Get Wild: The wisdom of biomimicry

Joyce Mosher

The Japanese bullet train was modeled after and improved by the design of a Kingfisher's beak, to reduce tunnel noise and increase aerodynamic performance. The technique of looking to nature to solve human design challenges is called biomimicry.
Simeon Amoo/Technovation

Biomimicry, the practice of learning from and mimicking nature to solve human design challenges, became a recognized science in the late 20th century, but studying and imitating the natural world has been a primary means of survival for our species as long as we've been on the planet.

Our ancestors took note of the growth and decay of plants to develop agriculture, a prehistoric closed-loop manufacturing process that runs on sunlight and water, and reuses all waste. Today, regenerative agriculture, with a focus on soil health, seeks to undo the use of heavy machinery, fertilizers, and pesticides to produce more nutritious food and increase biodiversity. Medicines, too, rely on plants and herbs that come from the land and sea, and researchers are racing against the rapid loss of species that are Nature's ultimate pharmaceuticals.

It is difficult to gaze about our built world and not notice all the human innovations that were inspired by nature. Observing birds eventually led to human-invented flying machines. Now we have the Bat Bot, biomimetic flying robots, capable of both flight and terrestrial movement, inspired by mammals and birds.

Water itself, indispensable to all life, can be literally pulled out of thin air by a beetle whose pattern of nodes on its back collects moisture from morning fog and delivers it to the beetle's mouth. Research is underway to develop patterns that will allow even desert dwellers to harvest water from air.

Artists, engineers, and scientists rely on biomimicry, emulating the models, systems, and elements of nature to solve complex human problems. Architects use sustainable materials and methods that satisfy needs of present users without diminishing prospects of future generations. One example is Mick Pearce's building in Zimbabwe that simulates termites' ability to build mounds with constant temperature and humidity. The Eastgate building, whose large chimneys draw in cool air at night, uses less energy to cool than traditional buildings.

Even the clothes we wear copy natural materials. In fact, recently, scientists were too successful replicating sharkskin's denticles, little skin teeth, into swimsuits that are now banned in major competitions. MIT-engineered wetsuits, emulating beavers' dense air-trapping fur, are made of a rubbery, fur-like pelt. These wetsuits have not yet been banned in surfing competitions.

Like agriculture, fashion is ripe for an overhaul. Organizations like Missoula, Montana's Biomimicry Institute endeavor to transform the fashion industry, discovering how to design and produce textiles that decompose. Working with nature and current technology, designers hope to transform the fashion industry away from wasting millions of tons of material annually, towards a functioning ecosystem of bio-compatible fibers.

For countless millennia, knowledge gained from birds, animals, and plants was passed down orally and is now part of our cultural inheritance and a source of hope for the future.

Not only technological advances came from earth's examples, but intangible aspects of human culture did, too: laws, values, and commonly held beliefs. Poetry and art, song, dance, and organized civilizations all owe their origins to observations of the earth and heavens.

For several thousand years, indigenous people have created stunning surface decorations on bags, moccasins, pottery, and blankets that come from the animals, plants, and heavenly bodies observable in their surroundings. The Pueblo tribes of New Mexico continue to recreate Buffalo, Corn, Deer, and Antelope dances through the year, according to traditional calendars.

The Earth has been developing efficient methods of life for 3.8 billion years. Our planet is the oldest and wisest teacher we could ask for. Innovators will continue to learn from nature how to design sustainable products, processes, and policies to help solve the most pressing problems of our time.

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"Get Wild" is a weekly column produced for the Eagle Summit Wilderness Alliance and publishes on Fridays in the Summit Daily News. Joyce Mosher is a long-time Breckenridge resident, a professor of literature and sustainability and friend of the Eagle Summit Wilderness Alliance, an all-volunteer nonprofit that helps the U.S. Forest Service protect and preserve the wilderness areas in Eagle and Summit counties. For more information, visit EagleSummitWilderness.org.