

ENVIRONMENTALLY SPEAKING

Peter Schwartzman

There is a better way. Nature will tell us. Let's listen. Let's start mimicking it.

Regarding the environment and its health, people generally fall into two camps. Either they believe that on the whole things are good and getting better or they are convinced that major problems exist that deserve our immediate attention. Not surprisingly, both groups can put together a laundry list of examples to defend their respective positions. And all too often, people, from either group, spend more time ridiculing the other side's position than on tackling the tasks at hand. I am here to say, "STOP!" Both groups should sit back, contain their self-righteousness for a while, gather all their senses, and listen to nature.

Two years ago, I introduced the concept of biomimicry to *The Zephyr* audience in a piece entitled, "Just when we thought we were intelligent." Here, after a more thorough reading of the seminal book on the topic, Janine Benyus' *Biomimicry* (published in 1997 by Perennial), I feel obliged to share more of its phenomenal insights with you. I truly believe it is a book that will be judged to be one of the most insightful and important books of the 20th century. (I realize that this is a very strong claim, but it stems from my belief that it contains many answers to our deep and perplexing questions about humanity, Earth, and the prospects for the survival of both.)

First, let's have a quick refresher. Biomimicry is, as described on the back cover of the Benyus' book, as "a revolutionary new science that analyzes nature's best ideas . . . and adapts them for human use." Typically, humans recognize that nature contains major feats of ingenuity. Inch for inch or pound for pound, what human can ever rival the jumping ability of a flea, the speed of a cheetah, or the flying mastery of a hawk? Yet, humans usually attribute these "skills" to purely physical advantages, not considering for a moment that they represent "intelligence" of any kind. Sure, we began building planes based on the physical, aerodynamic shape of bird wings—and this was/is an example of incorporating biomimic values/principles. However, we largely ignored the fuel the bird used to fly (I don't see birds eating million year old carcasses buried deep within the earth—what we call "petroleum" today), and we certainly didn't look at the birds everyday behavior in order to gain other insights as well (once again, birds don't go around creating biologically-identical worms to eat, do they?). In short, biomimicry tells us that there are rules that nature follows and when these rules are broken, species typically vanish from the Earth. And while it is inconceivable for most of us to contemplate human extinction (especially when we are now larger in number than ever before), nature, if we would listen and learn from it, might tell us that our current course of activities (i.e., modern industrialization) is leading us precisely to this end.

Humans are collectively acting in ways that are antithetical to future living (what some call "sustainable living"). For example, nearly everything we eat contains poisons in it; poisons that we put in the food supposedly because we have to. Nearly all consumption of "stuff" produces huge amounts of throw away, unusable, and toxic materials. When we are sick, what do we do? We take pills to make us better rather than attempt to determine why we got sick in the first place. Most things we manufacture require that we burn huge amounts of fuel (which puts toxins in our air), use toxic chemicals (such as

glues, heavy metals, and lubricants), and attain unnatural temperatures (in factory ovens) that produce deathly compounds (like dioxin). Thus, in the modern age, it is nearly impossible to do anything that isn't contributing to the detriment of our environmental well-being. Yet, as obvious as this observation is, and as significant its impact, we live as if there is no other way, as if this is the only way we can live. STOP! It doesn't have to be this way. And, there are better ways and we can realize them if we want to.

If we were to look at the natural world without preconceived notions of its simplicity and inferiority, we might just learn something that will allow us to survive (even flourish as a full humanity in) this millennium. In Benyus' book, she outlines and explains many of these lessons. Simple as they are, most are so profound that once they settle in and really bounce about the skull a bit, you are left wondering why it took so long to figure this stuff out. And more importantly, why is it that our civilization is seemingly so far from realizing or acting on any of its wisdom? So let's take a look at some of these ideas and see if you too come to a similar conclusion.

In chapter 7 of her book, Benyus lays out a prescription for better ways to conduct business. And since modern business (industrial style) is so great a presence on our landscape and in our lives, we might as well start by reconceptualizing it. There are 10 rules that govern how nature conducts business; we'll look at a few of these (and I hope you'll be motivated to read the book for the remainder).

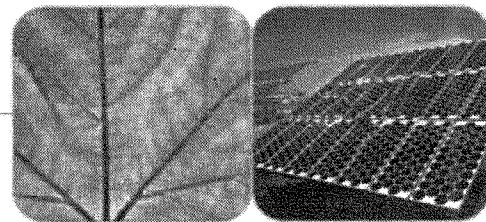
"Gather and use energy efficiently" is something worth doing, no? We actually know this, but how often do we do it? Anyone who has seen a satellite photograph of the Earth at night probably marveled at how amazing it is to see how our civilization has expanded and how big corridors (e.g. the region from Washington, D.C to Boston, MA—known as "BoWash") appear completely white. But, another way to look at that image is with horror. All of that light (visible from above the Earth's atmosphere) is simply wasted. It serves no purpose at all (unless we want little green people to visit us soon) and all of it is associated with the release of poisonous particulates and climate-changing gases (from coal-fired and natural gas power plants). We also waste so much of our gasoline in our cars. Consider that 87 percent of the gas that is burning in your automobile is **not** used to move the car (which is the primary goal, isn't it?); it is wasted on inefficiencies of motors, brakes, traffic patterns, and air conditioning. After more than 100 years of automobile technology, this is the best that humans have come up with? (And some think that drilling in Alaska is the best way to tackle our energy crisis?) Perhaps it is time to look elsewhere for a solution.

Plants, yes, plants—those brainless life forms that we have a love-hate relationship with—are extremely economically and efficient organisms. All the plants on the planet use only 2 percent of all the sun energy which reaches the surface. Yet, with this seemingly trivial amount, they are extremely frugal. They are 95 percent efficient (compared to our cars at 13 percent) with the energy that they absorb! Who are the best engineers on the planet? (Hint: They aren't the ones with degrees from MIT or Harvey Mudd—where I went to school.) Thus, if we could learn how the photosynthetic process maintains such a high efficiency, we would be able to reduce our climate impact of cars (overnight)

"Provocative, and could well provide one viable answer to the wake-up call that Rachel Carson sounded . . . in *Silent Spring*."

—SAN FRANCISCO CHRONICLE

B I O M I M I C R Y



Innovation Inspired
by Nature

JANINE M. BENYUS

by at least 82 percent (95-13)! So, how much money is going into photosynthetic research (from a technological point of view) as compared to the internal combustion engine? Do we recognize how important the answer to this question is relative to the impending climate change crisis or the thousands of our neighbors who die prematurely because of emissions from cars, trucks and SUVs?

"Don't draw down resources" is a mantra rooted in the souls of life forms. Organisms live on "harvestable interest, not principal" (Benyus). Tearing up our agricultural lands (for coal, as is recommended by our Democratic governor) and drilling in Refuges or continental ocean shelves (as has been prescribed by Republican-led Congresses over the last decade) are activities clearly at odds with nature's ways. No wonder then, our current energy policy (or, "addiction to oil," as the President himself has described it) has us spending hundreds of billions of dollars annually (to keep a military presence in the country with the second largest oil reserves on the planet), destroying beautiful mountain tops (in Appalachia), and planning to destroy vast areas of Illinois (for "clean" coal, a clear oxymoron when it requires the devastation of huge tracks of agriculturally- or biologically-productive land). There has to be a better way. And there is.

Nature relies on renewable resources to survive (not finite, fossilized ones). We will need to do the same to survive this millennium. Why not start ASAP and avoid all the wars, pollution, scarring of landscape, and risk (of nuclear meltdown or terrorist nuclear "suitcase" bombs) that are now firmly imbedded in our energy economy? How might we jump start this transition? Not by increasing subsidies to oil and coal (that is for sure). If we shifted the billions of dollars of subsidies (which

today is on the order of \$20-\$30 billion) that currently go to the oil and gas industries to renewable energy R&D, this would be a great start. Kudos to the recent U.S. House of Representatives who in its first 100 hours actually did something beneficial to all of us—cutting billions of dollars of subsidies to Big Oil and earmarking much of the revenue created for the promotion of renewable energy forms; the vote was 264-163, by the way, so it wasn't just "wacko" liberals who were for it. This policy is a start, and it still has to pass in the Senate (and get the President's signature), but perhaps it represents the beginnings of a wholesale change in perspective, a recognition that what we've been doing isn't working and a better way is possible. Let's hope biomimicry also plays a role in how future renewable resources are developed, extracted, disseminated, and used.

"Don't foul one's nest" is another principle organisms live by. Do we? The even more amazing aspect of plant genius is realized in the environmental conditions (temperature, pressure and chemical soup) in which they secure the sun's energy. While we "smart" beings "must" burn coal, gas, and ethanol (or extract radioactive materials from the ground—in nuclear power) to get sufficient energy to live the way we do, plants do everything at livable temperatures, with chemicals that are safe. Furthermore, the byproducts of our fuel burning/use contaminate the air, water, and soil, whereas plants produce oxygen as the major byproduct of their energy extraction. In fact, name a species, other than *homo sapiens*, which harnesses the energy that it needs by destroying landscapes, producing toxins, and defiling their neighborhoods. Thus, it is clearly unnatural to have coal power plants in urban centers (there are two inside Chicago's city limits, both of which are grandfathered out of the Clean Air Acts

