**Nature’s Gifts**

**Chemists say they’re pretty close to making a nearly perfect dental adhesive out of barnacle glue. Testers of barnacle glue claim it has twice the tenacity of the bonding glue in our space vehicles.  *(L. M. Boyd)***

**Those who know all about tropical rain forests say they're renewed mostly by scattered seeds, and 95 percent of those seeds are scattered by bats. (L. M. Boyd)**

**LEARNING FROM THE BEAVER: Researchers studying beavers’ ability to swim underwater are developing methods to improve open-heart-surgery procedures. A medical research team, funded by the American Heart Association, discovered that as soon as the animal’s nose hits water, blood rushes to those vital organs most easily damaged by oxygen depletion. At the same time, the heart rate slows to reduce oxygen needs. Nerve endings in the beaver’s snout trigger this reaction when it dives into cold water. Humans have similar nerves in their noses. Some doctors now treat one kind of abnormally fast heart rhythm by immersing the patient’s face in cold water long enough to trigger a slower, more normal heart rate. (Dave Ambrose, in Outdoor Highlights)**

**The Wright brothers didn’t have to look far for ideas when building their airplane. They studied birds. *(Shaun Pett, in Reader’s Digest)***

 **You can get 200 times as much gasohol from cattails as from corn.  That’s what a Florida University professor claims. *(L. M. Boyd)***

**The next time your day at the beach is ruined by cloudy skies, just remember this: without clouds and the other constituents of the earth's atmosphere, the surface of our planet would reach a temperature of 176 degrees at the equator by day, and -220 degrees at night! (Denver P. Tarle, in A Treasury of Trivia , p. 97)**

### George de Mestral, a Swiss engineer, found himself in a sticky situation. One day in the late 1940s, he returned from a walk in the woods, musing over the cockleburs that clung to his trousers and his dog. Examining the burs under a microscope, he discovered that they were composed of hundreds of tiny hooks that latched onto anything loopy. De Mestral figured out a way to weave nylon so that thousands of tiny hooks on one piece engaged thousands of tiny loops on another. He called the odd product Velcro, for velours and crochet . (Judith Stone, in Reader's Digest)

**One thing homeowners hate is a dandelion. But around the world the little yellow herb is a useful plant. Leaves are eaten for salad (a little bitter), and also serve as food for silkworms when mulberry leaves are in short supply. The root is used as medicine and also is roasted as ersatz coffee. In Russia the plant is a commercial source of rubber. (Bernie Smith, in The Joy of Trivia)**

**Some people eat dirt every day--on purpose. More than 200 cultures worldwide do it. The dirt of choice for many is clay. In India, some pour tea into newly formed clay teacups, drink the tea, then eat the cups. (L. M. Boyd)**

**The colors you sometimes see at sunrise or sunset are caused by dust, smoke or water droplets which scatter light in a different way. (Kim Taylor, in Light)**

**From time to time brush fires rage over these hills, burning away the vapor emitting leaves of the sage and chaparral. When that happens, nearby long-buried seeds of other plants immediately begin to sprout. (Lowell Ponte, in Reader's Digest)**

**John Dabiri says his goal is “to tap the inexhaustible supply of inspiration found in nature” in the name of innovation. At the moment, he’s applying a lot of his findings to renewable energy. Dabiri realized that one major problem on wind farms is interference between neighboring turbines. When placed close together, they funnel wind into each other, reducing energy output and increasing wear and tear. To avoid this, wind farms space turbines hundred or even thousands of feet apart. Dabiri found an analogous problem in the ocean. When fish move as a school, they push water against each other, potentially slowing the whole group. But they’ve found ways of moving together more efficiently and with less energy. Dabiri modeled their motion mathematically and used the results to develop software to define the optimal placement of wind turbines. He says his math makes it possible to squeeze more turbines onto a given plot of land and yield 10 times more energy. He started the company Scalable Wind Solutions to commercialize the software and plans to start selling it in the next few years. “He was the first person to think of” modeling wind farms on fish schools, says Alexander Smits, one of Dabiri’s engineering professors at Princeton. “It’s a game-changer.” *(Olga Kharif, in Bloomberg Businessweek magazine, April 9, 2012)***

The fungus called truffles can cost $225 to $425 per pound. They are sniffed out by female pigs, which detect a compound that is also in the saliva of male pigs. The same chemical is found in the sweat of human males. *(Noel Botham, in The Amazing Book of Useless Information, p. 175)*

**If CO2 and other greenhouse gases such as methane, nitrous oxide and chlorofluorocarbons vanished tomorrow, the earth would become overnight a frozen, lifeless world like Mars. (Lowell Ponte, in Reader's Digest)**

**BETTER FANS: While browsing in a gift shop one day, Pennsylvania biologist Frank Fish came across a sculpture of a humpback whale. He was surprised to find bumps on the “wrong” side – the front edge – of their flipper. Conventional engineering wisdom said that a smooth leading edge reduced drag, whereas a ragged edge increased it. If the surface was anatomically correct, everything Fish had learned on the subject would be turned on its head. And it was. Far from being a hindrance, Fish discovered, those flipper bumps, or tubercles, actually reduced drag and improved aerodynamics, allowing the whale to maneuver using less energy. Today, Fish’s White Power Corporation develops and markets tubercle-enhanced fan blades that move 25 percent more air than conventional fan blades while using 20-percent less electricity. *(Shaun Pett, in Reader’s Digest)***

**It was apparent to the casual observer that Hurricane Andrew did a lot of damage to the Florida Everglades. But scientists say such winds clean out the overload of organic matter than suffocates wetlands. The Everglades, they contend, owe their survival to hurricanes. Scientists agree hurricanes do more good than harm. *(L. M. Boyd)***

**The cochineal, a South American insect, changed history. Spanish explorers took home shiploads of the bugs. From their dried remains was made “Spanish red” dye. *(L. M. Boyd)***

**Insects: Bored with burgers? Sick of sausage? Well, cooked locusts, termites, flies and beetle larvae have more protein, pound for pound, than beef, chicken or milk. They're also low in fat and packed with vitamins and minerals. They taste good and they're good for you! OK, maybe just good for you! *(1993 Disney Adventures)***

**QUIETER RIDES: Japan’s Shinkansen bullet trains seamlessly zip passengers between the country’s major cities at speeds of up to 185 mph. But things haven’t always run so smoothly. During initial test runs, whenever the trains went from the outdoors and into a narrow tunnel at high speed, they produced a sonic boom that rattled windows some 400 yards away. Seeking a solution, engineer and avid birder Eiji Nakatsu asked himself if there was some living thing that manages sudden changes in air resistance as a part of daily life. There was: the kingfisher. It dives from the air, which is a low-resistance medium, and into water, a high-resistant one, with only a small splash. By redesigning the nose of the bullet train in the image of the kingfisher’s beak, engineers reduced noise and cut electricity usage. And saved a lot of windows in the process. *(Shaun Pett, in Reader’s Digest)***

**ENERGY SAVERS: Found in the rain forests of Central and South America, the morpho butterfly is famous for its iridescent blue wing. Grind up these wings, however, and you’ll get a drab powder. The butterfly’s hue is an optical illusion called structural color. That is, the gorgeous color is created by the way light hits it – some light waves get reflected, others absorbed. Research into the morpho has resulted in such commercial applications as low-power computer screens, counterfeit-proof currency and charge cards, and fibers that can “mirror” a rainbow’s range of tints without polluting dyes. *(Shaun Pett, in Reader’s Digest)***

**Normally, we try to stop moulds and bacteria forming on food. But many moulds and bacteria are quite harmless and it is some of these harmless ones that give certain cheeses their distinctive taste. For example, Swiss cheeses often have holes in them. The holes are caused by gases given off by bacteria that are introduced on purpose into the cheese while it is maturing. Another special mould produces the blue veins in Roquefort cheese from France. Camembert, also from France, has a greyish-white mould growing on its surface, which many consider the most delicious part of the whole cheese. (Simon Goodenough, in 1500 Fascinating Facts, p. 234)**

**John Steinbeck’s good friend the marine biologist Edward F. Ricketts (who is fictionally portrayed as the character Doc in Cannery Row and other Steinbeck novels, in his guide to marine animals of the Pacific Coast, said this of the octopus’s capacity to blend in and hide: “A little observation will convince one that in a given area probably half of the specimens escape notice despite the most careful searching – a highly desirable situation from the points of view of the conservationist . . . and the octopus.” He added, “The octopus has an ink sac, opening near the anus, from which it can discharge a dense, sepia-colored fluid, creating a “smoke screen” that should be the envy of the Navy.” (Rafe Sagarin, in Learning From the Octopus, as it appeared in The Week magazine, March 23, 2012)**

**Tiny parasitic growths get into the wood of the maple tree and cause swellings. When the wood is lumbered and sawed across, the swellings appear as little eyes. Result: Birdseye maple, a very valuable wood.
(Bernie Smith, in The Joy of Trivia, p. 232)**

**For those who weren’t paying attention when Mom told you about the birds and the bees (Dad was always too busy watching the ball game), here are some fascinating notes about pollination. All plants depend either on the wind or on birds or insects to do the job. Those that depend on the wind don’t need bright flowers (such as wheat, trees, shrubs, etc.), but insect-pollinated plants, such as the tulip or the hibiscus or the rose, need bright flowers to advertise their availability. In some cases they even have drops of honey to entice the bees or moths or hummingbirds. Nature certainly is grand. (Bernie Smith, in The Joy of Trivia, p. 236)**

**Raindrops won't form in perfectly unpolluted air. Without rain, no grass. Without grass, no people. We owe a lot to pollution. (L. M. Boyd)**

**Learning a trick from pythons: Snake blood may hold a key to combating heart disease in humans. Scientists studying Burmese pythons have discovered that when the snakes digest a large meal, a cocktail of three fatty acids in their blood causes their hearts and other organs to greatly increase in size. The process, called hypertrophy, helps the enormous snakes amp up their metabolism to process prey that’s often as big as they are. Yet within a few days of gorging, their organs shrink back to normal size without damage or scarring. In humans, an enlarged heart is sometimes a sign of heart damage, but “well-conditioned athletes” grow huge and healthy hearts that allow them to exercise harder, study author Leslie Leinwand tells Agence France-Presse. Injecting the same fatty-acid mixture into normal mice expanded their hearts in a beneficial way, proving it’s possible to “translate the python biology into mammals.” Understanding how fatty acids expand python hearts, Leinwand says, could help safely enlarge the hearts of people with heart disease, enabling them to pump more blood. (The Week magazine, November 18, 2011)

One summer four and a half years ago, meteorologist David Atlas was sailing in Buzzards Bay, off Cape Cod, when a storm suddenly came up. “The waves were about one and a half feet high at the time, and we thought we should batten down the hatches and get ready for intense rain," he recalls. “But to my utter surprise, as soon as the rain started, the sea became glassy and perfectly calm, except for the little ripples generated by the drops themselves." Atlas had witnessed something described by sailors for centuries: namely, that rain can calm choppy seas. (Discover magazine)
Rattlesnake venom was a popular treatment for epilepsy early in the twentieth century. After hearing about an epileptic who was free of seizures for two years after being bitten by a snake, some doctors hastened to treat their epileptic patients with this venom. Some reported they were successful, but most determined the venom to be valueless. Its use was almost completely abandoned by 1930. (Isaac Asimov's Book of Facts)**

**Crime goes down in rough weather. (L. M. Boyd)**

**CLEANER SOLUTIONS: Fouling – the slimy growth that collects on ships’ hulls – is an expensive nuisance to ship-owners and is often remedied with potentially harmful copper-based paints. But University of Florida engineering professor Anthony Brennan thinks he’s found a clean solution thanks to an unlikely ally: sharks. Brennan noticed that the microscopic tooth-like pattern of their scales prevents algae and barnacles from sticking to their bodies. Using that insight, he created Sharklet, a pattern that mimics shark scales and reduces fouling by 85 percent, as compared with smooth surfaces. But there’s more! Dangerous bacteria can’t adhere to Sharklet either. So its producers – aware that thousands of people die annually from hospital-acquired infections – developed the pattern into a material that can be applied to a hospital’s high-risk areas, such as bed rails, bedside control panels, and tray tables. *(Shaun Pett, in Reader’s Digest)***

**A company manufacturing skin cream from snail extract is exporting 20,000 bottles to the United States every month. (Noel Botham, in The Best Book of Useless Information Ever, p. 102)**

**Spiders, though not generally popular, are true friends of man, and some scientists believe that human life could not exist without them. For a spider's entire life is devoted to snaring and devouring insects which might otherwise multiply and desolate the earth. (Leicester Hemingway, in The Living World of Nature, p. 135)**

**Understand the British are trying to make bullet-proof vests out of spider webs. *(L. M. Boyd)***

**Nature's “SUPERGLUE”: A sticky substance produced by sea mussels is about to revolutionize dentistry and medicine. Dr. J. Herbert White of the University of Connecticut Health Center has been studying the extraordinary glue that enables mussels to adhere to structures underwater. It took three years – and 3000 mussels – to provide the tiny amounts of adhesive he needed. Now that Dr. Waite has identified the main ingredient – a protein – and can synthesize it, the result is a superglue that has a multitude of possible applications. The most powerful man-made glue cannot be used in water, but the mussels’ glue works in a wet or dry environment, sticks to any surface (rock, glass or metal) and is a completely natural, inert substance. Dentists foresee using the new substance as a filling for cavities, and for creating a bond between teeth and gums to aid in periodontal surgery. Surgeons are interested in using the glue to coat surgical incisions to prevent infections and for fastening small broken bones or tendons together. *(Jody Dove, in “Research News,” National Institute of Dental Research)***

**COOLER BUILDINGS: Here was the dilemma: Architect Mick Pearce had to design a building in his native city of Harare, Zimbabwe, that would remain cool under the scorching African sun. The catch: do it without air-conditioning which is expensive to install and maintain there. Pearce found a worthy predecessor to study in the mounds of termites. The insects, it was believed, cooled there mud homes using an ingenious system that catches breezes at the base of the mounds. Following their lead, Pearce’s design uses fans to suck fresh air from the building’s atrium and blow it upward through hollow spaces under the floors and then into offices through baseboard vents., Electricity costs were one tenth that of a comparable air-conditioned building, and Pearce’s structure used 35 percent less energy than six regular Harare buildings combined. *(Shaun Pett, in Reader’s Digest)***

**Termites are a delicacy to chimpanzees. (Eugene J. Walter, Jr.)**

**When years pass with few tropical volcanic eruptions, the stratosphere becomes a very clear window through which intense sunlight bakes the land below. (Lowell Ponte, in Reader's Digest)**

**In the Amazon jungle there are nine hundred different species of wasps , each of which pollinates a different shape and species of fig tree. These fig trees are the main source of nutrition for all the smaller mammals of the rain forest, and these smaller mammals in turn provide the basis of life for jaguars, monkeys, peccaries, and others. Each species of wasp keeps a chain of other animals alive. (Jack Kornfield, in Unity magazine)
Weeds are colonizers of disturbed and infertile ground. They prepare the soil for more valuable plants that follow and displace them. (Craig Varoga & the Associated Press editors, in It's A Fact, p. 202)
How do you account for so many varieties of butterflies? Credit the wind. It blows butterflies off course, sometimes. They lose their mother colonies, join other groups, and nothing in the butterfly bylaws says they can't mate with strangers. (L. M. Boyd)**

**When they were looking for a way to protect the heads of football players, researchers studied the woodpecker because this bird hammers steadily with its head without suffering injury. A helmet was designed with air spaces similar to those in the woodpecker’s skull, which act as shock absorbers. (Barbara Seuling, in You Can't Sneeze with Your Eyes Open, p. 14)**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***