



BIOMIMICRY

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Biomimicry is innovation inspired by nature, looking to nature as a teacher. Life is intimately interconnected and interdependent. It has taken me awhile, but I am beginning to appreciate the meaning of that statement. As historian J. R. MacNeill has pointed out, the best survival strategy for long-term biological success is to be very adaptable, pursue diverse sources of subsistence, and optimize resilience. When you look at our food web, it makes no waste; it is powered by a solar economy that neither mines the past nor mortgages the future. There is a relatively new group of people that are studying nature: trying to mimic nature in order to heal nature and serve human needs harmlessly.

Biological organisms (life) have learned to do some amazing things – fly, circumnavigate the globe, live at the top of mountains and bottom of the ocean, lasso solar energy, light up the night and make miracle materials like skin, horns, hair and brains. Organisms have done everything we humans want to do but without guzzling fossil fuels, polluting the planet or mortgaging their future. Life is very adaptable and an expert at survival. Think of the hummingbird. It flies up to 35 miles per hour, bursts across 600 miles of open water without stopping on a whopping 2.1 grams of fuel (nectar). In the process of fueling up, it manages to pollinate its energy source. When it dies, its body decays and nurtures the roots of flowers, mushrooms, grasses, trees and shrubs. In the process of meeting their needs, organisms manage to fertilize the soil, clean the air, clean the water and mix the right cocktail of atmospheric gases that life needs to live.

Life has learned to create conditions conducive to life. We can learn a lot from it. We need to step outside and ask the local geniuses that surround us. A key question is: what would nature do here? We tend to solve our problems by tweaking our conventional solutions. When we want to clean a surface, we ask questions like: “what is the least toxic detergent to use or how can I reduce the energy involved in sandblasting? A better question might be: how does nature stay clean? Other organisms do not use detergent or sandblasters at all but many depend on staying clean for their survival. A leaf has to stay dirt-free so it can breathe and gather sunlight.

Botanists in Germany looked to the lotus plant because it rises from muddy swamps yet remains dry and pristine. Under a microscope, they saw that instead of being smooth, for easy cleaning, the leaf surface is incredibly mountainous. Dirt particles teeter on the peaks instead of adhering strongly, and raindrops ball up instead of spreading out. As the rain drop rolls off the leaf, it lifts the loose dirt particle.



Advertisement for Lotusan paint in the Paint Pro Journal: “Sto Corp. has duplicated that “lotus effect” in Lotusan, its self- cleaning silicone exterior paint . Lotusan was introduced to Europe in 1999, and now, it’s being sold in North America for the first time. Lotusan’s extreme resistance to water is a product of Sto technology. The coating, after it is applied, mimics the microstructure of the surface of a lotus leaf. Tiny peaks and valleys on the surface minimize the contact area for water and dirt. As a result, the coating is highly resistant to dirt, mold and mildew, and it offers excellent resistance to weather, chalk and UV rays.”

The question then becomes not which detergent to use but how to keep things from getting dirty in the first place. A German company makes a building facade paint called Lotusan based on the lotus effect. The dried paint has the structure of the lotus leaf and rainwater cleans the building. (A quote about the company is listed below.) The deep design principle is that life surfs for free. Plants use the kinetic or motion energy in falling rain to deep themselves clean. It is a very simple concept. Instead of seeing nature as a warehouse that we can shop from, you begin to see her as a teacher. Instead of valuing what you can extract from her you value what you can learn from her. Next time you go out in your garden. Ask: How does nature teach? How does nature learn? How does nature heal? How does nature communicate? Your garden may help you discover an answer to one of life’s challenges.