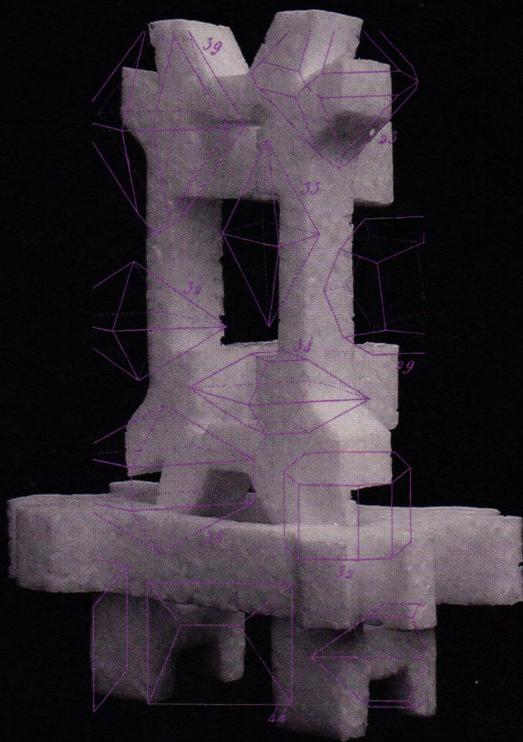


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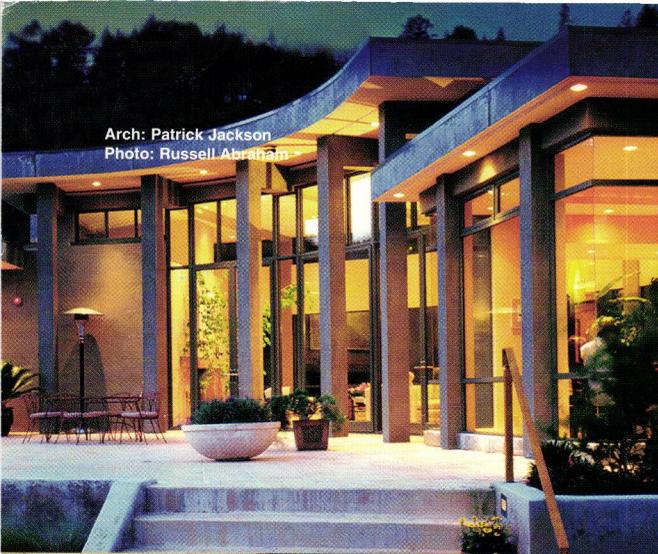
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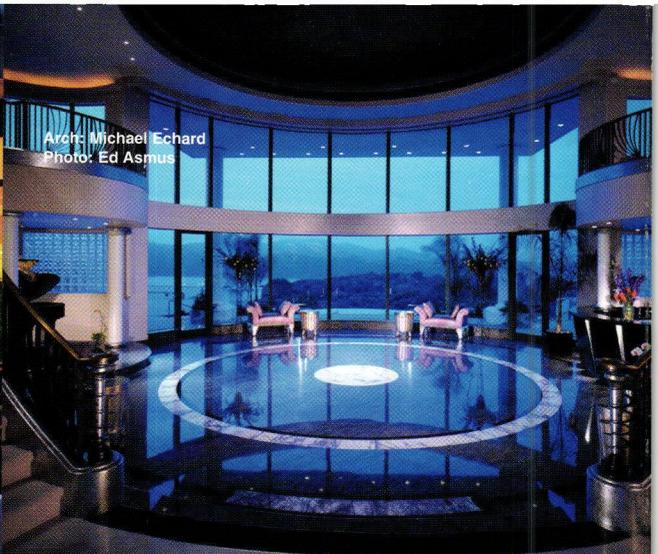


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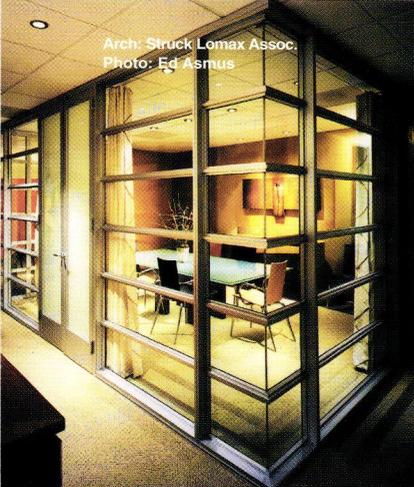
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- \* Of Transgenic Spider Webs and Bicycle Seats
- \* What Counts as Green? (and Why?)



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# Comment

"Incompetent, irrelevant, and immaterial," Hamilton Burger used to say, on the old Perry Mason show. "Immaterial," here, meant "of no substantial consequence." Stuff becomes material when it is of substantial consequence, when it is brought to bear, put to use. Materials can become material, but so can other things—ideas, methods, strategies.

Accordingly, the title of this issue of *arcCA*, "New Material," encompasses many things. New materials, of course, but also new ways of thinking about materials, old or new, and new ideas, as represented in the 2002 AIACC Design Awards.

Because the Design Awards—as well as "Under the Radar"—are so intensely focused on buildings, three of our other articles step away from architecture, to seek insight from the discipline of product design. A fourth article steps back from the eager application of green building guidelines, to question the comprehensiveness of those guidelines as they are currently being applied in the U.S. And, for the Coda, we present a "Green Map" that will help residents of the Ballona Creek Watershed find, among other salutary things, a place to dispose properly of *old* materials.

Like every issue of *arcCA*, this one bites off more than it can chew. For those who want to explore architecture's materiality more critically, the bibliography that follows may be of some help. I don't usually recommend my own articles (especially in such company), but one turns out to be material—er, relevant—here, so I've included it.

You should also check out the research work of Kieran Timberlake Associates LLP, of Philadelphia, the first recipients of the Latrobe Fellowship from the College of Fellows of the AIA. The fellowship sponsors a research initiative, in which they are evaluating, "for potential transfer to the building realm, a wide range of technologies (including both process innovations and cutting-edge material applications) used beneficially in other industries including automotive

manufacturing, aerospace and shipbuilding." For more information, go to <http://mb2010.com>.

For a proprietary material information database, Kara Johnson, author of "From the Science of Materials to Design," suggests you check out the Cambridge Engineering Selector at [www.grantadesign.com](http://www.grantadesign.com).

In the Bay Area, a timely show is running at CCAC's Wattis Institute through 10 January 2003. Curated by Adi Shamir and Marina McDougall, "In the Making" is an exhibition of artists and designers who experiment with tools and materials, conducting their studios like research laboratories. For more info, see <http://www.ccac-art.edu/wattis/exhibitions>.

Finally, I should mention that my whining, two issues back, about being unable to find someone to write a profile of citizen architect Michael Stepner, FAIA, has paid off. His profile appears in this issue, better late than never. ●

Tim Culvahouse, AIA, editor

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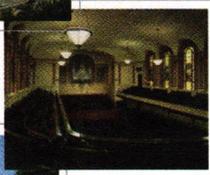
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# Contributors

**Tylor Garland** is founding principal of boomBang, a creative incubator that develops, patents, and solicits venture capital to build enterprises around innovative products that are informed by new and emerging materials and technologies. He was previously Managing Director of Product Development for frogdesign.

**Kara Johnson** is the Materials Lead at IDEO, an innovation and design consultancy. Her role is that of supporting designers in the selection of materials and introducing unique methods of integrating materials in the design process.

**Hal Levin** is a research architect and consultant with his own firm, Building Ecology Research Group, in Santa Cruz, and an Architect-Engineer/Scientist at Lawrence Berkeley National Laboratory. In the 1970s and '80s, Levin taught in the Architecture Department at UC Berkeley and in the Board of Environmental Studies at UC Santa Cruz, and for 8 years he served as a member of the California State Board of Architectural Examiners. He has been elected a Fellow of ASHRAE and ASTM. His "Building Ecology is My Destiny" appeared in *Architecture California*, vol. 17, no. 1 (May 1995).

**Elizabeth Martin** is creative director of Alloy Design & Technology, a multi-disciplinary design firm focusing on building, new technology, and craftsmanship. In addition to practice, Liz is the director of the new, Los Angeles-based A+D Architecture and Design Museum, located in the historic Bradbury Building.

**Lynne D. Reynolds, AIAS**, is a second-year student in the architecture program at CCAC (California College of Arts and Crafts) who spent most of the previous two decades as a professional photographer of furnishings and interiors.

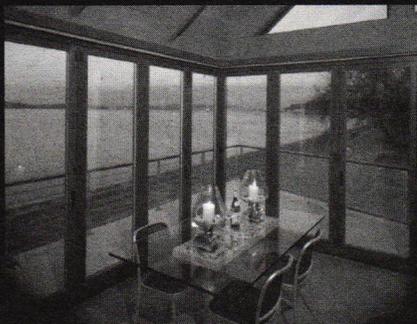
**David Sokol** is a New York-based writer who regularly contributes to *Architectural Record* and *Metropolis* magazines; he has also written for *Oculus*, *Architecture*, and *Grid*. Currently, Sokol is an associate editor at *Shopping Center World*, a real estate and retail design trade magazine.

**David Thurman** is a Senior Associate at Barton Myers Associates.

**Therese Tierney, Associate AIA**, holds a Bachelor of Landscape Architecture degree from UC Berkeley and a Bachelor of Architecture degree from CCAC. She is currently a student in the Master of Architecture program at UC Berkeley. She writes frequently for **arcCA**.

**Rosado (Rosie) Wiseman, CPS**, a Certified Professional Secretary, has been administrative assistant to Michael Steper for 13+ years, having accepted that challenge when both were employed by the city of San Diego.

[take a closer look]

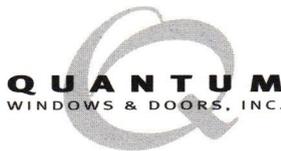


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# Correspondence

re: 02.1, Image Mirror

In *arcCA* 02.1, you noted the lack of humor in today's architectural world. I concur. But let's not get me started on the differences between today and the architectural milieu that existed before I reached Emeritus status in the AIA. For all these years, I have saved a copy of a cartoon from the May, 1977, issue of the Santa Clara Valley chapter's newsletter. Two characters who look like architects are chatting—drinks in hand—at a party of some sort. One is saying to the other, "What would I do with a million dollars? Why, I guess I'd just keep on practicing architecture until it was all gone." Please note that in those days a million dollars was a significant amount of money.

**Carroll S. Rankin (Mr.), AIA(E)**  
Palo Alto

I read the professional practice issue of the CA quarterly journal and indeed enjoyed the comments by the non-architects. It is an interesting way to humble oneself. The issue will be passed on to the rest of the Registration Board and any others with whom I may be in contact.

**Dana M. Newbrook, NCARB, AIA**  
Secretary, Rhode Island Board of Examination  
and Registration of Architects

re: 02.3, Building Value

I enjoyed the 02.3 issue of *arcCA*, particularly the essays on preservation and contemporary design, since this is a topic that generates much discussion in Pacific Grove, the community where I practice.

May I offer a comment on the graphics of this issue? Having just suffered through several issues of the national on-line newsletter *AIArchitect*, in which yellow text was presented on the white background of our computer monitors, I can't let the same go by without comment. Yellow is very hard to read against a white background, even when the color is more of an orange-yellow, as in this issue. But combining that color combination with the extremely small font size used with the photo captions made it impossible to read. Please have pity on our tired eyes and switch to a more functional color combination and font size.

Thanks for your consideration, and keep up the good work.

**Bill Foster, AIA**  
Flesher + Foster Architects  
Pacific Grove

[Editor's note: the following reader also noted problems with typography. He goes on to say...] I wonder at the inclusion of the Rodriguez Community Center—a simple pedestrian structure that is described in hyperbole and grandiose conceptual jargon. The pictures, as gray and bland as they are, convey a message of lack of attention to detail and poor workmanship and the contrast between them and the text is very strange.

I have enjoyed this publication over the years and have kept copies for future reference. This one will be kept as an example of poor [graphic] design and unctuous self-importance, but I know that your group can do better, and I look forward to the next edition (but with some trepidation). I am aware that it is easier to criticize than it is to produce a great product, but your magazine represents all of us, and I think it needs feedback to be as wonderful as possible.

**William E. Patnaude, FAIA**  
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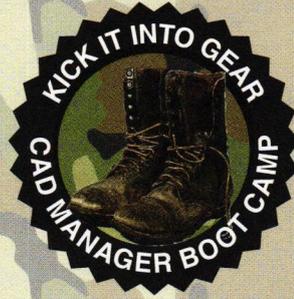


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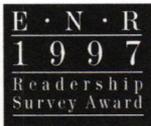
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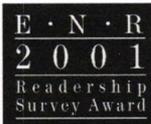
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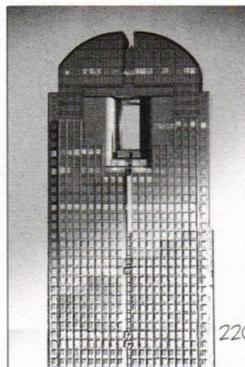
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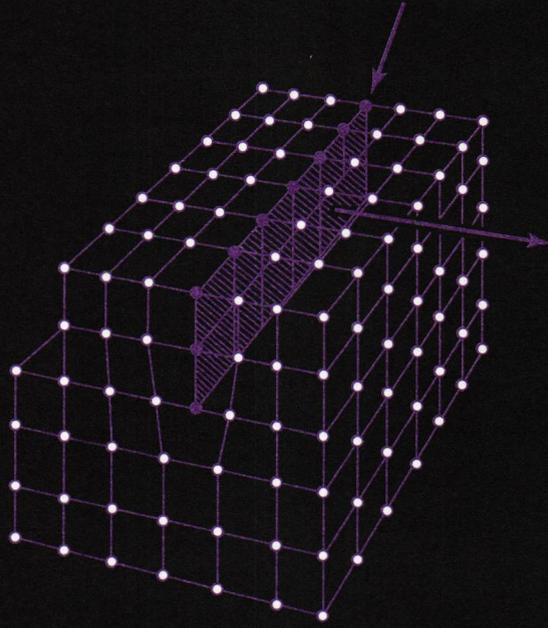
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# Of Transgenic Spider Webs ...and Bicycle Seats

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Tylor Garland

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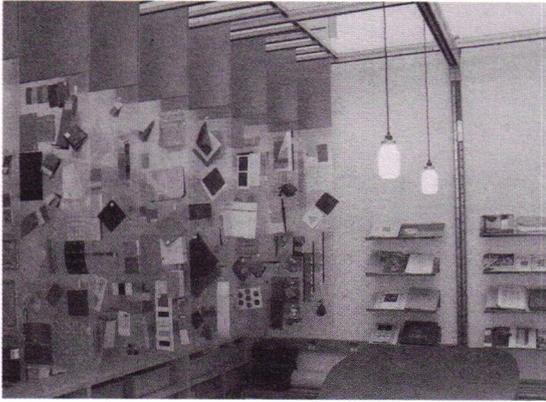
Take a look at many of the great pioneers in the design and architecture world, and more often than not you will see a thread of commonality: it's an awareness and re-assimilation of materials science and sensibilities. By re-assimilation, I mean a sort of cross-pollination of materials and technologies among tangential industries. The Eameses were the first to shepherd bent plywood into the furniture and military industries with their now iconic chairs and splints. Michael McDonough, AIA, borrowing from nature's toolbox, has found ways to conceive a wide variety of structures from unexpected natural resources like bamboo. Frank Gehry, FAIA, snatched fame with the application of aerospace technology and substrates; Gaetano Pesce with his goo; Marcel Wanders with something as commonplace as a sneeze. (His line of "snot" vases shocked and delighted the art world.)

Having been in the design consulting business for a decade and teaching college design classes for a few years, I've noticed a new guard of material rebels rise through the ranks. The fuel for their creativity is deeply seated in a hunger not only for new materials, but also new technologies and manufacturing processes that are hidden from commercial application. I believe the next wave of mega-designers will be defined even more by their ability to shift industry paradigms, solve consumer problems, and build sustainable business through

new material and technology application. The challenge that I've run into in my own design pursuits is that there really isn't a broad enough, deep enough, or centralized enough place to find this kind of inspiration. There have been a few attempts, one of the most noteworthy being the Materials ConneXion in New York ([www.materialsconnexion.com](http://www.materialsconnexion.com)). (The problem with MC is that their library leans heavily on the architectural side of the materiality spectrum.)

There has also been an emergence of material acumen as a core competency of companies who rely on product innovation to sustain their bottom line. IDEO, a Palo Alto-based product development consultancy, has been amassing, over the past several years, what they call the Tech Box. It is literally a box, comprised of several flat files populated with the leftover gizmos, mechanisms, and material swatches from dozens of projects over the years. Over time, it has taken on a life of its own by becoming its own revenue source as well as providing inspiration for the resident designers and engineers. Realizing the scarcity of this resource, IDEO has begun hiring out its Tech Box to companies needing a dose of the vanguard. Nike is also a materials disciple, with a textile library so large it has a dedicated staff to manage it.

All of these companies are on to something, but they are coming up short, short on variety and, in many cases,



New Materials Reference Library

While CCAC's New Materials Reference Library is in its start-up mode, single use appointments (up to 3 hours per visit) can be arranged by contacting the Library Archivist at (415) 551-9266 or at [matlib@ccac-art.edu](mailto:matlib@ccac-art.edu). The per visit fee is \$150 (payable in cash or check only). This donation is tax deductible to the fullest extent of the law. For information about corporate partnerships, please contact David Meckel at [dmeckel@ccac-art.edu](mailto:dmeckel@ccac-art.edu) or Leslie Speer at [lspeer@ccac-art.edu](mailto:lspeer@ccac-art.edu).

accessibility for the design community as a whole. During my tenure at CCAC (California College of Arts and Crafts), with the benefit of a small grant and even smaller task force, we decided to take a stab at our own materials culture. We spent a fair bit of time defining the theoretical framework that would be used to develop systems of collecting, evaluating, organizing, and growing what we felt would be an invaluable New Materials Reference Library for the creative spirit. We devised ways to build a critical mass of goods through the Bay Area community. We worked our way into the studios of our friends and associates with their disheveled drawers of samples and illegible Rolodexes of curious things. By helping local design offices organize and catalog their boxes of goodies, we were able to build substantial critical mass in relatively short order for the school. After that, we slated interns to scour a slew of industry rags and tech-journals, siphoning out all the good stuff and researching the genesis of the lead. We earmarked tradeshows that ranged from aerospace to biotech. Moreover, we schemed on how to partner with laboratories such as Lawrence Livermore and MIT to get hold of the white papers they publish on new and emerging tech. Lastly, we went after petrochemical companies like Bayer and BASF, who have a war chest of material technologies but lack the budget to market them to the design community.

Once collected, the challenge turned to organization. We developed a database that allows multiple points of entry, depending on how you want to search for things. Additionally, we created a storage system that doubles as a display system.

We wanted to create a space with an organized intellect and a spontaneous nervous system. One person would enter the space and go directly to the computer for a keyword search, another would decide to spend an hour (or ten) in the visual presence of dozens of floor to ceiling panels loaded with eye candy.

You wouldn't believe the stuff we dug up collecting dust in nameless attics. I'm talking about self-healing, microcapsule plastics developed by Scott White at the University of Illinois. Or transgenic spider webs, engineered at Nexia Biotechnologies, that are soft as silk, lighter than cotton, and stronger than Kevlar. There is a techno-gel-foaming-alloy-bio-mimicry-playground out there, and we wanted in.\*

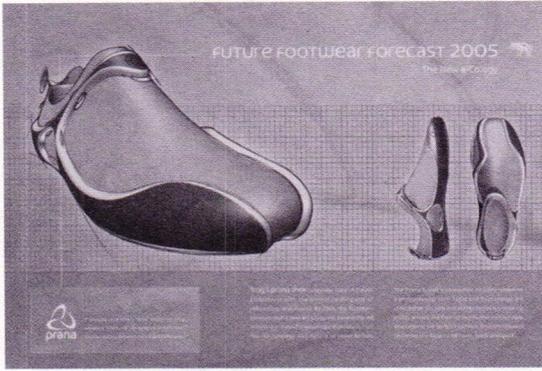
### NOW WHAT?

After a ten-year tour of some of the top product development firms in the U.S., I've decided to move out of the world of design and into the world of invention. What separates the two? Semantically speaking, not much. But connecting new business and new materials through design feels more inventive than consulting on someone else's brainchild, at least to me. The level of innovation behind self-initiated concepts, coupled with the freedom from work-for-hire projects, has been fertile ground for new ventures. Instead of a project being orchestrated with a basic desire to please the client first and then the consumer, my projects have been reverse-engineered, starting with the technology, and from there figuring out where the consumer could gain most from its implementation.

For a glimpse of some "material re-assimilation" in action, I'll start with a stretch of the imagination and work my way down to a "Why didn't I think of that?" scenario.

### SOLE FOOD

Prana was a future footwear concept commissioned by SF MoMA. They asked frogdesign to look five years into the future and take a stab at the state of sneakers. Well, if we had anything to say about it, we would be making these babies ourselves. The concept integrates all sorts of new and emerging technologies. We focused on the synergy of state-of-the-art biotechnics and grounded it in the ancient healing arts of reflexology and shiatsu. We suggested that, in 2005, a new ecology would start to surface, resulting in hybrid digital/organic products that fuse technology and nature. Prana bonds a bioelectric delivery system to a phytovascular sock. Light and heat energy are collected by the sock and distributed to key pressure points around the foot via exothermic piezo ceramic pads. Blockages in the body's molecular flow are released, restoring the balance of mind, body, and spirit.



frogdesign, Prana sneaker



Ashcraft, JBL TI speaker



boomBang, Flow bicycle seat

## SLICK SOUND

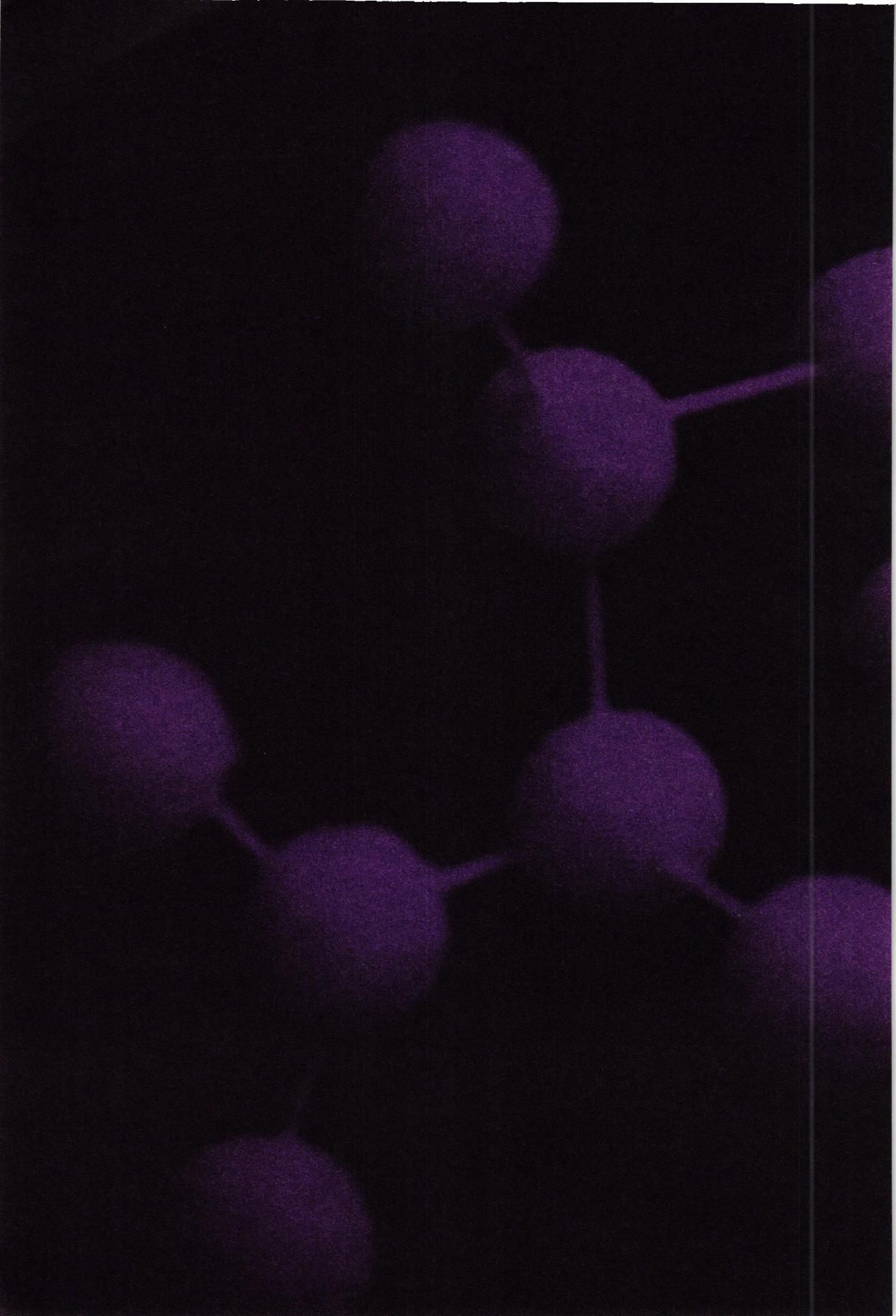
JBL gave Ashcraft *carte blanche* in 1993. They said, "We want innovation! Do anything you want to reinvent our loud speakers...as long as they are made from black, vinyl-wrapped MDF." And so it goes, the long series of debates, defending and eventually translating innovation into brand differentiation, into market share, into profit. I got pretty good at all the shoptalk, and on occasion was persuasive enough to get the client to take a gamble. This product, in particular, was a favorite that only made it to the EU market. It's about as far from a mitered vinyl box as you can get. In order to invent a product that felt more like furniture—i.e., a lamp—we went outside the traditional loudspeaker market to identify new manufacturing and material technologies. The drivers are incased in a roto-molded torpedo, which, in turn, is stretched with a Lycra sock and stuffed into a deep spun, aluminum cone. We landed on a fully integrated design/engineering solution that solved some stubborn acoustical reverberation and heat sync problems. The resulting product is as easy on the eyes as it is on the ears.

## AIR FLOW

I subscribe to the notion that opportunity doesn't need to be created, just recognized. The Flow bicycle saddle was a simple product that fell out of an intuitive, connect-the-dots exercise. It drew a line between a technology that has had great acclaim in office seating, with the Herman Miller Aeron chair, and applied it to an industry that hasn't seen an innovative leap in 100 years: the bicycle seat. It's the first bicycle saddle that effectively dissipates a rider's weight, with the added benefit of superior ventilation through the use of an elastomeric-encapsulation-molded textile. First an idea, then a product, and now a company (Saddleco) are born. It was as easy as falling off a bike.

Ultimately, there are a myriad of takes on design philosophy. For me, taking a lead in the exploration of new technologies and finding creative forms for their use has been a calling born from passion, a passion for evolution, albeit consumer product in focus. I would suggest—actually, I would encourage—any creative individuals who want to amplify their art and deepen their message to keep their eyes peeled and their minds open. Chances are there is a material right under your nose that is looking for a little form. ●

\*Editor's note: for more on "biomimicry," see Janine M. Benyus, *Biomimicry: Innovation Inspired by Nature* (New York: Quill, 1998).



# From the Science of Materials to Design

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Kara Johnson

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The scientific study of materials (material science), architecture, and product design—each seeks to understand and manipulate the fundamental character and behavior of materials. Scientists strive to create new materials; architects, new spaces; and product designers, new products. Material science has had remarkable success in achieving the first, with the result that designers are presented with a large number of materials, an overwhelming choice. The material scientists take the first step in innovation: the inception of a new technology. The designer takes the second: the novel application of this technology. The aim of this article is to present a discussion of the language of materials in design, to lead the designer on a path toward understanding and creative manipulation.

## **MATERIALS, NEW AND OLD**

It may seem at first that there are a relatively limited number of materials that are commonly used in design. And it is important that designers are able to differentiate among these materials. Even with this limited number of materials, the amount of information available (but not necessarily relevant) for each is considerable. To complicate matters, new materials—

insert-molded fabrics, elastomer/metal composites, biodegradable polymers, functional fabrics, ceramic foams, etc.—are constantly pushing the designer to reconsider existing material solutions. In addition to any technical or aesthetic advantages, these new materials are attractive because they provide a sense of immediate innovation.

The desire to introduce new materials or material combinations introduces the need to visualize, and thereby understand, the relationships between the “old” materials and these “new” materials. The information sources available to designers are limited and not wholly effective—suppliers and the Internet. Suppliers’ information is sometimes biased; the Internet can only provide results for materials of which the designer is already aware, and the quality of the information retrieved is inconsistent. For each material—both new and old—the information is hard to get. Some is only relevant in specific applications, some requires prior experience, some doesn’t. Ultimately, the challenge is to present this information in a creative way, so that it is simple, intuitive, inspiring, and practical. The first step is to identify what information is relevant for designers.

## INFORMATION AND DESIGNERS

Information about materials can be organized from the most structured and discrete to the most unstructured and highly-coupled. Common forms of information available to the designer, arranged according to these criteria, are shown in the accompanying figure.

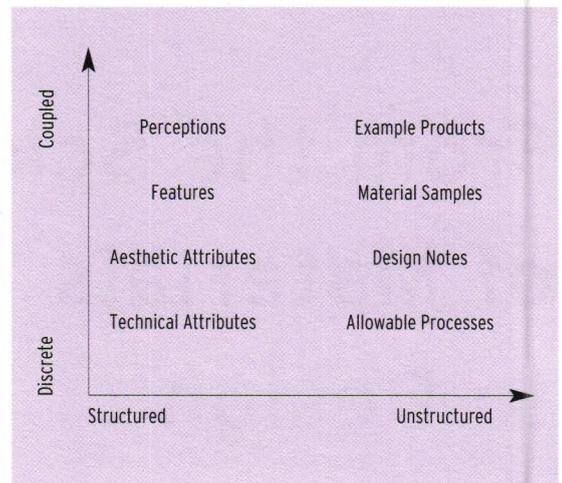
*Technical attributes* describe the mechanical or thermal character of materials. Mechanical attributes include well-characterized material properties like yield strength ( $\sigma_y$ ), elastic modulus (E), fracture toughness ( $K_{IC}$ ), and density ( $\rho$ ). Thermal attributes include thermal conductivity ( $\lambda$ ), specific heat ( $C_p$ ), and the range of possible service temperatures ( $T_{min}$ ,  $T_{max}$ ).

*Aesthetic attributes* are based on the senses: sight, touch, sound, smell, and taste. The attributes of aesthetics are less well characterized but can sometimes be related to technical attributes. Visual attributes include color, translucency, and reflectivity; tactile attributes include warmth and softness. Warmth is the result of the combination of a material's thermal conductivity, specific heat, density, and sometimes color. Softness is the result of a material's surface hardness, elastic modulus, and texture.

Material attributes are discrete; now consider information that is more coupled—the *features* of a material. These features are often represented by words or phrases that capture some combination of attributes or a general character. First, it is important to explore the features that can be directly related to material attributes—the mechanical features. When a material is described as “resilient” or “abrasion resistant,” this term summarizes a combination of technical attributes and character.

Resilient materials have high values of  $\sigma_y/E$  or—in words—they are able to return to an original state after loading, without plastic deformation. Abrasion resistant materials are hard, and the surface does not deform under abrasive conditions like grinding or scratching. For some features, like “stiff and light,” the designer may have the intuition to realize that as modulus increases, stiffness increases; as density decreases, weight decreases—the relevant index is  $E/\rho$ . This is an over-simplification, but it is sometimes all that is necessary.

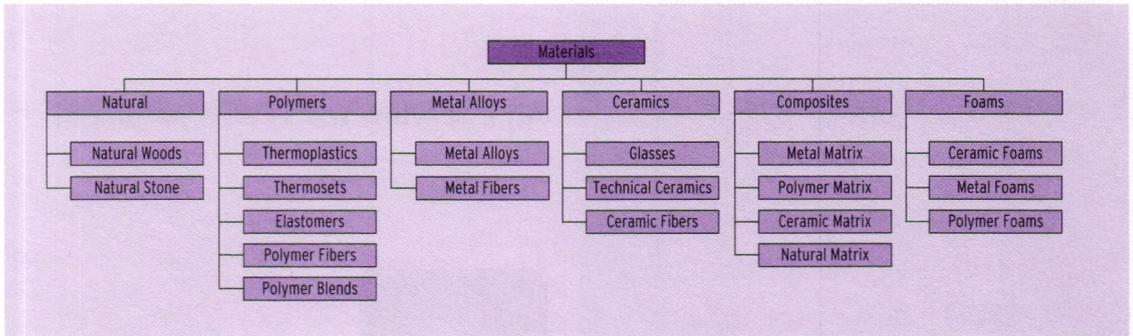
When behavior is abstractly, not technically, complex, it is usually the result of the subjectivity of the observer, that is, of *perception*. And for materials as well



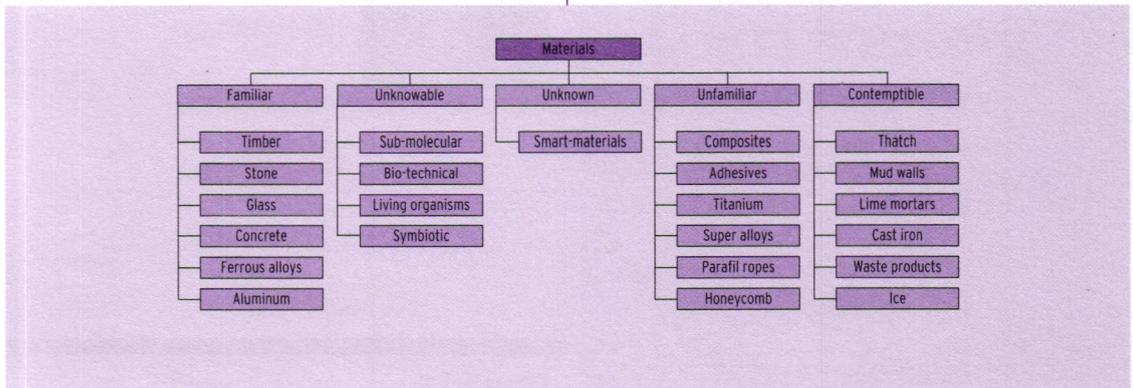
as products, perception is as important as the material or product itself. Materials can be perceived as “high-tech,” “clean,” “formal,” “rugged,” etc., without any particular understanding of how this behavior is created.

In a less structured way, materials can also be linked to the *processes* that can form or join them or alter their surfaces. These links provide insight into the behavior of materials. For example, polycarbonate can be easily joined by adhesives and coated with “soft” polyurethane. Magnesium can be easily die cast but is difficult to weld and anodize. These and other more colloquial descriptions of materials are often accumulated in notes by individual designers or in supplier-specific literature to document material behavior.

And, finally, one of the most valuable information sources for a material is a *sample* or a *product* made of that material. The next best thing is an image, both of the material and of a product made from it—a chair, for example. Thin carbon fiber weaves are translucent, and the fibers can be drawn and woven so thin that they are almost unnoticeable. These weaves are very flexible and easy to drape in a mold. Thick carbon fiber weaves, when tightly woven, do not transmit light. They can, however, be coated with resin before molding, and therefore thermoplastic/carbon fiber composites are possible. The same combinations are possible with glass fibers. The products that are made of these materials are the best visualization of possible behavior. Eames chairs are famous



A classification of materials for material science [GrantaDesign (2001)]



A classification of materials for architecture [Cardwell et al. (1997)]

as the initial manipulations of glass fiber composites in consumer products. And epoxy/carbon fiber is known for its ability to give form to thin, stiff, light structures, usually in sports equipment; it too has been realized in the form of a chair. As products, these examples are familiar expressions of material behavior when manipulated.

### CLASSES OF MATERIALS

Any set of information, as it increases in size, must be given a classification. Each audience—scientists, engineers, architects, or designers—requires a different classification. Materials are often naturally divided into classes. These classes form the beginning of a system and describe a set of materials that have something in common.

Material science has developed a classification that suits the needs of scientists. Its classification is most easily expressed in a tree structure; it is shown, partly expanded, in the figure above. As one moves down the tree, the materials that group together are increasingly similar. At the first level, groupings are based on the nature of the atoms of the material and the

bonding between them (e.g. metal); at the second level, groupings are based on the chemical differences within that family (e.g. aluminum); and, at subsequent levels, details of processing or composition are important.

Another classification, this one proposed by architects at Arup in 1997, organizes the information in a different way, emphasizing familiarity (and lack of it).

In the process of design, materials and a language to describe them are both necessary. The exercise of considering the most appropriate classification for any given audience of designers is left to the reader, but the answer lies somewhere between those presented for science and architecture. Science creates new materials, but it is the designer's manipulation of these materials that creates new architectural spaces—like the PTFE-coated woven glass fibers on London's Millennium Dome—or new products—like the soft, flexible silicone/fabric keypads for today's consumer electronics. And this manipulation is only possible with a clear understanding of the path of specific materials (whether new or old)—from science to design. ●

# What's Mutant Now?

## An Interview with Paola Antonelli



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### David Sokol

In 1995, "Mutant Materials in Contemporary Design" introduced Paola Antonelli to visitors of New York City's Museum of Modern Art. Formerly a lecturer at the University of California, Los Angeles (1991-1993), she joined MoMA's Department of Architecture and Design in 1994 as associate curator.

Proclaiming, "Today, adherence to the 'truth' of a material is no longer an absolute for design," "Mutant Materials" displayed uses for materials that transformed their physical characteristics as well as their capabilities. Although Antonelli has gone on to curate several equally successful exhibits, such as last year's "Workspheres," "Mutant Materials" qualifies as her favorite. David Sokol caught up with her to discuss the exhibition's continued relevance, as well as recent innovations in material development and applications.

**David Sokol:** I've read that "Mutant Materials in Contemporary Design" was your favorite exhibition to curate. Why is that?

**Paola Antonelli:** It was my first one at MoMA, and it was a completely new way of doing exhibitions for me. I had done a lot of exhibitions before, but never to preach to a very wide public. Design is really a shared cultural component, but in the United States it's much less recognized than in Europe. It was great—I was trying to address a very large public and at the same time educate, entertain, and add a little piece of scholarship to the work done on materials.

**DS: And did the public respond in kind?**

**PA:** Oh my god, yes. About 80% of the objects were touchable. And the tables were low enough that children could touch them. It had about 400,000 visitors, and so the public success was very strong, and the success with the design community was very strong.

**DS: Why do people love to touch?**

**PA:** The intellect is never enough. You have to engage the other senses. Sight is not enough. Sight is the first and always-respected sense. Touch is normally the forbidden fruit, so, when you give it to people, not only can they complete the experience, you give them a new freedom that they hadn't experienced before.

**DS: A lot has changed since 1995—the Internet exploded, for instance, and we're still trying to understand the economic and cultural ramifications of that. Have these phenomena affected the evolution of materials research and applications?**

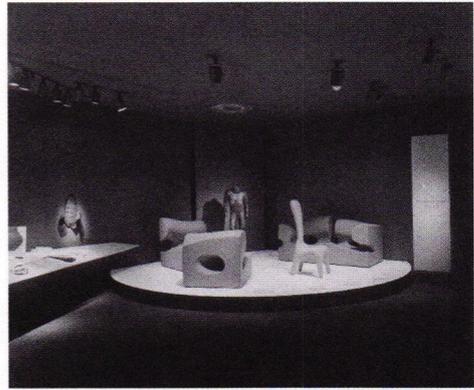
**PA:** No, I don't think so. There has been progress in general. What the exhibition was trying to capture was a curve, a moment of change in the use of materials. It was only the beginning. I'm saying quite immodestly, recent sea changes have underscored the exhibit's relevance.

It was about this new, contemporary way to use materials. You can manipulate them, you can intervene in them as a designer—you don't have to go back into the chemical lab. As a designer, you can actually do your work on them directly. You can bypass a lot, and that's happening even more now. And so the exhibition—the assumption of the exhibition—is still valid. And I think it will be valid for quite a long time, and direct intervention will only increase.

**DS: Has a material that was innovative in 1995 now experienced widespread adoption?**

**PA:** The ones that are persistently out of designers' reach are metals, of course. But there are many more resins that can be mixed under circumstances that are within reach. Many composites are made by big companies, but you can also mix fibers with resins and actually make them yourself. If you're thinking of Kevlar, if you're thinking of fiberglass, they are fibers—of carbon, of glass—and those fibers and resin are put in place. You act sculpturally at the beginning. If you have to do the hull of a new vessel, for example, you can do it by hand.

Another big revolution has been in computer-aided manufacturing. Karim Rashid has done a lot of experimentation with Nambé (the Santa Fe-based manufacturer of art objects for the home and office). The etching patterns for the Morphe



Installation view of the exhibition "Mutant Materials in Contemporary Design,"

The Museum of Modern Art, New York, May 25–August 27, 1995



Nambé's "Morphe" crystal, by Karim Rashid

crystal line were generated by computers that were giving instructions in a random way. In this instance, the patterns were actually applied by hand, but ultimately you can have a series in which every piece is different, yet you won't have to stop the machine and lose production. It is the dream of the diversified series first introduced in the '80s.

**DS: So who's working with what now?**

**PA:** Rashid is one, definitely. Also Ross Lovegrove in England and Alberto Meda in Italy. These are the ones that have been really specialized in testing out new materials. There are big companies like IDEO that have a lot of access, and then you

know that there are new services like Material ConneXion that have tried to spread these new riches among companies and designers. If you go to their headquarters and look at the samples of the materials, it's mind-boggling.

**DS:** In addition to Meda, are there any other architects who come to mind?

**PA:** Toshiko Mori, AIA,—she's very, very focused on materials. One of the most public applications of materials she's done, which everybody loved, was Pleats Please for the Issey Miyake store. But I would say that pretty much all architects I know are working on materials. It makes sense. Gaetano Pesce was trying to do a whole house in plastic.

You must not forget the interiors. Another person who uses an amazing array of materials in a dynamic way is David Rockwell. I just went to the Mohegan Sun Casino Resort, which he designed, and the kinds of materials he used, like turkey feathers encased in glass, onyx fused onto glass, and woven birch bark, are too many to count.

But it's almost unfair to talk about a few designers, because so many do experimentation. The ones that I mentioned to you are renowned for testing new materials by doing new products with companies. There's a company, for instance, that does work with fabrics, called Edra. They have plastic slipcovers, they're soft as silk. And inside, there's hay. It's not only about advanced materials; that's the beauty.

**DS:** What, then, makes a material mutant? What makes it contemporary?

**PA:** The idea came from maintaining personality while being able to change form and performance, a little bit like the mutants in science fiction movies. Once, if you played mental association with somebody, and you said "ceramics," and the person said "teacup," the person would be completely right and exhausting the possibilities for ceramics. Now, if you say ceramics, and somebody tells you teacup, it's an association that doesn't begin to describe what ceramics are today. You have a razor blade, and the ceramic looks almost translucent. For rotors, it looks like metal. It's the same material, but the applications and performances are so different and diverse.

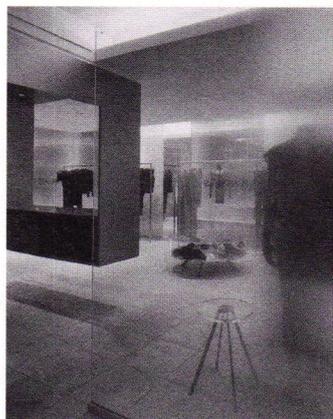
There are trends in materials that you'd call contemporary simply because they have elicited a fascination from contemporary designers, and some of them are mutant, and some of them are not. I think 'contemporary' is a pretty superficial label. I don't know if it would mean that much to me as a category. For a while, it was titanium, so 'contemporary' means nothing more than those things that you can see as being hailed and used a lot.



Ross Lovegrove, bladder molded kevlar and glass fiber stair



Vitra's die-cast aluminum Meda chair



Toshiko Mori, Issey Miyake's Pleats Please

**DS:** Is there a “green” component to the definition of mutant?

**PA:** There’s no component of green to the word mutant. In the exhibition, I purposely did not have a section devoted to green materials. I presume that any responsible designer or manufacturer is going in that direction. Also, sometimes, green materials have an invisible greenness—such as efficiencies in production, or longevity—and are not just recyclable. There’s much more to the idea of greenness. It’s about sustainability. So I tried to include objects that were long lasting in nature or had responsibility designed into them, but without singling them out.

**DS:** So that doesn’t mean that, say, only natural materials are responsible?

**PA:** Right. I am so tired of the simplistic ideology that so many people apply to greenness. I really respect the work of William McDonough, FAIA, because he’s actually tried to work within the system. He’s trying to teach people to be sustainable by acting on all the different components of the production process, as opposed to switching from plastic to wood. So it really takes so much more than natural materials to be able to have an impact on the current pollution and consumption of the environment. It’s crazy to think that you can stop factories from producing, and the consequences of that would be unemployment and, in the end, even more damage to the environment. It’s something I take very seriously, but it’s something I don’t like to preach about.

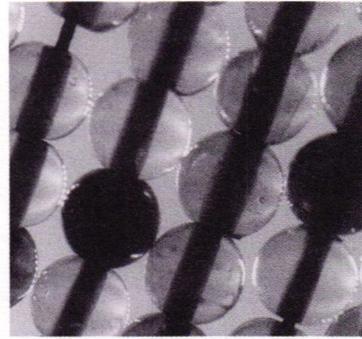
**DS:** How are materials studied? Is the architecture firm that studies materials differently structured from one that doesn’t?

**PA:** I really don’t know. I don’t think it’s necessary. You might have somebody on staff who is really passionate about it and wants to study it. You might have a subscription to Material ConneXion, and so you might go there. You might live near the Jet Propulsion Laboratory in Pasadena. You might live in Connecticut, and you might be close to a sailboat company that uses a lot of carbon fiber. It starts with passion and interest first, and then you adapt your tool.

But I believe that you can be in New York and do things only with wood, and you can be in Kansas and be obsessed with high-tech materials. Ultimately, I don’t think it has anything to do with geography or access.

**DS:** How and with whom can architects get more involved with investigations into innovative materials?

**PA:** I have a refrain that all of the most advanced materials get tested by militaries and by surfers. And afterwards they



David Rockwell, Glass beads, Mohegan Sun Casino

get down to normal people. The sports and military fields are really where most materials are tested, because they’re looking to minimize the use of energy and maximize performance. With the military, there were, at the time of the exhibition, five technology transfer centers in the U.S., and you call them up to find out if materials used in war or military purposes were now available for civilian uses. (For further information on military products, contact the public relations department of the U.S. Materiel Command, Alexandria, VA (703) 617-8010.)

**DS:** Techniques are becoming more widespread, materials are becoming more accessible. What’s next?

**PA:** If you simplify the conditions for manipulating materials so that it can be done at ambient temperature and ambient pressure, and you reduce the toxicity, then there you go. It’s also ceramics, it’s also wood—it really depends on the ingenuity and creativity of the designer and architect.

There is a recouping of craftsmanship in the world of industrial design, so a lot of contemporary design now takes into account handiwork. And, it puts back an artistic spin on work that is almost engineering. It’s still the goal to achieve an industrial process, but it’s easier to experiment—so you can be able to prototype without having to invest \$50,000. I think this is a great moment for design. ●

78-G Hay Market  
Hay Market

79-G Lemon Icing  
Lemon Icing

78-F Rothesay  
Rothesay

79-F Hey There!  
Hey There!

78-E Olive Branch  
Olive Branch

79-E Castledale  
Castledale

78-D Yellow Grass  
Yellow Grass

79-D Picture Perfect  
Picture Perfect

78-C Dried Leaves  
Dried Leaves

79-C Limeheart  
Limeheart

78-B Olive Garden  
Olive Garden

79-B Council Oaks  
Council Oaks

## What Counts as Green? (and Why?)

Hal Levin

"Sustainability" has been variously defined, as was clearly illustrated at the recent United Nations Earth Summit in Johannesburg. When discussed in the context of the impacts of buildings on the environment, its meaning is ambiguous and often distorted. Buildings are not either "sustainable" or not. No buildings being built today are sustainable in the true sense of the word. While many guidelines exist for guiding design to improve building environmental performance, most of the available guidelines do not assess the total impact of a building on the environment. Instead, they tend to rate buildings on the basis of individual features considered "green" or "sustainable" by the designers.

A more rigorous approach to assessing building sustainability is needed in practice. Such an approach evaluates a building by its total effect on the environment, not by the number of discrete "green" maneuvers it makes. Some software tools exist that can support decision-making to design buildings based on rigorous analysis of the environmental impacts.

Finally, the assessment of a building's impacts on the environment must be related to goals for meeting local, national, and global environmental needs. Such goals can be established and used as benchmarks for building performance. These procedures can be used with available design tools to create new buildings and to evaluate existing buildings on the

basis of their projected total environmental performance. When such tools are routinely used we will we learn enough to make wise decisions and create buildings that are more sustainable.

## DEFINING THE ISSUE

There is widespread and apparently growing interest in protecting the environment, especially in the design of schools and local, state, and federal government buildings. Designers are increasingly pressed to design “green” buildings. But how is one to know what is “green”? Is “green” the same as “sustainable”? Everyone who considers his building design services or product “green” knows what green is. Nearly everyone else is left wondering.

“Green building” is a construct without any inherent meaning as a label for environmentally responsible building. You can’t measure one characteristic of a building’s environmental performance and then decide whether or not it is “green.” In fact, many things have to be measured, and few of us would agree on what those many things are. Beyond that, we might not all agree on how important various characteristics are. Is air pollution more important than water pollution? That probably depends on where and who you are. What about global climate change versus species extinction?

At the heart of any operational definition of “green” building, there needs to be a clear, prioritized, weighted set of environmental goals. And there must be yardsticks available to measure how well a building performs against those goals. When evaluating a building’s “greenness,” we must assess the impact of the total building on all the environmental problem categories. It is possible to do this today, but not in California, not even in America. CADD-compatible software packages have been developed based on life cycle assessment methodologies, but so far only in Finland, Germany, and Holland. The latter two software programs are in German and Dutch, respectively, and the databases used are from those countries. We need such software in English, using data from sources of products, materials, and energy used in American buildings. Such tools could themselves then be used to develop guidelines based on a representative set of scenarios. They would provide designers with vastly better guidance than is available from existing green building guidelines.

## CURRENT GUIDELINES

Formal guidelines do, of course, exist for determining the “greenness” of a building. These have to do with energy conservation, use of recycled materials, reduced emissions of toxic chemicals, and many other specific characteristics. The guidelines generally involve incremental improvements over typical current practice. In general, buildings conforming to these guidelines may be less harmful to the environment than

buildings designed without the benefit of such guidelines, but we don’t actually know if that is true. And even the best of buildings built today fail to reduce resource consumption and pollution emissions to a sufficient degree compared to the scale of reductions needed to create truly “sustainable” buildings. It is difficult (if not impossible) to find a building being built today that could be regarded as truly sustainable.

Most green building guidelines are based on designers’ judgments about immediately available solutions rather than an analysis of the way a particular building design will actually affect the environmental problems of concern. Most of the available guidelines are prescriptive in nature; few are performance based. As such, they almost all suffer from the same fundamental flaw—they fail to involve an assessment of the combined impacts of the various individual measures promoted by the guidelines—that is, the actual or projected impacts of the completed building throughout its whole life cycle on the local, regional, and global environment. The guidelines may reflect good current practice, but few of them even involve best current practice.

The increasingly widespread acceptance and use of many green building guidelines—the US Green Buildings Council’s LEED Rating System and scores of others—give the incorrect impression that we know enough about buildings’ environmental impacts to provide reliable guidance. The truth is that we simply do not know the net environmental impact of buildings that get higher or lower scores using the available guidelines.

## DEFINING LOCAL GOALS

Environmental goals of projects are occasionally explicit but usually implicit. When stated, they often take the form of reducing resource consumption and pollution emissions and, occasionally, disturbance of sensitive habitats. The environmental goals of building projects may differ significantly depending on locale and client.

\* Acid deposition is not much of a problem in the Far West, but it is a major issue in the Upper Midwest and the Northeastern United States.

\* Urban air pollution is a big problem in the major communities in California’s Central Valley and along coastal Southern California but not along California’s Central Coast (Santa Barbara, San Luis Obispo, Monterey, and Santa Cruz).

\* Hydroelectric power generation in the Pacific Northwest is controversial due to the extensive damming of rivers and the resultant impacts on the fisheries. Pacific Northwest electric energy costs are so low that energy conservation measures do not gain much support through analysis using purely economic criteria.

\* Water consumption in water self-sufficient regions is not an issue of resource depletion. But what is the impact on air quality and climate—and the indirect impact on the abundance of allergens—when abundant water facilitates extensive landscaping in the otherwise arid climate of Phoenix? People who moved there to avoid exposure to pollen and mold are now victims of the “greening” of the desert.

As these and countless other examples suggest, differences in local or regional conditions will have significant impacts on the desirability of building designs and their operational protocols. In addition, building owners often associate particular aspects of the environment with their needs, products, or image. Thus, priorities have to be established in the context of a particular project location and client. Yet broad guidelines tend to follow a one-size-fits-all format.

### SETTING GLOBAL TARGETS

An ideal starting place for creating defensible guidelines is an analysis based on a comprehensive set of environmental concerns and a set of targets based on human impacts on the environment. Such targets have been set for large-scale development projects and regional or national development, and there are whole books written about criteria used and measurements made in such projects. Building projects can and should be similarly evaluated.

A rational approach to establishing guidelines for environmentally responsible buildings should start with a set of problems and measurement of the impacts of alternative design solutions on each of the problem areas. Too often, solutions are aimed at only one or a small number of problems and may end up working at cross-purposes with other solutions for different problems.

Buildings are very large contributors to environmental deterioration. They account for 15% to 45% of the total U.S. environmental burden for each of the eight major Life Cycle Analysis inventory categories shown in Table 1. Determining buildings' contributions allows us to prioritize generic environmental protection goals. The portion of buildings' environmental impacts is generally consistent around the globe.

### THE DUTCH EXAMPLE

A set of target values for environmental resource consumption and pollution can easily be derived. While such targets themselves are subject to human judgment, they can reflect the best available science, and, if the methodology is transparent, as it should be, the targets can be revised as new information arrives. The Dutch government commissioned a study to propose just such goals in order to move Dutch technology toward sus-

RESOURCE USE	% OF TOTAL
Raw materials	30
Energy use	42
Water use	25
Land (in SMSAs)	12

POLLUTION EMISSION	% OF TOTAL
Atmospheric emissions	40
Water effluents	20
Solid waste	25
Other releases	13

Table 1: Environmental Burdens Of Buildings, U.S.

tainability over a 50-year time frame. The authors assumed that all humans are entitled to utilize the same amount of environmental resources and to contribute an equal share of pollution—that is, each inhabitant is entitled to the same “ecospace.” They established some “ecocapacity” limits on basic resource consumption and pollution emissions, then calculated ecospace targets for 50 years in the future. The authors allocated environmental resources among nations and calculated the Dutch share. Then, working backward, they calculated reductions necessary in current consumption and pollution to achieve sustainability. Their informative results are presented in Table 2.

The Dutch authors point out that there is a 30 to 1 disparity in resource consumption and pollution emissions shares between inhabitants of OECD (developed) nations and developing nations, or between “north” and “south.” The authors propose to reduce the ecospace disparity by a factor of three, to a ratio of 10 to 1, during a 50-year planning time frame. They do not propose how such a shift toward universal environmental equity should be accomplished, but they base their analysis and projections on the assumption that such a shift is desirable.

The Dutch project that their carbon dioxide emissions must be reduced by 80% in the next 50 years. Using their method, we calculated reductions in per capita energy consumption in the United States necessary by the year 2050 for us to share equally with all the earth's projected 10 billion inhabitants. Just in terms of carbon dioxide and equivalent other greenhouse gas emissions, Americans must reduce current per capita consumption by more than 95%. Reductions of 80 to 95% are necessary in several other categories. Some consumption, such as copper, for example, will not have to be reduced much,

Dimension/indicator of environmental impact	Sustainable level	Expected level 2040	Desired reduction	Scale
<b>DEPLETION OF FOSSIL FUELS:</b>				
* oil	stock for 50 years	stock exhausted	85%	global
* natural gas	stock for 50 years	stock exhausted	70%	global
* coal	stock for 50 years	stock exhausted	20%	global
<b>DEPLETION OF METALS:</b>				
* aluminum	stock for 50 years	stock for >50 years	none	global
* copper	stock for 50 years	stock exhausted	80%	global
* uranium	stock for 50 years	depends on use of nuclear energy	not quantifiable	global
<b>DEPLETION OF RENEWABLE RESOURCES:</b>				
Biomass	20% terr. animal biomass	50% terr. animal biomass	60%	global
	20% terr. primary production	50% terr. primary production	60%	global
Diversity of species	extinction 5 species/year	365-65,000 species/year	99%	global
<b>POLLUTION:</b>				
Emission of CO2	2.6 Gigatons carbon/year	13.0 Gigatons carbon/year	80%	global
Acid deposition	400 acid eq./hectare/year	2400-3600 acid eq. /ha./year	85%	continental
Deposition nutrients	P: 30 kg. per ha. /year	no quantitative data	not quantifiable	national
	N: 267 kg. Per ha./year	no quantitative data	not quantifiable	national
<b>Deposition of metals:</b>				
* deposition of cadmium	2 ton/year	50 tons/year	95%	national
* deposition of copper	70 ton/year	830 tons/year	90%	national
* deposition of lead	58 ton/year	700 ton/year	90%	national
* deposition of zinc	215 ton/year	5190 ton/year	95%	national
<b>ENCROACHMENT</b>				
Impairment by dehydration	reference year 1950	no quantitative data	not quantifiable	national
Soil loss through erosion	9.3 billion ton/year	45 to 60 billion tons/year	85%	global

Table 2: Sustainable versus expected level of environmental impact for selected indicators.

if a large fraction of the copper in use is recycled, and the proven reserves are therefore not likely to be stressed in the foreseeable future.

### SETTING TARGETS FOR PERFORMANCE

The decision-maker must divide up and allocate the global, regional, or local "ecospace" for each problem being addressed depending on the type of problem:

- 1) on a per capita basis, determine how much of a building's use is allocated to a given number of people, or
- 2) on the basis of annual units of building use per person (person square meters per year), or
- 3) on the fraction of the building type accounted for by the particular building (x percent of all school or office or residential etc. space in the local (or regional or global) community)

There are some important issues with each of these three approaches that need to be addressed in the details of their implementation. One of them, for example, is what's called "normalization." This involves trying to create equivalencies so comparisons aren't distorted. There are questions of social justice. For example, if one house is very energy efficient but very large, and another is very energy inefficient

but very small, and if both are occupied by the same number of people and use the same total amount of energy, is the small, inefficient house dweller to be penalized for having an inefficient house?

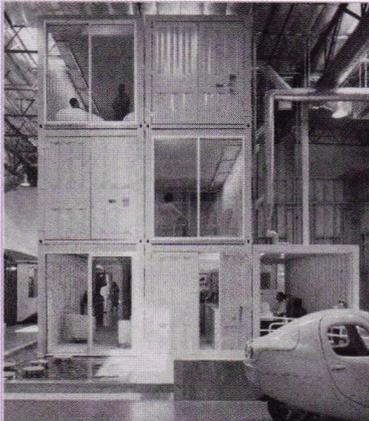
In the end, as is the case with most things, it's a matter of values. For the design process, what is important is that these questions be considered and resolved as part of the basis for making the many trade-offs that inevitably must be made. There may not be one single "correct" way to do this. But it must be done, and the assumptions and methods must be explicit in order for us to be able to evaluate the results.

Such target setting can provide benchmarks that enable us to evaluate a building's total contribution to environmental stress in quantitative terms. Using life cycle assessment tools in conjunction with CADD software, every decision can be evaluated in terms of the total projected impact on the environment throughout the building's life cycle. Using a "Building Ecology" perspective, comprehensive, science-based analysis can inform our designs so that we are able to measure our efforts toward sustainability. All that is lacking is the will to do so. ●

[Editor's note: for an expanded version of this article, complete with references, visit arcCA's website, [www.aiacc.org/communications/archcal.html](http://www.aiacc.org/communications/archcal.html).]

On these pages and in the articles following, arcCA celebrates the AIA California Council's 2002 Design Award Winners. Other honorees recognized by the Council include:

**Firm Award:** STUDIOS Architecture, San Francisco / **25-Year Award:** Eichler Homes, Anshen+Allen, San Francisco  
**Excellence in Educational Achievement Award:** Richard Hannum, AIA, and Shirl Buss, Assoc. AIA / **Lifetime Achievement Award for Distinguished Service:** Edward L. Oremen, FAIA / **Allied Professions Honor Award:** 3A Garage Architecture, San Francisco / **Community Housing Assistance Honor Award:** Mission Housing Development Corporation, Chinatown Community Development Center, and San Francisco Planning and Urban Research (SPUR), all of San Francisco / **Savings by Design Honor Award:** Governor's Office of Emergency Services, Headquarters and State Operations, Sacramento, by Dreyfuss and Blackford Architects, Sacramento, and Ross Drulis Cusenbery Architecture, Sonoma; and Camp Arroyo, Livermore, by Siegel & Strain Architects, Emeryville / **Savings by Design Citation of Merit:** South Coast Watershed Resource Center, Santa Barbara, by Blackbird Architects, Santa Barbara; Ross School, Ross, by EHDD Architecture, San Francisco; and the New International Terminal at San Francisco International Airport, San Francisco, by the joint venture of Skidmore Owings & Merrill LLP, Del Campo & Maru Architects, and Michael Willis Architects.



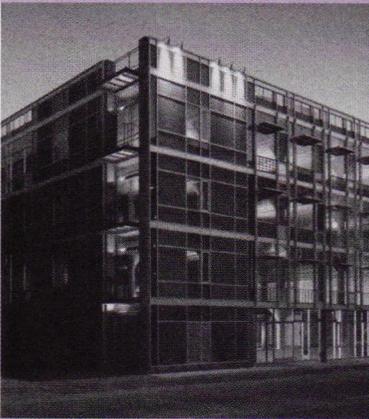
Palotta Teamworks National Headquarters, Los Angeles, by Clive Wilkinson Architects, Honor Award



Stealth, Culver City, by Eric Owen Moss Architects, Honor Award



The Bing Wing of the Cecil H. Green Library, Stanford, by Fields Devereaux Architects & Engineers, Honor Award for Historic Preservation



625 Townsend, San Francisco, by Leddy Maytum Stacy Architects, Merit Award



Hypo Alpe-Adria-Center, Klagenfurt, Austria, by Morphosis, Merit Award



People Assisting the Homeless (P.A.T.H.), Los Angeles, by Jeffrey M. Kalban & Associates Architecture, Inc., Merit Award



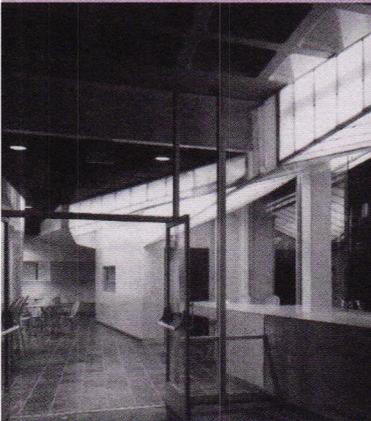
The Firm, Beverly Hills, by Pugh + Scarpa, Merit Award



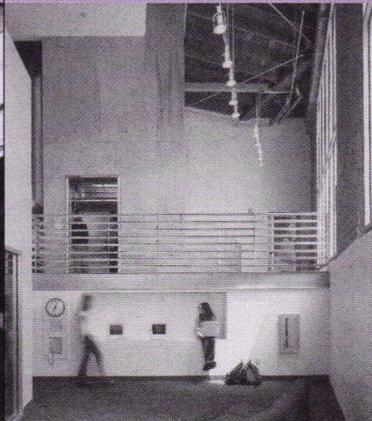
Blair Graphics, Santa Monica,  
by Randall Stout Architects, Merit Award



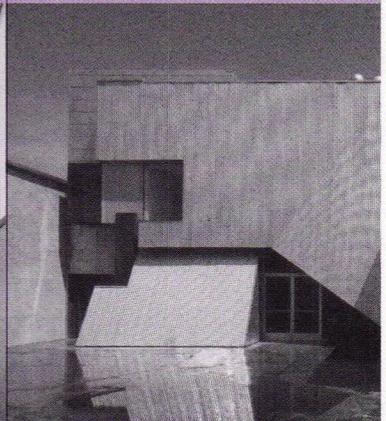
The Architecture of R.M. Schindler' Exhibit at  
MOCA, Los Angeles, by Chu + Gooding Architects,  
Merit Award



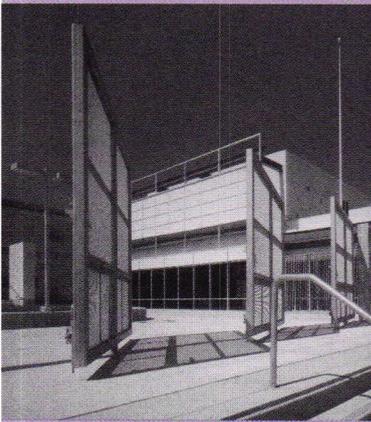
Tatum Student Lounge, California Institute of the Arts,  
Valencia, by Griffin Enright Architects, Merit Award



Wildwood School, Los Angeles, by SPF Architects,  
Merit Award



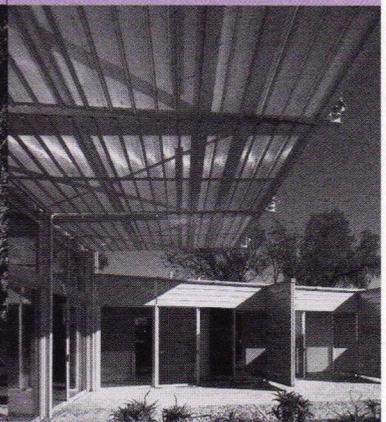
Bergamot Artist Lofts, Santa Monica,  
by Pugh + Scarpa, Merit Award



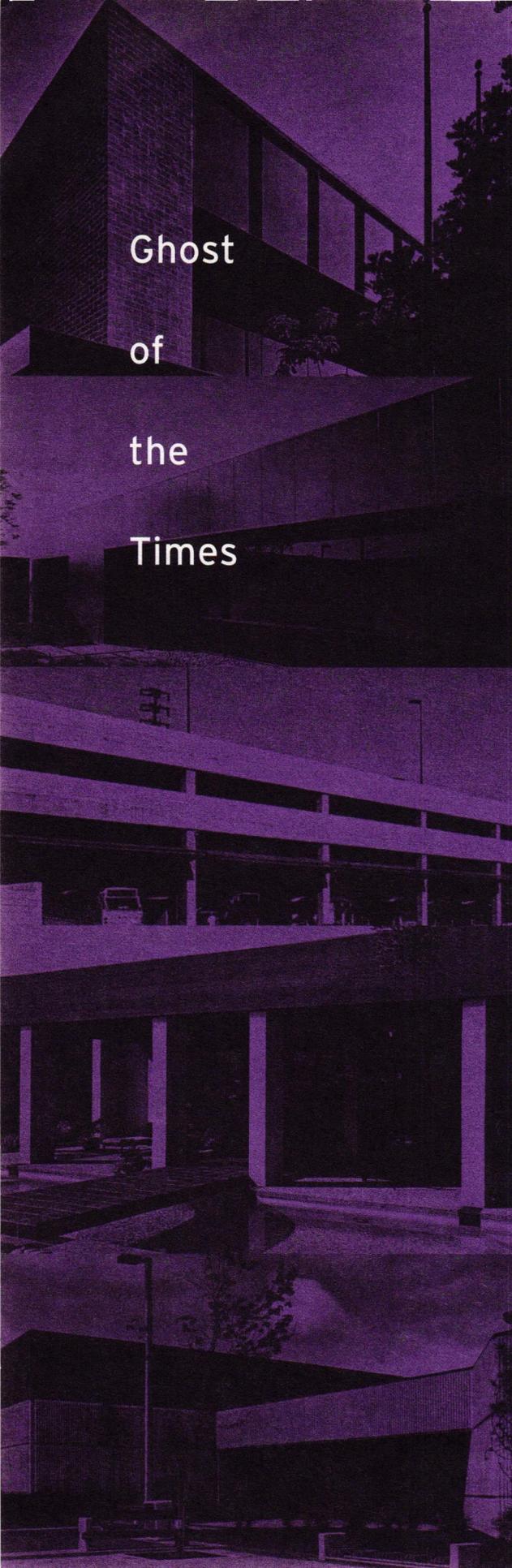
Gonzalo & Felicitias Mendez Fundamental  
Intermediate School, Santa Ana, by LPA, Inc./Francis +  
Anderson, Merit Award



University of Toronto Graduate Student Housing,  
Toronto, by Morphosis, Merit Award



House in Valley Center, Valley Center,  
by Daly, Genik Architects, Merit Award



Ghost  
of  
the  
Times

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**Tim Culvahouse, AIA, Editor**

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I am a skeptic of novel shapes in buildings. It seems to me—and I'm not the first person to have observed this—that novel form might best be reserved for novel content. And genuinely novel content, as far as living in buildings goes, arises infrequently.

I would feel more confident saying so, however, if it were easier to point to an alternative. If there were a tried and true way of making buildings, I would happily subscribe to it. Then I could entertain arguments for whatever novelties might appear.

The catch is that the relationship between the novel and the non-novel, the new and the not new, isn't so stable. The sad, mortal fact of the matter is that the not new is just the new, later.

Later, and more widespread, since a new form has two possible futures: to be forgotten or to proliferate. As for "tried and true," the surest thing I can say is that much has been tried, but little is "true." Otherwise, change would be slower—and harder.

I have been looking back over the history of the AIACC Design Awards, which are in their twentieth year. The most intriguing document I've seen is actually from the pre-history of the AIACC program. It is a record of the Pasadena and Foothills Chapter's 1980 Triennial Honor Awards Program. Of the eleven winners (out of forty-five entries), eight are striking for the similarity of their appearance. These eight—a low-rise office

building, a twelve-story tower, two manufacturing headquarters, a recreational center, a bus maintenance facility, and two single-family houses—are all composed of simple, blocky shapes, with broad, unrelieved, horizontal spandrels or fascias and equally broad, unrelieved bands of near-mullionless glazing.

The three other winners are anomalies: a Bay Area shingle style house, orphaned in Pasadena; a Japanese-themed shopping center; and an astronomical observatory. Each of these three tells us something about how the client or architect thought such a thing should look.

Paradoxically, the majority of the winners, not despite of but because of their similarity, tells us less about how the clients and architects thought buildings should look—or even if they really stopped to think about it at all—just as this is not the year to identify the real baseball fans in California. Popular success masks purpose.

It must make things tricky for a design awards jury, that the validation of popular sentiment, far from identifying conviction, favors its opposite: an easy opportunism. Among today's elongated polyhedra and fetishized details, a jury may be able to tell who's doing them well. What they can't tell is who believes in what they're doing.

Does it matter? It does, if the purpose of design awards is not only to recognize what has been done well, but also to air arguments for what is worth doing. Such arguments are, of course, difficult and contested, whether they have to do with sustainability (see Hal Levin's article in this issue) or social justice or appearance.

Appearance may be the toughest. Even the most compelling arguments about the appearance of buildings get caught up in the fate of their popular exemplars. So, for example, Robert Venturi, Denise Scott Brown, and Steven Izenour's arguments in *Learning from Las Vegas* have gone the way of the "postmodern" building fashion with which they are (to my mind, too closely) associated. Yet those arguments could be fruitfully applied today. I'll give an example.

The authors of *Learning from Las Vegas* argued that the abolition of ornament had left architects with an unsatisfied yearning for visual interest. As a result, instead of making simple buildings and then ornamenting them, architects designed highly (and unjustifiably) contorted buildings. Paul Rudolph was their smoking gun.

Today's irregular polyhedra could profitably be discussed on the same terms, as could the contemporary fascination with materials that prompts the companion theme for this issue. Some such continuity of argument (discussion, "discourse," theory...) might make up for the wild discontinuity in visual styles; might, even, moderate it.



People Assisting the Homeless (P.A.T.H.), Los Angeles, by Jeffrey M. Kalban & Associates Architecture, Inc. The building before and after renovation.

*Learning from Las Vegas* also gives us its own example of the proliferation of a novel building form: Kallman, McKinnell and Knowles's Boston City Hall, which spawned diminished progeny from coast to coast. Interestingly, one of its offspring appears among this year's Design Awards, as the "abandoned 1960s 3-story office building" that has been converted by Jeffrey M. Kalban & Associates into the headquarters for People Assisting the Homeless (P.A.T.H.).

Perhaps because it is, out of necessity, a problematic building for its time, the P.A.T.H. headquarters is, to me, the most intriguing of this year's winners. Its attitude toward adaptive reuse is unpopularity synthetic: we're not meant to tell easily what is old and what is new. It combines the earlier formal vocabulary of LeCorbusier's Villa Savoye with the later language of La Tourette (of which Boston City Hall was itself the offspring). And it sports pop art signage. In short, it thoroughly confounds the question of the timeliness of form.

Amidst the churning of fashion, in which the new so quickly passes into the "oh, whatever" and timelessness seems entirely beyond us, untimeliness may be the most responsible way to be. ●

"Architecture is the ultimate erotic 'object'."  
- Bernard Tschumi, "Architecture and Transgression"



\_Innovation does not require a background in industrial design, but it does require a working knowledge of how materials are joined. "First familiarize yourself with conventional construction," says Kevin Daly, AIA, "then you can identify where to make a radical intervention." Daly, Genik Architects took this approach in their House at Valley Center as a response to extreme environmental conditions: the previous dwelling had burned in a wild fire. In addition to designing with fire-resistant materials—corrugated concrete board and aluminum sheathing—they were also concerned with modifying the intense sunlight. Two different sliding partitions and operable panels veil the structure. When closed, they function as a double envelope, providing both privacy and energy conservation. For additional sun control, the vertical perforated metal panels slide into various positions, providing shade or additional reflected light according to the season. The mechanism, similar to a garage door, provided the owners with a simple means of maintaining temperature control in their building.

## Sensuous Surfaces

Therese Tierney, Assoc. AIA

\_Skin, surface, structure: all convey associations with the body. "We experience a building through its material details: both visually and tactilely," says architect and theorist Marco Frascari, "that is, through our body." It is a sensual experience, comprehended first through vision, then developed by hearing (revealing the size and proportion of a space) and, finally and most immediately, by touch. Besides providing a physical means to solve often-difficult problems, materials are an expressive language rich with signification. By incorporating a process of material investigation and developing the use of unconventional materials and applications, a number of experimental architects are expanding the contemporary definition of architecture.

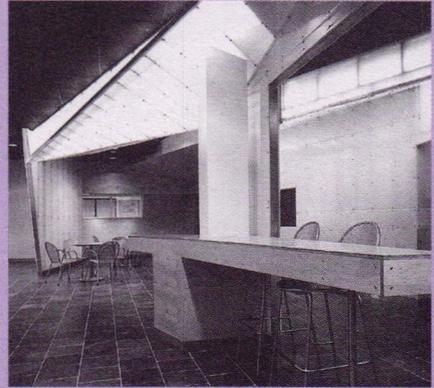
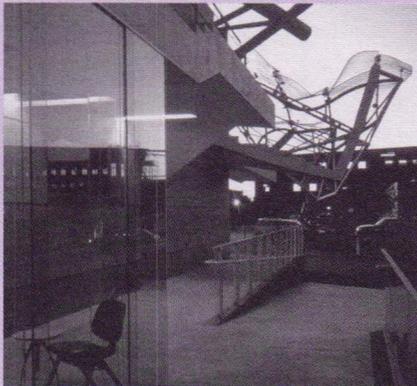
These experiments include explorations into the ductile limits of a material system, the translucency or opacity of a material, its absorptive qualities or reflectivity. But they are more broadly inclusive, as well. As Peter Pfau, AIA, says, "It's also about relating an unfolding, didactic language of assembly to a sequence of human experience."

\_Many of this year's AIACC Design Award winners are research-based design firms. Research forms an essential stage in their design process. The differences between this process and a conventional architectural process begin with an inquisitive philosophical stance, a refusal to know what a future building ought to look like—"an intrinsic uncertainty," as Eric Owen Moss, AIA, puts it. A project may start with a concept or a field of inquiry, but the design process may veer from initial expectations into a new direction entirely. Play is an integral part of the process, something explored without a defined purpose. This non-linear exploration has few parameters. It takes twice as long and involves "lots and lots of failures," says Annie Chu, AIA, of Chu+Gooding Architects, "but eventually you discover the one idea that works."

\_SCIArc Director Eric Owen Moss believes that architects have always emulated the processes of industry. In his own work, however, materials take second place to larger issues of organization, space, and form. Moss is interested in architecture as social critique and in displacement as part of the broader cultural condition of Los Angeles. In Culver City, faced with a waning industrial presence, Moss has dissected and reassembled existing structures to provide for the leasing requirements of a digital and economic shift. Here, he has designed “emotive geometries” of steel, concrete, concrete block, and glass, inserted into existing wood bowstring truss structures to create a conceptually rich landscape.

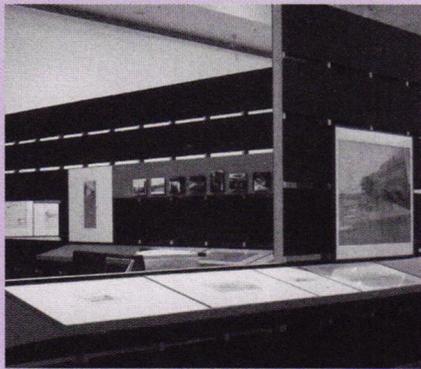
Within the Culver City complex, The Stealth (so named by Wolf Prix of Coop Himmelblau) is constructed of commonly available materials, but derives its immense visceral impact from its sheer scale and depth of color, a composite of black, green, and brown, applied and blended with a steel trowel.

Moss’s Umbrella Building, (below), an exuberant example of technical virtuosity, explodes most people’s pre-conceptions about glass. Curved, laminated glass panels cascade beyond the roof, supported by recycled trusses and new structural steel. This collaborative effort with Kelly Green of California Glass Bending involved numerous consultations and shop drawings examining the bending properties of glass. Immense heat was required to reshape the glass by slumping over pre-made forms. Later, the support structure was built in situ and the glass attached in place.



\_Many times, research is prompted by the rigorous demands of a limited budget. It may require that a given material perform more than one function, redefining its conventional use. During the schematic design phase for the Tatum Student Lounge, California Institute of the Arts, by Griffin Enright Architects, a number of pragmatic concerns demanded their attention. The limited budget required an original solution. “We worked with materials that anyone could get, but used them to do lots of things not normally associated with their given specifications,” explained Margaret Griffin, AIA.

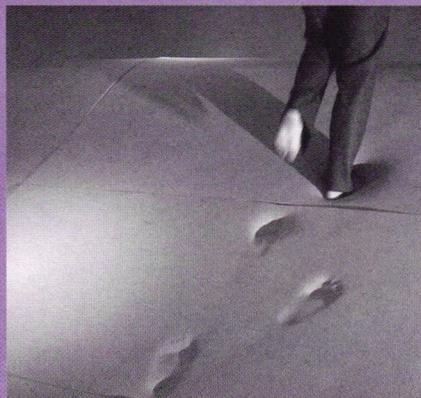
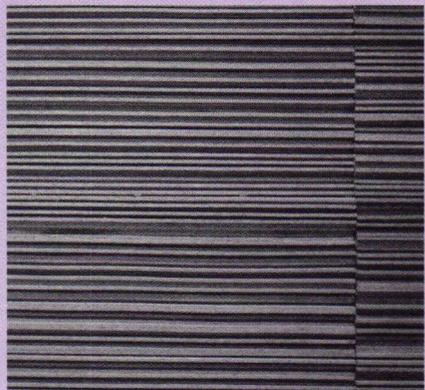
Their insertion into an existing 1960s concrete structure is comprised of a discrete palette of materials employed to unify spatial surfaces. Birch plywood and polycarbonate panels integrate programmatic functions to allow for flexibility and multiple uses. Materials shift their planar axes. An obliquely framed partition bends to create a sculptural wood ceiling that transforms into a faceted light structure. This same fluid lighting shell pierces an existing glazing system, while its diffuse glow serves as a beacon to the dorms beyond. The hardwood floor rises from the horizontal plane to become a bench or table, which then changes direction again to become a wall. Furniture becomes architecture and architecture changes into furniture or lighting.



\_Materials were central to the organization of Chu+Gooding's "The Architecture of R.M. Schindler" exhibit at MoCA, providing a means to discern the periods of Schindler's career. They were also instrumental in creating a space where the viewer could make the transition from the unfocused experience of the museum lobby to the contemplation of small-scale drawings. The existing, expansive entry space suggested a landscape to Chu + Gooding. Their desire to convey a sense of Schindler's experimentalism without resorting to mimicry led the designers to the simple use of materials, color, and light. The color concept, a key element in the design, was conceived in collaboration with Kay Kollar Design.

This language of materials was developed during both Annie Chu and Rick Gooding's previous design experience with Frank Israel Design Associates and Tod Williams Billie Tsien & Associates. Appropriating an industrial design methodology learned from their mentors, the Chu + Gooding

team constructs full size maquettes in-house. Testing yields unpredictable results; in a design for the exhibit "Architecture Tomorrow" at the Walker Art Museum (1988), part of their experience working for Williams and Tsien, a foam mold exploded. In that exhibit, they stacked 144 layers of Homasote to explore their expressive and constructive possibilities. Results included walls and chairs made out of the typically concealed material. Working with the manufacturer, they recommended an expanded color palette and suggested a presanded finish in order to remove the underlayment's waffle pattern. The finish idea was adopted by the manufacturer and is now available. To be effective as a designer, "an architect needs to understand the manufacturing process," says Chu, "and then erase preconceived notions in order to re-imagine the process and applications in a different way."



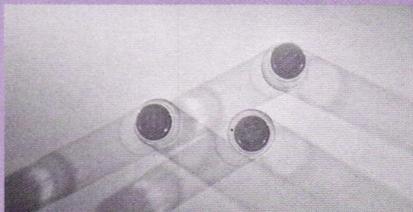
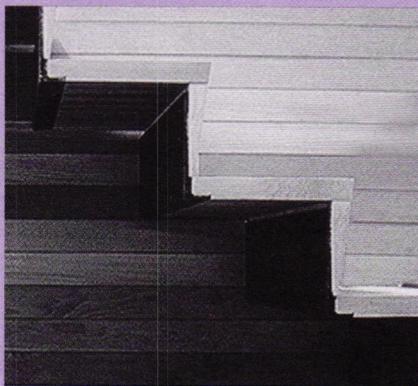
\_These architects often experiment with materials or forms unknown or atypical in architecture. In his "Mute Room," for the exhibition "Rooms for Listening" at the CCAC Institute (2000), Beige Design's Thom Faulders worked with a spin-off from space technology called memory foam. Not only was the foam comfortable, part interior landscape and furniture, but it also released imprints of people's presence like the lingering echoes of sound. "Knowledge is bordered by what we don't know," explains Faulders. "The only way to learn something is to push through it, to break the bubble."

Courtesy of Beige Design



Each project is the outgrowth of a particular form of questioning. The original Jellyfish Watch inspired Pfau Architecture's Swatch Pavilion for the 1996 Atlanta Olympic Games. Working with design firm *eyecandy* and his own in-house team, Peter Pfau, AIA, wondered if a building could be made entirely of plastic, so that its inner workings could be visible, as they are in the watch. While exploring plastic's characteristics of opacity, translucency, and solar gain, the team came up with the idea of using extruded polycarbonate panels for the interior and exterior skins. The resulting privacy and sound issues at the bathrooms led to the idea of using packing peanuts to fill and obscure the panels in these areas.

Andrew Dunbar, AIA, of *Interstice architects*, sees great potential in composites, in which materials with dissimilar characteristics are layered and then fused together, creating a product with hybrid properties. He enjoys attempting something new on every project and works from what could be described as an industrial designer's perspective. "It is essential for the architect to take an avid interest in understanding the manufacturing method," suggests Dunbar. "It may require a large investment of time, but it builds confidence with the client and the contractor." During his previous work in Canada, where less routine construction methods support a tradition of risk-taking, he found it relatively easy to design innovative materials applications. In the United States, liability issues and a more routinized construction industry make material innovation more difficult. In extreme situations, he has fabricated and installed the design with his partner, Zoe Astrakhan.



In a research-based approach, the architectural firm usually carries the financial cost of material investigations. Firms like *Daly, Genik and Pugh + Scarpa* have laboratory workshops as part of their architectural office; here, assemblies can be fabricated and evaluated. *Pugh + Scarpa* are actively developing and researching new uses of materials, without any client in mind. Most of their experiments, however, have somehow found a way into their architectural projects.

Lawrence Scarpa, AIA, frequently collaborates with manufacturers in order to refine fabrication or installation details. One of his recent investigations explores the experiential possibilities of wood. "The carving reveals an awareness of wood as a living organism," explains Scarpa. "It heightens our understanding not only of the material, but of the relationships interweaving the natural environment and ourselves." The fine line between art and popular culture informs much of *Pugh + Scarpa's* work. In their *Dixie Cup* façade (above) something familiar found in an unfamiliar setting allows for new interpretations.



# Corporate Culture:

## Extraordinarily Ordinary

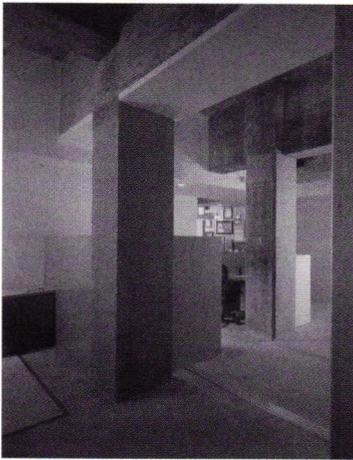
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Elizabeth Martin

The idea of the 'new workplace' has created a demand for innovation in the design of office working environments. Many companies are rejecting traditional fit-outs in favor of solutions that reflect their position on the cutting edge of their fields and provide a space that stimulates and supports valued employees. Ultimately, the interior spaces emerge from the inventive and dynamic atmosphere that is cultivated in response to the particular conditions of the project.

The biggest challenges for corporate office spaces today are not only the need to create a workplace that reflects what clients do, but also the need to occupy the spaces quickly, oftentimes in just a matter of weeks. A designer's inspired vision for a new workplace also has to be reconciled with a challenging construction budget, forcing a radical approach to the process of creating a work environment within a limited incubation period and time constraints, while keeping up with the changing context of how we work.

When Los Angeles based Pugh + Scarpa were engaged to design offices for the Firm, who are in the business of delivering and promoting talent in the music and film industries, image, comfort, and intrigue were paramount. The program was succinct:



The Firm, Beverly Hills, CA

Architects: PUGH + SCARPA

Principal-in-Charge: Lawrence Scarpa, AIA

Project Design Team: Peter Borrego, Angela Brooks, Assoc. AIA, Jackson Butler, Heather Duncan, Bettina Hermsen, Sabine Kainz, Anne Marie Kaufman-Brunner, David Montalba, AIA, Byron Merritt, Charlie Morgan, Tim Peterson, Gwynne Pugh, AIA, and Lawrence Scarpa

Structural Engineering: Gwynne Pugh and Joe Castorena of Pugh + Scarpa

Furnishings Consultants: Mike Whetstone and Sarah Walker

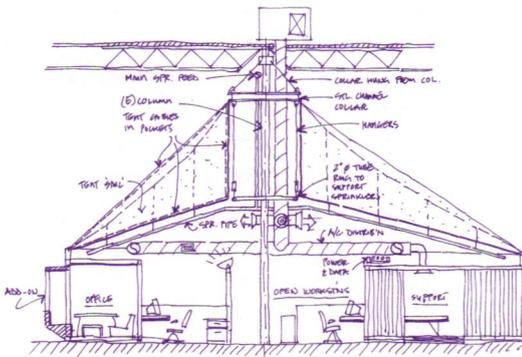
Mechanical and Electrical Engineering: Don Enyati

General Contractors: Crommie Construction

the client required a contemporary environment that facilitated interaction and communication and used high-tech materials in innovative ways to reflect the company's promotional leadership.

Pugh + Scarpa's response was to create a flexible reception area in which a sense of ownership and the freedom to control the environment can be maintained: furniture can be moved, lights dimmed, and spaces divided to create a domestic atmosphere. The communal spaces are open-plan, with freestanding elements creating a manufactured, industrial-design aesthetic. The film and music divisions of the company occupy distinct areas in the space, with, between the two, a shared, central entry lounge. This central meeting zone functions more like a public square, where clients hang out, watch TV, help themselves to a 7-UP out of the refrigerator, and so on. The architecture creates a landscape that bridges the film and music communities of the company.

Pugh + Scarpa transformed the Firm's business identity within a very low budget of \$72 per square foot and a move-in date of sixteen weeks after the client/architect's first meeting. Taking it down a



Pallotta Teamworks National Headquarters  
 Los Angeles, CA  
 Architect: Clive Wilkinson Architects  
 Principal-in Charge: Clive Wilkinson, AIA  
 Project Design Team: Ian MacDuff, Alexis Rappaport (Project Manager),  
 Bill Beuter (Project Architect), Philippe Pare, Vance Rupert,  
 Jonathan Chang  
 Mechanical Consultant: Alan Locke of IBE  
 Structural Engineer: Nabih Youssef & Associates  
 Design/Build Mechanical: Acco  
 Design/Build Electrical: Accord Electric Corp

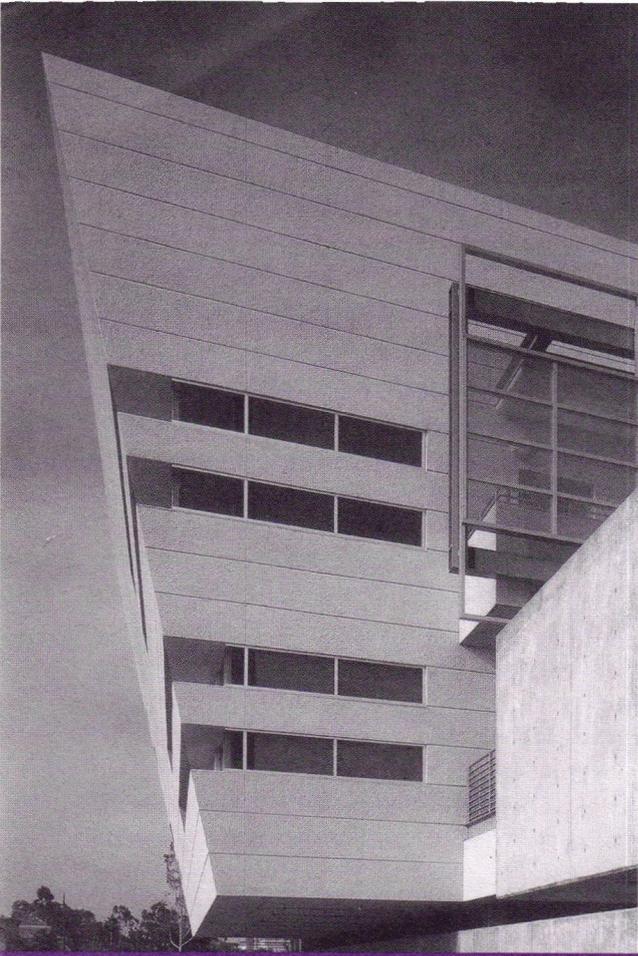
notch further, Clive Wilkinson created the new headquarters for Pallotta TeamWorks in record time for a shockingly low \$40 per square foot within a new, open warehouse space. In contrast to Pugh + Scarpa's scheme, Wilkinson created a traditional, very controlled entry sequence, but not without personality. The reception area features a desk modeled on Buckminster Fuller's Dymaxion world map, a projection showing the continents as one continuous land mass, accurately reflecting their true surface areas, showing no boundaries or states.

Economy of means could be used as a slogan for Pallotta TeamWorks' space. Rather than sacrificing other functional and aesthetic aspirations, the mechanical and electrical components were targeted to find ways of reducing spending on cooling, heating, and lighting. In order to reduce daily operating costs, systems were limited to areas where staff spent the most time working, leaving circulation areas as if they were outdoor streets with no direct conditioning. Taking cues from the mobile 'tent cities' created to shelter event participants at night, Wilkinson created 'breathing tent' islands to act as giant air diffusers, minimizing the volume of conditioned air required for comfortable working.

The pursuit of an idea about problem solving lifts these two projects out of the 'global business park' context. Problem solving, turned into an idea through architecture—not branding, identity-making, or fast cars—makes the ordinary extraordinary.

#### FOOTNOTE

Dan Pallotta, CEO of Pallotta TeamWorks, said in March 2001 that the company was founded "with a vision of re-inventing charity by bringing the most intelligent practices of the most successful businesses to the realm of common human decency." At this writing (late August, 2002), with the facilities opened for barely a year, Pallotta is in the LA Times, accused of misusing the funds raised by the company for its non-profit clients. In a time when all companies, shareholders, and CEO's are under intense scrutiny, one can't help but wonder how borderline business practices will affect the design of the future workplace. ●



## Striking a Balance:

### Designing Schools for Urban Settings

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David Thurman

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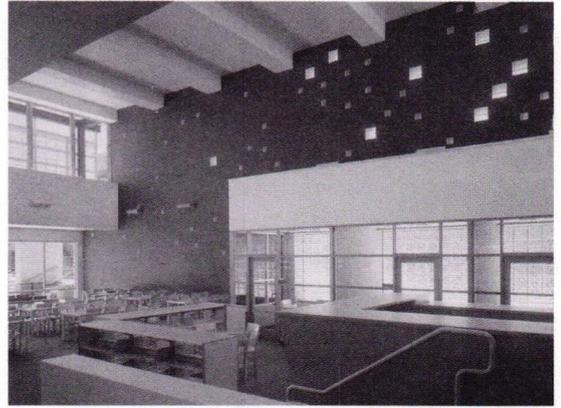
The school day for most students revolves around the rituals of reporting to class, studying, taking tests, playing sports, and interacting in a variety of campus settings. In southern California, the majority of schools have traditionally been located immediately in or near residential subdivisions, taking advantage of the availability of open space for sports fields, close access to students' homes, and isolation from perceived dangers posed by the city. Although schools do exist in a number of California urban settings, seclusion from the city rather than assimilation into it has often characterized the approach to school location.

In contrast to this tendency, two of this year's AIACC Design Awards winners, along with their clients, undertook efforts to design new schools located in relatively dense commercial areas. One of the two projects, Santa Ana's Mendez Fundamental Intermediate School (designed by LPA, Inc./Francis + Anderson), is located immediately adjacent to a large retail complex and incorporates a mixed use—a parking lot below its main building mass—to serve adjacent stores. The other school, Santa Monica's Wildwood School (designed by SPF Architects), is located on busy Olympic Boulevard in a light industrial/office district, in a renovated brick industrial building. While the two serve distinct constituencies, they respond to multiple—and sometimes contradictory—pressures presented by their urban situations.

The first of these two projects, the Gonzalo & Felicitas Mendez Fundamental Intermediate School, reflects modernism's fascination with nautical imagery in the design of a new facility for 1300 students. Spatially, the project's elevated plazas and promenades offer vistas that are high and dramatic, subtly recalling the experience of standing upon the deck of a grand ocean liner. The material disposition favors crisp edges and clean surfaces rendered in white plaster and concrete, architectural devices such as billboard-like translucent screens and shading canopies, and an elongated main building mass. Students experience much of school life upon this raised structure, which threads itself along the surprisingly narrow site. The composition of terraced building forms and densely arranged site plan creates an ordered hierarchy and extensive, although mostly hardscaped, outdoor spaces.

The nautical metaphor was natural for a design team that admired modernity's grand vessels, although this understates how aptly that metaphor is matched to the school's site constraints. Perhaps the design team's most astute choice was raising—and isolating—the main levels of the school from the ground. While this might be an unexpected strategy in a conventional setting, the school's location next to a series of "big-box" retail stores made it a necessity. The choice of this location was predicated on the use of funding from a special program for "space-saver" schools, which requires integration of mixed uses; the retail parking on the building's lowest level fulfills the mixed use requirement. This program allowed acquisition of a smaller site than would normally be approved, while providing funding equivalent to that of a full-sized school. Considering the unusual context—a narrow site and the necessity to isolate such outside parking uses from student activity—the school's elevation from the ground plane appears to be a perfect solution. Like other majestic liners, the school floats elegantly over the sea, although in this case it is a sea of cars.

Reflecting careful planning, the school grounds remain surprisingly secure from the adjacent retail area. Access is limited to a single entry court, contained by the walled edge of a residential neighborhood, utilizing the main building mass as a buffer. The playfield acreage is smaller than normal for a school of its population, but it is still ample and offers close and secure access to the main buildings. The flexible layout of clustered classrooms is comfortably linked to a common room. Meanwhile, the well-appointed library affords the visual play of a punctured "light wall" as the backdrop to individual study or group gatherings. Such destinations and the thought devoted to their layout help to create an educational environment that is both pleasant and appropriate to its mission.



Both school designs underscore the rich possibilities inherent in rejecting a policy of academic segregation from everyday urban life.

above and left:

Gonzalo & Felicitas Mendez Fundamental Intermediate School  
Irvine, CA

LPA, Inc. (Design Architect); Jim Kisel, AIA, Project Principal;

Glenn Carels, AIA, Principal in Charge of Design;

Steve Flanagan, AIA, Project Designer

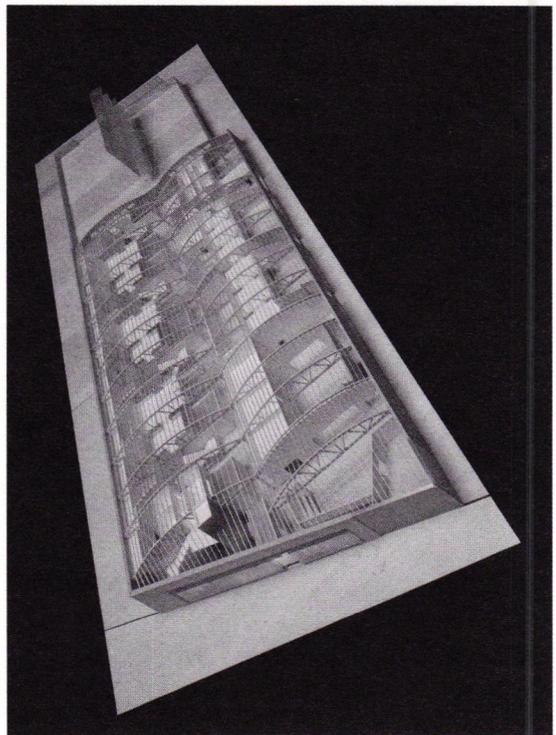
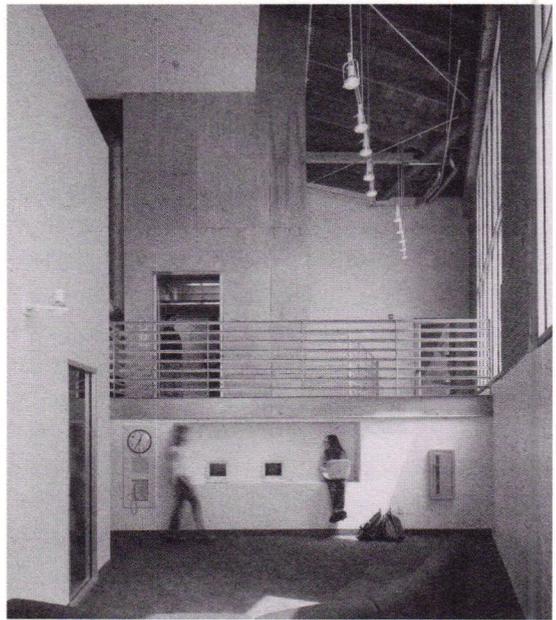
Francis + Anderson (Architect of Record);

Chris Francis and Andy Anderson, Principals

Like the Mendez Fundamental School, the private Wildwood School is the product of space and economic limitations, as well as its specific urban context. As an adaptive reuse project, the school shares its Santa Monica block with a surprisingly active group of businesses, including a home furnishings store (with its loading dock), a mid-rise office building, a restaurant, and a gas station. The school has previously offered only classes below the high school level; the present project creates an additional campus capable of absorbing graduates from its existing facility. The school welcomed the opportunity to inhabit an urban location in support of its mission to involve students with their community.

The project's material choices and spatial organization within a former industrial building convey a remarkable sense of exuberance and freshness, especially when one grasps the limits imposed by the project schedule and budget. The designers, SPF Architects, began their involvement with the project a mere five months before the scheduled first day of classes. The conversion of the 40,000 square foot existing space to a 420 student, 55,000 square foot school required the imposition of a radically accelerated schedule; in response, the team shrewdly organized the project in three phases to coincide with the arrival of each successive matriculating class. The project pushed the firm to "stretch its limits," partners Jeffrey Stenfors, AIA, and Zoltan Pali, AIA, explain. "It showed us what you are capable of doing in a very short time, if the ideas are sound. We went through a lot of quick gyrations." While the strategy required students and teachers to live with some dust, it seems worth the inconvenience. The completed design uses an attractive palette of low cost materials and expresses a vision well suited to the Wildwood School's alternative education model.

The lack of outdoor recreational space available on the site—students are currently transported to nearby facilities for sports activity—highlighted the need for appealing internal spaces. The most important of these is a boulevard-like passage that runs the full length of the building and serves as the primary link between four 'learning pods,' or multidisciplinary classrooms, and the main performance stage and music room. The pavilion-like 'pods' are independent of the main roof and help set the tone of a playful academic village. The open volume above highlights the many exposed ceiling elements. Existing bowstring trusses, structurally reinforced with glu-lam beams and steel connectors, electrical conduits, and sundry mechanical innards are carefully organized. The addition of acrylic lids on the lower 'pods' ingeniously exploits ambient natural light from newly-installed skylights, bringing a pleasant sense of street-ness to the main floor. The designers' willingness



above:  
Wildwood Secondary School  
Santa Monica, CA  
SPF Architects: Jeffrey Stenfors, AIA, & Zoltan Pali, AIA, Principals-in-Charge; Judith Fekete, Assoc. AIA, Principal; Dan Benjamin, AIA, Project Manager; Siddhartha Majumdar, Job Captain; Gregory Fischer, Frank Lopez, Damon Surfes, Shaheen Seth

to expose the existing brick, concrete, and wood and the new clear-coated plywood surfaces—a familiar but still-compelling strategy of loft renovators—highlight the building's own history and lend a vibrant, studio-like quality to the space.

As playful as all this seems, SPF's partners emphasize that rationality and clarity of purpose guided the design process. The dimension between the trusses, for instance, was thoughtfully matched to the ideal classroom size, and the light tones of wood, metalwork, and paint all help boost available illumination. The performance spaces are carefully positioned to allow control by a public reception desk and permit isolation from the classroom pods. The care in addressing these pragmatic issues preserves the design's playfully liberating, free-form ambiance; it also reminds one that education is ultimately about discovery and stimulation.

The success of these two award-winning designs serves to highlight the complexities of creating safe, pleasant, and effective schools in busy, nonresidential locations. The projects also emphasize the fact that urban schools—and the conditions that create them—are challenging school design conventions. One of the most visible challenges is a questioning of the notion that schools are timeless institutions whose materials will last for the long haul. The budgets associated with both of these projects seem to dictate the use of lower cost materials, perhaps indicating changing administrative attitudes or funding circumstance. The Mendez School, for instance, is built of plaster rather than more traditional materials such as brick or stone; no doubt this choice was made out of budgetary necessity. Even more dramatic is the Wildwood School's decision to create its studio-like loft through tenant improvements to a former industrial building. One could imagine that, as time goes on, this second approach would allow for easy, cost efficient modification. Both of the institutions tacitly acknowledge that impermanence is a necessary, if involuntary, reality for modern school projects. Nevertheless, both design teams succeeded in creating dramatic and stimulating environments despite limited resources.

A second challenge is posed by the reduced open space available for playfields in urban settings. Not surprisingly, both schools have developed specific strategies to deal with this dilemma. Of the two projects, the Mendez School's playfields offer the most generous outdoor space. Yet the school's most successful design feature—the building's elevation onto its own plinth—also increases the difficulty of adding landscaping to its promenades. Still, those promenades contribute to an airy sense of openness, which is desirable as an escape from the rigors of the classroom. In contrast, the Wildwood School

pragmatically transports its students to off-campus recreational facilities (although it is also currently studying the addition of limited landscaping to the roof of its own parking garage). Its ultimate architectural solution relies on the creation of an attractive indoor street. As different as these strategies are, both respond to their site particularities and offer creative, effective solutions.

A final challenge is the need to rethink security strategies as schools move away from more isolated and protected suburban sites. The defining question is how schools can strike a balance between hopes for community/student interaction and realistic controls on public access. In the Mendez School, a community room is available to the public, but it is only accessible near the school's secured main entry. Similarly, the Wildwood School's performance spaces are accessible via the controlled reception area near the front entry. The Mendez School is the more restrictive of the two, limiting access to a single entry point, which provides a reminder of the special security needs of an intermediate school. With one-quarter the student population, the Wildwood School utilizes two controlled entries, although the school also provides security staff at the main entry.

The result of these thoughtful design strategies is that both schools enjoy the embrace of their urban surroundings. While some of the Mendez School's retail neighbors have departed due to a slowing economy, its community room remains available for use by local residents. Likewise, the Wildwood School plans to engage its neighbors fully, providing accessible performances and encouraging students to undertake projects in the community. While the latter approach is more appropriate for high school than intermediate level students, both school designs underscore the rich possibilities inherent in rejecting a policy of academic segregation from everyday urban life. In this regard, both projects can serve as a bellwether for the next generation of urban schools. ●



## The SF Ferry Building: New Elegance, New Use

Lisa Kopochinski

[Editor's note: the 2002 AIACC Design Awards presentation gala was held at the newly-renovated Ferry Building.]



Not only is San Francisco famous for its spectacular views of the Bay and Pacific Ocean, but for its historic landmarks as well. One of these icons, the century-old Ferry Building has undergone a massive renovation and restoration to transform it into Class A office space.

Plant Construction has been responsible for building 160,000 sq. ft. of office space, plus another 60,000 sq. ft. for a retail marketplace as the focus of the new Embarcadero waterfront.

The \$44.5 million project, for the Port of San Francisco, included the demolition and removal of all nonhistoric interior improvements to the main, second, and third floors, as well as a complete exterior restoration and reconstruction. This was no easy feat for the San Francisco-based general contractor. On the to-do list was the restoration of 18,000 sq. ft. of marble mosaic flooring, 36,000 sq. ft. of Colusa sandstone facade, and another 25,000 sq. ft. of interior nave brick and terra cotta walls and arches.

Senior Project Manager Eugene Hom led Plant's construction team. Work entailed the seismic upgrade of the entire 660-ft.-long, three-story building and its 15-story clock

tower and the restoration of the interior historic elements and exterior sandstone.

Numerous subcontractors helped Plant in the venture. These include Pleasant Hill-based Inland Masonry Inc., responsible for masonry work at the loading dock and brick infills, and Whiteside Concrete Construction Inc. of Richmond, for the seismic concrete structure and architectural concrete work.

The building's existing steel trusses have been restored and the plumbing, sprinkler, HVAC, and electrical systems replaced. Throughout the central nave, the second and third floors are cut away to create a 3.5-story atrium space covered with skylights. Two bridges cross the nave on the third floor. The retail marketplace will open onto the Embarcadero.

San Francisco architecture firm Simon Martin-Vegue Winkelstein Moris has led the design effort since December 1998. Retail architect Baldauf Catton Von Eckartsberg and historic preservation architect Page & Turnbull are also part of the project.

"The central idea of the project is the restoration of the nave, the historic second-floor passenger gallery which once provided access to the ferries," explained Cathy Simon, FAIA, SMWM principal. The nave will be extended down to the first level, creating a naturally lit, public galleria that runs the length of the building. "This great new public space will be developed as a high-quality market hall, featuring the best food producers, purveyors and restaurants in the Bay Area. The building will open out to include the Ferry Plaza Farmer's Market," Simon continued.

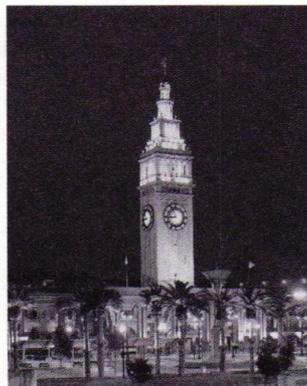
The building will also continue to offer transportation services—the reason it was built more than 100 years ago.

#### AN HISTORICAL BEACON

Originally completed in 1898, the Ferry Building has been the transportation hub for the Bay Area ferryboat system for decades. It was connected to a larger transportation network of streetcars, electric trains, and buses. It even survived the 1906 earthquake and fire, in which the 240-ft.-tall tower clock was severely damaged. At its peak in the 1930s, the Ferry Building saw approximately 100,000 passengers pass through it daily.

By 1939, service had declined dramatically, after the Bay and Golden Gate Bridges opened to serve automobile traffic. The Ferry Building went into a period of decline during the 1940s and '50s, when it was converted to office space.

In 1955, the World Trade Center finished renovations of the north wing. Three floors of offices, conference rooms, and a restaurant were created, as well as storefront windows to modernize the west and north facades.



#### EXPANSIVE VIEWS

According to Simon, the project provides one of the most spectacular public rooms in the city, with expansive views of the waterfront. "Because we were able to dismantle the building to its essential structural and architectural elements, we had significant freedom in terms of program placement," she explained.

This freedom has not been without its design challenges, some of which have been "walking the line between sensitivity and respect for the historic structure and the desire to distinguish the contemporary construction from the old," she said. "We produced multiple designs and worked closely with our client, the Port and Historic Preservation Office, to develop a design that complements the historic architecture."

Simon added that understanding 100 years of construction modifications has been enormously challenging. It has required developing a strategy for repairing the remaining parts that are in good condition, while other parts are completely gone. The historic portions that remain intact include the west façade, most of the roof and roof trusses, the tower, and the southern-most brick arches in the nave.

Hom concurred with the numerous sensitive issues connected with such a high-profile project. "We [attempted] to use the same or replacement materials to replicate materials and details that have been damaged or removed from the building. We [worked] to install and restore the affected areas as closely as possible to their original condition." ●



## Mr. Planning in San Diego



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### Rosie Wiseman, CPS

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An architect friend called my attention to the commentary in arcCA 02.2, "Citizen Architects," noting the absence of Mike Stepner's profile, because everyone in San Diego is alleged to have too many irons in the fire. (Or maybe we just spend too much time at the beach!) Giving Mike his just deserts comes down to a Herculean task—so much to say and so little time—but, if you have the appetite, I can satisfy it. The thing is, for a fellow with so many feathers in his hat, Mike Stepner, FAIA, is a very humble sort without an ego. He tends to give credit to everyone else and can't imagine an occasion when he and his accomplishments would be profiled. But all his admirers can, even if they don't stop to make it happen.

In that vast store of knowledge that architects accumulate and accumulate and accumulate, you were instilled with the notion that a perpetual motion machine is an impossibility. Let me lighten your information load and introduce you to Mike, an architect perpetually on the go. I should know; I've been trying to keep up with him for more than 13 years.

As president of the AIA San Diego Chapter, Mike and the Chapter are in the midst of planning to play host to the AIA National Convention 2003. He has been an active member of the AIA for almost thirty years. He polished a diamond-in-the-rough for San Diegans when he initiated the AIA's annual *Orchids and Onions* awards ceremony, a recognition of the best

and the worst and a welcome excuse for cheering and levity.

After receiving his degree from the University of Illinois and wearing a U.S. Navy uniform for a few years, he embarked on his career path with Crosstown Associates (C.F. Murphy Associates/Skidmore Owings and Merrill) in Chicago. Then, it was on to bigger and better things in San Diego and more than thirty years of leading, managing, and participating in comprehensive planning programs and the development of public policy. He served the city as Assistant Planning Director, Acting Planning Director, City Architect (the first in the city's history), Assistant to the City Manager and Special Projects Coordinator/Urban Policy Advisor, and City Urban Design Coordinator. He is internationally recognized for his leadership and innovation in community planning, public participation, visioning, and, particularly, for his reliable follow-through to implementation.

In 1997, Mike accepted the position of Dean of the NewSchool of Architecture & Design, where he had taught and lectured on urban planning and design for more than ten years. His leadership at NewSchool resulted in six-year accreditation for the school in 2001. He resigned this position last year to join the San Diego Regional Economic Development Corporation as Director of Land Use and Housing, but he has not forsaken academia and remains an adjunct faculty member of the school. In addition, he has taught and lectured at Woodbury University and other colleges and universities throughout the United States and appears to have no intention of eliminating those activities from his agenda.

If you took one of Mike's classes or heard the commencement address he gave at NewSchool in May, you know that in "the world according to Mike" architects have to be involved in their communities. Mike practices what he preaches and his is a very tough act to follow. He is known as the "Father of Gaslamp Quarter" for his vision, perseverance, leadership, teamwork, and political skill in preserving a 16-1/2 block historic district that was facing demolition in the early '80s. Today, it stands as a feather in the city's cap, a source of pride, and a delightful attraction for both tourists and residents. As Charles Reilly, president of Charles Reilly Company, a marketing/strategic planning/communications group, has said, "It is difficult to look at our downtown today or any of a dozen neighborhoods without seeing and savoring the fingerprints that Michael Stepner has left on the cityscape.... San Diego is fortunate to have among us such a visionary—a committed and warm educator, a leader who today is still helping us to see where we can go, and what we can become." Roger Showley, author and columnist for the *San Diego Union-Tribune*, has identified Mike as "Mr. Planning in San Diego" and says that not a month goes by that he does not figure into the debate on the direction of the region's future.

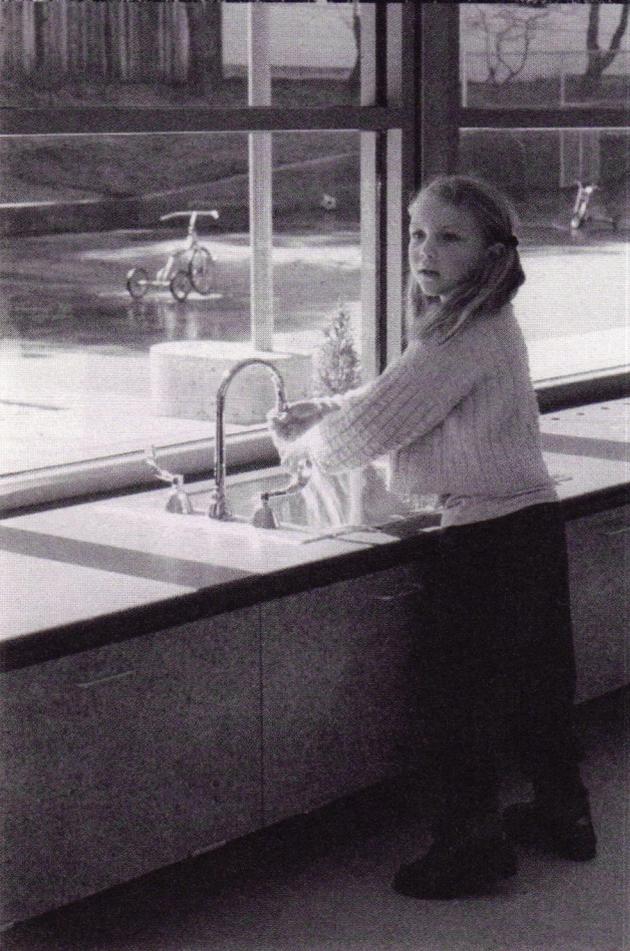
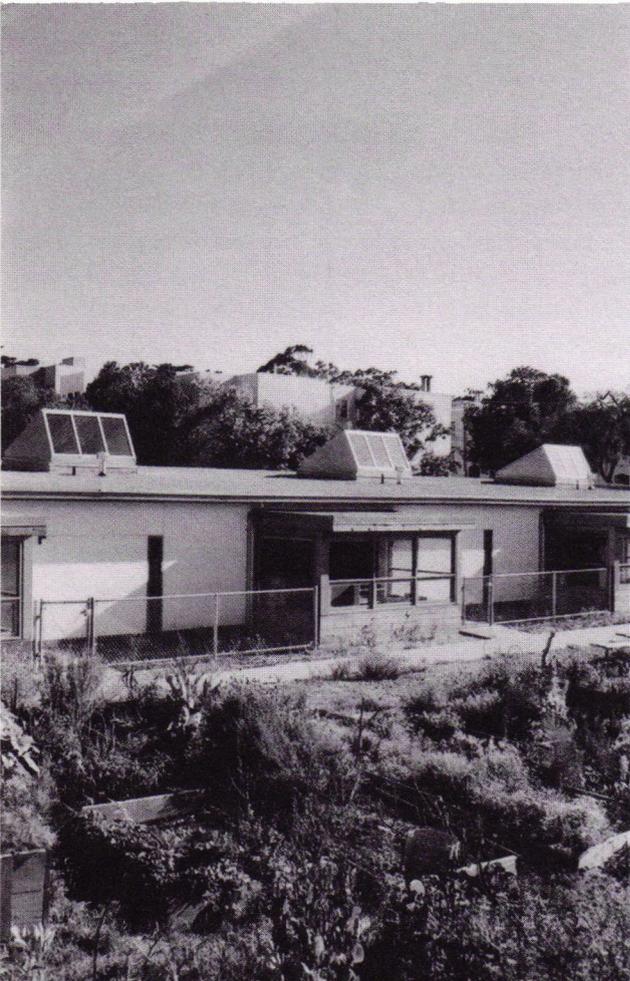
Mike's hallmark is all over Uptown District, too. This is a beautiful and successful mixed-use development that was given life after a Sears Roebuck property was abandoned and the acreage turned over to the city. It has received accolades galore and is recognized as a prime example of how to raise the Phoenix from its ashes. Prior to leaving city employment, Mike spent several years working with the community to shepherd the redevelopment of the former Naval Training Center, a work-in-progress now known as Liberty Station. Among other things, he is now lending his expertise toward improving Balboa Park and working with another group to redevelop an area known as The Bronze Triangle.

Mike has received more awards than I can count or remember, but here are a few to make the point: Distinguished Leadership Award from the American Planning Association California Chapter in 1991; Leadership in Planning Award from the Newschool of Architecture in 1992; the Gaslamp Pioneer Award from the San Diego Gaslamp Quarter Foundation in 1993; and the Michael J. Stepner Community Design Award, from the AIA San Diego Chapter in 1997. (Actually, it was the AIASD's Community Design Award, but, after it was given to Mike in 1997, the name was changed and the honor is given annually to a deserving individual within the planning and design professions.)

When Mike isn't directing or teaching or meeting or planning, he's probably writing. His articles and publications make up another very long list, but this will give you a general idea of the depth: for *San Diego Architect*, "Bureaucracy or Not?"; "Citizen Architects"; "Neo Downtown Urbanism." For the AIA San Diego Chapter, "Urban Design San Diego" (co-author). For *The Planning Journal*, "San Diego at a Crossroads—A Framework for the Future—Growth Management—It's back, as we knew it would be"; "The Ten Things San Diego Needs to Consider for the Future." For *San Diego Planning Journal*, "The City Architect of San Diego"; "Planning Under Pressure" (co-author). For *Los Angeles Times*, "It's Time to Link Balboa Park to San Diego Bay" (commentary). For *Hidden Leaves Magazine*, Ilan Lael Foundation, "The Balboa Park Connection." For Newschool of Architecture, "Borders, Not Bridges, The Mexican Connection."

Mike is a member of the California Architecture Board and is listed in *Who's Who in America*.

How's that for perpetual motion? ●



# Under the Radar

## A Glorious Modesty

Argonne Child Development Center

450 Architects

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Lynne Reynolds, AIAS

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Two definitions of the word *modest* describe the Argonne Child Development Center in the Richmond District of San Francisco, the work of 450 Architects, a young firm whose offices are also in the city. One definition is “free from showiness or ostentation,” the other “having or proceeding from a disinclination to call attention to oneself” (Random House). Although slightly different in meaning, each definition conveys something important—the first about this building, and the second about its designers. What the success of the Argonne school project means is that we now have a viable blueprint for a new kind of public school architecture.

From its Barbary Coast beginnings to the attenuated pyramid that is the centerpiece of its skyline today, San Francisco just is not a place that tiptoes and whispers. In marked contrast, by quietly and methodically serving a constituency of children and the community from which they come, 450 Architects significantly changed the method by which the city itself will build, when it created the first “green school” in the City of San Francisco. While the Argonne school’s balanced, pleasing design is modest, its contributions to responsible architecture are truly glorious: the design utilizes active and passive solar energy, natural convection for ventilation, and environmentally sound materials.

Technically speaking, the client for this project was the San Francisco Unified School District, which is to be commended for supporting an architecture that was, for them, somewhat off the map. They worked with the architects to ensure the removal of toxic adhesives and formaldehyde from existing specs and approved finishes and materials that had, until that point, been unseen in a public school. Throughout the process, the city and the architects worked for the project's true clients—the Richmond District parents and children of the Argonne Child Development Center. From the school's conception in 1995, through its opening this past January, and right up to the present day, the team at 450 Architects, particularly partners Richard Lee Parker, AIA, and David Bushnell, AIA, collaborated closely with active community members in order to be aware, at every pass, of their hopes for and concerns about the center.

The resulting building sits gently atop the site of the original center—built forty-six years ago—alongside a deep, narrow garden filled with flowers, vegetables, and fruit trees. At the far end of the garden stands a small, wood-framed, fiberglass-paneled geodesic dome. This somewhat anachronistic structure is the site of the Argonne Community Garden (the city's largest), which has been in existence since 1974. That the garden is itself organic and serves as diverse a population of ardent amateur horticulturists as any in San Francisco is entirely congruent with the mission of both the Child Development Center and its architects.

Finally funded by passage of San Francisco's Proposition A in 1997, the school was built to accommodate roughly one hundred students in four open-plan classrooms. It is configured in an L-shape that puts the short stroke at the front of the lot (where the administrative offices are located), facing the street; the long bar of the ell extends toward the back of the lot, parallel to the community garden. The inside of the L faces the playground and opens on to it. This length of the building houses the classrooms, which are themselves situated beneath a deep redwood-faced overhang that runs the length of the building, shielding the windows of each classroom from the heat of full southern exposure. Clerestory windows and large, windowed bays pour light and fresh air into the rooms. On the north-facing side of each room, adjacent to the community garden, bay-windowed niches function as reading and quiet areas.

This is not the architecture of grand gestures. The mass does not contort; the materials are not cutting-edge. The building, instead, follows a clean, homey, Southwestern vernacular that could be sited anywhere there was the need for protection from the sun and a desire for a cool breeze. It is



in every way a modest building. The exterior materials—stucco and wood—convey warmth, familiarity, and comfort and are consistent with the look of the houses that surround the center. The building makes no demand, oblique or direct, for an adjustment on the part of the community; rather, the opposite is true.

But the architects took full advantage of the relatively low density of the surrounding neighborhood and installed five photovoltaic panels on the Center's roof along the east-west axis, so that the same orientation that creates an abundant garden generates 25 percent of the electricity for the center. Similarly, inside, each room is finished, as completely as possible, using environmentally friendly, sustainably harvested or recycled materials: stains are soy-based, bathroom tiles are recycled glass, millwork is made from sunflower seed panels, flooring is natural linoleum. In addition to showing a commitment to green building, every detail also shows that the architects carefully considered its potential impact on the 96 small clients who now spend their days at the Center.

With little fanfare, 450 Architects has created not just the city's first green school but also the opportunity for the school district to address the pressing issues of sustainability, and they have done so with great aplomb. ●

*arcCA* welcomes submissions for **Under the Radar**. To be eligible, a project or its architect must be located in California; the project must not have been published nationally or internationally (local publication is OK); and construction must have been completed within the last twelve months or, for unfinished projects, must be 60%-70% complete. Architects need not be AIA members. Submissions from widely published firms (as determined by the *arcCA* Editorial Board) may not be accepted. Please send your submissions to the editor by email at [tculvahouse@ccac-art.edu](mailto:tculvahouse@ccac-art.edu), attaching three to five JPG images with a combined file size of no greater than 15MB. Describe the project in fewer than 200 words in the body of the email, providing a brief caption for each image, keyed to the image's file name. (If you don't have the capability to submit by email, you may send the equivalent information by regular mail to: Tim Culvahouse, AIA, Editor, *arcCA*, c/o AIACC, 1303 J Street, Suite 200, Sacramento, California, 95814, Re: "Under the Radar.")

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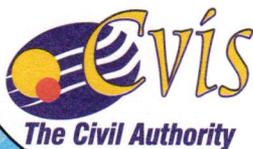
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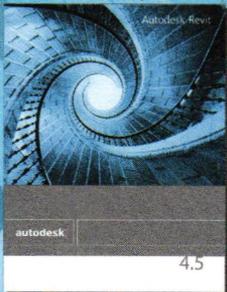
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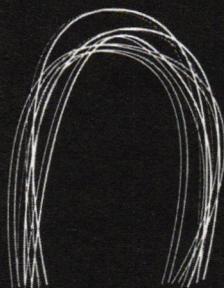
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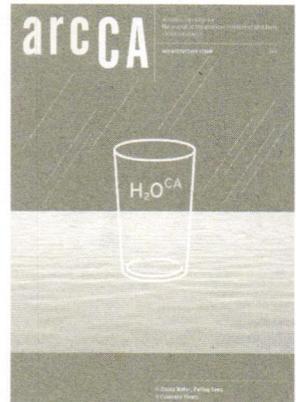
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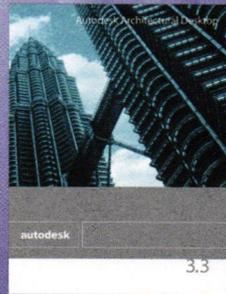


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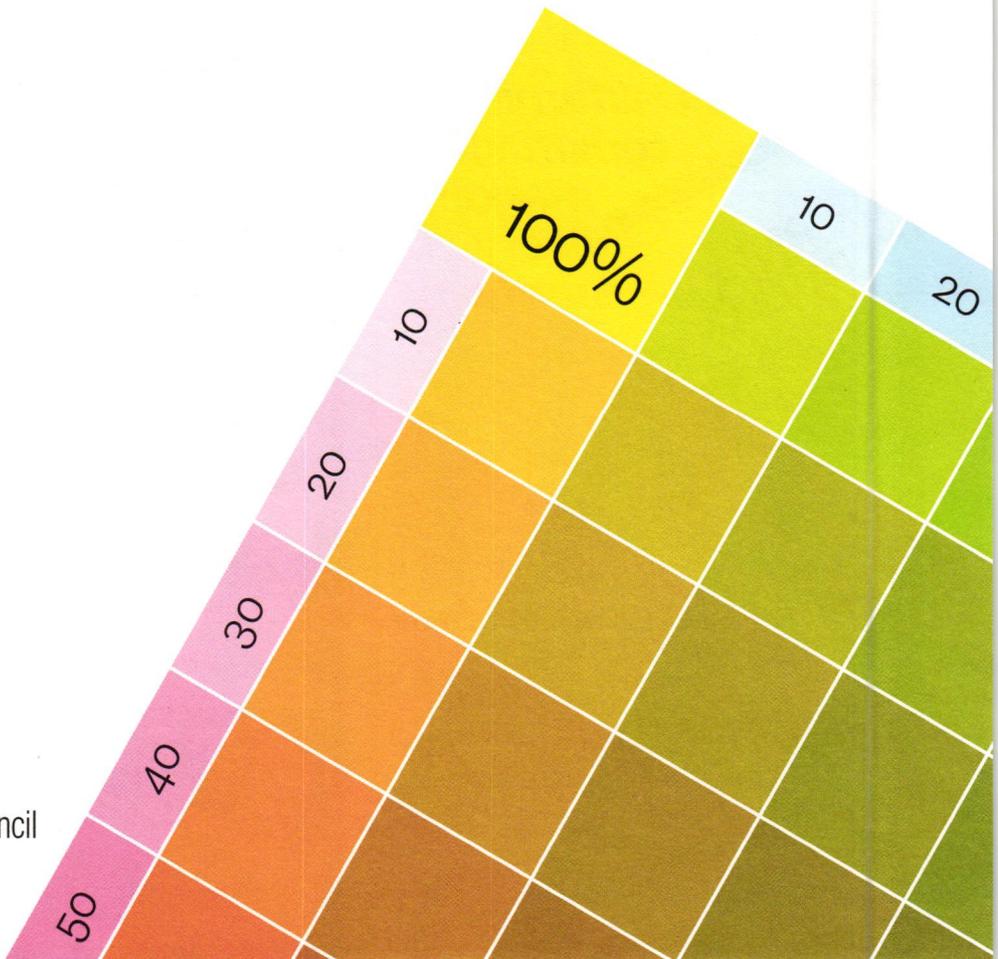
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# Coda

## Santa Monica & Ballona Watershed Green Map

A watershed is an area of land that drains all rain that falls within it to a common point. This map identifies environmental features and resources in the Ballona Watershed, which is part of the larger Santa Monica Bay watershed. The Ballona Watershed drains through Ballona Creek to Santa Monica Bay.

A watershed is an important way to organize how we think about natural relationships among water, earth, and people. Watersheds provide habitat for plants and animals and provide important environmental benefits such as water filtration and storage. The hydrologic cycle (precipitation, percolation and evaporation) intersects with and shapes earth's topography, contributing to unique combinations of plant and animal species. Humans are also part of watersheds, relying on their water and unique environments, yet, by channeling streams and paving over the earth, humans have drastically altered the original percolation and filtration zones of the watershed. It is our hope that the reader will contemplate these changes, and also dream of how we might restore some of the watershed while continuing to enjoy living an urban life in Southern California.

Green Maps locate and promote sustainable urban features, both natural and manmade. All over the world, cities and towns are being Green Mapped using the globally shared, award-winning icons used on this map. You can see them all at [www.greenmap.org](http://www.greenmap.org).

The Santa Monica & Ballona Watershed Green Map was conceived and designed by: Duvivier Architects, Isabelle Duvivier, AIA; with Dafna Kohn, Rosa Bruno, and Mark Child, GIS analysts; Keri Morton and Andrew Steinman, designers; Camille Kirk of Context Research & Mapping; and Bob Zuber and Wendy Brawer of Green Map System. Map development and printing was funded by the City of Santa Monica Environmental Programs Division. ●

For more about this map, visit [www.lagreenmap.org](http://www.lagreenmap.org).