

William McDonough on economy, ecology, and equity

**You talk about the Next Industrial Revolution, where industry and environment come together in harmony. What does this look like?**

It looks at the idea as Francis Crick said in 1962, that in order for something to be vital it has to have growth, it has to have a free form of energy, and it has to have an open system of chemicals. So if we think about a tree, it has to have some cells that grow, even for simple reproduction, and it has to have free energy from outside the system, in this case natural sunlight, and it needs an open system of chemicals that synthesize within its metabolism for the benefit of the organism, its reproduction, and its ecosystem.

If we saw human industry in a similar way we'd realize that there's something relatively new in evolutionary terms that we call technical nutrition. Not just biological nutrition, which is the living thing powered by the sun and "consumed" by other organisms as they breakdown (or, as we say, "waste equals food"), but actually seeing human artifice and technology as something that is put into the same kind of cycle. These are what we call technical nutrients.

Take aluminum for example. Our species has made 680 million tons of aluminum since 1880 and we still know where 440 million tons are. So the idea would be that you would design two kinds of things, one is what we call "products of consumption", those things that are literally biologically consumed and go back to soil, or "products of service", things from which we want the service, but not necessarily the molecular potential. With something like a computer or a car or carpet, the user is a "customer" not a "consumer". These are services and in fact, when you finish with a synthetic carpet, for example, you should be able to either return it back to industry forever and remake carpets or other useful things. So biological and technical nutrition – that's the protocol we initiated and have been continuously championing and developing.

**What is the difference between eco-efficiency and what you call eco-**

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## **effectiveness?**

Eco-efficiency (doing more with less) as a strategy is well meaning but not necessarily adequate to the task. Being efficient means that you're probably doing something right, in terms of using the least to do the most, but the problem is that if you're doing the wrong thing, it might be pernicious because it perpetuates the wrong system with the erroneous thought that things are getting better. For someone to tell a company to be more eco-efficient and please make twice as many cardboard boxes out of the trees in Indonesia, sounds like a factor 2 efficiency. Even if they said make it factor 4 or factor 10, you still haven't really solved the problem, because it's still goodbye to Indonesian forests. Why would you use something as beautiful and as diverse as a tree for something as prosaic as a cardboard box that's used once or even twice, and then put into a chlorine-laden "recycling" loop that is actually continuously down-cycling all the materials and destroying water quality?

From our design perspective, the question really needs to be, "With eco-efficiency, is being less bad being good, or is it simply being bad, just less so?" With eco-effectiveness, on the other hand, we ask the question, "Am I doing the right thing?" And then we start to do it efficiently, so we can create prosperity and growth.

## **So we're not interested in being less bad. We're interested in being 100% good.**

Right. That means you have to design with positive principles and positive goals. Modern industrial culture doesn't seem to have principles, except something like: "If brute force isn't working, you are not using enough of it." While its goals are unclear, its de facto goal appears to be to create ecological and human tragedy. If you play a game, you have to have a clear goal; in chess, you're going to take a king. So we have an end game in mind because without this strategy becomes meaningless. What we seek is a delightfully diverse, safe, healthy and just world, with clean water, air, soil and power, that is economically, equitably, ecologically,

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and elegantly enjoyed.

### **How did you get turned onto the idea of changing the world of design?**

I grew up in Hong Kong, so I was in a place with four hours of water every fourth day during the dry season and six million people on forty square miles. I saw a lot of optimization of very precious resources. Then, as we went to the Pacific Northwest for the summers with my grandparents and saw astonishing abundance – fresh water, big forests, pure springs, salmon. I went from a world of extreme limits to a world of extreme abundance, and yet my grandparents were also very careful and kept the spring clean, composted organic waste, and saved rubber bands and aluminum foil and so on. So I always thought the world was something you took care of, and it hopefully got better because you were there. And I also saw in Chinese agriculture a perpetual agriculture: farmers for forty centuries farming the same piece of ground. So that was the context in which I grew up. When I came to the United States to live as a teenager, I entered a world of profligacy and seeming wanton abandon of things in a take-make-waste production system, with a cradle-to-grave “throw it away” philosophy. I think this, in many ways, was the result of something I, personally, had not lived through – nuclear threat. While I was a child in Hong Kong, third graders in the U.S. were being taught how to dive under their desks because Armageddon may appear at any instant. When you sense that everything could end in an instant, you live as if there might not be a tomorrow. This became embedded in the culture -- modern culture actually created geo-political and physical threats (global terrorism, weapons of mass destruction, biological warfare) that could destroy us all tomorrow – so many industrialized countries have a “get it while we can” attitude rather than a continuous long term prosperity in mind.

### **What goes on in a cradle-to-cradle cycle?**

Cradle-to-cradle essentially says that you have an open metabolism of chemicals

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that are manifesting benefit for living systems or technical systems. They're not contaminating each other and they are designed to either replace themselves in cycles or get better as they go through the system. Typically what we call recycling today is down-cycling in our lexicon. Things are actually getting lower in quality as they go through the process. Clear milk jugs will be transformed into a park bench that's on its way to a landfill or an incinerator, getting contaminated by various additives and dyes and losing its quality through the system. We've been looking at nylon fibers, for example, that can be chemically recycled, and actually up-cycled. They get better as they come back and go through the new cycle because mechanical properties have been improved, thereby increasing the quality of the fiber. Essentially, cradle-to-cradle says that if things relate and can improve soil health, then we may return them to soil.

### **What does your fractal triangle diagram mean to you?**

We use this triangle known as the Sierpinski gasket, or fractal tile, to be able to navigate the relationships between ecology, equity, and economy. It's a fractal way of looking at the entire universe that's self-similar. Cost, performance, and aesthetics meet life, liberty, and the pursuit of happiness!

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