



# blueprints

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ANDREW HALL GRACE

*In Praise of Shutters... Sustainability and Architecture:  
Between Fuzzy Systems and Wicked Problems Building in the Aftermath*

# Parting Thoughts



President  
Susan Henshaw Jones

As Museum Chair Carolyn Brody reported in the last issue of *Blueprints*, I will be leaving the National Building Museum and Washington at the end of January 2003 to return to New York City. Though I am looking forward to new opportunities, I get misty-eyed as I look back on my time at the Museum and think of all the people I will miss.

I am very proud of the progress we have made at the Museum over the past eight years. The institution has grown tremendously by virtually every measure—attendance, contributed income, exhibition space, and press coverage. Thanks to generous and energetic board members, dedicated and talented staff, and ever-enthusiastic volunteers, we have put the Museum on the map as a vital forum for presenting and discussing ideas about the built environment.

The Museum truly is a unique institution. This fact really struck me a few years ago at the opening of an exhibition of photographs by Camilo José Vergara, who had compellingly documented the changing urban landscape of central Los Angeles. Camilo remarked that no other museum would have thought to organize such an exhibition, which blurred traditional disciplinary and topical boundaries but shed new light on the interrelationships among people, buildings, and urban space. Camilo recently received a “genius” grant by the John D. and Catherine T. MacArthur Foundation, and I am pleased that the National Building Museum was one of the earliest cultural institutions to give his work a prominent platform.

I leave the Museum confident that its future is both secure and filled with promise. Our 2002 fiscal year closed on September 30th, and, as every year before, we raised more money than the preceding year and ended with a strong surplus. The exhibition schedule for the next few years is more exciting and diverse than ever, and our education department has lined up many stellar lecturers from around the world. The Museum will continue to engage children and families through a variety of innovative, hands-on activities, and will, I am sure, become an increasingly important voice for the highest possible standards in design and planning.

When I first decided to return to New York, I did not know what turn my career would take next. I can now announce with delight, however, that I will be staying in the Museum community. I have recently accepted the directorship of the Museum of the City of New York. In this new capacity, I look forward to running into old friends from the National Building Museum and perhaps even developing collaborative programs involving both institutions.

For now, I simply wish to thank all of the good friends and colleagues I have been fortunate to have in my eight years here. And I look forward to continuing one very important role at the National Building Museum—indeed, the single most important role in any museum—a member!

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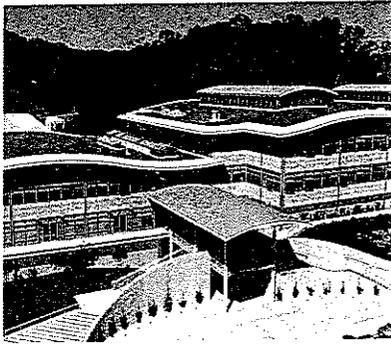
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### GREENERY, WATER, & WASTE

901 Cherry Offices  
Corporate Campus (detail)  
San Bruno, California  
William McDonough + Partners, 1996

Most large buildings place enormous demands on civic water supplies and, in turn, on sewage systems. "Gray" water resulting from hand-washing and other light uses is typically mixed with true waste-water, thus missing opportunities for appropriate recycling, such as for irrigation of landscaped areas within or adjacent to a given building.

Among its many environmentally-sensitive features, including roof ventilators and operable windows, the Gap headquarters in San Bruno contains the largest "habitat roof" in the United States. As opposed to typical office building roofs made of metal or synthetic rubber, habitat roofs contain soil, grasses, and other vegetation that retains and filters water. Such systems reduce rainwater run-off, thereby easing the burden on storm sewers—many also accept gray water. Habitat roofs also create a place for birds and native plants, allowing large-scale office buildings and local wildlife to coexist, while providing lushly landscaped areas that workers can enjoy during breaks or at lunchtime.

FEATURE

# Sustainable Architecture

## Between Fuzzy Systems

In the following article, Mark Jarzombek, associate professor of architecture at the Massachusetts Institute of Technology, describes three theoretical definitions of sustainable design. According to Professor Jarzombek, each model suggests a plausible strategy for achieving sustainability, but the value and applicability of each approach is limited by what he views as overly rigid ideology.

The first definition is that of John Dernbach, who favors, for example, a "National Sustainable Development Strategy," and advocates active governmental initiatives to encourage sustainable building. In contrast, the second definition, by Lisa Newton, places the primary responsibility for sustainability on the individual. The third model, that of William McDonough and Michael Braungart, proposes that true sustainability is simply the result of designers and others emulating nature and natural systems.

# Sustainability Lecture and Wicked Problems

by Mark Jarzombek

Today there exists a range of architectural firms, both small and large, that specialize in environmentally-sensitive architecture, whether that be in the form of design-build projects, self-sufficient structures (those requiring no outside, manufactured energy), "eco-villages," or skyscrapers with layered skins allowing natural ventilation and light. We have also seen in recent years the development of new high-tech materials, as well as the emergence of various "green" consulting companies, some advising individuals on how to place their bed based on *feng shui* principles, others advising multinational corporations on everything from waste management to product design.

In the last five years or so, the word "sustainability" has come into vogue as a way to put these disparate trends under a single rubric. The most immediate reason for the success of the term is that it has allowed advocates to avoid the stigma of environmental politics. Various definitions of sustainability have now been put forward, each with its own implications for the discipline of architecture. The debate, as a result, is not about whether one should or should not support sustainability, but rather about which version we want.

## The Noble Manager Model

Take, for example, the definition of sustainability by John Dernbach, a professor of law at Widener University and a leading scholar in the area. According to him, sustainability means "freedom, opportunity, and quality of life; more efficiency; more effective and responsive governance; a desire to make a better world for those who follow us; a willingness to find and

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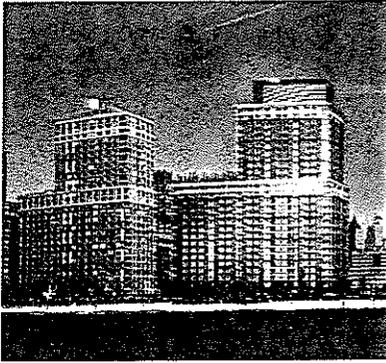
## CONSTRUCTION MATERIALS & METHODS

Esplanade Condominium Apartments  
Cambridge, Massachusetts  
Moshe Safdie and Associates, Inc., 1986-89

The materials used to construct large-scale buildings — concrete, steel, wood, plastics — all pose environmental challenges because of the energy used to fabricate them and the toxic chemicals often used to make them attractive, waterproof, or fireproof. Many construction methods, including on-site welding, material sizing and cutting, and assembly, only exacerbate the problem by contaminating the building site with chemicals, waste, and noise.

When Moshe Safdie designed Habitat for Expo '67 in Montreal, he claimed he was not designing a building but creating a housing system based on flexible modules manufactured entirely off site, which could be assembled in different configurations based on local conditions. Habitat remains a visionary system, primarily for its use of prefabricated units and the generous private outdoor space provided for every resident. With the Esplanade Condominium Apartments, Safdie demonstrates how the concepts of Habitat can be realized today in a dense setting, using contemporary construction methods. Instead of entirely prefabricated units, the Esplanade uses prefabricated, precast concrete panels and traditional brick veneer in a standard structural concrete frame.

## FEATURED PROJECT FROM THE EXHIBITION *BIG & GREEN*



### URBANISM

20 River Terrace  
New York, New York  
Cesar Pelli & Associates, 2000

Architects, planners, and civic leaders are increasingly seeking ways to apply sustainable design principles not just in individual buildings but also in broader urban precincts and, ultimately, entire communities.

The 252-unit apartment building at 20 River Park Terrace, near the lower tip of Manhattan, is the first to be designed under an ambitious set of guidelines developed by the Battery Park City Authority and modeled on the LEED (Leadership in Energy & Environmental Design) rating system of the U.S. Green Building Council. It will be the first green high-rise residential building in the United States. The design incorporates photovoltaic cells, a geothermal heating system, "black-water" treatment for the reuse of water from toilets and irrigation of a neighboring park, and occupancy sensor systems to maximize the efficiency of lighting and climate control. The building will serve as a prototype for subsequent structures in the area, potentially yielding the nation's first truly green—in the environmental sense—urban neighborhood.

exploit opportunities; a quest for a safer world; and a sense of calling to play a constructive role in international affairs." These, he argues, not only are "basic American values," but conform to the principles of the Earth Charter, which was issued in 2000 and grew out of the 1992 Earth Summit in Rio de Janeiro, and which, according to him, "has broad resonance among the world's major religions."

This type of definition, based on the politics of universal consensus, suggests that the field of environmental management might become the future Esperanto (a proposed universal language) not only of government agencies but also of religious systems. That is, various nations and cultures would subscribe to common standards of sustainable development, which would be promoted and enforced by officials with technical expertise and significant power. The implications, though somewhat frightening—given Dernbach's reliance on a broad and universally respected group of environmental leaders—are for architecture relatively prosaic, in that architecture schools would be expected simply to produce the necessarily enlightened class of experts and consultants. Schools would also be expected to shift toward the scientific edge of the discipline, given that corporate and government funding would go primarily in that direction.

### The Ethical Model

A very different vision of sustainability is presented by Lisa H. Newton in her book *Ethics and Sustainability* (2002). She argues that the first task "is to outline an understanding of the individual moral life, life in accordance with a Personal Worldview Imperative, and to show its logical relationship to environmental sustainability."

To define this Personal Worldview Imperative, Newton turns to Aristotle's definition of the *polis*—the city-state as a body of individuals working collectively to achieve the "highest good"—to emphasize the principles of virtue, happiness, and the simple life. Her point is that sustainability is not something new to be worked over by teams of bureaucrats and lawyers, but rather an essential responsibility of the individual, as foreshadowed in the writings of Aristotle, in the life of Christian monks, and even in the philosophy of Buddhism. Her purpose in constructing this relationship between sustainability and ancient philosophy is to detach the concept of a *polis* from the modern city, which for her, presumably, is the site of excess, greed, and immorality. As examples of "unsustainable" practices, she points not only to pesticide-dominated agriculture, but also to "our problems with the casinos... gambling, pornography, and the like." Her vision of sustainability ends in a technocratic utopia, which simultaneously reduces everything to a simple ethical-functional question, and ignores everything pertaining to the more complex aspects of social and urban life.

Whereas Dernbach posits sustainability as a universal movement cutting across political boundaries, Newton seeks a return to the simple life as advocated by the ancient Greek philosophers. Both, however, fail to take into account the complexities of culture, life, and technology. The first model exemplifies what sociologists describe as "a fuzzy system." It is composed of heterogeneous units that can never be—and were never meant to be—synthesized into a coherent system, and as a result, its ambition over-reaches its pragmatics. The second model is what sociologists describe as "a wicked

problem,” one in which conventional reality bites back, in this case, in the face of a utopian fantasy. The first perhaps puts too much faith in society, and the second, too much in the individual.

### The Eco-Determinist Model

Somewhere between the extremes of a fuzzy system and a wicked problem, lies the work of William McDonough and Michael Braungart. Their book *Cradle to Cradle* (2002) is eminently readable and practical, and speaks directly to the question of architecture and design. Yet here, too, there are underlying assumptions that should be highlighted. Basically, the book makes not one but two “ecological” arguments. One is about the endangered environment and is, of course, irrefutable—it is more than obvious that environmental degradation is accelerating at an alarming rate.

The other ecological argument, however, is subtler and more difficult. It comes into view when the authors discuss “the cherry tree” as a model for design. When we think of designing a building, so the authors explain, we should state, “Here’s how we imagine the cherry tree would do it.” This part of the argument is adapted from the controversial, century-old theory of “social ecology,” which holds that social life is much like plant life in that it is ordered by “natural” laws of growth and metabolism. The necessary correlate of this view has always been that human society in its non-natural, industrialized formations is both non-social and impersonal. McDonough and Braungart extend the argument when they contrast current industrial production with the life of the friendly leaf-cutter ants who live in an organized way and are obedient and ecological resourceful. “Like the cherry tree, they make the world a better place.”

Does this mean one goes from being a good ant to being a good citizen? Seemingly so, since the authors mention in this respect the name Edward Osborn Wilson, the evolutionary theorist and Harvard University professor, whose books like the Pulitzer Prize-winning *The Ants* (1990) set off a firestorm of debate about animal and human social behavior. Unfortunately, McDonough and Braungart never refer to this controversy or, for that matter, to the older debates about bio-determinism (the theory that individual actions and reactions are largely predestined by biological factors). Instead, they simply try to convince the reader that the Nature they see and wish to emulate is no more fearsome than an ecological exhibit in a science museum. They have repackaged old-fashioned social ecology into a non-threatening vision for a green future.

Sustainability is often regarded among the lay community as something that can only be beneficial. Be that as it may, the three positions I have discussed are grounded in ideological claims that need to be better understood before one builds an architectural foundation on them. Saving the world is important, but if the choice is between a future of noble managers, conservative ethicists, or eco-determinists then “sustainability” still has some important lessons to learn.

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