Bats have a way of flying through caves that are filled with dangerous obstacles, like stalactites and stalagmites. While most bats have decent vision, they also have extremely sensitive hearing. Bats make a sound that humans cannot hear. Do not confuse this sound with the squeaky noise you hear when you stand next to the bat exhibit at your local zoo (bats make those noises when they are frustrated, excited, or mating). This shrill, high-pitched noise that you can’t hear bounces off objects in a bat’s flying path, giving it plenty of time to dodge whatever is in the way. This process is called echolocation. The user of UltraCane gets feedback through his fingers. The signals reach a part of the brain that creates mental maps subconsciously, so, when the brain has become accustomed to the signals, the user can process the information from his cane’s echolocation almost effortlessly. More and more mobility trainers worldwide are learning how to use the UltraCane. Those who now can move more easily can thank not only the designers of UltraCane, but also the Creator of all life Who made those remarkable bats!

Scientists have used their knowledge of bat “vision” to create the Ultra-Cane. It is a new electronic mobility aid, designed to help people—even the blind—get around more easily and safely. It uses ultrasonic signals which bounce off objects in its path and “echo” back to the cane. The device sends that information to the buttons on the handle, telling the user how far away the objects are and whether they are in front or at head height.

The limestone caves of the American West are filled with bats. These flying mammals are fascinating creatures with an amazing ability to navigate through caves filled with obstacles like stalactites and stalagmites. Bats have two types of sensory systems: they rely on echolocation to detect objects in their path and use vision to see clearly.

Echolocation is a process by which bats emit high-frequency sounds and listen for the echo that returns from objects in their environment. These sounds are produced by special muscles that vibrate the eardrum, and the returning echoes are heard by the bats through their eardrums. The frequency and intensity of these sounds help bats determine the distance and size of objects in their path, allowing them to fly safely even in total darkness.

The importance of echolocation lies in its ability to provide bats with a way to navigate through their dark and cluttered environment. Unlike some other animals, bats do not have a night vision system like humans. Instead, they rely on their echolocation system to orient themselves and find food. This system is so effective that bats can fly through narrow crevices and avoid obstacles with great precision.

In the case of UltraCane, scientists have sought to imitate this ability by designing a device that uses similar principles. The Ultra-Cane is a mobility aid designed to help people navigate their environment, especially those with visual impairments. It emits ultrasound waves that bounce off objects in the path of the user, providing them with information about their surroundings. This allows the user to move more confidently and independently, much like how bats use echolocation to fly through obstacles.

Imagine seeing RoboLobster crawling in the shallow waters off of a beach. Its eight super strong plastic legs work just right to move it in any direction. Its antennae sense obstacles to avoid or destroy. Its claws and tail stabilize it in rough waters. You would conclude that this robot is the product of intelligent design.

Scientists are mimicking lobsters because the U.S. Navy is in need of a better way to hunt for deadly explosives (called “mines”) on the ocean floor. The ocean can be a very difficult place to look for mines because of the rush of waves and the difficulty of seeing clearly through the water. Now scientists have devised a new way. Actually, they have copied the ways of real lobsters.

Lobsters are excellent at moving both on land and in turbulent waters. They can adjust their position in the rough waters of the ocean, and can effectively walk along sand and rocks, preying on starfish, sea urchins, and clams. Scientists believe that RoboLobster will be able to search for mines along the coastlines by mimicking the movement of real lobsters.

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Now imagine seeing a real lobster scurrying along the same ocean floor. You recognize that its body is designed perfectly for the actions it performs. You observe its claws, legs, eyes, antennae, and tail. You watch how easily it moves around, automatically adjusting its body in the turbulent waters in order to stay in the right position to rest or search for food.

To what do we owe the real, living lobster? Evolutionists say it is the result of mindless time and chance. However, common sense and the Bible say otherwise. Design demands a Designer. “For every house is built by someone, but He who built all things is God” (Hebrews 3:4).
The year was 1966. My classmates and I were herded aboard buses by our school teachers in Phoenix, Arizona for a "field trip" to see a newly released science fiction movie titled *Fantastic Voyage*. The story line: Russian scientist, Jan Benes, who held the secret of how to shrink soldiers for an indefinite period, escaped from behind the Iron Curtain with the help of a CIA agent. While being transferred, their motorcade was attacked and Benes’ head was struck, causing a blood clot to form in his brain. A group of scientists then were miniaturized, along with a submarine, injected into his bloodstream, and had one hour to travel to his brain and remove the clot and get out before the immune system recognized them as a foreign body. As I remember, the teachers wanted us to see the internal marvels of the human body as the crew made their way from the arm, through the heart, and on to the brain.

While scientists can’t shrink people, Australian scientists are developing a miniature robot that they hope will be able to propel itself through human arteries to perform delicate medical procedures. Only two human hairs wide, the 250-micron microrobot will send images and perform microscopic tasks in areas of the body where current surgical procedure is risky. Once inserted by means of a syringe, the microrobot will be guided by remote control to the target site to perform its assigned tasks, and then return to the point of entry so it can be removed.

One of the obstacles researchers have faced for years is how to design the propulsion system. Since electromagnetic motors aren’t practical, this microrobot’s design is based on the *E. coli* bacterium of the human intestine. It includes flagella (fluh-GEL-uh) that propel it through the body. The flagella are made from human hair.

Once again, men turn to God and His creation to solve their problems. God built into His creation the principles that make the Universe work the way He wants it to work. Intelligent men are able to tap into the intelligent designs of the Master Designer to produce amazing technology that helps people. “Know that the Lord, He is God; It is He Who has made us, and not we ourselves” (Psalm 100:3).
Hey Kids! This month’s *Discovery* is special because we are starting a new contest to feature your creative writing and drawing talents. The contest for this month is called Copy a Creature. Simply think of how the design of a particular animal could be copied to make a new invention. Draw a picture of the new object and write a paragraph to explain how it is related to God’s design, and how people can use it. Be creative and have fun. We will select some of the most creative ideas and feature them in a future issue of *Discovery*. All winners will receive a special prize. But hurry! Copy a Creature ends in May, so get your biomimicry ideas to us soon!

**true or false**

1. It makes sense to believe that all of the animals, which scientists spend countless hours and billions of dollars studying, are the result of mindless time and chance.
2. A new microrobot’s design is based on the *E. coli* bacterium.
3. Termites evolved the ability to keep their large termite mounds the perfect temperature.
4. God made lobsters with the ability to move effectively in turbulent waters.
5. There is a beetle that has scales whiter than any piece of paper on Earth.
6. Biomimetic means mimicking (or copying) nature.
7. God made everything over a period of 15 billions years (Exodus 20:11).
8. The silk from this animal is (pound for pound) five times stronger than steel.
9. The process of making high-pitched noises that bounce off of objects
10. A new electronic cane that mimics the echolocation of bats
11. A new microbot’s design is based on the *E. coli* bacterium.
12. Miniature robots used inside the human body mimic this.

**ACROSS**

3. “He Who built all things”
6. The idea for the design of a new building built in Harare, Zimbabwe came from this.
9. Most of the silk in our clothing comes from these.

**DOWN**

1. The scales of this beetle scatter white light better than the fibers in any white paper.
2. A new electronic cane that mimics the echolocation of bats.
4. Miniature robots used inside the human body mimic this.
5. The silk from this animal is (pound for pound) five times stronger than steel.
7. The process of making high-pitched noises that bounce off of objects.
8. What a RoboLobster imitates.

**Hey kids, send your questions about the Bible and/or science to Digger Doug!**

Dear Digger Doug,

What kind of animals or insects give silk?

—Jamie, St. Albans, WV

Dear Jamie,

This is an excellent question. Almost all the silk in our clothing is from moth caterpillars. But many different types of silk are produced by a huge variety of insects, such as lacewings and spiders. Silk is the strongest of all natural fibers. Pound for pound, the silk from certain kinds of spiders is five times stronger than steel, and can stretch 30% farther than the most stretchable nylon, and is twice as flexible. World production of silk products has approximately doubled during the last 30 years.

Scientists are using God’s silk design to develop soft, lightweight bullet-proof vests for policemen that would protect officers even better than current vests. Lately, many scientists have tried to mimic the spider’s complex silk-spinning process, with little success. Companies like Nexia have experimented with a “spinneret” to form a consistent fiber.

Once again, we see that God’s design sets the standard, and science mimics God’s perfect creation.

**SEND TO:**

Digger Doug

230 Landmark Drive

Montgomery, AL 36117

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What do you do when it is 100 degrees outside in the middle of the Summer? I can think of two things: go swimming or stay inside in a cool, air-conditioned house. Have you ever wondered how your house can be 75 degrees inside when it is over 100 degrees outside? It is because engineers have learned to build machines that can pump cool air into our homes and pump hot air out.

Did you know that nature has some engineers that have mastered the art of air-conditioning? Termites. That’s right. These little wood-eating insects have an amazing ability to keep their large termite mounds the perfect temperature. Termites need to work in an environment that stays about 87 degrees. But termites often live in areas that can get extremely hot in the day, about 104 degrees, and cold at night, about 35 degrees. How do they keep their houses “just right”? Termites build special mounds with several vents that send hot air out the top. They also build vents at the base of the mound that trap the outside breeze and send cool air flowing through the structure. During cool nights, the special vents and airflow keep the mound warm.

In the city of Harare, Zimbabwe, architect Mick Pearce built an office building called Eastgate. He modeled his building after a termite mound. His biomimetic (nature-copying) building is a work of art, and it is very efficient. The building stays the perfect temperature, but uses only 10 percent of the energy used by other buildings in the area. The builders of Eastgate believe that they have saved over 3.5 million dollars in energy costs, simply by copying termites.

Where would termites learn to build an air conditioning system? They could not have evolved the ability, because they would have died before they learned to get the temperature to stay 87 degrees. The only honest answer is that God, the Ultimate Engineer, created them with the ability to build air-conditioned mounds. When we see design like we see in the termite mound, we should look to the eternal Designer and give Him our praise.