



Opposite: William McDonough & Partners' Park 20/20 in Hoofddorp, The Netherlands, features upper offices that "float" above a base of common areas that provide habitat for local bird species. The building was designed to reduce waste and was constructed with sustainably sourced materials.

health in addition to the traditional architectural standards of beauty and functionality. Growth doesn't have to be detrimental to environmental health. In nature, growth is a good thing."

The concept of waste, conversely, is a uniquely human idea; in nature there is no such thing. McDonough points out that it's entirely possible to revamp our way of living to be as efficient and creative as the rest of nature in our production and use of materials.

McDonough notes that while there appears to be a gap between economic activities like manufacturing and the concept of environmentalism, in fact that kind of compartmentalization merely represents a flaw in our approach.

"Like so many gaps in the world that we live in today, there is a false separation in these realms. What C2C can offer us is a fundamental shift in thinking," he says. "In this new framework, it would be clear that environmentalism, like so many 'isms,' is rather useless in and of itself, because it seeks to put some elements of life on earth ahead of others. The dichotomy is one that posits manufacturing as something inherently against the desires of environmentalists. But C2C thinking would remake the making of things so that it would be unassailable from an environmental perspective."

Some manufacturers are already on board with this way of thinking, and have achieved notable successes with the C2C approach. Susan Lyons of New York City, one of the three panelists addressing these issues at Design Santa Fe's Design Dialogue and Luncheon in September, is an award-winning textile designer who is working to align the principles of C2C with the production of furniture. Lyons works with Herman Miller Inc., an environmentally conscious furniture manufacturer



The two-wing form of the energy-efficient Ferrer Research & Development Center in Barcelona's Biopol Health Science Park was inspired by a butterfly. It features a 15-story atrium that serves as a ventilation system and houses a chrysalis hatchery where children come to release the butterflies. "It's a celebration of our abundance, not our limits," says architect William McDonough.

COURTESY OF WILLIAM MCDONOUGH + PARTNERS

COURTESY OF WILLIAM MCDONOUGH + PARTNERS (2)

# How Design Can Change The World

Architects and designers are leading the way to meaningful social change by transforming the way we perceive and experience the built environment

BY NANCY ZIMMERMAN

We all know that change is a constant in our turbulent world. But those signature moments of sweeping social change, those shifts of the collective consciousness toward embracing new ways of living and viewing our lives, remain exciting but rare.

Traditionally, those who talk about "changing the world" have been seen as idealistic dreamers, radical activists, or political bomb

throwers. These days, though, visions of transformation are less likely to come from aging hippies and diehard revolutionaries than from the field of architecture and design, where the changes being advocated are nothing short of revolutionary.

Among the leaders of that revolution is William McDonough, a Charlottesville, Virginia-based architect, designer, and co-creator (with German chemist Dr. Michael Braungart) of the Cradle to Cradle® (C2C) design philosophy. The C2C approach to

the built environment operates on the premise that many of the environmental problems we face are essentially design challenges. Its main goals are to eliminate the concept of waste, use renewable energy, and celebrate diversity.

"Rather than seeking to minimize the harm we inflict," explains McDonough, "C2C reframes design as a beneficial, regenerative force. We can expand our definition of design quality to include positive effects on economic, ecological, and social





The butterflies that inspired the design for Barcelona's Ferrer Research & Development Center. Below: The Herman Miller "GreenHouse" manufacturing facility connects all of its spaces to The Street, an open corridor that runs the length of the building and facilitates communication across departmental lines. The award-winning building was the prototype for the LEED certification process.

At Herman Miller, it's not just the furniture they produce that's sustainable, but their building as well. Designed by William McDonough + Partners, the 295,000-square-foot facility, nicknamed the GreenHouse, was built in 1995 as a pilot project for the development of the LEED (Leadership in Energy and Environmental Design) certification process. The award-winning building, considered a case study in how a sustainable building approach can enhance the physical and mental health of its occupants and boost productivity and profits, features an abundance of natural light, fresh air, and views of nature, along with a stunningly beautiful profile.

In the area of fabrics, Lyons has noted a return to natural fibers after many years of embracing synthetics, and in April 2011 the National Science Foundation approved a textile sustainability standard that will rate

in Holland, Michigan, to supply the company with textiles and designs sourced from sustainable products made via ecologically sound production methods using innovative materials that can be repurposed at the end of the product's life.

"In furniture and production generally, it's important to recognize the power of the supply chain," she points out. "It used to be that the supply chain and environmentalism were disconnected, but now there's a better understanding of how supply-chain decisions—issues like resource extraction, and what the product becomes after its useful life is finished—can contribute to creating a more sustainable world. The tricky piece is that the infrastructure to reuse products doesn't yet exist, but I'm confident we'll get to the place where recycling streams will happen. There doesn't need to be a disconnect between business and our environment."



LEFT: COURTESY OF WILLIAM MCDONOUGH + PARTNERS. RIGHT: TIM HULSEY/COURTESY OF WILLIAM MCDONOUGH + PARTNERS

CRAIG CAMPBELL/COURTESY OF MAZRIA, INC.



The Rio Grande Botanic Garden in the Albuquerque Biological Park was designed by Edward Mazria to use the solar and thermal properties of glazing to provide the proper balance of heat and light for the plants inside, with little or no outside energy input.

fabrics in much the same way as LEED certification does buildings. "There are no game-changing fiber stories yet, as fabrics are not commercialized on an industrial scale," Lyons says. "But it will come, as a lot of work is being done on dyestuffs and textile finishes. The industry is in a constant state of optimization."

Susan Szenasy, editor-in-chief of *Metropolis* magazine and moderator of Design Santa Fe's Dialogue, agrees that the design industry has matured to the point that it now occupies a leadership role in promoting positive change.

"One of the most dramatic changes we've seen is the acceptance of the LEED metrics," she notes. "As a result of measuring building performance, for the first time

*The concept of waste is a uniquely human idea; in nature there is no such thing.*

in a long time those who design and build our environment are asking questions about land use, water use, where materials come from, and their various toxicities, among other complex questions.

"Design for disassembly is often thought of now when manufacturing a product," she adds. "This means that the parts are fewer, and that the product can be taken apart quickly and easily and recycled, with its components and materials put back into the

post-industrial materials stream. Carpet manufacturers, for example, are using more recycled fibers, more PVC-free backings, and there's a growing tendency to reclaim used carpet before it goes into the landfill."

The importance of looking to architecture and design for solutions to the problems of climate change is underscored by the research of Santa Fe-based architect and visionary Edward Mazria. A longtime proponent of alternative energy who literally wrote the book on passive solar building (*The Passive Solar Energy Book: A Complete Guide to Passive Solar Home, Greenhouse and Building Design*, 1979), Mazria began studying the problem of CO<sub>2</sub> emissions in 2002, and what he discovered was a surprise even to him. >





The New Science Building, a renewable-energy research laboratory at Hawaii Preparatory Academy in Kamuela, Hawaii, was designed by Flansburgh Architects in Boston to meet the Living Building Challenge standards. It produces all of its own energy, harvests rainwater to meet its potable water needs, and provides natural ventilation.

“Everyone was worrying about the carbon footprint of SUVs at that time,” he says, “but I discovered that the real culprit was our buildings. Buildings use more energy than any other sector—almost half of all energy consumed, with 77 percent of all the electricity produced in the U.S. going just to operate them. In 2009 the building sector was responsible for nearly half of CO<sub>2</sub> emissions, while transportation accounted for just a third.”

It was this discovery that led Mazria to abandon his successful architecture practice to form a nonprofit group, Architecture 2030, with the goal of reducing and eventually eliminating greenhouse gas emissions in the building sector. “Buildings are the problem, and buildings are the solution,” he says. In 2006 he issued the 2030 Challenge, which calls for all new buildings and major renovation projects to reduce their fossil-fuel energy consumption by 60 percent in 2010, moving toward carbon neutrality by the year 2030.

The response to the Challenge has been dramatic: In January 2006 it was adopted immediately by the 80,000-member American Institute of Architects (AIA); that May a resolution was passed at the U.S. Confer-

*“Buildings are the problem, and buildings are the solution.”*  
—Edward Mazria

ence of Mayors calling for adoption of the 2030 Challenge by all cities. Among the many professional organizations that have signed on are the U.S. Green Building Council, American Society of Interior Designers, and the Royal Architectural Institute of Canada. More than 160 architecture firms are now designing to the 2030 benchmarks, and the 2007 Energy Independence and Security Act includes a section requiring all federal buildings to meet the energy performance standards of the Challenge from 2010.

A companion initiative unveiled earlier this year, the 2030 Challenge for Products, challenges the architecture, planning, design, and building communities to design and manufacture products to meet a maximum carbon-equivalent footprint of 30 percent below the product category average through 2014, increasing to a 50 percent reduction by 2030. Yet another project, to be unveiled next

year, is the 2030 Palette, a multilingual online resource that will allow architects and designers to create an individual “palette” of information on green building specs and procedures tailored to their region, neighborhood, and site, taking into consideration such factors as climate and culture.

“We can do this,” insists Mazria. “The U.S. is the biggest creator of greenhouse gas emissions, so we need to be the leaders in reducing them.”

Another influential proponent of social change through green building is renowned architect and author Jason McLennan of Bainbridge Island, Washington. McLennan is the CEO of the Cascadia Green Building Council and founder of the International Living Future Institute, as well as the Pharos Project, a network of building professionals and manufacturers committed to transparency as a core value on the path to sustainability. He devised a program he calls the Living Building Challenge, an advocacy platform and certification program that goes beyond LEED standards as the next step in sustainable building, based on seven performance criteria: site, water, energy, health, materials, equity, and beauty.

The inclusion of beauty in those criteria is

no afterthought, says McLennan. “I believe that the science of sustainability and beauty are related. We’ve unfortunately created an illiterate society around our built environment: Things like square footage, size, and features are played up, but the public doesn’t expect beauty. We tend to get caught up in the idea that only what we can measure is important, but that gets us into trouble. Beauty, social justice, and well-being are tough to measure, but we leave them out of the building equation at our peril.”

McLennan does find some cause for optimism, however. “It’s the customer demand

together designers from around the world to put forth ideas and execute solutions.

Established in 1999, Architecture for Humanity’s network now comprises more than 50,000 professionals in 104 countries, and provides advocacy, training, and outreach programs to some 60,000 people annually in addition to the 25,000 structures its members build each year. The group’s stated purpose is to produce thoughtful, inclusive design that creates lasting change in communities by:

- Alleviating poverty and providing access to water, sanitation, power,



Another Living Building Challenge project, the Bullitt Foundation’s Cascadia Center for Sustainable Design and Construction in Seattle, is billed as the most energy-efficient commercial building in the world and uses solar-powered electricity and harvested rainwater. It also has an on-site wastewater treatment facility.

for sustainability that creates change, both commercially and through regulation,” he says. “We have a long way to go, but we’re making progress. This is a journey: We’ve gone from being on the fringe, to talking about it a lot, to real adoption of the principles and methods.”

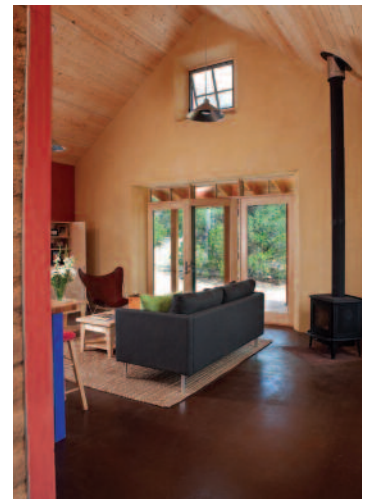
Equally optimistic about our capacity to build a sustainable future is Cameron Sinclair (AfH) and the keynote speaker at Design Santa Fe’s Dialogue and Luncheon. Sinclair believes that design can play a leading role in addressing social problems ranging from homelessness to pandemic diseases to lack of education, and his nonprofit brings

and essential services

- Bringing safe shelter to communities prone to disaster and displaced populations
- Rebuilding community and creating neutral spaces for dialogue in post-conflict areas
- Mitigating the effects of rapid urbanization in unplanned settlements
- Creating spaces to meet the needs of those with disabilities and other at-risk populations
- Reducing the footprint of the built environment and addressing climate change >

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The Kutamba Primary School for children orphaned by the HIV/AIDS epidemic in southern Uganda provides classrooms, offices, a kitchen and dining facility, a library, an infirmary, and a play space. It uses renewable energy systems and was built with sustainable materials according to local building methods.

In the course of carrying out its mission, AfH has ventured around the world, from post-tsunami Indonesia to the Katrina-ravaged Gulf Coast, and it is currently engaged in helping rebuilding efforts in Japan in the wake of the earthquake/tsunami/nuclear disaster. The group came into being when Sinclair was looking to create a plan to ease the housing crisis among refugees returning to Kosovo after the war.

“We started a website and put out a call for help, and in a couple of months we had hundreds of entries from around the world,” he reports. “We built transitional shelters designed to last about 10 years alongside the land the people used to live on, and they would live there while rebuilding their own homes. So this wasn’t imposing an architecture on a community, this was giving them the tools and the space to let them rebuild and re-grow in the way they wanted to.”

A different approach was taken in Africa,

where the link between architecture and solutions to social problems is perhaps less clear.

“We believe that where resources and expertise are scarce,” says Sinclair, “innovative, sustainable, and collaborative design can make a difference in people’s lives. For example, 75 percent of HIV/AIDS is in sub-Saharan Africa. Even if we found a vaccine in seven to ten years, there’s still no way to distribute it throughout the African continent. That, to me, is an architectural problem. You’re talking about an area where young women are at a 52 percent HIV/AIDS rate. Now, how do you connect with them in a way that’s dignified and that doesn’t stigmatize them? What we started looking at is that there had never been a soccer league for young girls in this community, ever—only for boys. So if we built a soccer field, we could actually host a girls’ league, and part of that field would have an HIV/AIDS outreach center

that would dispense information and then also eventually become a place for a mobile clinic.”

This kind of creative brainstorming has resulted in the construction of a series of mobile medical clinics, community centers, schools, and football fields throughout Africa that address issues like public health, economic self-sufficiency, and community cohesion.

Another innovation introduced by AfH is the Open Architecture Network, an online network offering open-source access to design solutions to enable architects, designers, builders, and their clients to share and download architectural plans, drawings, and CAD files at no charge. “We used Meetup and other networking tools, and got 40 networks started up with thousands of architects,” reports Sinclair. “What this

taught me was that there’s a grassroots movement going on of socially responsible designers who really believe that the world has gotten a lot smaller, and that we have the opportunity to really get involved in making change.”

Szenasy also believes that designers can lead the way in promoting more awareness of these complex issues. In addition to hands-on advocacy like that practiced by Architecture for Humanity, she says, “the best way for designers to lead the way is to do what they do best: create functional beauty.” To take the next steps, she adds, “we must turn to research and innovation as a country—in fact as the whole world. How we finance these essential activities is the biggest issue now, but if we don’t find the way, we cannot move on to a healthy, sustainable world. And we all agree, I think, that we need to make our world healthier, more equitable, and more beautiful.” ❁