

A Different Kind of Recovery

William McDonough and Michael Braungart hope to save the world by changing goods into services.

by ALAN MAMOSER

In a world driven by commerce and consumption, architect William McDonough was searching for a new way to design. Over time, he developed a unified philosophy derived from a central principle in which nature is the guide.

McDonough began his approach to natural systems design through the design of buildings. And his buildings are redolent with systems both natural and human. Their lines flow in the shape of the land. They are infused with sunlight. He orients them to the sun's angles and to the prevailing winds, providing both warmth and shade in the appropriate season. Sunlight enters through skylights and massive expanses of windows. The sun gives warmth through the windows and energy through the generous array of solar panels. The earth itself gives heating and cooling through geothermal pipes that reach down deep into the ground to where the temperature is always stable.

Living systems surround his buildings and even live atop them. Woods and wetlands are restored, rainwater is returned to a natural flow, until the site becomes again indigenous, functioning as a group of systems native to the place. Then the roof is literally covered with soil and planted, as if a patch of the local landscape leapt up and lay upon it. McDonough likes to design a roof such that a bird flying over will not see a building below. The landscapes and planted rooftops thrive and hold precious rainwater, protecting it from the fate of runoff, thereby conserving soil and water.

McDonough emphasizes human ecology in these natural settings. His buildings emphasize connection, linkage, communication between humans and ecosystem. Workers are never more than a few feet from a window (one that can open) and a view outside, overlooking the landscape or plantings on a lower roof. But the buildings work to enliven the patterns of communication among humans themselves.

These spaces encourage meetings and connections. In some buildings, long interior halls with high ceilings and walls of glass hold multitudes of trees. Other buildings get atriums or outdoor plazas as their central axis. These halls serve as a kind of central "street" for people. They form a juncture between spaces, a point of meeting between parts of a company where workers from different departments can meet in chance encounters. It is communication, spontaneous, stimulating, that is an often-overlooked but utterly central element of human ecology.

Tools of Nature

In a recent essay McDonough wrote that buildings today are like steamships. They pollute, contaminate, deplete, and hold their occupants in hulls of scarce natural light and little fresh air. Instead, he suggests, we should imagine a building like a tree. A tree purifies

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Waste trimmings from McDonough's clean fabric manufacturing process are composted into mulch for Swiss farmers.

the air, it gathers in solar power, and it produces more energy than it consumes. It creates shade and habitat, it enriches the soil and changes with the seasons.

Such metaphors can be a little startling, expressing as they do McDonough's complete and total rejection of the industrial measures we have internalized. They require a new conception of prosperity, taking into account the extent to which we use nature in productive ways, the extent to which everyone is healthfully employed.

That alternative concept, which has led McDonough to design award-winning "green" buildings, also has led him into a unique partnership with Dr. Michael Braungart, activist and founder of the Environmental Protection Encouragement Agency (EPEA). McDonough and Braungart began working together in 1996. Today, they share a friendship as well as a working relationship by working together on designs for just about everything.

From McDonough and Braungart's point of view, nature provides the principles: Produce nothing that cannot be metabolized. Respect diversity. Look to the nature of the place, trusting local landscapes and building materials. And respect the diversity and changeability of human life. Finally, very important: don't expend energy but capture it — and make it grow.

Nature, ever renewing, without waste, supplies the blueprint for every McDonough building and every product of McDonough Braungart Design Chemistry.

It also supplies the blueprint, say the partners, for the next industrial revolution. The first Industrial Revolution, the one that created the world we live in now, was a polluting phenomenon. It caused a tragic split between human industry and nature, setting the one against the other. The next industrial revolution, say McDonough and Braungart, will bring ecology and commerce back together. They will not only exist side by side but also become one and the same. Technical enterprises will become natural processes in the next revolution.

Sustainable Furniture

One of the first things McDonough and Braungart designed was a fabric for a furniture company. They began by looking at the very molecules of the stuff. They raised the question of inputs: what should go into it? Perhaps cotton? Or plastic? These things can get recycled, which is fine. But what are they doing before they even arrive at the furniture factory? Cotton, probably, was getting sprayed with a lot of insecticides. The plastics were filled with hundreds, thousands, of questionable chemicals. The question of inputs is the first question for them because it is critical for all life. People will sit on the fabric of a chair, for example. They will rub up against it and send little particles into the air. Those particles will get breathed into human bodies.

In looking for a new fabric, the partners created something at once novel and very practical. They combined the wool of free-

range sheep with the fibers of ramie, a plant grown in the Philippines. Teaming with the company Ciba Geigy, Ltd. to determine the chemical composition, they searched through 8,000 chemicals used in the textile industry. They found just 38 non-harmful ones for the fabric and added innocuous dyes. Combined, these elements make a most useful product containing wool, which absorbs water, and ramie fibers, which effectively wick it. The fabric is comfortable and durable, and when it wears out it can be tossed on the compost heap.

Production occurred at a factory in Switzerland where the men discovered, with some surprise, that water coming out of the mill was cleaner than water going in. The fabric's production was literally cleaning the water! That reversal of the normal industrial impact on nature is the kind of result that the partners want to achieve.

Recycling Isn't The Point

Despite their ecological goals, McDonough and Braungart are dubious about regulating the current industrial system. For them, the goal of pollution control is too limited; it's like saying, "don't poison the world too quickly..." Recycling, also, is seen as a mere patch over the problem, a way to slow the degradation of things. A world getting destroyed by industry is still getting destroyed — if only more slowly. So they're not interested in trying to fix the system through regulatory punishment or mandated recycling. Instead, using nature as

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their guide, the partners seek ways to get human industry to behave like nature, which gives forth a profusion of life-giving things, yet makes no pollution.

McDonough and Braungart want commerce to perpetuate the vitality of living systems, whether human social systems or natural ones. To that end, they have developed a Sustainable Design Protocol that calls for production without harmful emissions. The protocol states that manufacturers must begin by looking at the very molecules of a product, ruling out dangerous components from the start. It asserts that many biological substances can serve human commerce and then return to the organic cycle. These are the so-called "organic nutrients" of industry.

McDonough firmly accepts that civilization will need things made purely by the ingenuity of humans, things made of metals and compounds far removed from a natural state. These things, he believes, can be built with "technical nutrients" produced in closed-loop industrial cycles. The idea is to design things with foreknowledge, to anticipate their future such that they retain their value and even increase in value after cycles of use.

McDonough and Braungart bet that what people value are the services that things give to us; that possession of things is ultimately a matter of indifference. When producers are providers not of things but of services, they will learn to make things with the foreknowledge that those things will be used again, and again, in the production of the desired service. Intelligent design will put usefulness into things for generations. The things composed of organic nutrients will be left to normal biological metabolism, discarded, devoured and returned to nourish air and earth and water.

Similarly, technical nutrients — things that will not degrade in the organic realm of nature — should be returned to the technological cycle, with metal going back for reuse as metal, plastic for reuse as plastic, and so forth. This technological cycle doesn't really exist yet, but McDonough and Braungart are doing their best to invent it. For example, McDonough Braungart Design Chemistry has worked on a "hybrid" carpet: its organic top peels off. When its worn, you can toss it on the compost heap. The

padding, which is not organic, goes back to the producer to be prepared for reuse.

For Nike, the company has developed a non-toxic, eco-friendly compound for the soles of shoes. When the soles are worn away the tops are returned to the shoemaker for reuse, in a process that emulates the architect's conception of the two metabolisms.

Greater Challenges Lie Ahead

Next, McDonough and Braungart want to transform factories, remake cars, and move to the very heart of the industrial economy. McDonough has been embraced by Ford Motor Company and given the chance to remake the old factory complex at River Rouge in Dearborn, Michigan, where smokestacks reigned for eighty years. He has begun with a new factory building, to be phased in over the next twenty years. Already, it is a great openness of 600,000 square feet, with skylights heaping light upon the factory floor, and a raised mezzanine to allow workers free circulation above the floor. The factory will be powered by solar cells and fuel cells. Its roof will host a half-million square feet of plants, the largest of its kind in the world, holding inches of rain and filtering water on the site.

On land where stood gigantic, hulking masses of metal buildings and smokestacks and mills, the whole place is turning green. Native landscaping and rows of trees will cleanse water and protect the nearby Rouge. Special plants will rid the soil of contaminants. Vines will grow upon the walls of the administration building to guard it with cool shade, to give it life during summer. Everywhere the site will speak of human labor enriched by nature and of designs taken from nature.

McDonough cringes at the well-known statement of Le Corbusier, that a house is a machine for living in. Architects, he believes, must turn to nature, whose ways will teach good design, which will in turn enrich the lives of people. We are of the earth, and thus, he is certain we must live close to the earth in order to live well. McDonough looks forward to the next industrial revolution in which we learn to revitalize the natural world. Anticipating that transformation, he asks, "When will we become indigenous? When will we become tools of nature?" ☞

Learn More

William McDonough will visit Chicago during 2002 to meet with neighborhood groups and help formulate the Chicago Principles. The principles will give expression to the city's many initiatives in resource conservation and environmental design.

For more about the Chicago Principles, stay in touch with the City of Chicago Department of the Environment, www.ci.chi.il.us/Environment

To learn about McDonough Braungart Design Chemistry, mbdc.com/biz_ps.htm

To find more articles written about McDonough, and to learn about a new book by McDonough and Braungart, *Cradle To Cradle: Remaking The Way We Make Things*, www.mcdonough.com

To read more about McDonough's buildings, see his firm's Web site at, www.mcdonoughpartners.com



Photo: Gap Inc. office building, courtesy of William McDonough + Partners

Dear Bill McDonough,

Welcome to Chicago. It's a great town. We have wonderful architecture, friendly people, world class restaurants serving locally grown organic food, and Mayor Daley II — a guy who gets things done.

The word on the street is that you're working with the Mayor to transform Chicago into the greenest city in America. Bravo! To make your job a little easier, we've asked many of the region's top civic and environmental leaders to suggest the best steps you can take to achieve your goal. With their help, we've come up with an eleven point plan to truly make Chicago the greenest city in America:

1. Create a world class transit system.

The greenest city in America needs a world class transit system. Most of our environmental experts agree that the CTA, RTA, METRA, and PACE must make serious new investments to build an integrated transit system on par with New York, Paris, or London. Doing so will get people out of their cars and cut down on congestion and air pollution. Smart transit planning will also encourage smart growth through business and housing development around transit corridors. In recent years, ridership on the Chicago Transit Authority's bus and train lines has jumped dramatically. Yet some potential riders still shun the system because in many cases it is not convenient or reliable.

One easy fix is to institute a non-peak pricing system that would give discounts to riders who travel between 10:00 am and 3:00 pm. This will take some of the burden off rush hour. The CTA could also add more frequent trains at peak times or consider going back, at those times, to an A/B stop system in which trains load and unload at every other station.

In addition, the city and state should work together to build intermodal connections between METRA, PACE, and CTA transfer stations to make transfers easy. To expand service into new areas, many of the CTA lines can be extended. These extensions could include the red line along the Dan Ryan and the multiple branches of the blue line, including a Kennedy expressway branch to Schaumburg, the Eisenhower Expressway branch to Oak Brook, and the Douglas branch into the south suburbs. The

last suggestion is to purchase new fuel cell or hybrid busses, which will cut down or eliminate the noxious diesel emissions of the current fleet.

2. Force Midwest Generation to clean up or replace toxic coal fired power plants in Chicago neighborhoods.

Two of the most toxic power plants in the midwest are located in dense urban neighborhoods in the city of Chicago. The old Fisk and Crawford coal plants are owned by California-based Midwest Generation, and they pollute the air and harm peoples' health in the Little Village and Pilsen communities. A recent study by the Harvard School of Public Health shows the adverse chronic impacts on human health and increased mortality resulting from pollution from Fisk and Crawford.

Midwest Generation has been resisting efforts to require the company to substantially reduce pollution from these coal plants. You and Mayor Daley should insist that Midwest Generation clean up and substantially reduce the emissions from these coal plants to an acceptable level that will no longer harm public health and environmental quality. The tens of thousands of Chicago children who suffer from asthma that is exacerbated by air pollution will be eternally grateful!

3. Make Chicago the organic food capital of the midwest.

Chicago's central location helped make it an industrial powerhouse in the early 1900s and much of the economic activity centered around food. Yet in the past few decades most of the food processors have left town, weakening the city's economic base.

We can reclaim this heritage by encouraging the creation of a regional organic food system. Consumption of organic food has been growing by more than 20 percent per year and is now a \$25 billion global industry. The city and suburbs have nearly twenty Whole Foods, Trader Joes, and Wild Oats stores, plus an impressive network of health food stores, independent grocers like Sun-set Foods, and even Dominick's and Jewel chain stores, which are selling tens of millions of dollars of organic food. (Not to mention the hundreds of chefs who might

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The Journal of Ecology & Natural Living

Chicago means Green.

Mayor Daley wants to make our
city the greenest in America.

Public lands get pounded for oil.
Smells can make you sick.