strength of epoxies is reported to decrease as the temperature increases. The strength values have been graphed and exhibit a bell-shaped curve. At 140 F an epoxy's strength varies. At low temperatures epoxy becomes brittle.

• Skeist Laboratories of Livingston, New Jersey, reports that epoxy, properly cured, possesses such cohesive strength within the glueline and adhesion to other material, that failure under stress often occurs in either the substrate or the material being adhered rather than in the epoxy or at the interface. This happens with glass and aluminum as well as with weaker adhered materials such as concrete and wood (1).

• Surface temperatures of curtain walls can reach 180 F. The average epoxy/bolt pull-out tensile load at medium ambient temperatures reaches strengths of 11,600 psi. In laboratory tests on epoxies, when specimens were preheated to 170 F for 48 hours, the tensile load failure occurred at 5,250 psi. Manufacturers have acknowledged that epoxies will soften at temperatures between 140 F to 160 F.

Test results and evidence of material decay suggest uncertainty about the effectiveness of epoxies for long-term performance in anchoring, attaching, or repairing exterior stone veneers. Epoxy adhesives are organic compounds and thus will eventually decompose. Properly formulated and mixed, epoxies





4 ACCEPTABLE USE OF EPOXY AS FILLER

exhibit excellent short-term structural properties. However, where components of curtain walls utilizing adhesives are subjected to inconsistent blending of two component systems, improper application procedures, and exposure to various dynamic and environmental stresses, the applications and exposures can accelerate failures.

When considering an epoxy, compliance with applicable building code fire resistance ratings and mechanical-attachment requirements should be reviewed to determine product acceptance. For example, the New York City building code requires that the components of the exterior wall consist of materials that comply with one- or two-hour fire ratings performance tests; and the system's components must be anchored to the building frame with mechanical attachments.

Considering the consequences of failures and the vulnerability of structurally gluing components of the building envelope, architects should demand accurate information from adhesive manufacturers to make intelligent choices.

5 ANCHOR REPAIR WITH STONE PLUG AND EPOXY

Conclusions

Architects should require design detailing that employs anchors to provide positive mechanical fastening systems for attaching panelized veneers to building frames. These designs should use epoxies as fillers only and not for structural anchoring; and only with knowledge of the product's capabilities and longterm performance. The use of anchors or connections that do not depend on adhesives will prevent premature failures, expensive repairs, or replacement.

Epoxy resins and polymers

may be used for certain applications, such as fillers that prevent moisture from collecting in anchor holes and kerfs (4). Stone anchor holes and kerfs are commonly filled with moisture-resistant materials to restrain anchors or to block accumulation of moisture, which, when it freezes, can crack the stone.

Epoxy repair of damaged or broken stone (3) is not recommended. The stone material should instead be replaced. Thin stone veneers should not be joined with epoxy. Mechanical attachments (5) are the proven method for attaching separate or special shaped panels and broken panels. **George L. Maness**

The author is an exterior systems consultant in New York and is associated with Ava Shypula Consulting, Ossining, New York, specializing in the design of exterior building systems, building stone analysis, and stone testing. Larry Gutterman assisted in preparing this article.

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Practice Computers

CAD – to automate, or not to automate? James R. Franklin, FAIA, and Reid M. Neubert offer contrasting views.

An Automation Debate

Do CAD systems offer real savings in time and effort? Do they enhance productivity or do they sacrifice design quality? The architectural world seems to be divided into two camps on these issues. This month we present an experienced architect's critique of CAD, offering alternatives for enhanced productivity. On the other side, a software developer with architectural training explains why CAD has been inefficient for many, and how it can be used productively. **David Gruber**

Ruminations of a CAD Victim

Webster's defines cad (kad), n., as one who behaves crudely or irresponsibly, then goes on to capitalize and redefine it as computer-aided design.

Hemingway once wrote F. Scott Fitzgerald that the best parts of any story are either snatches of conversations you have eavesdropped on, or else the sum total of the wreck of your whole damn life, and that each has equal validity. This story is some of each. I frequently listen to architects in management workshops across the country commiserate with each other about their CAD operations. I once headed a firm with a whopping big CAD system. We never came close to making money with it in the two years we had it. Those losses were trivial, however, compared to what I experienced trying to get rid of CAD. Trying to unload that system was nearly the wreck of my whole damn life.

CAD is a major investment initially, and (by most reports I get) chronically as well. We are told constantly by a huge and wellfunded computer industry that we have to automate or die. Worse, they are telling our clients the same thing. Many practitioners tell me they lose money on CAD, but it is required by clients. I contend that when considering CAD to avert business failure, there is a good argument to be made it is more a case of both/and than either/or.

According to recent surveys, about half of all architecture firms now have CAD, and most of those say they are very selective about which projects they do using CAD. Obviously, there remain viable alternatives, and it's time architects consider them all before succumbing to the pressure to buy. More important, all of us (and particularly those already CAD-equipped) need to understand the professional implications of using CAD in the design and practice of architecture. Computer salesmen and engineers tell us that CAD is essential to total quality management, but their definition of quality turns out to be very different from that of most architects.

In my experience CAD has great utility for doing buildings, but not for doing architecture. Let me hasten to say that I am not CAD-literate, nor are most architects of my generation. Given that situation, using CAD requires all design decisions to be "final" before handing the project off to the CAD operator. As reported in "Keys To Design Excellence" (this author, AIA, 1990), any hand-off of design control before final inspection is anathema to all top designers. Design excellence, quality as we know it, is project specific, not replication of details from a

canned database. Good architecture comes from relentless project-long commitment to quality solutions to the thousands of microproblems that every building design involves. Without daily attention to micro detail, the macro solution – the design concept – will not be properly realized.

Charles Gwathmey put it well when he said that though his firm has CAD, they have decided not to use it for design. "It draws too well," he said, "It convinces us we've solved the problem before we really have." Others complain that without the telltale clues of erasure clouds and variations in line weight or lettering, CAD drawings are very difficult to check.

Automation or Hand-off Headache?

One Kentucky architect my age told me he loves his CAD system. He's a sole practitioner who does everything on computer. He finds he can get and do far bigger projects now than when he used traditional manual methodologies. When asked how one ever affords the time to get proficient in the new technology, he replied: "No Problem! Got a really complicated compound fracture in my leg - was in a body cast. Couldn't move for six weeks - and worked with the computer the whole time!"

There are others telling us "Oh, no problem. Emerging from the schools now, we have a whole generation of architects who have grown up with CAD. As soon as the top decision maker on the project is also the CAD operator, there will be no handoff of the project, no coordination problem, and just think how fast, economical, and easy it will be not to have to draw all that."

Practice Points

The Association for Project Managers (APM) is sponsoring a two-day symposium titled "Total Quality Project Management" May 13–14 in Chicago. Topics addressed will include partnering and new directions for the 1990s. For information call APM at (312) 472-1777.

According to Aetna Insurance, businesses that pay more than \$100,000 for workers' compensation insurance may be able to save 30 to 70 percent on their premiums by switching to large deductible plans that are available in many states. In these plans employers agree to pay at least \$25,000 of each claim and their insurers pay the remainder.

The Association for Safe and Accessible Products (ASAP) is a new trade association representing the interests of product manufacturers and design professionals to focus on the availability of products and services for people with disabilities and the aging. For information on membership contact ASAP, 1511 K St., NW, Suite 600, Washington, DC 20005. (202) 347-8200.

A new newsletter is available from the CRSS Center at Texas A&M University. The center was set up in 1991 to study leadership, innovation, and the process of business practice in the design and construction industry. For information contact The CRSS Center, Texas A&M University, College of Architecture, Suite 418C, College Station, TX 77843. (409) 847-9357. 59

Practice

That is only partly true. Architecture is still a team effort: when CAD is used, there are hand-offs. Hand-offs in any form are problematic and expensive. That is why we charge fees for the bidding and negotiation phase of services; it is a hand-off. In terms of both project design and profits, I find that the firms using CAD with the happiest results are the one-person automated firms. In those firms the CEO, CFO, head designer, and total production staff are all on the machine simultaneously. In that situation, there is indeed no hand-off.

Contrast that with a San Diego practitioner's report to a workshop of his peers. His mid-size firm was then into its tenth industrial park, tilt-slab, CAD-designed building. He was hoping they'd break even on this one, since they had invested - and lost - so much money and time on the first nine, all of which had been very similar! The understanding nods of his colleagues as well as conversations with hundreds of firms across the country lead me to believe his report was typical. Very few find CAD profitable. Surveys by Chicago's Howard Birnberg indicate the same thing.

Architecture and Quality

So much for immediate assembly-line economies through repetition and a data bank of identical details. But assume we make CAD work efficiently; will that be effective? There is a growing public mandate for design quality. I think it's in response to that mandate that virtually all architecture firms have now returned to using studio organizations for doing projects. It minimizes hand-off. Only those firms with a strong engineering component seem to remain departmentalized, and many of those are trying to change. Interestingly enough, the few large firms professing success through the use of CAD seem to be mostly EA and AE firms.

Though CAD in the hands of a project decision maker may someday become fast and accurate, will it produce good architecture? All the research on how we actually design talks of reciprocity between the designer and the project. Designing is consequential; while operating a CAD system is highly sequential. When you push the keyboard buttons to obliterate something on the computer screen, it can no longer look back at you through the layers of yellow tracing paper to reopen the dialogue. Even if you discipline yourself to run record copies at every change, you have to interrupt your reciprocity with the project to do so.

Whether or not you believe notions about dialogue with the project, we all agree that architecture is a social art - in that it involves a team in full consensus to implement it. The last building I ever designed all by myself was my fifth year thesis at school. One of the best design critics I had in my years of practice was my mechanical engineering consultant. Over time he became included more and more in the initial conceptual sketching. Design was a team effort. Handoff was not a problem.

Efficiency Without CAD

Up front I spoke of alternatives to CAD. Most, I have found, seem to involve innovative use of photocopiers. Of course there's the old pin-bar drafting, and recently I ran across a delightful variation. A Maryland architect uses what she calls "penny-bar" technology. She has one pin-bar on her drafting table and another scotch-taped to a photocopier. She punches and mounts her yellow trace on the pin-bar so that each iteration of the design is exactly registered. Any three sketches can be run through the copier on clear mylar sheets, which are then punched, assembled and copied on paper as a composite print. The mylar image closest to the camera prints with great clarity and darkness, while each successive layer gets more progressively "halftoned." For instance, the electrical plan shows the electrical diagram very boldly and overlaid on a slightly fainter architectural plan. I have seen her contract documents. They are beautiful, and she reports good speed and efficiency using the process at

every phase of the project, from free-hand conceptual sketches through final documents.

Through enlargements, reductions, paste-ups, and by printing on mylars, papers, or sticky-backs, there is great flexibility in using the photocopy machine creatively. To the extent that previously used details can successfully be incorporated into current projects, photocopied databases may be useful. Many small firms report they regularly publish contract documents at 11" x 17" or 22" x 34" format, just for portability and ease on the job-site. Many of them draw at twice final size and reduce before photocopies are run. One architect told me he works free-hand, then reduces for the final.

One Kentucky practitioner even invested in a Xerox machine with a 48"-wide glass. Much of his work is in campus planning and requires a large format. He works on Bristol board, rapidly building up a collage of original drawing, portions of which get quickly overlaid by paste-ups of smaller photocopies for inserts, corrections, or afterthoughts. The result is a giant collage. When he's satisfied, he runs a mylar on his big Xerox, and that becomes his record "original."

The members of the design and construction industry clients, architects, and engineers - need to say what quality assurance in architecture really ought to mean. We need to affirm the plurality of methodologies available and useful. We need to counteract the pressures insisting that the quality-control mechanisms useful for exact replications and industrial plant assembly lines be instituted for one-ofa-kind projects. Otherwise we may all become CAD victims by reason of living with a cookie-cutter built environment replicated endlessly from some giant database. James R. Franklin, FAIA

The author is the AIA's Resident Fellow, coordinating work sessions for 10 percent of the Institute's members each year. He is a former AIA Vice President in charge of Practice, Design, and Education Initiatives.

What is CAD really?

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This is the high-tech era, we are told, and everything is becoming more computerized and automated. But are architects following suit? In the recent movie, Housesitter, Steve Martin plays a young architect who works for a large architectural firm in Boston. The firm is of a sufficient size to occupy several floors of a highrise building. And yet, in the scenes that show Steve and his co-workers bent to their tasks, there is not a computer to be seen anywhere. Not one! Steve is shown working away on a drawing board with pencil and parallel rule, eraser and erasing shield. Is it Hollywood that has not yet embraced the concept of architects using CAD, or is it the profession itself?

Surveys tell us that virtually all architectural offices are using computers now, and the majority are using CAD. What they do not tell us is the extent to which CAD is being used in those offices, or what is included in the definitions of "CAD."

Having worked in the CAD software industry for a number of years now, I have followed the numbers and talked with many architects, both those who do and don't use CAD. Early on back in the days when AutoCAD was first swallowing its lion's share of the CAD market and "CADD" had two Ds on it - architects were seen as the last holdouts. We used to talk about architects being dragged kicking and screaming into the CAD era. Architects may still be the holdouts. Clearly, more and more architects are using CAD, and today there are more than ever who are advocates of CAD use. But the profession still trails others in CAD implementation.

There are many facets to this apparent reluctance on the part of the profession to adopt CAD wholeheartedly. Part of it is a lack of understanding of what CAD is and what it can do today. In this, architects and other professionals have been done a large injustice. This article is a case in point. I have talked about "CAD" as a generic whole, and this is the

injustice. You see, there is CAD, and then there is CAD.

Drawing with CAD vs. a CAD Application

What is this thing called CAD and what is it supposed to do for you? In general, "CAD" can, and should be, broken into two separate categories, the basic CAD "engine," and the "application software." They are two very different things.

AutoCAD, or any other general-purpose CAD software, does not provide the solutions to a professional's needs; it is not meant to. This is the basic CAD "engine." This basic, "vanilla" CAD can be used to draw anything, but this breadth of capability makes it inefficient and ineffective for the architect's direct use. It is the application software, produced by so-called "third-party" application software developers that gives the professional what is needed to use computers effectively. Most professionals, even those using vanilla CAD programs, have not known that application software exists or what it can do for them.

Application software customizes the CAD engine to provide design professionals with the tools they need to use CAD to their benefit. Here's an example: to draw a wall in plan with vanilla AutoCAD, you would draw it much as you would draw it much as you would with pencil on paper; you'd draw one line for one side of the wall, then draw another, parallel line, to indicate the other side of the wall. Then what do you have? You have two parallel lines of determinate size and position in your drawing.

Now let us contrast that process with the drawing of a wall with third-party architectural drafting software. To draw a wall, you select a wall type, thickness, and height (even other characteristics, if you choose), then indicate where it should start and end. The application software draws in the wall with the appropriate hatching, veneer indications, etc. It also cleans up intersections with any other walls automatically. Now what do you have? You have a wall in your drawing.

To begin to see the difference

this makes, let us add a door to the wall. With a vanilla CAD package, you would draw in the lines indicating the jambs, erase the wall lines and pocheting within the door frame, then draw in the door and indicate the swing again, just as you would do it manually. With architectural drawing software, you pick a door size and type from a template or menu, indicate in which wall you want to place it and how far it should be from the corner, and the program does the rest. The software breaks the wall, draws in the door, and may even prompt you for further information about that door or window for use in schedules and estimation. Windows are added in the same way.

Architectural drawing applications include hundreds of symbols, not just doors and windows. Among these may be furniture, fixtures, trees and shrubs, cars, people, electrical, plumbing and other such symbols, as well as common drafting symbols. All of the symbols are (or should be) easily accessible while using the program, and automatically scaled to your drawing scale.

Let us go back to drawing a wall. There is another difference between the vanilla CAD "wall" and that produced with application software. When you draw parallel lines to indicate a wall, you are merely representing a wall in a particular view. In other words, the two lines are an indication of a wall in plan view. When you draw a wall with today's high-end application software, you actually can have a wall at a set elevation and of a particular height, that can be viewed in 2-D or in 3-D from any angle you desire. Likewise, the doors and windows you place in the wall are full 3-D representations. Thus, a 3-D image, which can be shaded and rendered, even animated for design visualization and presentation, can be an automatic by-product of the basic drafting process.

Also, 3-D images can be displayed flat in any plane, so you can get elevations and the bases for accurate section views as well. In other words, when you use architectural drawing software, the task of drafting a floor plan produces a great deal more than a flat two-dimensional plan view.

Database of Information

The application software also gives you more than just a set of drawings. As you draw with CAD, the software also automatically builds a database of information. If you draw two lines to indicate a wall, the only information the database contains is that there are two lines in a particular location in the drawing. If you draw a wall using an architectural application, you potentially have a great deal of information in that database: square footages, both of floor space and of wall areas; quantities, sizes and types of doors; quantities, sizes and types of windows. As you add more elements to your drawings, information about those elements is added to the database.

CAD software also allows "attributes" or tags to be added to drawing elements – information that can be collected and used to build schedules, attatch CSI section numbers, or even manufacturers' part numbers. The database that is automatically generated as you draw can be as valuable as the graphics themselves.

What is emerging out of this capability is the ability to tie drawings directly or indirectly into specifications, estimating, even custom manufacturing of architect-designed elements. This is where more and more automation is being applied by third-party CAD application developers today.

You may have heard about or run across property owners and facility managers who want CAD files of finished projects. Now you can see why. They can utilize the database of information about their buildings and the equipment for space allocation, leasing, and building maintenance scheduling.

Economics

Along with the lack of understanding of CAD applications and their capabilities have been the economic issues involved. Recession is but one of these. When an architectural firm decides to take the plunge, those involved typically call and visit various computer dealers and get prices for CAD workstations. These usually include the desktop computers with their various peripherals, and AutoCAD or another vanilla CAD software package.

The price of desktop computer has plummeted recently, and PCs - name brands and generic clones - have become commodities with very low profit margins. Without skimping on some-thing computer dealers are hardpressed to put together packages that are any less expensive than those of their competitors down the street . Where they seem to "skimp" is on the software, and they do that by stopping short of including the application software - the very thing that will make the whole investment in CAD worthwhile.

But, with all the discussion of RAM and ROM, megahertz, megabytes, display cards and coprocessors, servers and two-, three-, and four-eighty-sixes the question of what the architects wanted out of using CAD in the first place gets lost. The architecture firm often wants to "wet its toe" first, so it may make the minimum investment. Unfortunately, many have gotten only this far. They have taken this "CAD system" back to the office and tried to make it productive and costeffective. They find it is not, so they stop using it, or use it only in limited areas. Word gets around that CAD isn't all it's cracked up to be.

I am always amazed when I hear about architecture firms using straight AutoCAD. I always advise them to investigate the various architectural applications that are available for AutoCAD, choose the one they like the best, and start using it immediately. This thing called CAD is much more than just a high-tech way to draw lines. **Reid M. Neubert.**

The author has worked for Autodesk and for two third-party architectural software developers. He holds a degree in architecture from U.C. Berkeley.

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THE MAKINGS OF PUBLIC BUILDINGS

At the dawn of what may be a new political and social era in the United States, the challenges facing this society have never been greater on the ecological, (multi)cultural, and urban fronts. At this time, our profession may be seen to be at a turning point – on the cusp between readdressing itself to a broader social vision, or continuing to pursue the fragmented and hermetic interests that have contributed to its marginalization. And so it is an appropriate, even fortuitous, time for P/A to build on the promising beginnings of our Affordable House and Public Realm competitions, and to devote an entire issue to public buildings and their role in the creation of the "civic realm."

In this issue, the recently completed Supreme Court of Israel is the focus of an extensive case study (p. 66); a companion article reports on an international architectural symposium on public buildings (p. 84). Also included are a critique of California civic centers (p. 98), and a portfolio on a network of community centers and public clinics in La Paz, Bolivia (p. 92). Related essays in this month's Perspectives explore the electronic, economic, and political makings of the public realm.

Plaster vaulting in the great foyer of the Supreme Court Building, Jerusalem.





A VIEW OF THE JUDGES' COURTYARD, LOOKING NORTH



EARLY COMPOSITE SKETCH

OF A LIFETIME

IN THE DESIGN OF ISRAEL'S SUPREME COURT BUILDING, RAM KARMI AND

ADA KARMI-MELAMEDE DO JUSTICE TO A CHALLENGE OF THE HIGHEST ORDER.

How many architects dream of getting the commission to design one of their country's premier institutions? And how many are called upon to do so in a city as spiritually, historically, and politically loaded as Jerusalem? To get the juices flowing with lesser commissions, we often imagine our project as the "star" of its environment. But what is it like when there is nothing fanciful about that – when the building *is* a central symbol, located on a site that holds the key to an entire complex of national institutions? Clearly, it's the time to muster everything you've got; a time when lofty intentions must be lived up to; when the "should be's" that constitute your professional credo must be fulfilled. A commission like this – the job of a lifetime – requires the kind of mental and creative exertion that leaves an architect forever changed.

The Supreme Court is the last of Israel's major institutions to be given a home. Since the founding of the state in 1948, the justices of the High Court had occupied "temporary" quarters in an old monastery in Jerusalem's Russian Compound. And they might have continued to do so, had the Rothschild family not

stepped in. The Rothschild Foundation's tradition of benefaction in Israel goes back to the 19th Century and Baron Edmund Rothschild; in the 1950s, his son, Lord James Rothschild, bequeathed the funds to erect the parliament building for the Knesset. In the early 1980s, Lady Dorothy Rothschild offered to complete her husband's vision and underwrite the construction of a fitting seat for the Supreme Court. A site was finally fixed upon, after some 20 years of deliberations by successive cabinets, and the Foundation, headed by the Hon. Jacob Rothschild, organized a two-phase competition to find an architect (see p. 82).

Upon winning the international competition in 1986, the brother-sister team of Ram Karmi and Ada Karmi-Melamede (themselves successors to the prominent practice of their father, Dov Karmi) embarked on six years of design and construction. Taking them through 16 alternatives, it was a process shaped by "an exceptional dialogue between architect and client," recalls Karmi-Melamede. The client, in this case, was twofold: Arthur Fried, a trustee of the Foundation, represented the donor and a host of broader public interests; on the other hand, Chief Justice Meir Shamgar and the judges of his court contributed to a profound exchange the architects came to revere.

The parti evolved in response to complex urban and symbolic considerations (see p. 70). Occupying a key position on a spur designated to become a vast governmental precinct, and within walking distance of the Knesset, the competition-winning organizational scheme was maintained throughout subsequent developments; cardinal axes define four blocks that house the Court's primary functions: library, judges' chambers, courtrooms, and a "khan" for public parking.

However compelling the geometric logic of the parti, the architects were faced with the problem of knitting the building's discrete (and competing) parts together. "To create a common denominator, we returned to the intersection of the cardo and decumanus," explains Karmi-Melamede. "From this point was born the great stone wall that crosses the building from east to west."

Though the great wall emerged very late in the design process, it was forceful enough to unlock possibilities until then hidden: built of the dry-hung rough offcuts of stones from all over the country, its bold arc, slicing through all levels of the structure, resolved the knotty back-andforth struggle to shape a distinctive public "anteroom" to the courts; its concave sweep lent itself to the incision of deep portals to the courtrooms. Furthermore, the wall's extension to the east and west edges of the building suggested a "break" between the north and south portions of the structure. A serendipitous concept followed: to make the wall the marker of a "time divide" between the "world of Modern architecture" that ruled the north part, and the more archaic world of vaults, apses, basilical sections, and regionally inspired courtyards in the south sector.

Generally, movement – rather than any figural strategy – is central to the experience and understanding of this building. Its choreography carries symbolic weight – whether in the historical "regression" that takes place as one advances through the building, or in the "journey of preparation," as Karmi describes the prolonged entry sequence, which is intended to effect the transition from the realm of the profane to the sanctum of the courts (see p. 74). In abstract, the architects assert, "Public movement in the building is a combination of circular and linear patterns, intended to give a clear geometric expression to values of justice and law, as they are described in the Bible: justice as a circle, the law as a line." For the most part, the public procession works (although one monumental-minded Israeli critic found it too convoluted, and as such "undignified"). But there was a price to pay in premiating the experiential: a crucial transition space between the library's ceremonial "gatehouse" and the great foyer is underdefined – a muzzy segue that would be hard to improve without compromising the compelling sweep of the great wall.

More serious is the less than convincing resolution of the west apex of the foyer's segment form, and particularly of that extremity of the great wall; its abrupt ending is the only instance in the building where the thinness of the stone cladding is noticeable. According to the architects, the awkward detailing of the edge is the result of an error in its execution, which will eventually be corrected.

Pursuant to the overall logic of the parti, the vertical organization of the building contributes another layer of meaning to the patterns of movement: the judges inhabit the highest tier; holding cells and other facilities for prisoner-petitioners occupy the lowest; the courtrooms are literally grounded on the public level in-between. Thus, the judges descend from a contemplative height; the prisoners ascend to the light; and for citizens coming in from the street, the leveling effect and accessibility of the courts embodies their *raison d'etre*.

The architects' astute handling of the public dimension of the building offers some insight into the quandary of architecture in the private sector. Most architects regard the opportunity to shape publicspirited places as the most rewarding aspect of a commission. But for many clients, focused on functionality or yield, this ineffable "greater good" is a non-factor. "The competition program did not take a position in regard to the public dimension," Karmi recalls. "Therefore, the dimension expressing the building's social and cultural scale, without which it is impossible to create public architecture, was 'hidden' within the residual floor area." If this was the case with the unarguably enlightened clients of the Supreme Court, what does it augur for those of us trying to eke public space out of a commercial building?

Public places of real quality were born also from the architects' recognition that many people find themselves in court from necessity, and that this public has to spend many hours in tense expectation. Thus, considerable effort was made to create diverse places where visitors could "while away the time in a dignified manner." The necessary evils of registration, administration, and archives are bordered on the ground floor with gracious arcaded ambulatories, generously outfitted with built-in benches and sitting alcoves; the periphery of the judges' cloister-like courtyard is likewise inviting.

The architects had the good fortune to work with second- and third-generation masons, ironmongers, plasterers, carpenters, and engineers (see p. 78). Paradoxically, the exquisite quality of construction sets a perfectionist standard by which the building itself must be judged. For instance, the generally masterful detailing of stone and plaster is marred by gross aluminum profiles of off-the-shelf operable windows; ungainly aluminum frames similarly compromise otherwise graceful curtain walls. Also, given the astonishing execution of the building's plaster vaults, one wishes a more seemly "coarse" finish could have been applied to the interior of the library's mystical pyramid, instead of the cheap-looking spatter paint used to hide imperfections along the sloping surfaces. Impossible tolerances must account for another minor, yet aggravating defect: the reveal between the great foyer's curving plaster ceiling and the uninterrupted rise of the stone wall is simply too narrow, and so seems less than intentional.

But these are quibbles. To the building's everlasting credit, it relies on no empty formal machinations for its consequence. This building lives up to its public charge with architecture as it could be: a richness of experience, a symphony of spaces, transcendent light. If you are seeking regeneration, a renewal of hope in architecture's sometimes disheartening pursuit, you might do well to come here. **Ziva Freiman**


THE PHYSICAL AND PHILOSOPHICAL PREMISES OF THE PARTI

In their statement of intent, tendered during the competition, the architects asserted that "the Supreme Court should derive its personality from its place in the historical and cultural context, from its location in the urban fabric, and from its topography and site." The words ring with the self-evidence of a cliché, but an examination of the geographic, historical, urban, and symbolic considerations in the evolution of the parti reveals a genuinely complex contextual response.

Topography and Urbanism

The site of the Supreme Court building occupies a long spur extending from the main bus terminal at the city's entrance to the Israel Museum. Other urban landmarks strung along this gently sloping north-south ridge include: Binyanei Ha'Uma, the city's premier convention and concert hall; the Hilton Hotel; Government Ministries; the Bank of Israel; and the Knesset, seat of the parliament. On either side of the ridge are green valleys: to the east, Sacker Park, and to the west, the amphitheater adjoining the campus of the Hebrew University. The master plan of Jerusalem envisions the growth of a sizable government precinct that would eventually engulf the northernmost portion of the ridge, up to the site of the Supreme Court (see plan). The Court building itself is located on the northern periphery of the Rose Garden, which flanks the existing government ministries and extends south to the edge of the Knesset compound.

In their site analysis, the architects noted that it was possible to draw a straight line from the bus terminal to the museum. The Knesset compound, however, was slightly shifted from that north-south axis.

Beyond their examination of the Court's immediate environment, the architects considered the geographic characteristics of Jerusalem at large. The city straddles a portion of the Judaean Mountains and the watershed between the Judaean Desert to the east and the fertile foothills and plains that stretch west toward the Mediterranean. They perceived a similarity between the condition of Jerusalem's Old City and the site of the Supreme Court: the walled, ancient part on the east edge of the modern city also occupies a spur, visible from various parts of town, and bounded on either side by valleys. They concluded, "Jerusalem is built as two arenas: one, which is the Old City including the Temple Mount, addressing the sacred aspect, and oriented east toward the Judaean Desert, and the other, which is the government precinct, addressing the secular capital dimension, and oriented west toward the Mediterranean."

Historical Sources

During the competition, Ada Karmi-Melamede recalls, "we looked at the physical Jerusalem, and selected four images that created certain atmo-



SITE ANALYSIS: TOPOGRAPHY AND RELATIONSHIP TO KEY URBAN LANDMARKS



HISTORICAL INSPIRATIONS: COURTYARD OF ROCKEFELLER MUSEUM, ABSALOM'S MONUMENT, TOMB OF MARY



RELATIONSHIP OF GOVERNMENT HILL TO THE OLD CITY, AND THE EAST-WEST AXIS OF PUBLIC URBAN LANDMARKS IN THE NEW CITY \mathbb{N}_{+}



spheres, which we wanted to simulate in the building." These were: the courtyard of the Rockefeller Museum, designed in the 1930s by S.B. Harrison, a legacy of British Mandate architecture in the form of an austere blend of Romanesque and Middle Eastern precedents; a white-stuccoed, thick-walled alley, typical of the Armenian quarter; Absalom's Monument, a small structure named for King David's rebellious son and built in the first century A.D., whose singular, concave-conical form dominates the Kidron Valley; and Mary's Tomb in the Garden of Gethsemane, a Byzantine shrine excavated in the rocky slope of the Mount of Olives.

Added to these inspirational markers were two important material and urban characteristics of the historic city: the prevalence of stone construction (designated by the British as a compulsory cladding material for all latterday buildings), and the organization of the Old City quarters around the cardo and decumanus thoroughfares of Roman times.

The Design Parti

"The building attempts, on a small scale, to emulate what happens in the city on a large scale," explains Ram Karmi. The building is a quadrangle, divided into uneven quarters by axes akin to the cardinal axes of the Roman camps. The north-south watershed line is represented by a pedestrian axis that originates at the entrance to the city, crosses through the building, and continues to the Knesset. The east-west axis is a desire-line, relating the building to a panoramic view of the modern city (and the presence of the Old City beyond it) to the east, and to the University and the Bank of Israel to the west. The quadrants were each given a distinct function and significance: the northwest quadrant houses a "khan" for parking and public transportation; true to its verdant, westward orientation, the southwest quadrant is embedded in the Rose Garden, and houses the terrestrial, worldly domain of the courtrooms. East of the "divide" reside the building's spiritual components: the library in the northeast quadrant, and the judges' chambers, enclosing an arid cloister, in the southeast. The spur's grid geometry is resolved by placing three quadrants on axis with the Knesset, and shifting the parking structure to align with the north-south ridge line.

Portions of the architects' comments above, and on pages 76–77, were culled from videotaped commentary produced by the Israel Museum, and from a forthcoming book on the Supreme Court Building, written by Yosef Sharon under the auspices of the Rothschild Foundation.

ACCESS TO PUBLIC PARKING LEVEL	
TAXI/BUS DROPOFF	
PROMENADE	
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FINAL GROUND FLOOR PLAN (PRISONERS' FACILITIES WITHHELD)





VIEW OF NORTH ENTRY FAÇADE WITH THE KNESSET IN THE BACKGROUND

- 1 LIBRARY'S PYRAMID GATEHOUSE 2 LIBRARY STACKS, PUBLIC 3 FOYER TO COURTROOMS 4 COURTROOMS 1-5 5 STAIR TO CAFETERIA 6 ADMINISTRATION 7 REGISTRY 8 JUDGES' COURTYARD 9 LIBRARY STACKS, JUDGES 10 JUDGES' CHAMBERS 11 JUDGES' CLAB 12 CHIEF JUSTICE'S CHAMBERS 13 SMALL CONFERENCE ROOM 14 LARGE CONFERENCE ROOM 15 SUPPORT STAFF



JUDGES' LEVEL PLAN (ABOVE), PUBLIC LEVEL PLAN (BELOW)

N 7 1 40'/12m





EAST-WEST SECTION THROUGH COURTROOMS AND JUDGES' WING



NORTH-SOUTH SECTION THROUGH LIBRARY AND JUDGES' COURTYARD



EAST FAÇADE



NORTH-SOUTH SECTION THROUGH LARGE COURTROOM AND PARKING STRUCTURE



DESIGN DEVELOPMENT SKETCHES OF ENTRY SEQUENCE. AT THE TIME, THE PYRAMID'S BASE WAS UNRESOLVED

ON THE ENTRANCE SEQUENCE AND THE LIBRARY AS GATEHOUSE

As opposed to Beaux-Arts or Baroque architecture, which employ formal strategies to invoke the civic dimension, the architects of the Supreme Court favored an experiential approach, creating an entrance procession intended to achieve the transition from the mundane to the venerable.

The building is entered, rather modestly, at the intersection of its cardinal axes. From the sheltered loggia there, one can pass through the building to the stone-arcaded "Uffizi" corridor to the Knesset.

Just beyond glass doors on one side of the loggia is the Court's security gate – a barrier "we would have been happy to live without," says Karmi-Melamede. Once cleared, visitors ascend a stately stone stair, evocative of a Jerusalem alley, hugging the roughhewn masonry wall that bisects the entire building. The stair narrows as it rises towards a vast bay window overlooking the city. The window is the turning point, from which visitors are deflected into the symbolic entrance to the Court: the library and pyramid.

As the "memory" of the institution , the library is made of layers of stone, plaster, and wood. Its main is accessible to the public. The top two tiers, though partly visible, are reserved for the judges. The library's innermost membrane, a sinuous curtain wall, embraces the autonomous pyramid, inspired by Absalom's Monument and raised off the ground on four angled legs. "From the moment you enter it you lose contact with the everyday and are nurtured only by light from above," explains Karmi.

This soulful volume segues into a small transition space, much compressed by the low ceiling of the judges' conference room above. From here, one proceeds to encounter with amazement the sudden, soaring space of the great foyer.







Clockwise from facing page, top left: The main entrance to the building also offers access to the pedestrian passage to the Knesset; the entry stair rises toward a vast bay "window" overlooking the city; the library's inner curtain wall wraps around the pyramid "gatehouse"; light pours into the pyramid through four oculi; the library's curving stacks are repeated on the public's and judges' levels; the window to the city is a turning point from which one has a view of the security gate below, the stair to the judges' level in the center, and the copper-clad pyramid to the right.

ARCHITECTS RAM KARMI AND ADA KARMI-MELAMEDE REVEAL SOME OF THE THINKING BEHIND THEIR DECISIONS

Starting Points

At the outset we went on a reading binge - each taking up what seemed most appealing. And that is why there are so many different points of origin for the design. We went back to the biblical sources, and each selected things that we loved.

In the Bible, concepts of justice, virtue, merciful law, and truth are abstract. Generally, biblical references link justice with the circle and the sky, and law with the straight line and the earth. One of the key phrases was, "Truth shall spring out of the earth; and justice shall reflect down from heaven" [Psalms 85:12]. It implies that justice is unattainable - whereas truth is temporal and relative.

This is one of the reasons that both of us agreed that we wanted to "go down" to the law; that it was terrestrial, not celestial.

Simpler metaphors were, for instance, the city wall, and the fact that in biblical times the judges sat in the city gate. We chose to surround the building with a simple stone wall such that it becomes an integral part of the natural landscape, expressing the genius loci. The image of the wall is appropriate, given its roots in Jerusalem and the building's meaning as a bastion of justice.

Old and New

We were influenced by Jerusalem in the sense that there are many contradictory elements in the city, conflicts between the green and the desert, for example, and between the layers of history, where each period's builders built on top of the preceding age with no consideration for what went before. We did not intend to resolve these conflicts; this is a building that originates from conflicts.

We sought an uncompromising combination of old and new, a design that did not seek a common denominator, but a dialogue between autonomous parts. We created a situation where old and new







THE ARCADED "UFFIZI" CORRIDOR TO THE KNESSET

A SUBSEQUENT DESIGN ALTERNATIVE EXPLORED A DIFFERENT TREATMENT OF THE PUBLIC "ANTEROOM" TO THE COURTS



LATE IN THE DESIGN PROCESS. THE SEGMENT-SHAPED GREAT FOYER AND ARCING WALL EMERGED



SKETCH FOCUSING ON THE DESIGN OF THE INTERSECTION OF THE CARDINAL AXES



THE "TERRACED" REAR FAÇADE OF THE COURTROOMS, TOP, EVOLVED FROM SKETCHES INSPIRED BY THE TOMB OF MARY, AND FROM A LATER DESIGN DEVELOP-MENT SECTION DESCRIBING A LARGE COURTROOM AND ITS RELATION TO THE GARDEN each has its own right to exist; we allowed each to attain its maximal presence, without creating an architecture of in-between.

One of the interesting aspects is the movement through the building: you enter and advance towards the courtrooms, and this progression entails a regression in time. You enter through a world of Modern architecture; you pierce the great wall — and go back in history.

On the Stone

We had to decide whether to treat the stone "honestly" as a cladding material, or to emphasize a vertical dimension. We chose to treat the stone as though it formed bearing walls. Since the masonry had to have the aesthetic of a bearing wall, one cannot see the real thickness of the stone at any point.

At the same time, we didn't want to convey that this was not a contemporary building, and so on the main façades of the building one can see that the internal plaster wall is disconnected or separated from the masonry wall. The greatest "dislocation" takes place in the courtrooms, where we took advantage of the interstitial space between the walls for ambulatories, and for the entrance of the light.

On the Light

The justice that was brought down from Mount Sinai is unequivocal, and burning. It brooks no concessions; it is absolute. And the light in Jerusalem is likewise absolute, desertlike and cruel. It is so bright you cannot look up. In a sense, the light represents justice.

In this building you do not get justice; you get the law, which is manmade. Light enters as reflection, and thus becomes "man-made."

It is possible also to say that the light enters the pyramid of the library as a bright shaft, which can be likened to an internal enlightenment. The light there symbolizes the enlightenment of the judge seeking a just judgment.



ON ASPECTS OF THE CONSTRUCTION PROCESS



MASONRY DETAIL FOR WINDOW SURROUNDS HIDES THE ALUMINUM FRAMES AND DISGUISES THE THICKNESS OF THE CLADDING

DETAIL OF STONE TREATMENTS ON FACADES



CONSTRUCTION DETAIL FOR MASONRY PLANTERS (DIMENSIONS IN MILLIMETERS)

"There was only one way to meet the deadline: by doing the design and the construction at the same time," explains Eliezer Rahat, who managed the three-year construction process, overseeing a crew of 200. It meant that the architects had to race through design development on many parts even as construction began on others.

State-of-the-art building methods and equipment, employed by general contractor Gabriel Perez, supported the fast-tracking: thanks to computerized, electronic surveying, it was possible to fix the exact location of each point in the building, and to bring its axes together with maximum precision; lasers enabled correct grading of the structure's various levels. "Since we could construct the walls in such an exact way, we were able to begin the time-consuming stone facing before the frame was fully completed," explains Perez.

The stonework in the building was clearly a labor of love: thirty masons, under stone contractor Yehiel Grebelsky, spent two and a half years dressing and laying some 250,000 pieces of domestic limestone. "You'll find here all the detailing of classical Jerusalem stonework, with all the effects achieved by hand," says Grebelsky. Four dressing techniques (here referred to by their Arabic names, as befits a field still dominated by Arab artisans) yielded a spectrum of textures: the "Tubzeh" method produced the rusticated stones for the building's base; higher up on the façades, "Taltish" was used, employing a pointed chisel for a more regular effect; "Musamsum," (chiseling with a hammer with three teeth on each side) rendered an even finer grain for delicate parts such as the courtroom interiors. The finest workmanship, "Motabeh," (chiseling with hammers of 16-32 teeth) was used on the interiors of the window frames.

The architects' decision to create the aesthetic of bearing walls



THE STEEL FRAMING OF THE VAULTS; ARCHES HAVE GLASS-REINFORCED-CEMENT TRIM.

led to detailing that disguised the actual thinness of the cladding. For example, special stone profiles were carved for the window surrounds, so the blocks turn into the jambs and abut the aluminum frames (see detail).

The articulation of the stone was carefully considered for the arcaded façades of the "Uffizi" corridor and the Judges' Courtyard. Several 1:1 mockups were built to explore alternative stylings.

The great masonry wall bisecting the building also gave rise to some imaginative treatments: in order to emphasize its vertical continuity, a wide, mirrored reveal was laid between the wall's rustic surface and the edge of the stone flooring. A corresponding open reveal runs between the edge of the plaster ceiling and the top of the wall.

The plaster construction offered its own challenges. I was fortunate enough to visit the building three times during its construction. The third visit took place just when diverse plaster vaults were being executed. The method of construction was quite ingenious, enabling the architects to attain great plasticity of form: a steel frame provided the structural skeleton; expanded steel mesh covering the frame was then coated with a 1.17-inch layer of plaster. The plaster phase suffered some setbacks at first: for instance, a day prior to my visit, the workmen had quit partway through plastering the cloister vaults in the judges' chambers. By the time we walked through, virtually every vault was cracked. It was decided that each vault had to be completed in one stretch so the plaster could set in one piece. The strategy worked: there was no more cracking.

Comments of building tradespeople provided courtesy of the Israel Museum, from its exhibition on the Supreme Court and its construction, curated by Izzika Gaon.

Project: Israel Supreme Court Building, Jerusalem.

Architects: Karmi Architects, Ltd., Tel Aviv (Ram Karmi and Ada Karmi-Melamede, principals; Alan Aranoff, Daniel Azerrad, Meir Drezner, Zvi Dunsky, Tzadik Eliakim, Simone Friedman, Iftach Issacharov, Ruth Rotholtz-Van Eck, Motty Shyovitz, Rami Yogev, project team). Client: Yad Hanadiv (the Rothschild Foundation), Jerusalem. Client project supervision by Arthur W. Fried, Yad Hanadiv trustee in Jerusalem; Arthur Spector, architectural consultant; Dan Wind, early planning and permit consultant.

Site: A ten-acre lot in West Jerusalem, centrally located on a ridge extending north to south from the main bus terminal to the Parliament and National Museum.

Program: Five courtrooms;

registry/administration; library facilities for the public, judges, and judges emeritus; 14 judges' chambers; Chief Justice's chambers; judges' lounge; two conference rooms; cafeteria and kitchen; auditorium/bomb shelter; public parking and bus/taxi dropoff; judges' parking; holding cells and parking. Total gross area 236,000 sq ft.

Structural system: Poured-in-place reinforced concrete structure, with the exception of prefabricated elements for parking structure, and glass curtain walls.

Major materials: Interior vaults of painted plaster over expanded metal lath frames. Partition walls of concrete block and plaster or plaster board over metal stud with coated aluminum channels along bases; stone cladding (interior and exterior) of domestic limestone with four types of hammered finishes; exterior hammered stone flooring; interior floors of three types of polished stone, laid with brass or glass dividers; aluminum operable and fixed-frame tinted windows; ceramic spandrels; laminated glass and aluminum- frame skylights and curtain walls; beechwood millwork, bookshelves, and furniture with

brass inlays; integrated steel handrails and spiral stairs.

Mechanical system: The cooling system consists of two centrifugal water chillers with a refrigeration capacity of 480 tons; double-duct constant and variable air-handling system with air conditioning provided by a single air handling unit with six automatic variable-volume axial fans. Judges' chambers have auxiliary individual units for off-hours operation.

Construction management and coordi-

nation: E. Rahat Engineering/ Management/ Coordination (Eliezer Rahat, principal; Moti Kobi, Yigael Kurtzweil, Ann Mintz-Cohen, Dimitry Perlin, Shimon Yerushalmi, staff). Consultants: Dr. Eng. Eliyahu Traum, structural; B. Schorr & Co., mechanical; G. Itkin-E. Bloom, electrical; Jules Fischer and Paul Marantz Inc., lighting; A. Yosha, plumbing; S. Greenbaum, acoustics; Peter Smuk, graphics and signage; M. Marton, insulation/sealants; Y. Landman, aluminum; Haim Kahanowitz, planting; Kibbutz Nahshon, kitchen; Enosh, initial programming; Dotan-Cooperman, general surveying; M. Heller, building surveying; A. Arnan, safety; Shachak, communication; R. Waltman, maintenance; A. Tsamir, transportation.

Subcontractors: Aharon Grebelsky and Son, masonry; Goren Metal Industries, ironwork; Rapaport Technologies, gypsum work; Segal Industries, millwork and judges' chambers furnishings; Galilee Furniture, courtroom furniture; Braun's Carpentry, public seating; Ouziel Roof Designing and Building, pyramid copper roof cladding. General Contractor: G. G. Perez Engineers (Gabriel Perez, Giora Perez, principals; Yosef Hershtig, Menachem Heller, Moshe Brodetsky, Zion Regev, staff). Costs: Withheld by client's request. Photos: Richard Bryant, except as noted.

REPRESENTING THE INSTITUTIONAL CLIENT, CHIEF JUSTICE MEIR SHAMGAR

DISCUSSES SOME OF THE TENETS UNDERLYING THE SUPREME COURTS' DESIGN

Ziva Freiman: Could you elaborate on your philosophical concepts of the Supreme Court and of justice in this country, and how they are physically manifested?

Chief Justice Meir Shamgar: Yes. Experience of life and the history of human beings proves that centralization of power in the hands of one single authority creates totalitarianism. Therefore, already thousands of years ago, Aristotle, and later on the Reform movement in Europe, Locke and Hobbes, developed the idea of the separation of powers. The Americans copied the extreme approach of Montesquieu, namely, the power division which prohibits any connection between the different arms of government; in the States, by contrast to Britain, a member of Congress cannot be a member of the cabinet. Our system is more similar to the British.

But there's always the third arm, responsible for creating the basis of justice in the country. And because the government is very often party to the cases coming before the court, and could be interested in other cases also, the independence of the judicial arm is a very important component of a democratic system of government.

The independence of the judiciary, contrary to common belief, doesn't serve the judges, it serves the citizen who is coming to court. The judges, being brought up in a certain tradition, are normally not afraid of pressures surrounding them. But when you have the Knesset building on the one side, and the government ministries on the other hand, and then the highest level of the judiciary sitting in a decrepit old Russian monastery, there could be a misunderstanding in the eyes of the man in the street that this is some kind of inferior body. I believe that the justices of this court will write the same judg-

ments even if they sit in the cellar of an old monastery. But in the eyes of the people this could decrease their certainty – their belief in the existence of justice that could defend them, protect them.

Secondly, you asked me about the feeling of dignity, etc. That is an architectural achievement that is very important. You could create something Kafkaesque, a court somewhere, high up, distancing itself from people, but we didn't want it. There were many discussions in this court about this problem; justices would say, "In Washington, have you seen how many stairs lead up to the Supreme Court?" The architects didn't agree, and I think they were right. They said, "You walk to the court on a level – you don't have the feeling that you have to climb up to a certain place. Inside, we want to lift you up. You must have the



THE "ROOM WITHIN A ROOM" CONCEPT OF THE COURTROOMS EVOLVED FROM THE SEPARATION BETWEEN STONE AND PLASTER WALLS



ABOVE, A VIEW ACROSS THE LARGE COURTROOM TOWARD THE SKYLIGHTED AMBULATORY. ON FAC-ING PAGE, THE CLOISTER-VAULTED INTERIOR OF A SMALL COURTROOM.

feeling that here you are in a place where you are protected, important, dignified, where you have to behave in a dignified manner." I think they have a very good combination here, between creating a dignified atmosphere and not creating fears and apprehensions in the person coming to court.

Freiman: One can see the building from various points in Jerusalem, yet it never speaks of great scale. Is this another facet of the humane face you are talking about?

Justice Shamgar: Yes. I would say that the first drawings the architects made had the court even lower, dug in. I didn't like it because it's not *de profundis* – I don't want to go too deeply into the earth, and the court must have a presence in some way. So they lifted it. But it mustn't be creating a presence over and above what is needed in a government area.

If you're standing at the Hilton, which is higher, you're virtually looking down on the roof. This is one of the reasons I opposed any antennas and other things on the roof; as you approached the building it would look like a broadcasting station.

Freiman: I went to architecture school in Israel, and grew up in Jerusalem; there was the sense, among Israeli architects, that we don't have an aesthetic heritage, per se. What is your feeling regarding the imagery of the building and its roots?

Justice Shamgar: I don't want to go back to a discussion of the historical religious roots of not having graven images, but things have been developed in North Africa for example, or in Spain, without them. In different Arabesque forms of art, we have something of our own culture. The wood screen over the rear wall of each courtroom, for instance, serves acoustics, but it is beautiful.

It is Moroccan, actually.

We had discussions about it, and I am adding mosaics. We have a very big mosaic of the floor of the synagogue of Hamat Gader, which will go in the big foyer where the public is. We're putting a mosaic downstairs near the entry; We have some mosaics now on what we call the "Uffizi" axis to the Knesset. I see this as not only something aesthetic; I want to create some connection between history and this court, as if it has been there always. The building is new, but we are not new; we are old.... My great predecessor, Agranat, stated in one of his judgments that you had to understand the law of the country according to the culture and heritage of its people. So I like these symbols of the continuity, of the permanence of our people, the strength of our people.



MULTIPLE SENSIBILITIES TOWARDS PUBLIC BUILDINGS

EMERGED IN THE COMPETITION FOR THE ISRAEL SUPREME COURT



AXONOMETRIC

Entrants to the Israel Supreme Court competition were urged to deal with context and with finding a suitable image for the court that would project authority, stability, openness, and ceremony.

The first round was open to all Israeli architects; of 174 entrants, four were chosen join three invitees from Israel and three non-Israeli firms in the second round. In the final phase the field was narrowed to four firms, who were interviewed by the jury for final selection.

In the first phase, the jury comprised five architects: Bill N. Lacy (chair), Cesar Pelli, Charles Moore, Daniel Havkin, and David Reznik. In latter rounds they were joined by Chief Justice Meir Shamgar, British philosopher Sir Isaiah Berlin, Financial Times critic Colin Amery, and the Hon. Jacob Rothschild.

The schemes of four secondround finalists are presented here.

Amir Kolker, Opher Kolker, and Randy Epstein's scheme centered around a contrast between the

SECOND FLOOR PLAN

Jerusalem traditions of heavy stone cladding and light screen filigree the latter interpreted in a modern curtain wall. The courtrooms would be entered via a corner courtyard or by an internal corridor, each with its own stair. This scheme's strength - straightforwardness - makes it appear quite modest when compared to other finalists. What emerges is an almost domestic attitude, with each courtroom in its own articulated pavilion.

GROUND FLOOR PLAN

Ricardo Legorreta's rather infor-

mal design called for placing the courtrooms on the ground floor, beneath an atrium with a pool, covered by a blue square-dome with an oculus. Monitors in the pool would bring light into the courtrooms. The water meanwhile would flow down to the first floor and outside to the entry. The power of the scheme lies in its sensuality. The use of water to create lighting and sound effects, combined with a very sensitive treatment of the stone announce its public amenity.



ENTRY WITH LIBRARY IN BACKGROUND



SKETCH OF ROOFS IN LANDSCAPE



GROUND FLOOR PLAN

Moshe Safdie's proposal was perhaps the most provocative of all. Safdie envisioned digging out the hillside and creating a grid of stone columns. The interior areas of the building would be located at the rear, against the hillside. The glass roofs of the main courtroom and library would protrude above the forest of columns. The courtroom would be topped by a half pyramid with a quarter sphere within it, while the library's roof would be a quarter sphere with a half pyramid inside it. While the sculptural image of the parti was extremely strong, it forced an uncomfortable triangular geometry on the plans of the courtrooms themselves. And although the proposed glass roofs might have been a spectacular sight, they appear rather inappropriate for the climate of Jerusalem.

James Freed's scheme, designed with Ian Bader, Shimon Piltzer, and John Perkins of Pei Cobb Freed & Partners, introduced a dramatic dichotomy between interior and



MODEL



SECTIONAL PERSPECTIVE THROUGH ROTUNDA AND MAIN COURTROOM

JAMES FREED



SITE PLAN

exterior. In this design, the courtrooms would have been grouped on the south side of a great courtyard, next to a prominent rotunda. The exterior would have had a monumental, fortress-like feel, while the courtyard would have taken on the image of a cloister with its arcade and single fountain. Outwardly the design seems to proclaim the independence of the court, while inside it seems determined to encourage quiet contemplation. As with the Karmi solution, great attention was paid to dealing with the intensity of the light while admitting as much of it as possible to the interior. Freed's was probably the most sophisticated proposal, and he was the only non-Israeli to get an interview.

If there was anything that united the ten finalists it was the absence of any direct historicism – unusual for a competition that took place in the mid-1980s, and in Jerusalem at that. David Gruber

Shoring Up the Center

An international symposium on public buildings raises issues central to the standing

of the profession. Ziva Freiman reports.

For some time now, as construction in the private sector has overshadowed the volume and scale of commissions for public agencies, architects have been trying to back up their aesthetic mandate in the marketplace with the argument that good design is good business. Most recently, this was one of the messages borne by a group of design editors, critics, and practitioners summoned before President Clinton's transition team in Little Rock to advise on ways American industries could be made more competitive (see Washington Report, p. 21).

Even if we manage to make a more compelling case for this than we have, I would suggest that architects are shortchanging themselves by limiting the argument for design to questions of commercial viability. In fact we have the opportunity to make a far more ambitious claim with the promise of greater rewards: it is possible to establish that sound architecture is indispensable in both the public and private sectors of the civic realm, and that in architecture's recuperation lies one key to the recovery of our social fabric itself.

Some of the questions surrounding the role of architecture in the public arena came up, albeit obliquely, in the course of a symposium entitled "The Public Building: Form and Influence," which was held last November in Jerusalem. Conceived by the Rothschild Foundation and pegged to the opening of Israel's Supreme Court Building, the three-day event brought together an impressive roster of world-known figures, including Henry Cobb, Charles Correa, Romaldo Giurgola, Herman Hertzberger, José Rafael Moneo, Richard Rogers, and Moshe Safdie. Historians Stanford Anderson, Kenneth Frampton, and Joseph Rykwert were on hand as respondents. Cochairs Julian Beinart and Arthur Spector headed a contingent of prominent Israeli practitioners who provided a framework of introduction and commentary. The following report attempts to synthesize and enlarge on issues that emerged from the forum's diverse presentations and panel discussions.

The Erosion of Consensus

In the course of an interview on the new Supreme Court Building, Chief Justice Meir Shamgar made a point significant to understanding the societal role of architecture. "The existence of the court itself is not more than a consensus," he stressed. "The judges are ordinary people, but society has decided that to keep up life in an orderly manner, you need some institution that decides disputes among people. And this must be respected; otherwise, you have anarchy. This consensus," he added, "is served by creating certain symbols."

It is not hard to extend this assertion to say that public buildings generally embody the social contract. Furthermore, as part of a civic infrastructure, public buildings constitute our most enduring didactic tools for the crucial renewal and reestablishment of this social contract from one generation to another.

This "consensus" has nothing to do with the repressive assignment of privilege to a particular political ideology or architectural style. Rather, it is about accepting that we cannot survive without the fundamental societal agreement that human life has value. As history has repeatedly proven over the past 50 years, this agreement is tragically fragile. Only when it is secured – and clearly expressed in our public buildings and streets – may we aspire to the refinements of tolerating cultural difference, protecting nonviolent dissent, and encouraging the freedom of artistic expression. In short, our pursuit of democracy, of civilization itself, isn't worth a damn if our public arena is allowed to become a moral void – as it has in Sarajevo and Somalia.

At the symposium, Giurgola was among the first to present the notion that architecture expresses a consensus. "Public buildings are the embodiment of a shared idea," he stated. "Architecture is the midwife' of the idea of 'public." Correa, in his presentation, assented. "Public buildings are highly polemic; in every period and culture they expressed the central paradigm," he said. "Nowadays they are banal, partly because of the failing of architects but also because our societies have lost their sense of the sacred."

There can be little question that in the United States we have allowed this societal contract to erode; it's enough to look at the physical blight of inner-city streets – or at the fact that, as Richard Sennet has observed, the public spaces in our urban centers and suburbs have become sites of "exposure" and fear – to realize that in its stunted and often decrepit state, there is little in the built civic edifice to inspire stability or any kind of confidence in the future. Further proof of the innate socio-political "message" embedded, willy-nilly, in buildings and thoroughfares can be seen in the upheaval that took place last May in South Central Los Angeles, when rioters, in a not so inexplicable "psychotic break," lashed out at their own neighborhoods (P/A Feb. 1993, p. 104). In the premises that the public physical plant plays a civilizing role, and that investment in public buildings must be linked to shoring up the public infrastructure, lies a profound approach to architecture's indispensability and meaning.

A Broader Definition of "Public"

In his lecture at the Jerusalem conference, Joseph Rykwert raised a further point related to the voiding of the civic realm. "We have forgone the display of power, of hegemony, for the reality of it," he asserted. The transition from power seen to power felt "is worrying," he added, "and it is a situation that exists also in architecture: as the KGB once did, the National Security Council now resides in a bland office building." The same could be said of economic power; the great corporations, notwithstanding numerous 1980s commissions for image-driven flagship buildings, also reside in office towers that by and large have only token presence at street level.

At the same time, never have privately developed buildings held more sway over the visage of the public realm than they do now. Frampton referred to the difficulties inherent in "the embodiment of (continued on page 88)





A VIEW OF ONE OF THE ENTRANCES

Polygoonschool, Herman Hertzberger

One of the works presented by Herman Hertzberger at the symposium was a small primary school in Almere, The Netherlands, which aptly illustrates the architect's attitudes toward public buildings. Fundamentally, Hertzberger believes, we are faced with a "false alternative" between individualism and collectivism, and finds that "there is no opposition between public and private; these are relative terms." The operative premises derived from these assumptions have to do with creating "in-between zones" that combine the characteristics of public and domestic, making public spaces more intimate, private ones more open.

Hertzberger's chief decision in the design of the school was to build an internal "street," with small classrooms lining it like storefronts. A raised walkway allows children an overview of the activity along the "avenue." Outside, similarly simple gestures entail the use of street furniture: a long bench

THE INTERNAL STREET

running along the exterior of the building and small freestanding lunch shelters.

Shrewd treatment of the building section adds interest to what otherwise might have been simply a long, double-loaded corridor: a vaulted roof accommodates the raised walkway; fixed and louvered clerestories along the length of the classroom wing afford children on the walkway outdoor views; the glazed "gable" ensures against the dead-end tedium usually associated with extended hallways.

"Today the street is something

to be afraid of, but this is something we will overcome," says the architect. In this project, Hertzberger's architectural "domestication" of the street (a hallmark of well-publicized works like the Centraal Beheer Office Building of 1972) carries added pedagogical weight; you could say that the conduct children learn along that internal street is as important as anything they might pick up in the classroom.



CAFETERIA

- 3 EXHIBITS OF JEWELRY, MANUSCRIPTS, MINIATURE PAINTINGS, AND MUSICAL INSTRUMENTS RAJASTHANI COSTUMES AND TEXTILES
- ARTISANS' STUDIOS
- 6 RAJASTHANI WEAPONRY AND ARMOR
- LIBRARY AND DOCUMENTATION CENTER
 EXPERIMENTAL THEATER FOR PERFORMING ARTS
 OPEN COURTYARD



PLANET SYMBOLS



GROUND FLOOR PLAN



VIEW TOWARD THE MANGAL MAHAL. OR ADMINISTRATION PAVILION

Jawahar Kala Kendra Museum **Charles** Correa

Of all the symposium participants, Correa was probably the strongest proponent of cultural rootedness, maintaining that "art and architecture cannot be a private idea." In opposition to the phenomenon of global architecture, Correa asserted that public buildings can derive their meaning only from the "deep structure" of communal memories, rituals, and aspirations. Technology provides architects with the means to reinterpret these "primordial" or

"sacred" cultural foundations. Among other works, Correa

illustrated his points with the Jawahar Kala Kendra Museum in Jaipur, Rajasthan. Dedicated to the memory of Jawaharlal Nehru, the museum is devoted to the textiles, jewelry, illuminated manuscripts, and other crafts for which Rajasthan is known. It contains a street of studios for traditional artisans, a library, a small performing

arts center, and an experimental theater. The organization of the muse-

um is based on the Vastu-Purush mandalas of the Vedic shastras, in

VIEW FROM WITHIN THE DOMED STRUCTURE IN THE ADMINISTRATION PAVILION

which architecture is conceived as a model of the cosmos. The specific mandala used is the nine-square Navgraha, in which each square is the house of a planet, including two imaginary ones.

The nine-square mandala is also the foundation for the city plan of Jaipur, drawn up in the 17th Century by Maharaja Jai Singh (builder of Jaipur's renowned Jantar Mantar astronomical observatory). In the structure of the city, one of the nine squares was displaced by a hill; Correa's museum footprint acknowledges this by shifting one of its own squares to

form the entrance.

100'/30m

Each of the nine pavilions is named after a particular planet, and is designed to express the mythic qualities associated with it. As much as possible, the program was divided into functions that correspond to the spirit of each pavilion. For example, the planet Mangal represents power; its symbol is the square, and its color is red. Accordingly, the administration of the museum and the office of the director are located in this "house."

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SURYA KUND, AN OPEN COURTYARD IN THE CENTER OF THE MUSEUM



THE LIBRARY IS ENCLOSED BY A CURTAIN WALL IN THE GURU PAVILION















"Our pursuit of democracy, of civilization itself, isn't worth a damn if our public arena is allowed to become a moral void – as it has in Sarajevo and Somalia."

(continued from page 84) the public institution being subject to privatization." Rogers illustrated the dangers with a slide show of ghastly office buildings marring the cityscape of London. "Architecture is dominated by having to make a profit," he complained. "You can't make architecture for a developer who wants a complete return in ten years." Since commercial development holds pride of place in both the urban and suburban arenas, making it more and more difficult to limit the definition of public buildings to civic or institutional uses, the private sector can no longer be excused from its public/civic role. It follows that the clients for buildings of prominence must be required to modify their priorities in the calculation of communal and personal gain, and be made more accountable for the effects of their entrepreneurship in the public domain.

On the flip side of the coin, several participants pointed to the extreme distension occurring in the institutional sector. Cobb described the problem vividly in presenting his project for the United States Courthouse in Boston. With a program that calls for some 30 courtrooms, he explained, "each is to some extent devalued. Secondly, the whole enterprise is devalued by being wrapped by hundreds of thousands of square feet of bureaucratic space." One can blame architects for failing to find compelling representations of the institution, Cobb added, "but society has created the programs, and architecture hasn't managed to find ways to handle this institutional explosion."

The advent of a new administration offers a timely opportunity to contend with the dual problems of the increasing privatization of the public realm on the one hand, and what Frampton calls the "ever-burgeoning bureaucracy of the modern world" on the other. Put this down to incurable optimism, but it seems to me that we might witness the elevation of the "greater good" over the "what's-in-it-for-me" mentality of recent decades. Also encouraging is the clear message sent by voters last fall against what came in campaign parlance to be known as "government as usual": taxpayers will no longer tolerate (much less pay for) self-perpetuating, uncontrollably proliferating agencies of government. Which is just as well, since the private sector doesn't necessarily need more regulation to make the adjustment to its enlarged public responsibilities – only better incentives.

I recognize that acting on this attitudinal shift will take nothing less than a sea change in the libertarian thinking that lies at the foundation of this society: until now, the rights of private property have reigned supreme, often to the detriment of public interests.

The Role of Architecture in Practice and in Theory

Two propositions arise from the confluence of a new administration avowedly committed to social reconstruction, and the recognition that such reconstruction, if it is to endure, must be *physically seen*. The first proposition is that an argument must be made for private, as well as public, investment in our civic infrastructure, and particularly in the rehabilitation of our cities; and second, that architects have the potential to play a central role in advancing this argument.

Unfortunately, our profession is not in the best position to seize this opportunity for reempowerment; many practitioners operate in isolation, having lost sight of the social program that underlay Modernism and the consensual strength that came with it. Moreover, in the case of many of the most successful architects (those, arguably, in a position to influence powerful figures in politics and the economy) this profession-wide weakness of conviction is compounded by the lesser vice of vanity, long habits of obfuscation, and an abdication from the responsibilities of leadership. Frampton described the situation most severely in his closing presentation at the conference. "In the last analysis," he said, "the fate of the public building bears some relation to the question of the continued existence of architecture." Correa had earlier voiced a similar concern: "Stendhal wrote that there are no great men, only great events," he stated. "For architects, it is the issues that can engender greatness. We have made ourselves myopic."

Sadly, architects can expect little support from the academy. With few exceptions, the younger generation of theoreticians has also abdicated from the discussion of the civic realm. In part, this can be attributed to a widespread preoccupation with post-structuralist ideas, which negate the existence of commonly held values that form the cohesive underpinning of any society, even as they promote the revival of democratic debate; others among the up-and-coming teachers and critics are perhaps simply bored with the classic humanistic ideas of urbanism, preferring instead the twin lures of technology and futurism – thus, the preoccupation with cyberspace and the electronic village. But human capacity and nature lag behind these fond, far-flung extrapolations – as they always have; to the "thinkers" it may be old hat, but we remain saddled with the inglorious problems of poverty and prejudice, violence and tyranny.

Consensus in a Multicultural Society

Anderson introduced the problem of the global designer. "Architecture cannot operate without social, political relations," he posited. "Can any architect comprehend the challenge of expressing shared ideas when working in so diverse an array of cultures?" Correa (whose inclination has ever been to plumb his own culture's aggregate of memory and myth) concurred, declaring that it was the architect's "goddamn responsibility to say 'no'" to inappropriate commissions.

At the time, it struck me that globetrotting was hardly the issue. Surely, most architects in the large cities of the West need venture no farther than a few blocks from their offices to encounter a diversity of cultures and ethnic groups. It seems that it would be more to the point to question how architects, be they in Paris or London, New York or Los Angeles, can create public buildings and urban spaces as arenas for peaceable contention and coexistence - rather than pursue stylistic symbols of false unity; how architects can promote those spatial qualities that "speak" to people of different races and creeds rather than subjugate their heterogeneity to the forced depiction of a "majority culture." I put the question to Correa and Hertzberger during one of the panel discussions. Though he didn't go nearly as far as I hoped to address the architectural implications of multiculturalism, Correa's response serves well to summarize the challenge of public building: "Trying to find what we have in common is a noble undertaking," he said. Clearly, finding what we can in good conscience hold sacred is the task at hand. Ziva Freiman



MODEL VIEW OF WATERFRONT FACADE



PLAN OF TYPICAL COURTROOM LEVEL N K 100'/30m



CROSS SECTION

100'/30m

United States Courthouse Henry Cobb

Cobb's presentation at the conference was surprising – and refreshing – in that it reflected a prominent architect's reevaluation of many tenets that had hitherto guided his built work. In particular, Cobb allowed that it would be legitimate to question the contribution to the public realm made by tall office buildings such as his own John Hancock Tower in Boston, which are characterized by single, overscale gestures, and which "eloquently render the problem of modern society" in balancing between memory and invention. Cobb also voiced trepidation regarding the overblown scale of institutional commissions such as the United States Courthouse now being designed for a 4.6-acre site on Boston's Fan Pier.

In the conception of the courthouse, Cobb determined to take full advantage of the site's spectacular view of downtown Boston, and to "give voice, through architecture, to those aspirations and beliefs that underlie our American



SITE DEMARCATED ON FAN PIER

system of jurisprudence." To embody the principle that "every citizen shall have equal access to the law," the 500,000-square-foot building is configured as an "L" facing the city skyline, enclosing an open waterfront space intended as a public square.

The building's waterfront façade features a vast, crescentshaped sloping wall of glass, behind which three levels of galleries accommodate public circulation. The program calls for 19 district, six magistrate, and two appeals courts, with space for the addition of four more courtrooms. The building must also accommodate a significant number of administrative spaces, currently located on the first level.

The design is in development, and is subject to considerable revision. It remains to be seen how Cobb will articulate the building's public face on the urban façades fronting Old Northern Avenue and Farnsworth Street, and whether the parti will lend itself to a further breaking down and diversification of interior public spaces.



HABITUÉS OF THE TOWN HALL ARCADE, OVERLOOKING THE PLAZA

Logroño Town Hall José Rafael Moneo

Moneo's approach to public buildings, as reflected in his presentation of the impressive Atocha Train Station in Madrid and the New Town Hall in Logroño, is based on the principle that "the larger the commitment of the public building, the more general its design should be."

In describing the "new life in Spain following the death of Franco," Moneo explained that from the first, he didn't want the Town Hall to symbolize a seat of power, but rather in its openness and accessibility to represent social, democratic principles. His solution was to design a building that "rejects the idea of buildings," and that is conceived instead as an extension of the city itself.

As a further argument for the necessary humility of public buildings, the architect observed that "in New York, when the homeless invade certain public buildings, even if they are not ejected, the building rejects them."

In the interest of "dissolving the presence of the building as such," the Town Hall was made permeable, rather than given one prominent entrance; its façades are rather unassuming, and purposely diverse – an approach Moneo terms "collage architecture contained in a compact building."

Completed in 1981, the Town Hall is located on a site previously occupied by army barracks, close to the confluence of the city's 19th-Century grid and later expansions, and in a position to focus local pedestrian movement toward the riverfront.

The 250,000-square-foot building integrates a governmental area, an administrative office block, and a large meeting hall. A plaza, required for public celebrations, was seized on to lend the disparate parts their definitive image and unifying form.



CUTAWAY AXONOMETRIC



VIEW OF PLAZA AND TOWN HALL FAÇADES

Portfolio: On the Slopes of La Paz

Miguel Angel Roca's district centers, medical clinics, and urban park bring civic aspirations to the outer reaches of Bolivia's capital.



Sketch of La Paz from the air, showing district centers, clinics, and park on urban periphery.

Until the 1960s, La Paz was a small city at the bottom of a valley in the Andes mountains, with an old Spanish colonial core and a few highrise buildings. In the last 30 years it has mushroomed in size, with most growth in new, unplanned neighborhoods of lowrise structures of poor quality, built of brick and concrete. Much of this new fabric suffers the blights of ad hoc modern urban growth: it lacks basic infrastructure, amenities, and a sense of focus – socially, physically, and visually.

Miguel Angel Roca, noted for his tenure as city architect in Córdoba, Argentina (P/A, August, 1985, P. 75) worked here from 1988 to 1991 at the invitation of La Paz's dynamic young mayor, Ronald MacLean Abaroa. He knew about Roca's successes in Córdoba: the city core was upgraded and transformed within the framework of its ancient traditions and its strong physical plan. Roca's experience in planning urban spaces, renovating historic town centers, and – not



Panorama of La Paz periphery, San Antonio district center highlighted.

least – his ability to work rapidly within stringent fiscal and political constraints rendered him an able architect for the mayor.

La Paz, like many cities, initiated a program to preserve and revitalize its historic neighborhoods, a program familiar to Roca. But this was only part of the urban agenda of the mayor, a socialist liberal. He also asked Roca to design three district centers (branch city halls with community services) in the neighborhoods that sprawl up the vast bowl that contains the city. Time and lack of money, but also the lack of urbanity, were among the challenges facing Roca. Fortunately, MacLean Abaroa's political agenda to decentralize municipal services coincided with the architect's own rationalist ideology: Roca has written that inserting highly structured and symbolically charged "fragments" of urban design into a relatively amorphous fabric can create a node for an urban district, an insertion that can raise the overall quality of the built environment. The Aymara and Quechua Indians of La Paz – 80 percent of the population and, for the most part, poor – are the intended beneficiaries of the trio of civic structures. One could say that MacLean Abaroa (whose administration lasted four years) wanted to resolve a twofold problem with his building program: it is unacceptable not to have civic services at hand in the burgeoning precincts of a city; moreover, it would be politically imprudent. Each of the three branch city halls comprises an office for the district mayor, one for the district council, and a multiuse hall for general meetings, with additional offices for social services and local administration. In the early stages of planning, the national Ministry of Public Health received financing from the World Bank to build a series of small healthcare centers in La Paz; Roca was asked to design these as well. One of the largest adjoins one of the district centers; a dozen small dispensaries are in the poorest neighborhoods of the periphery. Composites of cubes and cylinders



San Antonio district center.

Axonometric, San Antonio district center.



and brightly colored, they have a dignity born of expediency. These are sanctuaries in the midst of the architectural fray.

Miguel Roca has proven talent in conceiving public urban spaces; he helped make the pedestrian districts of Córdoba flourish. But his district centers in La Paz have shortcomings. Perhaps these are due to constraints imposed on the designer, but they also come from flaws in the architectural design. Roca intended the buildings to be highly visible markers in the cityscape and, accordingly, applied a design vocabulary of straightforward geometric forms and volumes - squares, cubes, cylinders, and pyramidal shapes - to signal the municipal institutions on each of the three widely dispersed sites. Principal spatial components, such as the local mayor's office, the local council meeting room, and the multipurpose hall were to be painted bright symbolic colors. In fact, they all have façades clad in white tiles. Perhaps the aim was an architecture parlante (a speaking architecture), employing a language similar to Claude-Nicholas Ledoux's bold geometric masses for government buildings in 18th-Century France. More likely, Roca sought to emulate the work of his teacher at the University of Pennsylvania, Louis Kahn. My reservations about the district centers lie not in the geometry itself - the buildings are clean precise figures but in their scale and details.

The San Antonio district center is a case in point: the cylinder, cube, and octagon are discrete elements, lined up beneath a large concrete canopy with triangular metal bracing (perhaps a metaphor for the *chiwena* – collapsible umbrellas – in Aymara marketplaces). A

glass wall separates the three solids from a pedestrian passageway, closed at both ends, and the social service offices on the opposite side. Some parts seem juxtaposed in a rudimentary fashion rather than harmoniously articulated; the major volumes tend to have odd residual spaces between them. The tubular steel roofing and interior bridges with metal balustrades do not succeed in unifying the distinct parts.

Often the scale of the principal volumes (square, cylinder, etc.) in the district centers is ambiguous. Do they relate to the city scale? To the human scale? Or to both, as they should? Roca's sketches, photographs of the buildings, and even views from far away suggest a monumental scale. In fact, they do not seem monumental at all when one approaches them. Perhaps this is deliberate. Nonetheless, some spaces could be better-proportioned. The drum-like space of the San Antonio conference hall, like its counterpart in the Uruguay center, is tall and compressed; the size and placement of windows in relation to the wall, or to the volume as a whole, often seems arbitrary, or alternatively too systematic.

Civic architecture, intended to render democratic institutions more accessible, should seem permeable, even inviting. On one hand, Roca's façades appear fragile, a result of their flat surfaces and unarticulated apertures; to his credit, Roca did not create monolithic institutional buildings. Nonetheless, each center turns inward toward its pedestrian "street" or plaza, not outward toward the civic realm. When you look at the Uruguay center from the street, it is not clear how to reach the mayor's office or how to enter the rotunda. Admittedly, this

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Axonometric, Uruguay district center.



Uruguay district center; market stalls at grade level.

was the most complex of Roca's commissions in La Paz: it replaces a prosperous street market on a narrow sloping site with a permanent structure. Retail stalls at grade level flank a vast sidewalk; overhead, outdoor stairs lead to the government offices above.

Were I to revisit Roca's civic centers (they were just completed when I saw them) I might find that the Aymara and Quechua have appropriated them in ways I could not have anticipated. Now that the centers have been used for several years, one could assess how they might eventually be enlarged to define, encompass, and improve the urban spaces in their immediate vicinity. When they first opened, the centers were the dominant structures in a dense urban sprawl, but without developed links to them (with the exception of the Uruguay center). Roca mentioned a program at the San Antonio center to build a school and other facilities nearby; these could make it seem less isolated.

The most successful of Roca's new work in La Paz, in my estimation, is the Florida Public Park, a carnival of colored walls, meeting places, shops, trees, and grass (there are almost no trees in La Paz). Located along the narrow bank of a river bed, previously the site of an annual fair, the park is a minimalist intervention, a series of walls running east-west, perpendicular to a spine-like covered gallery that crosses the site. People on opposite sides of the walls can talk to and see each other through apertures and wide porticos cut through the walls. One can enter the park along the periphery or from either end of the spine; people are free to cross without lingering. But linger they do, to exercise or to relax in a shady, festive atmosphere.

Overall, La Paz is a city that lacks shade, greenery, and vivid color ... except, of course, for the Aymara women's clothing. It may in fact be that Roca's use of color recalls the riotous color and pageantry of the Oruro Carnival celebration, an annual event near La Paz (although he used similar colors in Córdoba as well). It makes little difference whether the colors are regularly renewed or allowed to fade. The quality of the spaces, their sequences and interconnectedness, the apertures that frame human activity, and the play of light and shadow through the trees make the park quite agreeable.

Roca faced an immense task in La Paz. The mayor likes to refer to him as "our Genghis Khan," presumably because Roca was able to overcome all obstacles in his building campaign and to deliver on time. His structures, like many of his public spaces, have become controversial statements in Bolivia, in Argentina, and throughout Latin America. He has a reputation as a man of action who gets his work built, as well as a man of ideas and vision. These attributes appeal to clients in positions of authority and power – particularly in those developing societies where projects often take years, even decades, to materialize. **Brian Brace Taylor**

The author, an American architectural historian and critic, teaches at the École d'Architecture Paris-Belleville, and was executive editor of the journal MIMAR, Architecture in Development for ten years. MIMAR Books published a monograph on Roca in 1992.



Poor neighborhood served by a new medical clinic.







La Paz Portfolio: And Then Came The Architect

Could the initiatives at La Paz apply to North American cities? Our needs are comparable,

our responses more cumbersome.

Miguel Angel Roca told me that the derby hats and 19th-Century costumes of the Aymara and Quechua women of La Paz can be misleading. These native (South) Americans are likely to tell you they own Toyota pickup trucks and use Apple PCs to manage import/ export businesses from their homes. (Women control most of the small-scale retail trade in this city of one million.)

This portable technology isn't obvious in photos of the neighborhoods where the Aymara and Quechua have settled over the past 25 years. Houses of adobe or of masonry, most of them built by their occupants, occupy slopes with maze-like streets; only a third are con-

nected to the city water supply. There is little sign of municipal order. After Roca described the locale to me, it became clear that I'd made categorical assumptions about vernacular culture and modernity. Like many in our field, I'd assumed a polarity between the indigenous heritage of South Americans and the presumably disruptive technology that made its way there from the Northern Hemisphere. No doubt, the Aymara's migration to the city was an upheaval. Their standard of living should be better. But the ad hoc character of their neighborhoods bespeaks resiliency, not despair.

Architects like Roca are late arrivals in neighborhoods like these. If you lived

here, you'd have designed and built your house with the help of family and friends. No one had the means to commission an architect, let alone designate any civic buildings that would give focus to the place. Roca's encounter here was the reverse of Modern architecture in interwar Germany and in Lenin's Soviet Union, when it was a harbinger of a revolutionary urbanity. Buildings were to inspire people to see their lives anew; architects were prophetic. Within a generation, though, utility took precedence over cultural renewal. Today architects don't intend a social overhaul with their buildings (the Aymara and Quechua seem capable of steering their own course) and clients needn't wait for architects to provide evidence of modern technology's impact on daily life.

If designing a satellite city hall or a medical clinic isn't a medium for social change, what might an architect do to ensure more impact than building just a house or a bodega? Roca, a stalwart Modernist, explains that the Platonic forms of his buildings, by virtue of their abstraction, are resonant with meaning: their scale and profile imply a significance that transcends utility. Brian Brace Taylor, whose impressions from his visit to La Paz precede this essay, considers Roca's aspiration stronger than his buildings. But the formal results are only part of the reason his buildings appear in this issue of P/A: they're a rarity – a collection of civic buildings commissioned by an enlightened politician, Mayor Ronald MacLean Abaroa. Would that good counterparts were built here in the United States. Most of our metropolitan areas grow by accretion, with peripheral neighborhoods that accommodate individual households comfortably, but offer only shopping centers to suggest a shared public realm.

Many ask whether we should bother to construct civic buildings; they doubt that the public realm matters these days. I'd concur that emulating the great public spaces of the past can easily lapse into empty rhetoric. But among the Aymara and Quechua of La Paz, as well as in North America's poorer neighborhoods, civic architecture is

> more than a gesture; it's a point of access for outsiders, a place to get medical care or to inquire about housing assistance and support programs for the aged. Debates about cultural relevance fade quickly when you learn that the little city hall is where social workers introduce single mothers to computer training programs or where teenagers join the summer jobs corps.

The hillsides where La Paz's native Americans live aren't beyond comparison with poor inner-city neighborhoods here in the States: the stretches of East Philadelphia I see from an Amtrak train or the blocks in South Central Los Angeles I read about (see P/A Feb. 1993, p. 104). Evidence of municipal

An open-air waiting room at one of La Paz's new clinics.

support – civic architecture – could be especially potent here, a sign that the rest of the city wants to make the streets safer, bring jobs to the unemployed, and upgrade the schools. But our local governments are clogged with debt and stymied by special interest groups at odds with each other; they need to repair the buildings they have before they raise bond revenues for new ones. Seldom do our mayors have the means for a commission as visible as Roca's in La Paz.

Maybe we shouldn't wait for the mayors to come to us. As curators of the public realm, architects have the expertise to propose solutions. Who is more aware than architects of the potential within a scarred neighborhood? We can learn from a few initiatives already under way: 150 architects have created master plans for the Florida towns blown apart by Hurricane Andrew; NOMA, the National Association of Minority Architects, has sponsored joint ventures for rebuilding South Central Los Angeles; and community design centers have been quietly working with nonprofits and the disadvantaged for decades. In this arena, commentary on the formal qualities of architecture is secondary. Building comes first: people need evidence that their neighborhood is part of a bigger realm – a place supported, not bypassed. This is what civic architecture is all about – a social contract rendered visible. **Philip Arcidi**

Progressive Architecture 4.93

In 1965 Charles Moore wrote an article for *Perspecta* titled, "You Have to Pay for the Public Life." In it he praised Disneyland for providing the kind of enthralling public environment so lacking in the featureless private world of Southern California. He also observed that monumental public architecture in California, for example the city halls in San Francisco and Los Angeles, had not generated much in the way of public life despite the civic

correctness of the architecture. If Americans wanted to have the kind of urban theater at home that they enjoyed in Disneyland and in European cities – people walking, talking, eating, drinking, and watching each other in public spaces – they

would have to replace cheap talk with public and private funds. Nearly 30 years later

California has a number of new civic and community centers that have been designed more or less with this kind of public life in mind. Since Moore himself has been involved in the design of several of these new public centers, it seems a good time to assess the effects of his words by taking a close look at two Southern California civic centers, Beverly Hills and Pasadena, that began in the 1920s and 1930s with, as Moore put it, "an enormous assist from the Hollywood vision in the days of its greatest splendor" and have proceeded haltingly in response to the cycles of municipal fortunes.

In the high-rolling 1980s, the cities of Beverly Hills and Pasadena approved plans for the expansion of their civic centers, the former at the beginning of the decade, the latter at the end. Since the Beverly Hills civic center is now virtually complete and the one for Pasadena is in an early phase, the achievements and shortcomings of the first one can be balanced against expectations for the other. Whether or not they will ultimately provide the rich and complex public life envisioned by their creators is an open question that, given the dynamic nature of public life, may never have a definitive answer.

In both places, imposing city halls were built at a time when the spirit of the City Beautiful Movement still guided civic design. Bakewell & Brown designed the one for Pasadena in 1925; William J. Gage designed the Beverly Hills City Hall in 1932. In Pasadena, a Civic Center plan had been drawn up by the Chicago iety among the pedestrians crossing it. Two building sites facing the city hall on Centennial Square remained vacant, with the result that the Y.M.C.A. and the Y.W.C.A buildings at the other ends of the block turn their backs on the city hall and offer blank walls to those walking along Holly Street. People in the civic center area were inspired to linger only when they found themselves in the lush courtyard garden of the city hall itself. Moshe Safdie.) The program called for a fire station, a parking structure for 450 cars, a police facility with a small jail, and a major expansion for the library. A 40-foot height limit was adopted in deference to the city hall. Moore's team won with a baroque scheme that invoked the spirit of Bernini rather than the staid classicism of the City Beautiful Movement. The new structures framed interlocking oval courtyards, creating an imposing

C R I T I Q U E A TALE OF TWO CIVIC CENTERS DEVELOPMENT AROUND THE CITY HALLS OF BEVERLY HILLS AND PASADENA, CALIFORNIA Sally Woodbridge

firm of Bennett, Parsons, Frost & Thomas in 1923. But neither city acquired a full complement of civic buildings, and equally significant, neither acquired the panoply of civic art, landscaping, and urban design extolled by City Beautiful Movement advocates as important contributions to public life. In reality civic centers became the precincts of bureaucracies with few activities that invited the participation of the general public. No matter how elegant the Renaissance Revival envelope of, say, a public utility building may be, a public attraction it's not.

Over time Beverly Hills added a fire station and a library that fell far short of the high architectural standard of the city hall. Pasadena did better, continuing the Beaux-Arts tradition in a library by Myron Hunt and a civic auditorium by Bennett & Haskell, both the results of a competition held in 1923. The two buildings anchor an important axis that crosses Holly Street, the main street leading to the city hall. In front of the city hall, a very large plaza suggesting milling crowds and celebrations was an important formal element of the plan that remains featureless and little used; it serves mainly to raise anxUsually they preferred driving by, particularly in the summer heat, when the architecture could be appreciated from the comfort of an air-conditioned car.

Post-World-War-II additions to civic centers like Pasadena's were invariably rude and intimidating, as is the 1970s county courts building across Ramona Street from the city hall. Bureaucracies were growing all the time, with no thought given to minimizing their intrusiveness. Other parts of town or out-of-town got the shopping malls and along with them the appealing eateries and fountains to sit beside; buildings for the bureaucracies got invisible employees' cafeterias and spartan lounges.

Beverly Hills Civic Center

In 1982, when community pride swelled again in Beverly Hills, the commission for the expansion of its civic center was awarded to the winners of a national design competition, Charles Moore and the Urban Innovations Group, which associated with Albert C. Martin & Associates for the production of the final design. (Other firms in the invited competition were Eisenman/Robertson, Arthur Erickson, Frank Gehry, and nugget of civic buildings that commanded attention from cars passing by on Santa Monica Boulevard and, in a diagonal chain of interior courts, provided a pedestrian environment replete with the "hierarchies of excitement and

sequential occurrences" that Moore had written about in the 1960s. The varied menu of spaces bedecked with balconies placed at optimum viewing points, arcades, and open circulation corridors on upper levels, along with places to sit by palm trees and admire it all, evoked the image of complex public use. The public could even drive through in true So-Cal tradition and relish the vistas extending from either side of Rexford Drive, which divides the two-block site (P/A, Oct. 1987, p. 80).

The city hall remained preeminent, contributing elements such as the small balconies on its tower as architectural grace notes to the courtvard walls, and its rhythmic bay and pilaster system to the walls of the new structures. The new structures were colored like the city hall but, sensibly, the architects did not try to match the city hall's cast stone ornament; instead they chose ceramic tile as a means of enriching the new buildings and relating them to the city hall dome. (Tina Beebe was a consultant on color.)

The competition program requested suggestions for community facilities, and Moore's team proposed an auditorium, a cafeteria, and an art gallery. Following the award of the com-

At the Beverly Hills Civic Center, the entry portal offers a view of palms in an oval court – along an axis that leads on through two other ovals. Upperlevel platforms inside this gate offer different perspectives of the court and lead to upper-level exterior office corridors. Although the court offers visitors and public employees a refuge from the car-dominated environs, minimal seating discour-

ages lingering.





At Pasadena, pedestrian passages along a chain of pools and fountains give the Plaza Las Fuentes development its name. Cutting through the center of an existing block, this plaza extends the axis of the city hall (left in photo) eastward one block to Los Robles Avenue; another passage extends north (right in photo) from the pool shown here. At this crossing point, the Gothic All Saints Church contributes a counterpoint to the Civic Center's Mediterranean Classical theme.

BEVERLY HILLS





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This tiled channel at the main entrance to the sequence of courts was to add the sparkle and sound of water, until considerations of maintenance cost dried it up.

Though formally much more restrained than the Civic Center's series of oval courts, the public library shares a similar cladding of stucco with ceramic tile accents. With a real public program, the library is by far the most animated part of the center.





BEVERLY HILLS CIVIC CENTER PLAN



The interior of the library offers some surprising angles in plan, with views through segmental arches toward a central grand stair.

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N _ _ _ 100'/30m



The central oval, largest of the three, is split by the off-center passage of Rexford Drive through it. The tower of the original city hall can be seen, sending out its own, earlier, orthogonal axis to Rexford Drive.



The northeastern oval was theatrically designed, with swelling balconies, to support the festive mood of the public visiting the programmed theater, art gallery, and cafeteria. Lacking these, or any other object of communal interest, it has the forlorn look of an empty theater.



The broad oval pool (upper photo) that was intended to reflect these festivities is now seen drained (lower photo) as a rink for a solitary roller-blader.

mission, a community group that included the mayor and some council members advocated expanding the auditorium to serve as a theater. The architects completed the design for the theater, a budget was set, and bids were taken. Meanwhile costs were rising, and although the theater seemed reasonable at \$15 million, opponents came forward to argue that it was after all a frill. Unfortunately they prevailed,

"No matter how elegant the Renaissance Revival Envelope of a public building may be, a public attraction it's not."

even in affluent Beverly Hills, getting the city council to vote down the budget for the theater. The architects were retained to redesign the space as a parking area for the library. The following year, the new scheme was found to cost only \$5 million less than the theater would have but the decision was final. The cafeteria, which was to have been at court level below the theater. was canceled, along with the art gallery, which was to have faced it across the court. The space allotted to the gallery was given to mechanical equipment for the police station.

At the other end of the complex, the architects converted the awkward interruption of the street grid by Burton Way into an opportunity to create a corner entrance to the chain of interior courts, distinct from that of the city hall. This southwest entrance featured several short flights of steps that fanned out at the sidewalk and led up to a rectangular gateway. A water element consisting of a raised channel dividing the stairs was meant to introduce the pleasures waiting inside the palmy courtyard. Alas, to keep down maintenance costs, the channels remain dry; the absence of burbling water diminishes the effect of the whole approach.

Credits, Beverly Hills Civic Center:

Charles W. Moore, FAIA, and Albert C. Martin & Associates, with Urban Innovations Group. Landscape architects: Campbell & Campbell. Color consultant: Tina Beebe.

Other omissions, such as the unfinished pedestrian bridges connecting the upper levels of the police building to the parking structure, do not significantly affect the liveliness of the complex. The library, the only community facility with general appeal, contributes most of the street life on a daily basis. Inviting and bustling with activity, it works very well in plan and houses its users in spaces that are varied, nicely proportioned, and well appointed. Outside the library entrance that would have been adjacent to the theater, the removal of that compatible community facility is a crying shame. Although the people exiting the library on the parking area side can find their way to the sunken oval court, it takes dedication because the path requires going up steps or ramps to the arcade and then down again, making it hard to just wander in. Since no place of activity opens onto the court, it is not a destination. Although it has an air of seclusion, it is hard to see it as a refuge from the hectic world outside when there is no seating except for low concrete ledges. In the absence of any engaging activity in the court, the landscaped stairway leading down from the street level seems somewhat pointless.

The perimeter of the complex is dominated by requirements for vehicular access – to the fire station, the parking structure, or the police facility. The city hall, grandly set off by its surrounding greensward, remains aloof from foot traffic.

Thus the architects pinned most of their hopes for promoting the public life on the attractions of the interior courts. Yet, traversing the length of the interior courts conveys the impression that the public is somehow not fully welcome, despite architectural signals to the contrary. The city has made vending permits so difficult to obtain that you cannot even buy a hot dog within the confines of the civic center. You know that this is a public place, and a lot has been done to lure you into it. But once inside you are not encouraged to linger for longer than it takes to admire the architecture.

Pasadena Civic Center

Meanwhile in Pasadena, public appreciation for its original civic center buildings, particularly Bakewell & Brown's scenographic city hall, had increased while the only major blow to the cross-axial composition linking the three main buildings was the construction of Plaza Pasadena shopping center (P/A, July, 1981, p. 94). This massive brick-walled mall, stretching across three blocks between Colorado and Green Streets, severed the visual connection between the library and the civic auditorium. To ward off more such planning disasters and to reassert the importance of the civic center, the city held a competition for a new master plan for the area in 1988. The winning team assembled by Lyndon/Buchanan Associates prepared a plan that was adopted in September 1989. Although the plan had no specific architectural component, a site for a police building was indicated in the vicinity of the city hall.

The high point of the civic center was and is the city hall. Here Bakewell & Brown used a strategy that, as Moore pointed out, was also successful with the more fanciful Santa Barbara County Courthouse: the central grand arch leads not into the building but through it and immediately out the other side into a lush garden court, making the building more a backdrop than an enclosure. This is of course the stuff of movies, but in Pasadena it is hard to imagine a better solution to achieving civic pomp while making the most of the warm climate. However, the delightful promenade through the city hall ended at the court's rear arcade, which was bounded to the east by a street lined with a miscellany of buildings.

In 1989 Plaza las Fuentes, a six-acre mixed-use development, got under way a block to the east; the first phase, consisting of an office building and a hotel with related courts and public gardens is virtually complete. The architects for Plaza las Fuentes, Moore Ruble Yudell, were especially sensitive to the importance of connecting the new buildings on Los

Robles Avenue with the city hall a block away. Their solution was to extend the Holly Street axis from Centennial Square through the city hall across Euclid Avenue and, by means a garden court with a linear water course, trace the axis through to Los Robles Avenue. A secondary court perpendicular to the garden court runs by the office building arcade and ends in an outdoor restaurant for the hotel. Here landscape architect Lawrence Halprin has employed the full array of art and nature to attract passersby. Although the hotel restaurant is off the main path, one popular restaurant is on it and more are coming. At this writing the office building is not occupied, and its ground-floor retail spaces are not yet in use, so that the people who will really use these garden courts have not arrived. The lack of humanity confirms what we already know: no matter how wonderful the setting, you cannot have a party without people.

Meanwhile at the front of the city hall, Lyndon Buchanan Associates and their team member Alan Jacobs studied the 1923 plan and observed that although the traditional strategies of creating axes and vistas had been used to mark important structures, the plan stopped there. The lackluster quality of the civic center area was particularly striking in Centennial Square and in the blocks of Holly Street leading to (or from) it. Despite rows of trees on the square and along Holly,

(continued on page 131)

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Credits, Pasadena Civic Center:

Civic Center Master Plan Team: Lyndon/Buchanan Associates (Donlyn Lyndon, project director; Marcia McNally, project manager; Marvin Buchanan); Allan Jacobs; Randolph Hester, Community Development by Design; Frances Halsband, R.M. Kliment & Frances Halsband Architects. Plaza las Fuentes development: Moore Ruble Yudell, architects; Lawrence Halprin, landscape architect. Police building: Robert A.M. Stern Architects; Campbell & Campbell, landscape architects for adjoining plaza. Civic Center West development: Johannes Van Tilburg & Partners, architects.

PASADENA



Looking north along Garfield, one sees the city hall tower (to right) overlooking Centennial Square, with the public library terminating the axis 1½ blocks away.



Lyndon/Buchanan's current proposal for Centennial Square would reduce its expanse and give it definition with a lofty arcade that would provide sheltered circulation and seating. Masonry bollards would delimit a central space where, it is hoped, markets and other community events could take place.



Civic Center West, an apartment complex of 358 units by Johannes Van Tilburg \mathfrak{S} Partners now under construction, will provide a resident population within two blocks of city hall to enjoy the public amenities and celebrations contemplated in the plan.





The new police building by Robert A.M. Stern Architects revives the monumentality in a Mediterranean Classical mode of earlier buildings along the Garfield axis. Just to the south (left in photo) is a courtyard by Campbell & Campbell with a pool and a modestly scaled monumental column.





tain (also seen on page 99), along arcaded shops at the bases of office buildings. Punctuated by water elements, the paseo ends at a terrace restaurant that belongs to the

development's hotel.

Progressive Architecture 4.93

Critique: California Civic Centers

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A wall fountain designed by noted early 20th-Century Pasadena Arts-and-Crafts designer Ernest Batchelder a city landmark - has been absorbed into Plaza las Fuentes. But its preservation inspired a commission of a tile mural by artist Joyce Kozloff that overwhelms Batchelder's delicate scale and colors.

NOTE: SHADED STRUCTURES ARE PROPOSED IN MASTER PLAN

Perspectives Architecture's Public

Michael Benedikt, a professor of architecture at The University of Texas at Austin,

argues that we must promote the value of architecture to a public increasingly ignorant of its benefits.

Architecture is never private. For better or for worse, the effects of a work of architecture extend outwards in space and time. What we build for ourselves always removes space, light, and view at least from others, and sometimes more than that. Buildings displace as much as they emplace. Every interior produces, somewhere, an exterior, and that exterior in turn broadcasts its presence everywhere it can be seen, heard, or learned of – down the street, between the trees, into the future.

But, one might say, architecture itself is experienced privately, as is music, or art, or anything else for that matter. Each of us is a subjectivity facing the world essentially alone and through a single pair of eyes. What more could a composer or designer want to do than enhance the quality of private experience?

However, the observation that all experience is private is no defense – no shelter – from the reality that the making and emplacing of architecture is a public act through and through, and from start to finish. Not just because a building extends itself beyond itself, not just because large amounts of labor and capital are often involved, but because, throughout, things are done for reasons and those reasons are produced by the understanding we come to of our audience, our public. Architects are required not just to enhance the experience of individuals, to entertain, but also to secure, by means of persuasive presentation, the approval, legitimation, and commitment to the whole enterprise of architecture that only a public can give. And this with every commission, "public" or "private." Without this action, there can only be defection, each architect not contributing to, but feeding on, the accumulation of legitimacy provided by architects of the past, by their works, their patrons, their more civic-minded clients.

Who, then, is architecture's true audience? Who is architecture's public today? And when does the appeal to that public begin and end?

During school years, the audience for a student's work is not just her teachers, but the hovering presences of charismatic designers, dead and alive, to whom her teachers also address themselves. The education of an architect runs in tight circles, canon succeeding canon, like a coin that miraculously spins ever faster, ever shallower, without settling on the table. History is compressed. Bows are made in the right direction. Healthy self-interest, however, keeps competition boiling and the studio lights on all night.

The view changes drastically when a young architectural graduate leaves school and is lucky enough to find a job. Effort drops, as does time for debate. Suddenly the discrepancy becomes apparent between the buildings featured in journals, lauded for their design, and the buildings that appear in the advertisements of those same journals being lauded for the use of rubber flooring or automatic door closers. The discrepancy becomes poignant as she realizes that she now lives and works more in the second world than in the first. The audience has changed, composed now of real clients, to be sure, and a boss, but also a public seen for what it really is: larger than imaginable, and indifferent, even hostile, to Architecture. The single most powerful factor guiding architectural design, she learns, is that most-public-of-pressures upon the private experience, namely, economic law. The single most crucial fact about a published, high-style building, she also learns, is the most private one: its true cost, and not just to the client, but to the architect.

Of all this, at school, she heard only rumors.

Let us broaden our scope. Consider this: other things being equal, the quality of the designed environment – a "public good" if ever there was one – depends on the devotion and skill of architects. The amount of time, devotion, and skill that can be applied to building design is constrained in turn by the fee that architects can charge for their labor and expertise: the greater the fee, the greater the time, training, care, and consideration that can be applied. (We are assuming, optimistically, that individual architects apply their "surplus" fees to design rather than to personal consumption or investments in other areas of the economy.)

But architects compete with each other for commissions, and one of the ways they do so is by lowering their fees or the price they charge for their services-per-unit-of-time devoted to projects. As each individual architectural firm seeks to win scarce commissions and/or to increase its total profit, and as clients seek to minimize their costs and risks by shopping for cheaper services and bigger firms, the average fee rates and salaries of all architects fall. By some accounts, the former have roughly halved since 1971. Firms, to succeed, become larger, and architects as a group become less and less well recompensed for practicing their art. Indeed, they must practice it with ever less care, skill, and time, and with ever greater numbers of shortcuts, repetitions, and no-trouble materials and details. Abetting the process is computer-aided design. The architect is constrained to consider as primary not the public good of the people who will use the building over time, probably for generations, nor the state of her art, nor the fate of her CAD-displaced draftsmen, but rather the profitability of the building for her clients, a not-so-public good which, while it may not be inimical to the public good, is hardly identical with it.

Worse still, if her fees are computed as a percentage of the construction cost, which they often are, then the competition among architects extends beyond being cheap to hire. It forces competition among architects to design the "most economical" building without it's appearing to be so.

The result of this, over time, is that the proportion of society's resources (as expressed in the Gross Domestic Product) devoted to the design and construction of the public domain falls. Its quality suffers accordingly. Indeed, statistics show that the real cost of American buildings, per square foot, has been in steady decline since the 1920s. Other sectors of the economy have made up the difference: entertainment, military expenditure, bureaucracy, computers, tourism, fast food, real estate, telecommunications, medical care – things both triv-
erspectives

"What we face is a failure of ideas at the most fundamental level: ideas about design, about audience, about work, about value."

ial and profound. Every architect, every builder, and almost every client laments this decline. Façades grow thinner, weeds sprout sooner, fountains go out and are not fixed. But each continues nonetheless to pursue what is rationally in his or her own interest: to do "better," for now, *with* less and *for* less, while capitalizing maximally on what remains of the common weal.

Ours is the story of every over-subscribed profession, of every over-subscribed industry. Automation increases productivity, which produces unemployment in the industries automated and lowers wages. Without significant technological advances that translate into the quality and complexity of the product, and without a powerful, publicly-endorsed agenda for maintaining the value of that quality and complexity, competition in the marketplace does not improve the product - any product - but cheapens it instead, allowing it to fall to the least stillacceptable level for the greatest number of consumers. Architecture is not immune from these laws. Look around.

In this context, one wonders what standard architectural history, theory, and criticism can do. The broken-up sidewalks and crooked-poled streets, the parking lots and falling-apart malls of the



Lancaster, Pennsylvania 1990.

American public realm do not suffer from lack of academic attention. Nor does the city, itself, suffer from such lack of attention. Never have so many Ph.D.s in architecture, planning, and public affairs put their minds to "urban problems." What we face is a failure of ideas at the most fundamental level: ideas about design, about audience, about work, about value, about procedures, about economics, about what we want for a future.

It is time for our best minds to stop taking sides on matters of aesthetics, form, function, and the rest; it is time to throw out the whole art-historical, art-critical machinery, and to confront the question of architecture's political economy. Why, exactly, do buildings cost what they do? Where are the decisions made, in government and out, that affect the quality and quantity of building activity? What is the seat of our power and legitimacy? Why did we hear from no architects at Clinton's economics symposium?¹ Why did Kahn die penniless?

It is time to look at the production of architectural design in terms of the production of value, especially economic value, on a broad front and for a universal public, and not in terms of their entertainment value to a small audience intoxicated by idea and form. In the schools, we should teach without embarrassment how ambitious a businessman was Le Corbusier, how tireless a promoter he was, of himself, to be sure, but more important, of Architecture. So were Walter Gropius, Mies van der Rohe, Hannes Meyer, and Frank Lloyd Wright, and so are Robert Venturi, Robert Stern, Michael Graves, Richard Meier, and Frank Gehry, to name a few successful, design-oriented architects of the day. These men are studied for their innovative

> styles and for the philosophies of design they have put forward. But each also invites study as a profferer of ways to produce "architectural value" more economically than did his predecessors and mentors. Each has found a way to neutralize Modernism's legacy of environmental commodification with an ideology that makes new acceptances possible – or a way to resist the legacy with the help of a university salary or deep pockets.

> It is time for our younger designers not to fall victim so easily to the belief that they can delight any client, and meet any budget, with pure, white-hot creativity. What is true occasionally, or of a detail here or there, is simply not true at large and in the long term. Our confidence in our creativity, and our eagerness to build under any circumstances are our worst enemies. We should admit that symphonies cannot be played on a

ukulele. Designers' *machismo* does nothing but reduce our communal welfare. While architects burn the proverbial midnight oil in order to make it look easy (and build cheaper) clients are laughing their way to the proverbial bank with our erstwhile fees.

It is time for our professional bodies and media to launch the most concerted public education program ever: a training not in history, properness, and the procession of architectural styles on PBS, but an education in raw phenomenology; architecture sold like 501 jeans on CBS, VH1, even MTV. There is a difference between hyping architecture and hype architecture.

The physical world is dying of neglect as we spend longer hours passively absorbed by television, stalled on freeways, or stupefied by the enormity of music heard in headsets. The coming, rapid evolution of electronic connectivity will amount to something else, however: the evolution of new public spaces, totally digital, totally mediated, totally unreal, and far from passive. Cyberspace. There will be commerce in that space, and inhabitation, and art. If we cannot stop this movement, we can yet resolve to conquer both worlds, real space and cyberspace. They must be set together not as enemies but as counter-

Perspectives

Meeting Spaces

Michael Sorkin asks if an increasingly electronic world

spells the end of architecture or its liberation.

points, balanced upon each other, needing each other, casting each other into relief. The essential observation? Both require design.

It is therefore time to quit producing esoteric, polemical, ephemeral, fake, lite, illusory, and entertaining architecture: books do it better, movies do it better, and cyberspace will be more fun, more profitable, and more dangerous.

It is time for a good number of architects to move into the computer and media arts without shame, indeed, with boldness and ambition. Our skills and our sensibilities are appreciated there. Cyberspace is ours as much as anyone's. And it is time for the rest of us – the majority, no doubt – to re-address, re-discover, re-promote, and re-insist upon what only buildings can provide: shelter, physical comfort, addresses, unique and abiding presence, unmistakable spatial power, keen materiality, a repository of significance to real lives, an exemplification of labor value over exchange value. In blessed contrast to the media world, we must offer a blessed absence of contrivance or the desire to manipulate, a greater affinity with nature and the nature of Nature. We must provide buildings with dignity, buildings with depth. Call it real architecture.

Would that this could be the last word. For with or without more real architecture, the realm of private experience will continue to grow, and rapidly, as it did with the advent of movies and recorded music. With or without fine squares and parks, the public realm too will expand, as it did with newspaper and radio. Architects may wish to be Stoic, but they can neither ignore the changing psychic landscape nor call the world back to an earlier time. The craft, the money, and the means of our ancient art are slowly slipping away. The continuing production of luscious, intensely designed places - new resorts, bedand-breakfasts, celebrity homes, where sunshine, ever-slanted, falls across crystal and fruit as ocean winds move the curtains beyond should offer us no comfort. These places are as rare as they are totemic in a public realm whose increasing banality and poverty is palpable. It is as though they exist precisely to be disseminated through the media as antidotes, healing charms, on the promise of the very possibility of their unmediated experience.

The exceptional buildings you find in these pages are different, but not so different. Gathered together in a sort of paginated utopia, they are presented here for our education and admiration. They are here, shall we say, for our belief and our *disbelief*. (Ours? Who is Architecture's public?)

We return to our boards and screens. The phone rings.

Real architecture is still possible. Isn't it?

Michael Benedikt, author of For an Architecture of Reality and Deconstructing the Kimbell, is the editor of and a contributor to Cyberspace: First Steps.

1. Architects did address Clinton's transition team. See News Report, p. 21.

On February 11th, President Clinton held an "electronic town meeting" in a small auditorium in Detroit. During the session, Clinton answered 17 questions, some from the studio audience and some phoned in. His style was colloquial and personal; he "connected" with people.

We heard a lot about electronic town meetings during the campaign, from Clinton and, especially, from Ross Perot. Rhetorically, the promise of these meetings did double duty, evoking both a return to the intimate forms of earlier American democracy and a move into the realms of high-tech, our bright future.

But are these televisual events, watched by millions but orchestrated by a few, in any way "town meetings"? Indeed, can we say that 10 million people watching the President (or the Simpsons or C-Span) have, in any meaningful way, *met*? It's a question with deep implications for architecture.

The town meeting – which dates at least to the Greeks – stands for the certainty of being heard. It's democracy at its most direct, a setting in which citizens argue with all the nuance they can summon about their collective concerns. Here, people are not abstractions, not reduced to the cipher of a vote or narrowed to the statistical embodiment of some special quality or "interest."

The electronic town meeting, on the other hand, involves very large numbers of people observing *someone else* being heard, substituting spectatorship for participation, a passive, auditory relationship to politics. The "democracy" is based on a pollster's conceit: that statistical samples are "representative." At these gatherings, it is the electorate that is picked, not the candidate.

At Clinton's town meeting in Chillicothe, Ohio, on February 19, the audience was chosen randomly. While this may have elicited an adequate number of "representative" questions, the event was clearly a very different version of representation from either the universal participation of an old-fashioned town meeting or the contested make-up of an elected legislature. The will of the electronic audience finds expression only in the dim echoes picked up by Gallup, in 95-cents-a-minute, 900-number votes – results on "Live At Five" – or in the President's personal sense that any given opinion is either meritorious or widely shared.

Although they're a political innovation, the form of these electronic meetings is quite familiar, a version of the talk show, that nightmare of demography. Does it overstate things to say that the prurient succession of arcane identities offered up on Oprah, those abused ichthyologists and unionized strippers teasing the envelope of social oxymoron, is extracted from the same ether as ethnic cleansing or gay-bashing? Here's the risk: the dynamic tension in democracy between individual differences and collective values is more and more solved at the extremes, either by assaults on anyone perceived as other or by the isolation of individuals in their private fantasies.

"Can anyone doubt that our ability to produce more persuasive virtual space will threaten spaces of palpability and touch, the materiality, the physicality of building?"

Do I overstate the case? Of course, expanding knowledge and experience, stimulating discussion, giving greater visibility to the processes of government are good. To see the President speaking with obvious attention and concern with "real" Americans is bracing. The power of the electronic media to spread the (good) word is profound. And, the pleasures and conveniences of virtuality as it develThere is a happy possibility. Architecture finds itself at a moment filled with irony: the means behind this physical contraction might also be the medium of liberation. As architecture attempts to deal with the new post-functionalist, electronic environment, it will be self-defeating to view these changed circumstances as simply a threat to our social and physical best interests. After all, if, as architects,

ops further will certainly be breathtaking. The question, though, is about what gets squeezed out.

Aristotle proposed that the space of democracy - the polis - should be dimensioned by the audibility of a shout. Our own early town meetings, with their intimate public architectural settings, enforced the link between democracy and propinquity, the same link that the presidential talk-shows are meant to evoke. But, save for the studio audience, that propinquity is a sham. What are the true acoustics of electronic democracy? At the electronic town meeting, no one can hear you scream. Democracy demands the



Suburban living room.

accessibility and malleability of its institutions: self-government is inevitably threatened by lengthening chains of mediation between people and leaders, by the erasure of the historic means of direct contact, by the irrelevance of space. This disconnect between assembly and space spells peril for architecture. Architecture physicalizes the space of human relations: if not, it isn't architecture. Architecture's politics devolves on the ways and means it brings people together.

This is a dilemma that has the power to remake architecture, is remaking architecture. The privatized space of the electronic town meeting is the space of enclaved communities with their rapid-response burglar alarms and of the shapeless edge cities in which traditional body-based logics of location are displaced by the promiscuous adjacencies of the electronic, where the video screen becomes both window and doorway. Can anyone doubt that our ability to produce more persuasive virtual space will threaten spaces of palpability and touch, the materiality, the physicality of building? Court TV makes the bedroom the courtroom. The home shopping network is a stroll for the post-electronic *flaneur*. Where does the fiber optic superhighway lead? stood as more than an economic organism, its layout dictated primarily by the need to separate the incompatible. As we recreate our social life in terms of the prospects for vast new compatibilities and networks, new standards can come to predominate, based on pleasure, free association, and the sustainable rhythms of the body. Architecture can reassume its most primary tasks as the guarantor of place.

The space of virtuality threatens only if it supplants the space of the physical. As supplement, as sheer augmentation, electronic means can put us in touch with fresh cohorts and global possibilities. As replacement, though, the risk is clear. Unembodied rights simply do not exist. It may be sentimental of me, but I believe that the historic links between democracy and spatiality must be retained not simply in the interests of justice but in defense of architecture.

If we're not spacemakers, what are we?

Michael Sorkin, a practicing architect in New York, is former architecture critic for The Village Voice, author of Exquisite Corpse, (Verso, 1991), and editor of Variations on a Theme Park (Farrar, Strauss & Giroux, 1992).

we're no longer bound by use-based imperatives, if space really can be configured far more freely, then not only will we be able to find new forms with greater abandon, we will be able to reimagine the very basis for building. Instead of a pan-electronic octopus with power at its center, let us struggle for the more democratic fantasy of polycentrism, a web of relations that guarantees rather than obliterates our rights.

Under these fresh

circumstances, the city

can come to be under-

ALBUM

The tomb terminates a street of mausoleums (right). The openair interior (below) consists of a series of stepped, acentric circles.

CIULA FAMILY MAUSOLEUM

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This tomb for the Ciula Family in Viterbo, Italy, designed by Swedish architects Anders Wilhelmson and Ingrid Reppen, shows that, though possibly dead, God is certainly not forgotten. The small, sixsquare-meter (64.5-square-foot) structure powerfully evokes, in a highly abstract manner, a long tradition of Christian symbolism related to death.

Terminating an avenue of mausoleums, the travertine-clad masonry block has a narrow opening in its shadowy, bush-hammered face, giving access to a light-filled, one-meter-wide space that steps up in a series of acentric circles to the sky. One of the circular steps projects forward to hold, on axis with the entrance, a flower vase and a dedication to two family members buried in the chambers.

Wilhelmson points to the many religious symbols. The narrow entry, he says, represents passage into the next world, and the concentric circles suggest the heavens. But symbolism aside, this small structure is a lesson in how much can be accomplished with the most minimum of means. Thomas Fisher



SECTION THROUGH BURIAL CHAMBERS



PLAN SHOWING CIRCULAR MEDITATION SPACE



One of Frank Lloyd Wright's last buildings was also one of his smallest: the Seth Peterson Cottage, a one-bedroom, 800-square-foot structure adjacent to Mirror Lake in Wisconsin, now run by a nonprofit conservancy for use as vacation rental property.

The recently completed restoration, directed by Chicago architect John Eifler, revealed the cottage's tectonic shortcomings. For example, Wright rested the roof's cantilevered joists on the plywood transom panels – two layers of ³/₄-inch Douglas fir – which acted as small trusses between the load-bearing window jambs. He also placed a masonry mass at the bottom of the sloped roof without proper flashing, created cantilevered corners without adequate framing, and detailed the roof without provision for its ventilation. As a result, the roof had to be rebuilt with steel flitch plates at the corners, joists bearing directly on the studs, and a cricket where the roof meets the masonry wall.

When you see the restored cottage, however, you can forgive Wright his technical lapses, for it lifts your spirits. **Thomas Fisher**

The cottage consists of a single sloped-roof space with a small bedroom under a flat roof at the rear (above). The restored interior contains furniture Wright designed for the cottage plus new pieces designed by John Eifler to match (top).





YUKON VISITOR RECEPTION CENTER

Built along the Alaska Highway, this new visitor center, designed by Calgary architects Jenkins & Sturgess in association with FSC, Groves, Hodgson, Manasc of Edmonton, makes several references to the geography and traditions of its place. The onestory structure contains a tent-like entry porch, whose glulam bents are covered by fabric in summer; a drum-like wash pavilion, with a central, toplighted space and a series of individual restrooms; and a curved, hull-like display hall culminating in an audiovisual presentation room.

The curved and pointed forms of the building and its use of fabric roofing, wood framing, vertical board-and-batten siding, and copper cladding refer, says Jeremy Sturgess, to the Yukon's traditional dependence on boats and airplanes for transportation and on tents and log buildings for shelter. Its long, rounded shape also recalls the Grey Mountains visible through the structure's eastfacing glass wall. "This building is about balance," says Sturgess, not the least of which is the balance it successfully strikes between nature and culture. **Thomas Fisher** The reception center (above) recalls building forms associated with the Yukon.



SECTION THROUGH EXHIBIT HALL AND WASH PAVILION



Books

Fin de Siècle Puerto Rico

On Classicism's Behalf

A wealth of classical architecture in the Caribbean comes to the fore in a review by **John Loomis.**

Demetri Porphyrios writes that Classicism is the essence of good construction. Whither Modernism?

Books of Note

Yesterday's Houses of Tomorrow: Innovative American Homes 1850 to 1950 by H. Ward Jandl, Preservation Press, National Trust for Historic Preservation, Washington, D.C., 1991, 216 pp., \$29.95. Twelve prototype houses, designed to reconfigure domestic space, are examined and documented.

Morris Lapidus: Architect of the American Dream *edited by Martina Duttmann and Friederike Schneider, Birkhäuser Verlag, Boston, 1992, 247 pp., \$79.* Lapidus's predilection for theatrics is generously documented in this monograph. An interview with the architect reveals the lively imagination that generated the Fontainebleau Hotel in Miami Beach and other design fantasies.

The New Finnish Architecture by Scott Poole, Rizzoli, New York, 1992, 224 pp., \$50 cloth, \$35 paper.

A survey of contemporary work is supplemented with three essays (one devoted to Alvar Aalto) examining the history of the Modern Movement in Finland.

Urbanism and Industrial Culture/Industry and Urban Culture edited by Vitra and the City of Weil am Rhein, Birkhäuser Verlag, Boston, 1992, 117 pp., \$77. The relationship between Vitra, a Swiss furniture manufacturer, and its hometown – documented with proceedings from a workshop held in 1991 – makes a valuable case study.

Puerto Rico 1900: Turnof-the Century Architecture in the Hispanic Caribbean 1890–1930 by Jorge Rigau, Rizzoli, New York, 1992, 232 pp. \$50 cloth, \$35 paper.

Spanish fortresses and cobblestoned colonial streets are the stereotypical images that most people associate with the architecture of Puerto Rico. But apart from this colonial heritage, rich as it is, a wealth of architectural and urban culture has remained relatively undocumented. *Puerto Rico* 1900 opens up some of these layers of architectural history and adds to the expanding canon of an international, multicultural urban discourse.

Puerto Rico 1900 is not another folksy book about Caribbean or Latin style, but a serious investigation of the transformation of architecture and urban space when the island was radically transformed. The book covers the years when Puerto Rico exchanged its dependency on Spain for a new dependency on the United States, a time of radical transformations in politics, economics, and culture. Style, so often the mechanism through which architecture of this period is framed, is rejected in favor of a multi-disciplinary approach that embraces socioeconomic history, literature, cultural history, and architectural and urban typology. This approach dismisses the narrow "eclectic" classification given to 19th-Century architecture in favor of a diverse analysis. It provides a new lens through which the wider phenomenon of the period's architecture can be considered.

Employing this diverse methodology, the book moves not linearly through history, but laterally across five themes that form its chapters. The first, "Prefigurations of a New Urban Realm," examines the laws that formed the 19th-Century Puerto Rican town. It presents local manifestations of urban form in light of European developments under Haussmann, Cerdá, and others. Rigau also traces the subsequent decline of Puerto Rico's urban realm and public life, which were formed by the urban design (continued on page 131)



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Classical Architecture: The Living Tradition by Demetri Porphyrios, McGraw Hill, New York, 1992, 155 pp., \$52.50.

Good architecture is a balancing act of allusion and structural rigor. Well designed buildings illustrate the way they're made, but don't stop there; they tell us something about the way we inhabit the world as well. Classicism, according to Demetri Porphyrios, has always performed this hybrid role best – and still does today. Modernists would reply that abstraction is more potent than the figurative. More important, they'd cite industrial technology as their mandate, an inspiration for radical manipulations of space and form.

Classical Architecture, which Porphyrios adapted from six of his lectures, responds to many, but not all, of the Modernists' claims. This is, nonetheless, a solid book, an apologia for those empathetic to the cause of Classicism today. Its intellectual dividends extend to Modernists, as well: Porphyrios has written an erudite argument for humanistic architecture, all the more valuable today, given the testimonials we hear about humanism's eclipse. Porphyrios stands his ground: he writes that lasting truths remain as valid for architecture today as they were before Classical humanism was jettisoned by the profession. He concurs with Deconstructivists that presenting Classical standards promotes an ideology - and then adds that every architectural proposition, including theirs, does the same. Why, he asks, cast aside the successes of Classicism (particularly in urban design) when its replacement offers an immature canon? Take away Classicism's layers of metaphor, and we're obliged to a Modern syntax of design that Porphyrios finds ostensibly liberating, yet ultimately impoverished.

Classical Architecture will enrich your appreciation for the West's centuries-old building tradition. But it shortchanges Modernism. For all his analysis of architecture as a craft-rooted design sensibility, (continued on page 131) 111

Books

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ADVERTISING

Cladding and Related Products Literature Digest



Buchtal Ceramics's 1993 product catalog is now available. An extensive line of glazed and unglazed ceramic tiles is depicted in this four-color, 20-page catalog through dramatic installation photographs, detail drawings, a color palette, and size chart. A new section featuring Keraion/Novachrom large format tiles (ranging in size from $2' \times 2'$ to $4' \times 4'$) is included.

Buchtal Ceramics. Circle No. 340





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Composite Technology. Circle No. 343



Dryvit Systems, Inc., the leading manufacturer in the exterior insulation and finish systems (EIFS) industry, announces the publication of an informative, full-color brochure. It describes the energy efficiency, design flexibility, and low-mainentance characteristics of Dryvit's high-performance residential siding systems as well as a wide range of decorative, yet functional, coatings. **Dryvit Systems, Inc.** Circle No. 344



The 1993 EFCO Product Catalog is important for selecting Division 8 products. It features photographs of new and retrofit projects along with detail drawings and product information. It also includes complete product descriptions, specifications, performance ratings, lab test results, and options for the entire line including historical replications. For your free copy call (800) 221-4169. **EFCO.** Circle No. 345



Architectural copper applications are portrayed in the *Comprehensive Resource Handbook and Video Program*. The handbook contains updated details and specifications in hard copy and CAD formats, while the videos offer an on-site look at system installation techniques.

Copper Development Association. Circle No. 342



A myriad of project applications are majestically enhanced by this collection of 16 Endicott thin brick colors. Genuine, kiln-fired thin brick possesses all the durability and elegance of Endicott face brick, yet weighs considerably less. It has also been tested according to ASTM-C1088–88 specifications and meets Type TBX requirements. Endicott Clay Products. Circle No. 346

ADVERTISING



Offering the roughly textured, asymmetrical appearance of hand-molded brick, this collection of 17 beautiful face brick help create the charming atmosphere of another place and time. To learn more, order a free Collection brochure.

General Shale Brick. Circle No. 347



Louisiana-Pacific's wood windows and patio doors are available with three types of exterior finishes including aluminum cladding, factory-applied high-performance coating, and primed wood. They are available in basic styles and custom shapes, and with rounded tops. Double insulating glass is standard with all products, though high-performance glass is available. Louisiana-Pacific. Circle No. 351



Neoparies, a wall cladding that is as practical as it is beautiful, is introduced in a four-color, four-page brochure from N.E.G. America. The brochure provides valuable information concerning Neoparies's stunning appearance, superior weather resistance, durability, zero water absorption rate, amazing design flexibility, and product specifications. **N.E.G. America.** Circle No. 354 Exercised of the second of the

This brochure highlights construction techniques and design considerations that help make the basement into a livable space. By using these recommendations and Koch Materials's Tuff-N-Dri Exterior Foundation Waterproofing System, leaks in basement walls can be eliminated. The system comes with a 10-year limited warranty. **Koch Materials.** Circle No. 348



Thin stone systems for exterior cladding are available from Marble Technics. Vacuumimpregnated epoxy and steel mesh reinforcing applied to thin sheets of natural granite only 5/16" thick transforms thin stone into a strong, lightweight (4.5psf), non-brittle, and impermeable cladding material. Extruded aluminum framing provides structural stiffness and facilitates attachment to the wall. **Marble Technics, Ltd.** Circle No. 352



Starphire glass from PPG is a glass of unmatched clarity and brilliance. The glass transmits the true colors of everything around it when used in interior panels. As a furniture material, Starphire's light blue edge provides unmatched elegance. Starphire is designed to redefine elegance. **PPG Industries, Inc.** Circle No. 355



Colored grouts in more than 40 classic and designer tones are presented in this sample color chart. LATAPOXY Spec-L Grout, the first and only multicolor grout, offers a range of non-fading, non-staining designer blends to complement virtually any application of ceramic tile, quarry tile, pavers, brick, or stone. Laticrete. Circle No. 349



See the latest indoor and outdoor applications for vitreous (less than three percent absorption) unglazed ceramic tile from Metropolitan Ceramics. METRO® Accents is a new, colorful selection of hand-glazed accent tiles designed for use with Metropolitan's IRON-ROCK® and METRO®Tile unglazed tile. This brochure also includes color swatches, performance specifications, trim shapes, and more. **Metropolitan Ceramics.** Circle No. 353



Petersen Aluminum offers a full-color, 32page brochure featuring their complete line of quality metal roofing products. PAC-CLAD Kynar 500[®], backed by a 20-year non-prorated warranty, is available in 24 standard colors. Three production facilities enable Petersen to offer unmatched service, economy, and product availability. **Petersen Aluminum.** Circle No. 356

ADVERTISING



Innovative designs can be made simply and economically and are easy to install with PLASTRGLAS Glass Fiber-Reinforced Gypsum. A complete line of columns, domes, coffered ceilings, capitals, and light shelves are offered; they are engineered to meet the most exacting architectural specifications for interior and exterior use. Products are shipped in special crates to avoid handling problems. PLASTRGLAS, Inc. Circle No. 357



SupraCem[®] flat and profiled fiber-cement building panels are not affected by humidity, moisture, temperature variations, caustic chemicals, salt air, ultra-violet light, rust, or rot. The panels are non-combustible, do not emit toxic fumes, and have a FMRC Windstorm Classification of I-90. Flat sheets, corrugated panels, interlocking panels for roof deck systems, and cooling tower elements are available.Supradur. Circle No. 359



Wind-Lock's Wind-Devils mechanically attached expanded polystyrene can be used with exterior insulation finish systems. Its fasteners reduce or eliminate most wall preparation and can be used in conjunction with adhesives. A free sample kit includes product samples, spacing patterns, application information, and test data.

Wind-Lock Corporation. Circle No. 362



REYNOBOND® panels are featured in a new color brochure from Reynolds Metal Co. Extremely flat and formable, the panels are used as cladding, soffit, fascia, column covers, and beam wrap. REYNOBOND® FR is available with a fire-resistant core which qualifies as a Class A material, exclusive of the aluminum skins.

Reynolds Metals Co. Circle No. 358



This 20-page brochure provides a detailed description of Durock ExteriorSystems. The systems are lightweight, fire-, moisture-, and impact-resistant cement board substrates suitable for residential and light commercial projects. The panels can be finished with a variety of exteriors including ceramic or thincut stone tile, thin brick, stone aggregate, EIFS, and Durock Exterior Finish. United States Gypsum Company. Circle No. 360



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Alliance Ceramicsteel Interior Wall Panels provide you with the strength and durability of ceramicsteel in an easy-to-install "Butt Joint System." Eight pastel, eight small speckle, and three metallic colors and finishes are available.

Alliance America. Circle No. 335

Cladding and Related Products Literature Digest

Project

Lighting Fixture

Photo

American Family Insurance Company National Headquarters Location Madison, Wisconsin Architect Flad & Associates Affiliated Engineers, Inc. Pendant-Mounted Mod-44, 4" x 4" indirect lighting Charles Mayer

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Cerritos Center for the Performing Arts Cerritos, CA Architect: Barton Myers Associates, Los Angeles, CA Product: 717 Brilliant Black, 700 Glacier White and additional custom colors in custom size



ographer: Bob Shewach

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C

R A M 1 C S

New Products and Literature

New Products and Literature

New Products and Literature121Technics-Related Products126



An Illuminated Table

Designer William Prichett sees both Bauhaus and Art Deco references in his Metalum Table, the former for its philosophy of simplicity in design and manufacturing and the latter for its expressive curvilinear forms. The table's glowing legs and tough industrial elegance also suggest a Retro-Futurist sensibility. But beyond its formal attributes, it is Prichett's use of materials that makes the table so interesting. The tabletop $(3' \times 6' \times 1'')$ is constructed of Fireslate®, a concrete fiber material developed

in Germany for use in laboratories. It is cost-effective, heatand stain-resistant, and may be ordered in black, white, gray, oxide green, or rose madder with three edge options. The table's three 29-inch-high stainless steel rod legs provide structural support for the top while framing sleeves of epoxied canvas (other materials may be specified). The legs are illuminated with three 40-watt incandescent lamps. Power can be supplied by an outlet positioned under one of the legs. Metalum.

Circle 100 on reader service card



New Tabletop Light

"Cirrus" is one of three models in the recently introduced "Cloud Series" of lighting fixtures designed by Stephen Blackman. The white shade is constructed from 100 percent recycled paper; the metal base is available with a black or bronze finish. Lightning Bug. *Circle 101 on reader service card*



Furniture for Children

Architect Roberto Gil of Gil Associates, New York, has designed the "Tribeca Collection" of children's furniture. The soft maple and birch plywood pieces are finished with a nontoxic, water-based glaze. In the collection are an armchair with a tilt-up lid that reveals a hidden storage space, and an armless chair with a drawer in the seat. The chairs, tables, and sofa come in primary colors and other more subdued tones. Gil Associates. Circle 102 on reader service card



New Seating Series

The "Byron" chair, available in executive, conference, and office chairs, is one of six new seating series introduced by this San Francisco-based manufacturer. DF/m.

Circle 103 on reader service card



Rayon/Cotton Chenille

"Donegal Chenille," a 54-inchwide upholstery with a bouclé warp and chenille weft, is available in seven colorways – granite, maroon, indigo, bronze, hunter, eggplant, and taupe. Brunschwig & Fils. *Circle 104 on reader service card*

New Products and Literature

Multicolored Paint

Multicolored paint for interior or exterior applications is a spray-applied wall coating available in stock and non-stock preformulated colors. Custom colors may also be developed through a support program featuring the "MultiSpec Custom Color Palette" and the "MultiSpec Computer Color Selector" (the latter provides a laser print-out or an actual spray-out of the color being specified). Multicolor Specialties.

Circle 105 on reader service card

1993 CSI Catalog

The Construction Specifications Institute's 1993 Services and Publications Catalog is now available. It contains a comprehensive list of technical documents, educational materials, programs, and a calendar of events. CSI. Circle 200 on reader service card



Batik Textiles

Batiks from Indonesia are handcrafted in eight-yard lengths of cotton; fourteen patterns are available. S. Harris & Company. *Circle 106 on reader service card*

Wood Casegoods Catalog

Dimensions in Wood is a new catalog covering both traditional and contemporary wood casegood lines. Edge detailing, finishes, hardware, and molding treatments are illustrated and described. Panel Concepts. *Circle 201 on reader service card*



Detectable Warning Tile

The "Detectable Warning Tile" meets all requirements of ANSI A-137.1 and the ADA. Available in black, white, and yellow, this impervious, frost-resistant tile is $2^{1}/16'' \times 2^{1}/16''$ and may be ordered in $23^{1}/2'' \times 12^{3}/4''$ sheets. Dal-Tile. Circle 107 on reader service card

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Rubber, Vinyl Flooring Catalog

This comprehensive catalog of rubber and vinyl flooring products and accessories is new for 1993 and includes detailed product descriptions and specifications. An extensive palette of colors is available. Johnsonite.

Circle 202 on reader service card

Commercial Windows/Doors Brochure

Glazing options, and the complete line of casement, doublehung, awning, fixed frame and sliding windows, and sliding and hinged doors are described in Pella® Commercial Division: Your Source for Solutions. New for 1993, this brochure of heavy and light commercial products also includes a description of the manufacturer's support services. Pella.® Circle 203 on reader service card

New Carpet System

Peerless Carpet Corporation and Interface Flooring Systems have jointly founded Future Step Technologies, a carpet manufacturer. Carpet face, a stabilized backing material, and an installation catalyst are incorporated into a single system using the "TacFast"® system. A patented hook and loop system mechanically locks carpet to floors without glue, or other fasteners. Future Step Technologies.

Circle 108 on reader service card



Sound-Absorbing Masonry Units

"Acousta-Wal"® masonry blocks are sound-absorbing structural concrete masonry units with closed tops and exposed vertical slots. Two new models - "Type IS" and "Type III" - have metal septums inserted into each unit's cavities for improved level of sound-absorption. The products are designed to provide noise control in auditoriums, gymnasiums, and industrial plants. They are available as unfinished concrete or with a factory-applied glaze, ground face, or exposed aggregate finishes. Trenwyth. Circle 109 on reader service card

Snap-On Coping

"Hi-Tuff Cap"" is a new snap-on coping system for use on wood nailers or masonry or on top of concrete parapet walls. It has dual, non-curing sealant strips for added moisture protection. "Hi-Tuff Fascia,"® and "Hi-Tuff Edge"® metal roof edge products were also recently introduced. Stevens Roofing Systems Division, IPS Elastomerics. Circle 110 on reader service card

Compact Fluorescent Fixture

The new "Super Baflux,"® a compact fluorescent lighting fixture designed to produce as much power as fluorescent troffers, is available in two sizes (seven or eight inches in diameter). A parabolic reflector and a cross-baffle assembly require a shallow ceiling recess 43/4 inches deep. Edison Price. Circle 111 on reader service card

(continued on page 125)



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Detectable Warning Surfaces

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Window Products Guide

The 1993 edition of A Complete Window Guide to Andersen Windows & Patio Doors is now available. The book includes product photos, descriptions, size charts, detail drawings, specifications, and performance data. The "Vent/Tilt Roof Window" and "Andersen® Feature Windows" are among the new products presented. Andersen.® *Circle 204 on reader service card*

Elevators and the ADA

The A.D.A. from A to Z is a new piece of manufacturer's literature on making elevators and escalators in existing buildings comply with the Americans with Disabilities Act. An ADA audit section is included to help with on-site evaluations. Montgomery. Circle 205 on reader service card

1993 Flooring Brochure

This new brochure of rubber flooring products includes specifications, installation guidelines, and warranty information. It also includes information on "Constellation," a new line of matching rubber tile and stair treads with a random speckled pattern. Burke. *Circle 206 on reader service card* (continued on next page)



Progressive Architecture 4.93

Technics-Related Products

The products listed here complement the Technics articles on cladding (see p. 51).



Wall System

Glass, stone, ceramic tile, and other cladding materials can be attached with structural silicone to "Cygnus," a prefabricated, galvanized-steel frame system. The system consists of a galva-



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nized steel deck supported by light-gauge steel stud framing. Eastern Exterior Wall Systems. *Circle 114 on reader service card*

Aluminum Curtain Walls

"Facade" is a curtain wall system of flat aluminum composite panels with a complete extrusion support and fastening system. "Facade 100" is a wet-seal system hung from the top support members and has no edge grip fastening. "Facade 200" is a dry-seal system with weatherseals and continuous extruded aluminum internal gutters that provide a secondary drainage system for the wall panel. E.G. Smith.

Circle 115 on reader service card



Reinforced Stone Cladding

Developed by Technomaiera of Turin, Italy, the "Reinforced Stone" system is a composite panel, for exterior cladding and interior wall floors. "RS1," one of three versions of the system available, is a 5/16-inch composite sheet of thin natural stone, marble, or granite reinforced with galvanized or stainless expanded steel mesh and epoxy resin. Applicable as exterior cladding, curtain wall systems, walls, floors, soffits, and partitions, "RS1" can be attached to structural elements using a patented clip that provides a positive mechanical attachment through the steel mesh into the stone. Marble Technics. Circle 116 on reader service card (continued on page 128)

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(continued from page 126)



Building Envelope Products Brochure

This new brochure covers a wide range of building envelope products including coating systems, ribbed metal roofing and siding panels, concealed fastener panels, interior liner panels, curved panels, and standing seam roof systems. Panel guide specifications, color charts, maximum span data, and other information is provided. Steelite. *Circle 207 on reader service card*



Curved Metal Panels Nearly one hundred varieties of building panels can be curved, including standing seam and batten-seam concealed-fastener panels. Simple and complex curves can be specified for 29- to 18-gauge panels ranging from ³/4 to 4 inches in depth. Stainless steel, painted or unpainted galvanized steel, aluminum, anodized aluminum, and aluminized steel can be curved. Curveline. *Circle 117 on reader service card*



Window and Curtain Wall System "Visionwall"[®] is a high-performance window and curtain wall system. It consists of a glazing unit with two layers of glass (reflective or tinted) and two low-E films suspended in an insulated aluminum frame. An extruded EPDM gasket system is designed to ensure the continuity of the building's air vapor barrier. Visionwall Technologies. *Circle 118 on reader service card*



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"Squareline" is a new line of profiled metal (steel or aluminum) wall panels with a concealed fastener system. Available with either two-inch or five-inch vertical ribbing, the panels come in a standard 12inch width and 1½-inch depth. Custom orders can also be accommodated. The panels may be used in single-skin applications or in composite wall systems. N.A.T. Industries. *Circle 119 on reader service card*



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128

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Books *Puerto Rico (continued from page 111)* codes of this period.

In the second chapter, "On Being Modern in the Caribbean," literature is used as a revealing vehicle through which to view the period's architecture. Insightful parallels illustrate how architecture, like literature, critically appropriated and transformed (or deformed) European and other cultural models in the quest for an identifiable regional modernismo.

Literary works by Rubén Darío and others are used to support this thesis; they add meaning to the period's architecture, characterized by volumes linked by transparent layers (*mediopunto*), the integration of interior and exterior space (courtyards, balconies and porticos), and the liberal reinterpretation of Spanish, Moorish, and Oriental vocabularies.

"Coming Home to Build," chapter three, introduces the reader to works of individual architects: Juan Bértoli, Manuel Domenech, Antonín Nechodoma and Alfredo Wiechers. Rigau does not hesitate to dismiss Nechodoma for his often flagrant cribbing of Frank Lloyd Wright. The author's clear favorite is Wiechers, born in Puerto Rico of German and Catalan heritage and educated in Paris; his residential architecture showed great concern for connections to the street and the relation to the city as a whole.

The urban realm, specifically the street, returns to focus in chapter four, "The Harvest." Puerto Rico's rich regional vocabulary is examined: porticos and balconies provided a semipublic layer to mediate between the public street and the private residence. The analytical street sections graphically illustrate the typology of these spaces. This chapter also analyzes the development of layering in residential space, especially through the device of the mediopunto, and its relationship to plan typology.

Puerto Rico's public schools are important to this period because they were direct imports from the United States, and the most important public works projects sponsored at the time. These schools provided access for

many to education that had been unavailable under the Spanish, but they were part of a political and cultural policy to "Americanize" the island. Furthermore, as object buildings, the schools broke with the Spanish urban context (a symbolic act of cultural hegemony) and pointed the way for further development on the island based on North American rather than local typology. The political dimension of these issues is discussed tactfully. A further in-depth examination of the cultural contradictions and tensions between the United States and Puerto Rico during this period would have been interesting and especially instructive to North American readers who are, sadly, unfamiliar with Puerto Rico's history.

The book concludes with "Spanish Revival as Spanish Denial," a provocative chapter that addresses the final irony of a Latin style imported from the United States. Spanish Revival was invented as a nostalgic image of a fantasy past, all this a mere 20 years after Spanish influence in Puerto Rico had been replaced by that of the United States. Rigau emphasizes that this embrace of style and the object building, coupled with the rejection of typology and urban continuity, denied Puerto Rico the richest part of its heritage, an urban culture that celebrated the street as the locus of public life. **John Loomis**

The author is a professor of architecture at City College of New York and an associate with KCA-Architects.

Books Classicism (continued from page 111) Porphyrios says nothing about Mies van der Rohe, Louis Kahn, or SOM, who reconciled traditional values with Modern design.

Unlike them, Porphyrios seems to say that the figures of Classicism are as fundamental as its syntax. Perhaps another chapter to Porphyrios's book is in order, one that synthesizes modern construction and literal Classicism. His polemic, which is sound, as far as it goes, would then mandate a broader response from the profession. **Philip Arcidi**

Civic Centers (continued from page 102)

the open spaces are too big and too devoid of markers for human scale. The Y.M.C.A. offers the only building entrance for the length of the first block of Holly Street. Its counterpart, the 1922 Y.W.C.A. building by Julia Morgan, on the opposite corner of Holly Street, faces Marengo Avenue, so that pedestrians are here mainly because they just found a parking place.

To remedy all this, the architects propose giving Centennial Square the same kind of visual excitement that Plaza las Fuentes has. To reduce the size of the square they will line it with a 20-22-foot-high arcade made of durable materials that will withstand heavy public use. The arcade will have decorative paving along with seating either integral with the walls or freestanding. Masonry bollards 48 inches high will delimit the inner area of the plaza, and vehicular access to the center will be accommodated on days when the festivals and the market that the architects envision take place. As for Holly Street, the roadway will be reduced to two lanes to make room for a wide pedestrian promenade down the center, punctuated with planting beds or water pools. Along the way there will be nooks and alcoves for commissioned artworks and street furniture.

All this urban finery will be for naught, the architects assert, if the resident population of the civic center area does not grow. The plan proposed housing for several sites, and as of this writing the first residential development is under construction. Called Civic Center West, it is sited two blocks west of the city hall (see plan, page 100) and abuts Memorial Park to the west. The project will provide 358 new apartment units, designed by Johannes Van Tilburg & Partners, and will rehabilitate the former hall of justice into 16 loft apartments. Seventyfive of the units will be for very low income tenants. On the corner of the site at Holly and Marengo Streets, the Janss Corporation, project developers, will also build 11,000 square feet of retail space. This high-density development will terrace over the existing railroad tracks, which at some future date will be part of a light-rail system to downtown Los Angeles with a station handy to the complex.

As for the recent additions to the area, the obvious and important one is the new public safety building (police station), designed by Robert A. M. Stern and completed in 1990. Unlike most of its ilk, this is a bold but not an intimidating building. Giant volutes accent its corner tower on Walnut and Garfield Avenues. The main entrance faces a mini-park with gravel and paving that lies between it and the former Central Gas Company building of 1929, diagonally across from the city hall. This small square, designed by Campbell & Campbell, has a stone water channel crossing it that terminates in a vertical sculpture near the Garfield Avenue sidewalk. The sculpture seems curiously stunted, given the formality of the space and the monumentality of the adjacent public safety building. Currently the park has a pro forma quality, but the conversion of the former utility building, an elegant Renaissancerevival box, for commercial use may bring users to enjoy the park.

So much has been promised and so many architectural invitations have been sent out that one feels confident that Pasadena's public life will blossom like the roses of its famous annual parade in the coming years. But much also depends, as we saw in Beverly Hills, on the city's holding fast to its good intentions and bolstering them with adequate funds to create attractive settings and community facilities. Charles Moore's words should be prominently displayed in public places because he was right: "You Have to Pay for the Public Life." Sally Woodbridge

The author is P/A's Bay Area correspondent, and has also written on recent architecture in Japan. Her most recent book is Bernard Maybeck: Visionary Architect, 1992, Abbeville Press.

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Furthermore ...



Till the Short Fellow Sings On April 21, the Madison, Wisconsin, Opera Guild presents the world premiere of Shining Brow, an opera about Frank Lloyd Wright. Written by Daron Aric Hagen and Paul Muldoon, the opera depicts Wright's life from 1903 to 1914, beginning with the construction of the Cheney House and ending with the tragic Taliesin fire that killed Wright's inamorata, Mamah Cheney, and her children. Shown at left is David Birn's set design for Act One, Scene Two, when a portion of the Cheney House is built on stage.





This Is a Plug You've seen the winners (P/A, Oct. 1992, p. 73), now see the show: P/A's New Public Realm exhibition, featuring 30 visionary proposals from last year's competition, has been on the road since October. If you missed it in Washington, D.C., San Francisco (above), or Los Angeles, don't worry. The exhibition, currently in Denver (see News Report, p. 19), will travel to Miami, Chicago, Boston, New York, Toronto, and Jackson, Mississippi, through the spring of 1994. Watch P/A for dates and places. Martian Microcosm New from the drawing board of Phil Hawes, the Arizona architect who designed Biosphere Two, is "Marsphere" (above), a vacuum chamber where the pressure, atmosphere, and temperature of Mars could be replicated. Researchers could be replicated. Researchers could be replicated. Researchers could be replicated. Researchers could experiment with creating habitats, mining, developing equipment, and breeding plants, says Hawes, adding that Marsphere could, like Biosphere Two, attract tourists by opening part of the facility to the public.

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P/A in May

Next month's issue will feature a remarkable house in Brentwood, California, by Eric Owen Moss. The article will explore Moss's endeavors in "experimental architecture." Also in the issue:

 a duplex apartment by Krueck & Sexton in Mies van der Rohe's 860 Lake Shore Drive apartment building in Chicago;

 a Catalan Modernist building in Barcelona restored for the Tapies Foundation by Roser Amadó and Lluís Domènech;

 a Critique of the Society Center complex in Cleveland by Cesar Pelli & Associates;

 an Emerging Talent feature on Boston architects Sheila Kennedy and Frano Violich;

 a Computer Focus with articles on the A/E/C marketplace, emerging technologies, new client relationships, and CAD performance tests.



What departed building do you miss the most?

What building's destruction (at human hands or by act of God) really sticks in your craw? Send your nomination (a photo would be a plus) before June 15 to Furthermore Editor, P/A, 600 Summer Street, P.O. Box 1361, Stamford, CT 06904. We'll print the most intriguing responses in Furthermore in August.