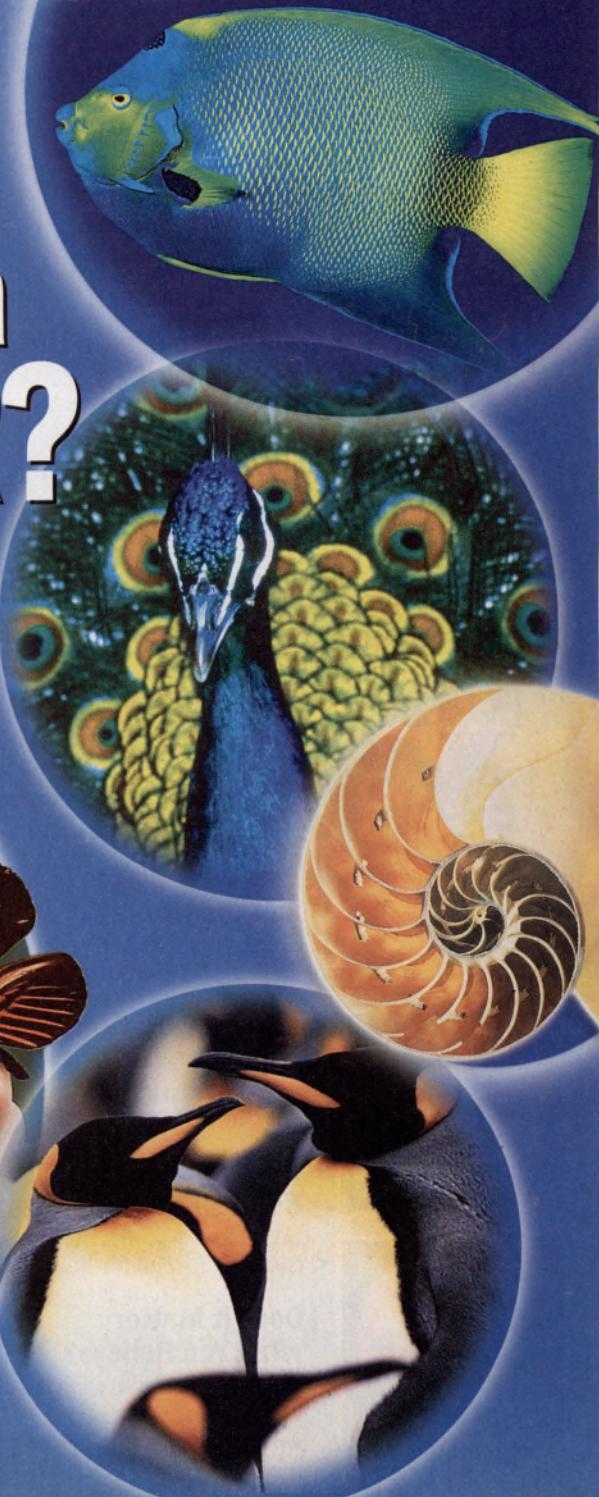


Awake!

SEPTEMBER 2006

SPECIAL ISSUE

Is There a CREATOR?



Is There a CREATOR?

Is it reasonable to conclude that the design evident in nature requires belief in a Designer, a Creator?

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Whom Should You Believe?

"Of course, every house is constructed by someone, but he that constructed all things is God."—HEBREWS 3:4.

DO YOU agree with the logic of this Bible writer? Mankind has experienced some 2,000 years of scientific advancement since that verse was penned. Does anyone still think that the design evident in nature requires belief in a Designer, a Creator—God?

Even in industrialized countries many people would say yes. In the United States, for example, a survey conducted by *Newsweek* magazine in 2005 found that 80 percent of people "believe that God created the universe." Is this belief due to a lack of education? Well, do any scientists believe in God? The science journal *Nature* reported in 1997 that almost 40 percent of biologists, physicists, and mathematicians surveyed believe in a God who not only exists but also listens to and answers prayers.

However, other scientists strongly disagree. Dr. Herbert A. Hauptman, a Nobel laureate,

Investigate
the evidence
for yourself

recently told a scientific conference that belief in the supernatural, especially belief in God, is incompatible with good science. "This kind of belief," he said, "is damaging to the well-being of the human race." Even scientists who believe in God are reluctant to teach that the design evident in plants and animals requires a Designer. Why? Identifying one reason, Douglas H. Erwin, a paleobiologist at the Smithsonian Institute, says: "One of the rules of science is, no miracles allowed."

You can let others tell you what you are allowed to think and believe. Or you may wish to investigate some of the evidence yourself and reach your own conclusion. As you read about recent discoveries of science presented on the following pages, ask yourself, 'Is it logical to conclude that there is a Creator?'

ARE JEHOVAH'S WITNESSES CREATIONISTS?

Jehovah's Witnesses believe the creation account as recorded in the Bible book of Genesis. However, Jehovah's Witnesses are not what you might think of as creationists. Why not? First, many creationists believe that the universe and the earth and all life on it were created in six 24-hour days some 10,000 years ago. This, however, is not what the Bible teaches.* Also, creationists have em-

braced many doctrines that lack support in the Bible. Jehovah's Witnesses base their religious teachings solely on God's Word.

Furthermore, in some lands the term "creationist" is synonymous with Fundamentalist groups that actively engage in politics. These groups attempt to pressure politicians, judges, and educators into adopting laws and teachings that conform to the creationists' religious code.

Jehovah's Witnesses are politically neutral. They re-

spect the right of governments to make and enforce laws. (Romans 13:1-7) However, they take seriously Jesus' statement that they are "no part of the world." (John 17:14-16) In their public ministry, they offer people the chance to learn the benefits of living by God's standards. But they do not violate their Christian neutrality by supporting the efforts of Fundamentalist groups that try to establish civil laws that would force others to adopt Bible standards.—John 18:36.

* Please see the article "The Bible's Viewpoint: Does Science Contradict the Genesis Account?" on page 18 of this issue.

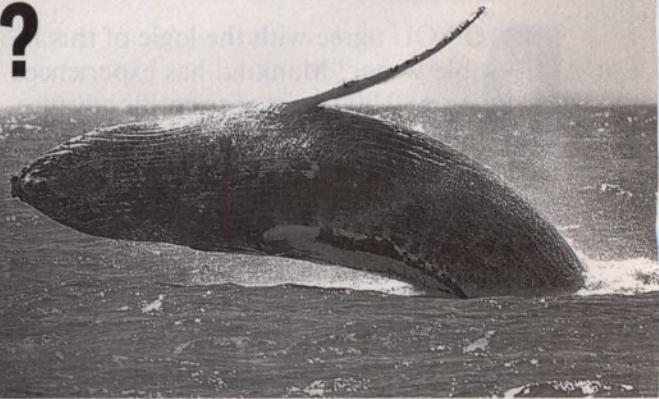
What Does NATURE Teach?

"Ask, please, the domestic animals, and they will instruct you; also the winged creatures of the heavens, and they will tell you. Or show your concern to the earth, and it will instruct you; and the fishes of the sea will declare it to you." —JOB 12:7, 8.

In RECENT years scientists and engineers have, in a very literal way, allowed plants and animals to instruct them. They are studying and mimicking the design features of various creatures—a field known as biomimetics—in an effort to create new products and improve the performance of existing machines. As you consider the following examples, ask yourself, 'Who really deserves the credit for these designs?'

Learning From a Whale's Flippers

What can aircraft designers learn from the humpback whale? A great deal it seems. An adult humpback weighs about 30 tons—as much as a loaded truck—and it has a relatively stiff body with large winglike flippers. This



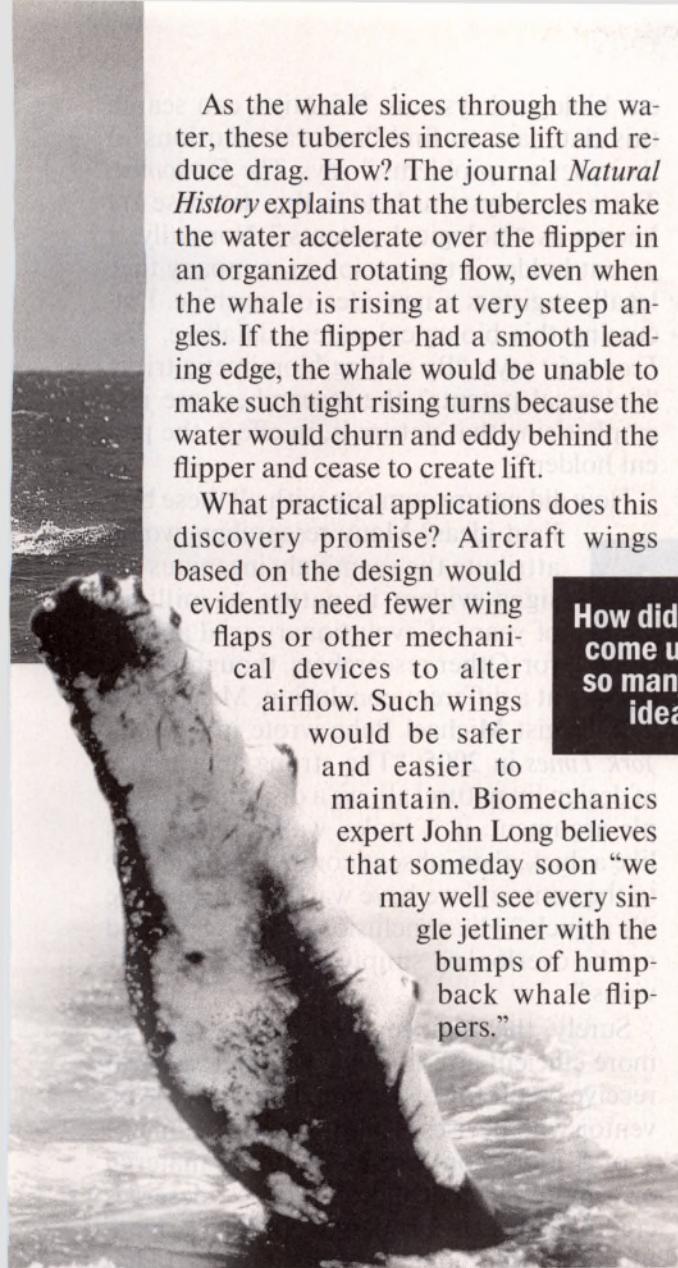
40-foot-long animal is remarkably agile under water. For example, when feeding, a humpback may swim in upward spiraling circles beneath a prospective meal of crustaceans or fish, all the while blowing a stream of bubbles. This bubble net, as small as five feet in diameter, corrals the creatures at the surface. The whale then snaps up its tidy meal.

What particularly intrigued researchers was how this stiff-bodied creature turns in what seem to be impossibly tight circles. They discovered that the shape of the whale's flippers holds the secret. The leading edge of its flippers is not smooth, like an aircraft's wing, but serrated, with a row of protruding bumps called tubercles.

Awake!®

THIS JOURNAL IS PUBLISHED for the enlightenment of the entire family. It shows how to cope with today's problems. It reports the news, tells about people in many lands, examines religion and science. But it does more. It probes beneath the surface and points to the real meaning behind current events, yet it always stays politically neutral and does not exalt one race above another. Most important, this magazine builds confidence in the Creator's promise of a peaceful and secure new world that is about to replace the present wicked, lawless system of things.

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As the whale slices through the water, these tubercles increase lift and reduce drag. How? The journal *Natural History* explains that the tubercles make the water accelerate over the flipper in an organized rotating flow, even when the whale is rising at very steep angles. If the flipper had a smooth leading edge, the whale would be unable to make such tight rising turns because the water would churn and eddy behind the flipper and cease to create lift.

What practical applications does this discovery promise? Aircraft wings based on the design would evidently need fewer wing flaps or other mechanical devices to alter airflow. Such wings would be safer and easier to maintain. Biomechanics expert John Long believes that someday soon "we may well see every single jetliner with the bumps of humpback whale flippers."

How did nature come up with so many good ideas?

Mimicking Seagulls' Wings

Of course, aircraft wings already mimic the shape of birds' wings. However, engineers have recently taken this mimicry to new heights. "Researchers at the University of Florida," reports *New Scientist*, "have built a prototype remote-controlled drone with a seagull's ability to hover, dive and climb rapidly."

Seagulls perform their remarkable aerobatic maneuvers by flexing their wings at the elbow and shoulder joints. Copying this flexible wing design, "the 24-inch prototype drone uses a small motor to control a series of metal rods that move the wings," says the magazine. These cleverly engineered wings enable the small aircraft to hover and dive between tall buildings. The U.S. Air Force is keen to develop such a highly maneuverable craft for use in searching for chemical or biological weapons in big cities.

Copying the Gecko's Feet

Land animals also have much to teach. For example, the small lizard known as a gecko has the ability to climb walls and cling upside down on ceilings. Even in Bible times, this creature was known for this amazing capability. (*Proverbs 30:28*) What is the secret of the gecko's ability to defy gravity?

The gecko's ability to stick even to glass-smooth surfaces comes from the tiny hair-like structures, called setae, that cover its

Languages: Afrikaans, Albanian, Amharic, Arabic, Bulgarian, Cebuano, Chichewa, Chinese, Chinese (Simplified), Croatian, Czech,[#] Danish,⁺ Dutch,^{#,+○} English,^{#,+○} Estonian, Finnish,^{#,+○} French,^{#,+○} Georgian, German,^{#,+○} Greek, Hebrew, Hiligaynon, Hungarian, Iloko, Indonesian, Italian,^{#,+○} Japanese,[#] Korean,^{#,+○} Latvian, Lithuanian, Macedonian, Malagasy, Malayalam, Myanmar, Norwegian,⁺ Polish, Portuguese,^{#,+○} Romanian, Russian, Serbian, Sesotho, Sinhala, Slovak, Slovenian, Spanish,^{#,+○} Swahili, Swedish,⁺ Tagalog, Tamil, Thai, Tsonga, Tswana, Turkish, Ukrainian, Xhosa, Zulu

* Audiocassettes also available.

+ CD also available.

○ MP3 CD-ROM also available.

Publication of *Awake!* is part of a worldwide Bible educational work supported by voluntary donations. Unless otherwise indicated, Scripture quotations are from the modern-language *New World Translation of the Holy Scriptures—With References*.

Would you welcome more information? Write Jehovah's Witnesses at the appropriate address: **America:** United States of: Wallkill, NY 12589. **Australia:** Box 280, Ingleburn, NSW 1890. **Britain:** The Ridgeway, London NW7 1RN. **Canada:** Box 4100, Halton Hills (Georgetown), Ontario L7G 4Y4. **Ghana:** P. O. Box GP 760, Accra. **Jamaica:** P. O. Box 103, Old Harbour, St. Catherine. **New Zealand:** P.O. Box 75-142, Manurewa. **Nigeria:** P.M.B. 1090, Benin City 300001, Edo State. **South Africa:** Private Bag X2067, Krugersdorp, 1740. **Zambia:** Box 33459, Lusaka 10101. **Zimbabwe:** Private Bag WG-5001, Westgate.

feet. The feet do not exude glue. Rather, they exploit a minute molecular force. The molecules on the two surfaces bond to one another because of very weak attractive forces known as van der Waals forces. Normally, gravity easily overpowers these forces, which is why you cannot climb a wall simply by placing your hands flat against it. However, the gecko's tiny setae increase the surface area in contact with the wall. Van der Waals forces, when multiplied across the thousands of setae on the gecko's feet, produce enough attraction to hold the tiny lizard's weight.

What use may this discovery have? Synthetic materials made to imitate the gecko's feet could be used as an alternative to Velcro—another idea borrowed from nature.* The journal *The Economist* quotes one researcher as saying that a material made from "gecko tape" could be particularly useful "in medical applications where chemical adhesives cannot be used."

Who Deserves the Credit?

Meanwhile, the National Aeronautics and Space Administration is developing a multi-legged robot that walks like a scorpion, and engineers in Finland have already developed a six-legged tractor that can climb over obstacles the way a giant insect would. Other researchers have designed fabric with small flaps that imitate the way pinecones open and close. A car manufacturer is developing a vehicle that imitates the surprisingly low-drag design of the boxfish. And other researchers are probing the shock-absorbing properties of abalone shells, with the intention of making lighter, stronger body armor.

So many good ideas have come from nature that researchers have established a database that already catalogs thousands of differ-

ent biological systems. Scientists can search this database to find "natural solutions to their design problems," says *The Economist*. The natural systems held in this database are known as "biological patents." Normally, a patent holder is the person or company that legally registers a new idea or machine. Discussing this biological patent database, *The Economist* says: "By calling biomimetic tricks 'biological patents', the researchers are just emphasising that nature is, in effect, the patent holder."

How did nature come up with all these brilliant ideas? Many researchers would attribute the seemingly ingenious designs evident in nature to millions of years of evolutionary trial and error. Other researchers, though, arrive at a different conclusion. Microbiologist Michael Behe wrote in *The New York Times* in 2005: "The strong appearance of design [in nature] allows a disarmingly simple argument: if it looks, walks and quacks like a duck, then, absent compelling evidence to the contrary, we have warrant to conclude it's a duck." His conclusion? "Design should not be overlooked simply because it's so obvious."

Surely, the engineer who designs a safer, more efficient aircraft wing would deserve to receive credit for his design. Likewise, the inventor who devises a more versatile bandage—or a more comfortable clothing material or a more efficient motor vehicle—deserves credit for his or her design. In fact, a manufacturer who copies someone else's design but fails to acknowledge or credit the designer may be viewed as a criminal.

Does it seem logical to you, then, for highly trained researchers who crudely mimic systems in nature to solve difficult engineering problems to attribute the genius of devising the original idea to unintelligent evolution? If the copy requires an intelligent designer, what about the original? Really,

* Velcro is a hook-and-loop fastening system based on the design found in the seeds of the burdock plant.

Who is nature's patent holder?



This highly maneuverable aircraft mimics a seagull's wings

If the copy requires an intelligent designer, what about the original?

A gecko's feet don't get dirty, never leave a residue, stick to any surface except Teflon, and attach and detach with little effort. Researchers are trying to copy them

Airplane: Kristen Bartlett/
University of Florida;
gecko foot: Breck P. Kent;
box fish and car:
Mercedes-Benz USA

The surprisingly low-drag design of the boxfish inspired a vehicle concept

who deserves more credit, the master artist or the student who imitates his technique?

A Logical Conclusion

After reviewing evidence of design in nature, many thinking people echo the sentiments of the psalmist who wrote: "How many your works are, O Jehovah! All of them in wisdom you have made. The earth is full of your productions." (Psalm 104:24) The Bible writer Paul arrived at a similar conclu-

sion. He wrote: "For [God's] invisible qualities are clearly seen from the world's creation onward, because they are perceived by the things made, even his eternal power and Godship."—Romans 1:19, 20.

However, many sincere people who respect the Bible and believe in God would argue that God may have used evolution to create the wonders of the natural world. What, though, does the Bible teach?

INSTINCTIVELY WISE NAVIGATORS

Many creatures are "instinctively wise" in the way they find their way around planet Earth. (Proverbs 30: 24, 25) Consider two examples.

■ Ant Traffic Control

How do foraging ants find their way back to their nests? Researchers in the United Kingdom discovered that in addition to leaving scent markers, some ants use geometry to build trails that make finding home easy. For example, pharaoh ants "lay trails radiating out from the nest that fork at an angle of 50 to 60 degrees," says *New Scientist*. What is remarkable about this pattern? When an ant is returning to the nest and reaches a fork in the trail, it instinctively takes the path that deviates least, which inevitably leads home. "The geometry of the forking paths," says the article, "optimises the flow of ants



through the network of trails, especially when ants are walking along them in two directions, and minimises the amount of energy individuals waste by going in the wrong direction."

■ **Bird Compasses** Many birds navigate with pinpoint accuracy over long distances and in all types of weather. How? Researchers have discovered that birds can sense the earth's magnetic field. However, the earth's "magnetic field lines vary from place to place and don't always point toward true north," states the journal *Science*. What prevents migrating birds from veering off

course? Birds apparently calibrate their internal compass to the setting sun each evening. Since the position of the sunset changes with latitude and season, researchers think that these birds must be able to compensate for the changes by means of "a biological clock that tells them the time of year," says *Science*.

Who programmed the ant with an understanding of geometry? Who provided birds with a compass, a biological clock, and a brain capable of interpreting the information these instruments provide? Unintelligent evolution? Or an intelligent Creator?

Did God Use EVOLUTION to Create Life?

SHORTLY after Charles Darwin made the theory of evolution popular, many so-called Christian denominations started looking for ways to marry their belief in God to their acceptance of the theory of evolution.

Today, most prominent "Christian" religious groups seem willing to accept that God must have used evolution in some way to create life. Some teach that God preprogrammed the universe to develop in such a way that living things inevitably evolved from lifeless chemicals and eventually produced mankind. Those who subscribe to this teaching, known as theistic evolution, do not feel that God interfered with the process once it started. Others think that, in general, God allowed evolution to produce most families of plants and animals but occasionally stepped in to move the process along.

The Marriage of Teachings—Does It Work?

Is the theory of evolution really compatible with the teachings of the Bible? If evolution were true, then the Bible's account of the creation of the first man, Adam, would be, at best, a story meant to teach a moral lesson

"You are worthy, Jehovah, even our God, to receive the glory and the honor and the power, because you created all things, and because of your will they existed and were created."

—REVELATION 4:11.



but not intended to be taken literally. (Genesis 1:26, 27; 2:18-24) Is that how Jesus viewed this Bible account? "Did you not read," said Jesus, "that he who created them from the beginning made them male and female and said, 'For this reason a man will leave his father and his mother and will stick to his wife, and the two will be one flesh'? So that they are no longer two, but one flesh. Therefore, what God has yoked together let no man put apart."—Matthew 19:4-6.

Jesus was here quoting from the creation account recorded in Genesis chapter 2. If Jesus believed the first marriage to be a fictional story, would he have made reference to it to support his teaching on the sanctity of marriage? No. Jesus pointed to the Genesis account because he knew it to be true history.—John 17:17.

Jesus' disciples likewise believed the Genesis account of creation. For example, Luke's Gospel account traces Jesus' genealogy all the way back to Adam. (Luke 3:23-38) If Adam were a fictional character, at what point would this genealogical list have turned from fact to myth? If the rootstock of this family tree were mythological, how firm

WHAT IS EVOLUTION?

One definition of "evolution" is: "A process of change in a certain direction." However, the term is used in several ways. For example, it is used to describe big changes in inanimate things—the development of the universe. In addition, the term is used to describe small changes in living things—the way plants and animals adapt to their environment. The word is most commonly used, though, to describe the theory that life arose from inanimate chemicals, formed into self-replicating cells, and slowly developed into more and more complex creatures, with man being the most intelligent of its productions. This third notion is what is meant by the term "evolution" as used in this article.



Jesus believed the Genesis account of creation. Was he mistaken?

would that have made Jesus' claim that he was the Messiah, born in the line of David? (Matthew 1:1) The Gospel writer Luke said that he had "traced all things from the start with accuracy." Clearly, he believed the creation account in Genesis.—Luke 1:3.

The apostle Paul's faith in Jesus was linked to Paul's trust in the Genesis account. He wrote: "Since death is through a man, resurrection of the dead is also through a man. For just as in Adam all are dying, so also in the Christ all will be made alive." (1 Corinthians 15:21, 22) If Adam were not literally the forefather of all mankind, the one through whom "sin entered into the world and death through sin," why would Jesus have needed to die to undo the effects of inherited sin?—Romans 5:12; 6:23.

To undermine belief in the creation account in Genesis is to undermine the very foundations of the Christian faith. Evolutionary theory and the teachings of Christ are incompatible. Any attempt to marry these beliefs can only give birth to a weak faith that is prone to being "tossed about as by waves and

carried hither and thither by every wind of teaching."—Ephesians 4:14.

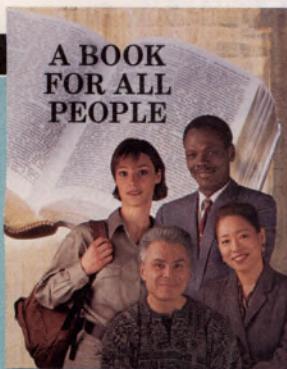
Faith Based on a Solid Foundation

For centuries the Bible has endured criticism and attack. Time and again the Bible text has been vindicated. When the Bible touches on history, health, and science, its accounts have repeatedly been proved reliable. Its advice regarding human relations is trustworthy and timeless. Human philosophies and theories, like so much green grass, sprout and then wither over time, but the Word of God "will last to time indefinite."—Isaiah 40:8.

The teaching of evolution is not limited to the realm of scientific theory. It is a human philosophy that blossomed and then flourished for decades. In recent years, however, the traditional evolutionary teaching of Darwin has itself evolved—in fact, mutated—as efforts have been made to explain away the increasing evidence for design in the natural world. We invite you to examine this topic further. You can do so by reviewing the other articles in this issue. In addition, you may also want to read the publications shown on this page and page 32.

You will likely find that after researching this subject, your trust in what the Bible says about the past will be bolstered. More important, your faith in the Bible's promises for the future will be strengthened. (Hebrews 11:1) You may also find yourself moved to praise Jehovah, "the Maker of heaven and earth."—Psalm 146:6.

P. Scowen (AZ State Univ.); NASA



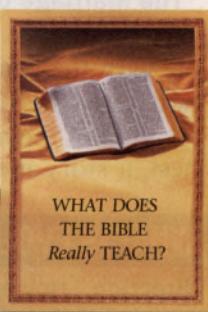
FURTHER READING

◀ Specific examples of the Bible's authenticity are discussed in this brochure



Is There a
Creator
Who Cares About You?

◀ Examine more scientific evidence and learn why a caring God would permit so much suffering



WHAT DOES
THE BIBLE
Really Teach?

▲ The question What is God's purpose for the earth? is answered in chapter 3 of this book



AN INTERVIEW WITH A

Biochemist

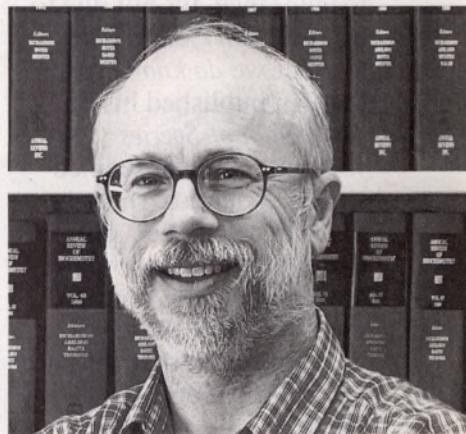
IN 1996, Michael J. Behe, now professor of biochemistry at Lehigh University in Pennsylvania, U.S.A., released his book *Darwin's Black Box—The Biochemical Challenge to Evolution*. The May 8, 1997, issue of *Awake!* carried a series of articles under the title "How Did We Get Here?—By Accident or by Design?" which referred to Behe's book. In the decade since *Darwin's Black Box* was published, evolutionary scientists have scrambled to counter the arguments Behe raised. Critics have accused him of allowing his religious convictions—he is Roman Catholic—to cloud his scientific judgment. Others claim that his reasoning is unscientific. *Awake!* interviewed Professor Behe to learn why his ideas have caused such controversy.

AWAKE!: WHY DO YOU FEEL THAT LIFE PROVIDES EVIDENCE OF INTELLIGENT DESIGN?

PROFESSOR BEHE: We infer design whenever we see complex functional arrangements. Take, for instance, the machines we use every day—a lawn mower, a car, or even simpler things. An example I like to use is a mousetrap. You conclude that it is designed because you see different parts arranged to perform the function of catching a mouse.

Science has now advanced enough to have uncovered the foundation level of life. And much to our surprise, scientists have found functional, complex machinery at the molecular level of life. For instance, within living

cells there are little molecular "trucks" that carry supplies from one side of the cell to the other. There are tiny molecular "sign posts" that tell these "trucks" to turn left or right. Some cells have molecular "outboard motors" that propel the cells through liquid. In any other context, when such functional complexity is evident, people would conclude that these things were designed. We have no other explanation for this complexity, claims of Darwinian evolution notwithstanding. Since it's been our uniform experience that this sort of arrangement bespeaks design, we are justified in thinking that these molecular systems were also intelligently designed.



AWAKE!: WHY IN YOUR OPINION DO THE MAJORITY OF YOUR COLLEAGUES DISAGREE WITH YOUR CONCLUSIONS REGARDING INTELLIGENT DESIGN?

PROFESSOR BEHE: Many scientists disagree with my conclusions because they see that the idea of intelligent design has extrascientific implications—that it seems to

1. The serpent talked to Eve, not to Adam.—Genesis 3:1.
2. Adam and Eve did not have children until after they were removed from the garden of Eden.—Genesis 4:1.
3. Adam and Eve were naked while living in the garden.—Genesis 2:25.
4. “Day” 4.—Genesis 1:14–16, 19.
5. “Day” 6.—Genesis 1:24, 31.
6. “Day” 5.—Genesis 1:20, 21, 23.
7. Cain.—Genesis 4:17.
8. Adah.—Genesis 4:19.

“In my view it is a failure of something that is so strongly indicated by the evidence simply because you think the conclusion has unwelcome philosophical implications”

PROFESSOR BEHE: Just because we don’t know the reason for some feature in an organism does not mean that it doesn’t have an important role to play. For example, so-called vestigial organs were called vestigial organs because poor design. The appendix and organsisms were poorly designed. The human body and other organsisms were poorly designed. That is despite the tonsils, for instance, were once thought to be vestigial organs and were routinely removed. But then it was discovered that these organs play a role in the immune system, and they are no longer considered vestigial.

Another point to remember is that some things occur by chance. But just because things apparently do occur by chance, my car has a dent in it or gets a flat tire does not mean that my car or the tire was not designed. Likewise, the fact that some things occur by chance in biology does not mean that the things are sophisticated, complex molecular machines. That argument is simply wrong.

AWARE: HOW DO YOU RESPOND TO THOSE WHO POINT TO FEATURES

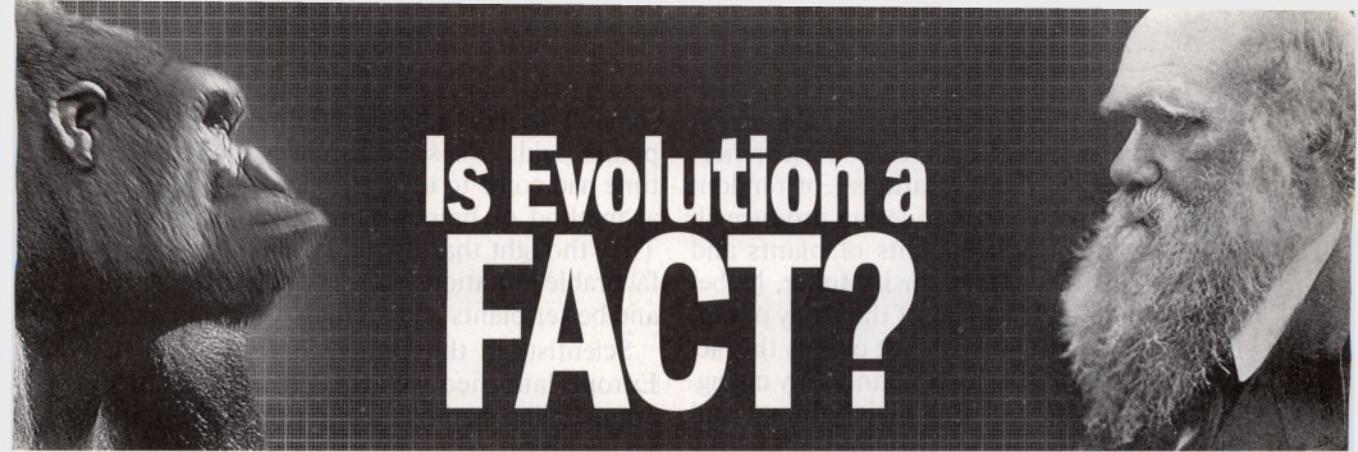
PROFESSOR BEHE: The conclusion of design is not due to ignorance. It’s not due to a failure of science to discover that in the ten years since my book was published, many scientific organizations, such as the National Academy of Sciences and the American Association for the Advancement of Science, have issued urgent appeals to their members that it might just spontaneously bubble up from sea mud. But since then, scientists have discovered that cells are enormously complex, much more complex than the ma-

chine. This is despite the fact that the cell was so simple 150 years ago, like seemed to do everything that they can to fend off the idea that life provides evidence of intelligent design. They have issued urgent appeals to their members that it might just spontaneously bubble up from sea mud. But since then, scientists have discovered that cells are enormously complex, much more complex than the machine. This is despite the fact that we do know; it’s due to what we *don’t* know. When Darwin published his book *The Origin of Species* to what we *do* know, it’s due to a failure of science to prove that design promotes ignorance? To critics who claim that science promotes ignorance, I think the conclusion has unwelcome philosophical implications. That is so from something that is so strong. In my view it is a failure of science to back away from leads. In my view it is a failure of science to suppose that that science is supposed to follow the evidence wherever it leads, I was always taught ever, I was always taught that people nervous. How many people beyond na-

ture. This conclusion makes point strongly beyond nature. Of plants or animals that they have poorly designed? Chinery of our 21st-century world. That function makes people nervous. How ever, I was always taught that science is supposed to follow the evidence wherever it leads, I was always taught that people nervous. How many people beyond nature. This conclusion makes point strongly beyond nature.

AWARE: HAS SCIENCE PRODUCED ANY EVIDENCE TO PROVE THAT EVOLUTION, BY MEANS OF NATURAL SELECTION, COULD HAVE CREATED THE COMPLEX MOLECULAR MACHINES THAT YOU TALK ABOUT?

PROFESSOR BEHE: If you search the scientific literature, nobody has made a serious attempt or detailed scientific model—that explains how such molecular machines arise by Darwinian processes—such as the National Academy of Sciences and the American Association for the Advancement of Science, have issued urgent appeals to their members that it might just spontaneously bubble up from sea mud. But since then, scientists have discovered that cells are enormously complex, much more complex than the machine. This is despite the fact that we do know; it’s due to what we *don’t* know. When Darwin published his book *The Origin of Species* to what we *do* know, it’s due to a failure of science to prove that design promotes ignorance? To critics who claim that science promotes ignorance, I think the conclusion has unwelcome philosophical implications. That is so from something that is so strong. In my view it is a failure of science to back away from leads. In my view it is a failure of science to suppose that that science is supposed to follow the evidence wherever it leads, I was always taught ever, I was always taught that people nervous. How many people beyond nature. This conclusion makes point strongly beyond nature.



Is Evolution a FACT?

EVOLUTION is as much a fact as the heat of the sun," asserts Professor Richard Dawkins, a prominent evolutionary scientist. Of course, experiments and direct observations prove that the sun is hot. But do experiments and direct observations provide the teaching of evolution with the same undisputed support?

Before we answer that question, something needs to be cleared up. Many scientists have noted that over time, the descendants of living things may change slightly. Charles Darwin called this process "descent with subsequent modification." Such changes have been observed directly, recorded in experiments, and used ingeniously by plant and animal breeders.* These changes can be considered facts. However, scientists attach to such slight changes the term "microevolution." Even the name implies what many scientists assert—that these minute changes furnish the proof for an altogether different phenomenon, one that no one has observed, which they call macroevolution.

You see, Darwin went far beyond such observable changes. He wrote in his famous book *The Origin of Species*: "I view all beings not as special creations, but as the lineal descendants of some few beings." Darwin said

* Dog breeders can selectively mate their animals so that eventually the descendants have shorter legs or longer hair than their forebears. However, the changes dog breeders can produce often result from losses in gene function. For example, the dachshund's small size is caused by a failure of normal development of cartilage, resulting in dwarfism.

that over vast periods of time, these original "few beings," or so-called simple life-forms, slowly evolved—by means of "extremely slight modifications"—into the millions of different forms of life on earth. Evolutionists teach that these small changes accumulated and produced the big changes needed to make fish into amphibians and apes into men. These proposed big changes are referred to as macroevolution. To many, this second claim sounds reasonable. They wonder, 'If small changes can occur within a species, why should not evolution produce big changes over long periods of time?'

The teaching of macroevolution rests on three main assumptions:

- 1. Mutations provide the raw materials needed to create new species.[#]**
- 2. Natural selection leads to the production of new species.**
- 3. The fossil record documents macro-evolutionary changes in plants and animals.**

Is the evidence for macroevolution so strong that it should be considered a fact?

Can Mutations Produce New Species?

Many details of a plant or an animal are determined by the instructions contained in its

* While the word "species" is used frequently in this article, it should be noted that this term is not found in the Bible book of Genesis, which uses the much more inclusive term "kind." Often, what scientists choose to call the evolution of a new species is simply a matter of variation within a "kind," as the word is used in the Genesis account.

[#] See the box "How Organisms Are Classified."

genetic code, the blueprints that are wrapped up in the nucleus of each cell.* Researchers have discovered that mutations—or random changes—in the genetic code can produce alterations in the descendants of plants and animals. In 1946, Hermann J. Muller, Nobel Prize winner and founder of the study of mutation genetics, claimed: “Not only is this accumulation of many rare, mainly tiny changes the chief means of artificial animal and plant improvement, but it is, even more, the way in which natural evolution has occurred, under the guidance of natural selection.”

Indeed, the teaching of macroevolution is built upon the claim that mutations can produce not only new species but also entirely new families of plants and animals. Is there any way to test this bold claim? Well, consider what some 100 years of study in the field of genetic research has revealed.

In the late 1930’s, scientists enthusiastically embraced the idea that if natural selection could produce new species of plants from random mutations, then artificial, or human-guided, selection of mutations should be able to do so more efficiently. “Euphoria spread among biologists in general and geneticists and breeders in particular,” said Wolf-Ekkehard Lönnig, a scientist from the Max Planck Institute for Plant Breeding Research in Germany, who was interviewed by *Awake!* Why the euphoria? Lönnig, who has spent

* Research shows that the cell’s cytoplasm, its membranes, and other structures also play a role in shaping an organism.

some 28 years studying mutation genetics in plants, said: “These researchers thought the time had come to revolutionize the traditional method of breeding plants and animals. They thought that by inducing and selecting favorable mutations, they could produce new and better plants and animals.”*

Scientists in the United States, Asia, and Europe launched well-funded research programs, using methods that promised to speed up evolution. After more than 40 years of intensive research, what were the results? “In spite of an enormous financial expenditure,” says researcher Peter von Sengbusch, “the attempt to cultivate increasingly productive varieties by irradiation, widely proved to be a failure.” Lönnig said: “By the 1980’s, the hopes and euphoria among scientists had ended in worldwide failure. Mutation breeding as a separate branch of research was abandoned in Western countries. Almost all the mutants exhibited ‘negative selection values,’ that is, they died or were weaker than wild varieties.”#

Even so, the data now gathered from some 100 years of mutation research in general and

* Lönnig’s comments in this article are his own and do not represent the opinion of the Max Planck Institute for Plant Breeding Research.

Mutation experiments repeatedly found that the number of new mutants steadily declined, while the same type of mutants regularly appeared. Lönnig deduced from this phenomenon the “law of recurrent variation.” In addition, less than 1 percent of plant mutations were chosen for further research, and less than 1 percent of this group were found suitable for commercial use. The results of mutation breeding in animals were even worse than for plants, and the method was abandoned entirely.

HOW ORGANISMS ARE CLASSIFIED

Organisms are classified into increasingly inclusive groups, from specific species to kingdoms.* Compare, for example, the classifications of humans and of fruit flies listed below.

	Species	Genus	Family	Order	Class	Phylum	Kingdom
HUMANS	sapiens	Homo	Hominids	Primates	Mammals	Chordates	Animals
FRUIT FLIES	melanogaster	Drosophila	Drosophilids	Diptera	Insects	Arthropods	Animals

Chart based on the book *Icons of Evolution—Science or Myth? Why Much of What We Teach About Evolution Is Wrong*, by Jonathan Wells

* Note: Genesis chapter 1 states that plants and animals would reproduce “according to their kinds.” (Genesis 1:12, 21, 24, 25) However, the Biblical term “kind” is not a scientific term and should not be confused with the scientific designation “species.”



"Mutations cannot transform an original species [of plant or animal] into an entirely new one"

© Dr. Jeremy Burgess/Photo Researchers, Inc.

A mutant fruit fly (at top), while malformed, is still a fruit fly

Plant mutation experiments repeatedly found that the number of new mutants steadily declined, while the same type of mutants regularly appeared
(Mutant shown has larger flowers)



70 years of mutation breeding in particular enable scientists to draw conclusions regarding the ability of mutations to produce new species. After examining the evidence, Lönnig concluded: "Mutations cannot transform an original species [of plant or animal] into an entirely new one. This conclusion agrees with all the experiences and results of mutation research of the 20th century taken together as well as with the laws of probability. Thus, the law of recurrent variation implies that genetically properly defined species have real boundaries that cannot be abolished or transgressed by accidental mutations."

Consider the implications of the above facts. If highly trained scientists are unable to produce new species by artificially inducing and selecting favorable mutations, is it likely that an unintelligent process would do a better job? If research shows that mutations cannot transform an original species into an entirely new one, then how, exactly, was macroevolution supposed to have taken place?

Does Natural Selection

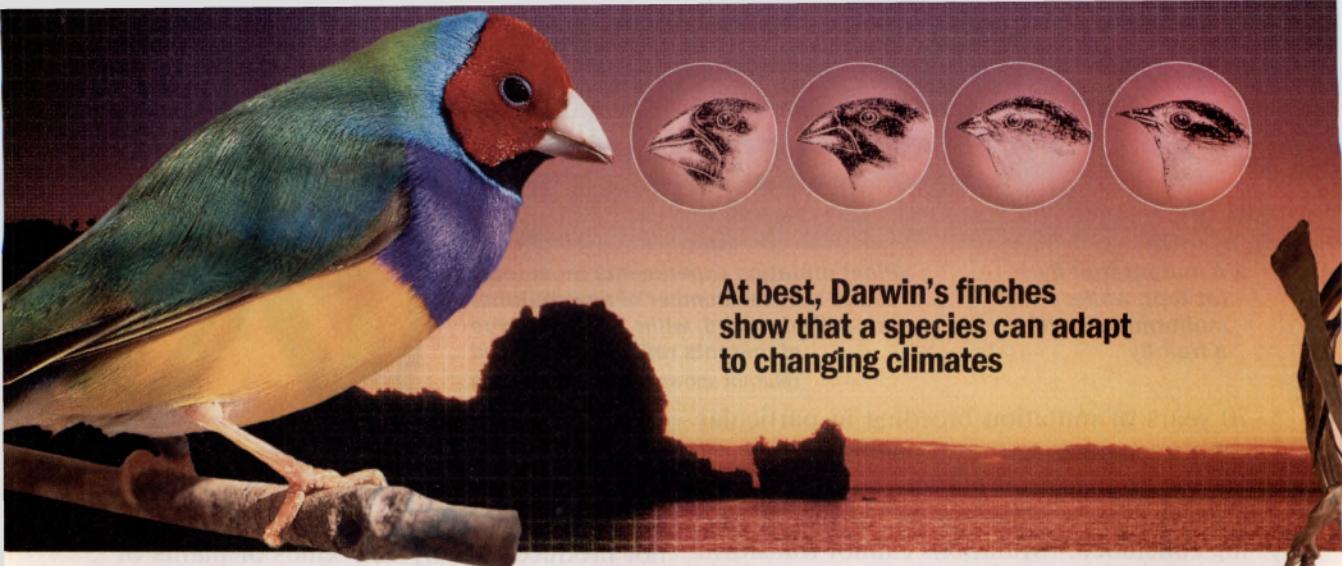
Lead to the Creation of New Species?

Darwin believed that what he called natural selection would favor those life-forms best suited to the environment, while less suitable life-forms would eventually die off. Modern evolutionists teach that as species spread and became isolated, natural selection chose those whose gene mutations made them most fit for their new environment. As a result, evolutionists postulate, these isolated groups eventually developed into totally new species.

As previously noted, the evidence from research strongly indicates that mutations cannot produce entirely new kinds of plants or animals. Nevertheless, what proof do evolutionists provide to support the claim that natural selection chooses beneficial mutations to produce new species? A brochure published in 1999 by the National Academy of Sciences (NAS) in the United States says: "A particularly compelling example of speciation [the evolution of new species] involves the 13 species of finches studied by Darwin on the Galápagos Islands, now known as Darwin's finches."

In the 1970's, a research group led by Peter and Rosemary Grant began studying these finches and discovered that after a year of drought, finches that had slightly bigger beaks survived more readily than those with smaller beaks. Since the size and shape of the beaks is one of the primary ways of determining the 13 species of finches, these findings were assumed to be significant. "The Grants have estimated," continues the brochure, "that if droughts occur about once every 10 years on the islands, a new species of finch might arise in only about 200 years."

However, the NAS brochure neglects to mention some significant but awkward facts. In the years following the drought, finches with smaller beaks again dominated the population. Thus, Peter Grant and graduate student Lisle Gibbs wrote in the science journal *Nature* in 1987 that they had seen "a reversal



**At best, Darwin's finches
show that a species can adapt
to changing climates**

in the direction of selection." In 1991, Grant wrote that "the population, subjected to natural selection, is oscillating back and forth" each time the climate changes. The researchers also noticed that some of the different "species" of finches were interbreeding and producing offspring that survived better than the parents. Peter and Rosemary Grant concluded that if the interbreeding continued, it could result in the fusion of two "species" into just one within 200 years.

Back in 1966, evolutionary biologist George Christopher Williams wrote: "I regard it as unfortunate that the theory of natural selection was first developed as an explanation for evolutionary change. It is much more important as an explanation for the maintenance of adaptation." Evolutionary theorist Jeffrey Schwartz wrote in 1999 that if Williams' conclusions are correct, natural selection may be helping species to adapt to the changing demands of existence, but "it is not creating anything new."

Indeed, Darwin's finches are not becoming "anything new." They are still finches. And the fact that they are interbreeding casts doubt on the methods some evolutionists use to define a species. In addition, they expose the fact that even prestigious scientific academies are not above reporting evidence in a biased manner.

**Does the Fossil Record Document
Macroevolutionary Changes?**

The previously mentioned NAS brochure leaves the reader with the impression that the fossils found by scientists more than adequately document macroevolution. It declares: "So many intermediate forms have been discovered between fish and amphibians, between amphibians and reptiles, between reptiles and mammals, and along the primate lines of descent that it often is difficult to identify categorically when the transition occurs from one to another particular species."

This confident statement is quite surprising. Why? In 2004, *National Geographic* described the fossil record as being like "a film of evolution from which 999 of every 1,000 frames have been lost on the cutting-room floor." Do the remaining one-in-a-thousand "frames" really document the process of macroevolution? What does the fossil record actually show? Niles Eldredge, a staunch evolutionist, admits that the record shows that for long periods of time, "little or no evolutionary change accumulates in most species."

To date, scientists worldwide have unearthed and cataloged some 200 million large fossils and billions of microfossils. Many researchers agree that this vast and detailed record shows that all the major



According to the fossil record, all the major groups of animals appeared suddenly and remained virtually unchanged

groups of animals appeared suddenly and remained virtually unchanged, with many species disappearing as suddenly as they arrived. After reviewing the evidence of the fossil record, biologist Jonathan Wells writes: "At the level of kingdoms, phyla, and classes, descent with

modification from common ancestors is obviously *not* an observed fact. To judge from the fossil and molecular evidence, it's not even a well-supported theory."

Evolution—Fact or Myth?

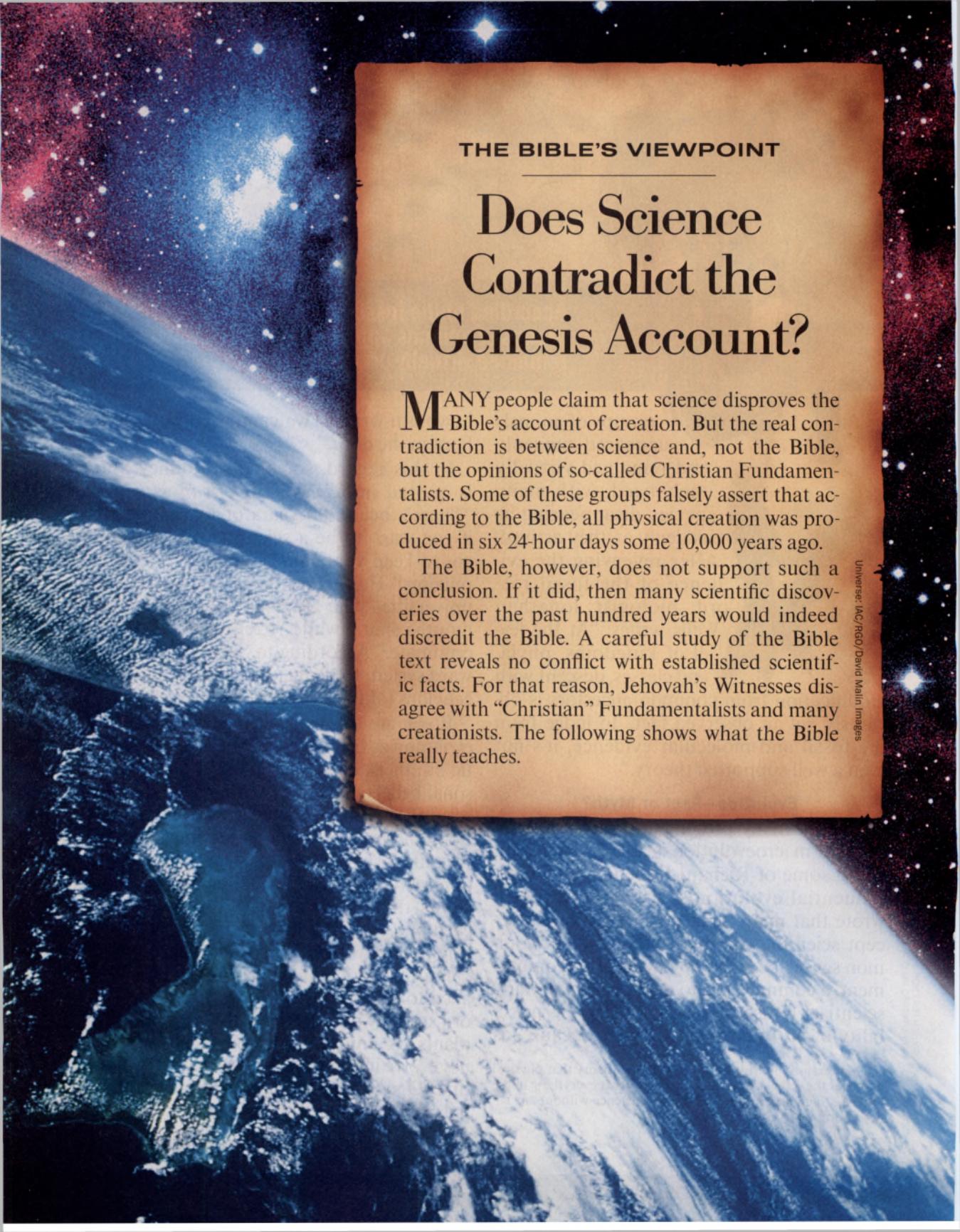
Why do many prominent evolutionists insist that macroevolution is a fact? After criticizing some of Richard Dawkins' reasoning, influential evolutionist Richard Lewontin wrote that many scientists are willing to accept scientific claims that are against common sense "because we have a prior commitment, a commitment to materialism."^{*} Many scientists refuse even to consider the possibility of an intelligent Designer because, as

* Materialism, in this sense, refers to the theory that physical matter is the only or fundamental reality, that everything in the universe, including all life, came into existence without any supernatural intervention in the process.

Lewontin writes, "we cannot allow a Divine Foot in the door."

In this regard, sociologist Rodney Stark is quoted in *Scientific American* as saying: "There's been 200 years of marketing that if you want to be a scientific person you've got to keep your mind free of the fetters of religion." He further notes that in research universities "the religious people keep their mouths shut," while "irreligious people discriminate." According to Stark, "there's a reward system to being irreligious in the upper echelons [of the scientific community]."

If you are to accept the teaching of macroevolution as true, you must believe that agnostic or atheistic scientists will not let their personal beliefs influence their interpretations of scientific findings. You must believe that mutations and natural selection produced all complex life-forms, despite the fact that a century of research, the study of billions of mutations, shows that mutations have not transformed even one properly defined species into something entirely new. You must believe that all creatures gradually evolved from a common ancestor, despite the fact that the fossil record strongly indicates that the major kinds of plants and animals appeared abruptly and did not evolve into other kinds, even over aeons of time. Does that type of belief sound as though it is based on fact or on a myth?



THE BIBLE'S VIEWPOINT

Does Science Contradict the Genesis Account?

MANY people claim that science disproves the Bible's account of creation. But the real contradiction is between science and, not the Bible, but the opinions of so-called Christian Fundamentalists. Some of these groups falsely assert that according to the Bible, all physical creation was produced in six 24-hour days some 10,000 years ago.

The Bible, however, does not support such a conclusion. If it did, then many scientific discoveries over the past hundred years would indeed discredit the Bible. A careful study of the Bible text reveals no conflict with established scientific facts. For that reason, Jehovah's Witnesses disagree with "Christian" Fundamentalists and many creationists. The following shows what the Bible really teaches.

When Was “the Beginning”?

The Genesis account opens with the simple, powerful statement: “In the beginning God created the heavens and the earth.” (Genesis 1:1) Bible scholars agree that this verse describes an action separate from the creative days recounted from verse 3 onward. The implication is profound. According to the Bible’s opening statement, the universe, including our planet Earth, was in existence for an indefinite time *before* the creative days began.

Geologists estimate that the earth is approximately 4 billion years old, and astronomers calculate that the universe may be as much as 15 billion years old. Do these findings—or their potential future refinements—contradict Genesis 1:1? No. The Bible does not specify the actual age of “the heavens and the earth.” Science does not disprove the Biblical text.

How Long Were the Creative Days?

What about the length of the creative days? Were they literally 24 hours long? Some claim that because Moses—the writer of Genesis—later referred to the day that followed the six creative days as a model for the weekly Sabbath, each of the creative days must be literally 24 hours long. (Exodus 20:11) Does the wording of Genesis support this conclusion?

No, it does not. The fact is that the Hebrew word translated “day” can mean various lengths of time, not just a 24-hour period. For example, when summarizing God’s creative work, Moses refers to all six creative days as one day. (Genesis 2:4) In addition, on the first creative day, “God began calling the light Day, but the darkness he called Night.” (Genesis 1:5) Here, only a portion of a 24-hour period is defined by the term “day.” Certainly, there is no basis in Scripture for arbitrarily stating that each creative day was 24 hours long.

How long, then, were the creative days? The wording of Genesis chapters 1 and 2 indicates that considerable lengths of time were involved.

Creations Appear Gradually

Moses wrote his account in Hebrew, and he wrote it from the perspective of a person standing on the surface of the earth. These two facts, combined with the knowledge that the universe existed before the beginning of the creative periods, or “days,” help to defuse much of the controversy surrounding the creation account. How so?

*Genesis does not teach
that the universe was created
in a short period of time
in the relatively
recent past*

A careful consideration of the Genesis account reveals that events starting during one “day” continued into one or more of the following days. For example, before the first creative “day” started, light from the already existing sun was somehow prevented from reaching the earth’s surface, possibly by thick clouds. (Job 38:9) During the first “day,” this barrier began to clear, allowing diffused light to penetrate the atmosphere.*

* In the description of what happened on the first “day,” the Hebrew word used for light is ‘ohr, light in a general sense; but concerning the fourth “day,” the word used is *ma’ohr*, which refers to the source of light.

IN OUR NEXT ISSUE

- **Television—How Does It Influence Your Life?**
- **Can You Help the Dead?**
- **Do I Have an Eating Disorder?**

On the second “day,” the atmosphere evidently continued to clear, creating a space between the thick clouds above and the ocean below. On the fourth “day,” the atmosphere had gradually cleared to such an extent that the sun and the moon were made to appear “in the expanse of the heavens.” (Genesis 1:14-16) In other words, from the perspective of a person on earth, the sun and moon began to be discernible. These events happened gradually.

The Genesis account also relates that as the atmosphere continued to clear, flying creatures—including insects and membrane-winged creatures—started to appear on the fifth “day.” However, the Bible indicates that during the sixth “day,” God was still in the process of “forming from the ground every wild beast of the field and every flying creature of the heavens.”—Genesis 2:19.

Clearly, the Bible’s language makes room for the possibility of some major events during each “day,” or creative period, to have occurred gradually rather than instantly, perhaps some of them even lasting into the following creative “days.”

According to Their Kinds

Does this progressive appearance of plants and animals imply that God used evolution to produce the vast diversity of living things? No. The record clearly states that God created all the basic “kinds” of plant and animal life. (Genesis 1:11, 12, 20-25) Were these original “kinds” of plants and animals programmed with the ability to adapt to changing environmental conditions? What defines the boundary of a “kind”? The Bible does not say. However, it does state that living creatures “swarmed forth according to their

kinds.” (Genesis 1:21) This statement implies that there is a limit to the amount of variation that can occur within a “kind.” Both the fossil record and modern research support the idea that the fundamental categories of plants and animals have changed little over vast periods of time.

Contrary to the claims of some Fundamentalists, Genesis does not teach that the universe, including the earth and all living things on it, was created in a short period of time in the relatively recent past. Rather, the description in Genesis of the creation of the universe and the appearance of life on earth harmonizes with many recent scientific discoveries.

Because of their philosophical beliefs, many scientists reject the Bible’s declaration that God created all things. Interestingly, however, in the ancient Bible book of Genesis, Moses wrote that the universe had a beginning and that life appeared in stages, progressively, over periods of time. How could Moses gain access to such scientifically accurate information some 3,500 years ago? There is one logical explanation. The One with the power and wisdom to create the heavens and the earth could certainly give Moses such advanced knowledge. This gives weight to the Bible’s claim that it is “inspired of God.”—2 Timothy 3:16.

NASA photo

***“In the beginning
God created the heavens
and the earth.”***
—Genesis 1:1



HAVE YOU WONDERED?

- How long ago did God create the universe?—**Genesis 1:1**.
- Was the earth created in six days of 24 hours each?—**Genesis 2:4**.
- How could the writings of Moses regarding earth’s beginnings be scientifically accurate?—**2 Timothy 3:16**.

Why We Believe in a CREATOR

the Designer and Builder of the material universe. Why have they arrived at that conclusion? *Awake!* asked some of them. You may find their comments interesting.*

Many experts in various scientific fields perceive intelligent design in nature. They find it illogical to think that the intricate complexity of life on earth came about by chance. Hence, a number of scientists and researchers believe in a Creator.

Some of these have become Jehovah's Witnesses. They are convinced that the God of the Bible is

"Unfathomable Complexities of Life"

■ **WOLF-EKKEHARD LÖNNIG PROFILE:** Over the past 28 years, I have done scientific work dealing with genetic mutation in plants. For 21 of those years, I have been employed by the Max Planck Institute for Plant Breeding Research, in Cologne, Germany. For almost three decades, I have also served as an elder in a Christian congregation of Jehovah's Witnesses.



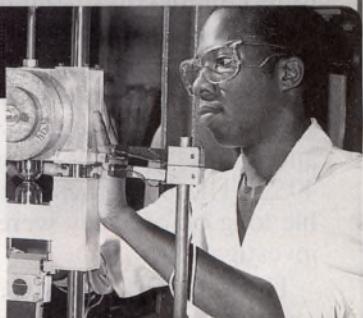
My empirical research in genetics and my studies of biological subjects such as physiology and morphology bring me face-to-face with the enormous and often unfathomable complexities of life. My study of these topics has reinforced my conviction that life, even the most basic forms of life, must have an intelligent origin.

The scientific community is well aware of the complexity found in life. But these fas-

cinating facts are generally presented in a strong evolutionary context. In my mind, however, the arguments against the Bible account of creation fall apart when subjected to scientific scrutiny. I have examined such arguments over decades. After much careful study of living things and consideration of the way the laws governing the universe seem perfectly adjusted so that life on earth can exist, I am compelled to believe in a Creator.

"Everything I Observe Has a Cause"

■ **BYRON LEON MEADOWS PROFILE:** I live in the United States and work at the National Aeronautics and Space Administration in the field of laser physics. Presently I am involved in the development of technology to improve the ability to monitor global climate, weather, and other planetary phenomena. I am an elder in a congregation of Jehovah's Witnesses in the Kilmarnock, Virginia, area.



In my research I often work with the principles of physics. I seek to understand how and why certain things happen. In my field of study, I find clear evidence that everything I

observe has a cause. I believe that it is scientifically reasonable to accept that God is the original cause of all things in nature. The laws of nature are too stable for me not to believe that they were put in place by an Organizer, a Creator.

*The views presented by the experts in this article do not necessarily reflect those of their employers.

If this conclusion is that obvious, why do so many scientists believe in evolution? Might it be that evolutionists look at their evidence with presupposed conclusions? This is not unheard of among scientists. But observation, no matter how convincing, does not presuppose conclusion. For example, a person researching laser physics could insist that light is a wave, similar to a sound wave, because light often behaves like a wave. However, his conclusion would be incomplete because the evidence also indicates that light behaves as a group of particles, known as photons. Similarly, those who insist that evolution is a fact base their conclusions on only

part of the evidence, and they allow their own presupposed conclusions to influence the way that they view the evidence.

I find it amazing that anyone accepts the theory of evolution as fact when evolutionary "experts" themselves argue over how it is supposed to have happened. For example, would you accept arithmetic as a proved fact if some experts said that 2 plus 2 equals 4, while other experts said it was believed to total 3 or possibly 6? If the role of science is to accept only what can be proved, tested, and reproduced, then the theory that all life evolved from a common ancestor is not a scientific fact.

"Something Cannot Come From Nothing"

■ **KENNETH LLOYD TANAKA PROFILE:** I am a geologist presently employed by the U.S. Geological Survey in Flagstaff, Arizona. For almost three decades, I have participated in scientific research in various fields of geology, including planetary geology. Dozens of my research articles and geologic maps of Mars have been published in accredited scientific journals. As one of Jehovah's Witnesses, I spend about 70 hours every month promoting Bible reading.



I was taught to believe in evolution, but I could not accept that the immense energy required to form the universe could have originated without a powerful Creator. Something cannot come from nothing. I also find a strong argument in favor of a Creator in the Bible itself. This book gives numerous examples of scientific facts in my field of expertise, such as that the earth is spherical in shape and hangs "upon nothing." (Job 26:7; Isaiah 40:22) These realities were written in the Bible long before they were proved by human investigation.

Think of the way we are made. We possess sensory perception, self-awareness, intelligent thought, communication abilities, and feelings. In particular, we can experience, appreciate, and express love. Evolution cannot explain how these wonderful human qualities came to be.

Ask yourself, 'How reliable and credible are the sources of information used to support evolution?' The geologic record is incomplete, complex, and confusing. Evolutionists have failed to demonstrate proposed evolutionary processes in the laboratory with the use of scientific methodologies. And while scientists generally employ good research techniques to acquire data, they are often influenced by selfish motives when interpreting their findings. Scientists have been known to promote their own thinking when the data are inconclusive or contradictory. Their careers and their own feelings of self-worth play important roles.

Both as a scientist and as a Bible student, I search for the whole truth, which reconciles all known facts and observations to reach the most accurate understanding. To me, belief in the Creator makes the most sense.

"The Obvious Design Evident in the Cell"

■ **PAULA KINCHELOE PROFILE:** I have several years of experience as a researcher in the fields of cell and molecular biology and microbiology. I am presently employed by Emory University, in Atlanta, Georgia, U.S.A. I also work as a volunteer Bible teacher in the Russian-speaking community.



As part of my education in biology, I spent four years focusing on just the cell and its components. The more I learned about DNA, RNA, proteins, and metabolic pathways, the more amazed I became with the complexity, organization, and precision involved. And while I was impressed with how much man has learned about the cell, I was even more amazed at how much there is yet to learn. The obvious design evident in the cell is one reason I believe in God.

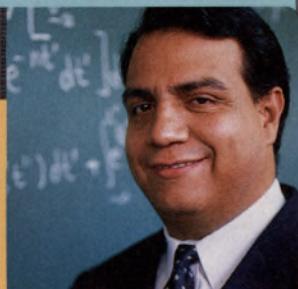
My study of the Bible has revealed who the Creator is—namely, Jehovah God. I am convinced that he is not only an intelligent De-

signer but also a kind and loving Father who cares for me. The Bible explains the purpose of life and provides the hope of a happy future.

Young ones in school who are being taught evolution may be unsure of what to believe. This can be a confusing time for them. If they believe in God, this is a test of faith. But they can meet that test by examining the many amazing things in nature that surround us and by continuing to grow in knowledge of the Creator and his qualities. I have personally done this and have concluded that the Bible's account of creation is accurate and does not conflict with true science.

"The Elegant Simplicity of the Laws"

■ **ENRIQUE HERNÁNDEZ-LEMUS PROFILE:** I am a full-time minister of Jehovah's Witnesses. I am also a theoretical physicist working at the National University of Mexico. My current work involves finding a thermodynamically feasible explanation for the phenomenon known as the gravothermal catastrophe, which is a mechanism of star growth. I have also worked with complexity in DNA sequences.

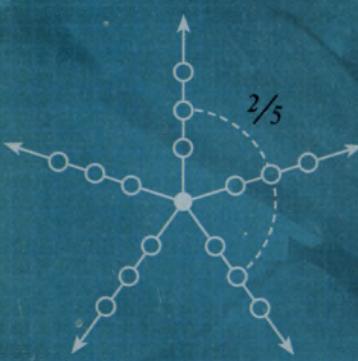
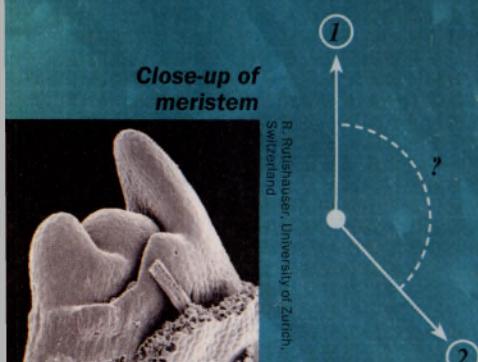


Life is simply too complicated to have arisen by chance. For example, consider the vast amount of information contained in the DNA molecule. The mathematical probability of the random generation of a single chromosome is less than 1 in 9 trillion, an event so unlikely that it can be considered impossible. I think it is nonsense to believe that unintelligent forces could create not just a single chromosome but all the amazing complexity present in living beings.

In addition, when I study the highly complex behavior of matter, from the microscopic level to the movement of giant stellar clouds through space, I am impressed by the elegant simplicity of the laws governing their motion.

To me, these laws imply more than the work of a Master Mathematician—they are like the signature of a Master Artist.

People are often surprised when I tell them that I am one of Jehovah's Witnesses. Sometimes they ask me how I can believe in God. Their reaction is understandable, since most religions do not encourage their believers to ask for proof of what they are taught or to research their beliefs. However, the Bible encourages us to use our "thinking ability." (Proverbs 3:21) All the evidence of intelligent design in nature, together with evidence from the Bible, convinces me that God not only exists but is also interested in our prayers.



① HAVE you ever noticed that many plants grow in spiral formations? A pineapple, for example, may have 8 spirals of scales going around one way and 5 or 13 going in the opposite direction. (See figure 1.) If you look at the seeds in a sunflower, you may be able to see 55 and 89 spirals crossing over each other or perhaps even more. You may even find spirals on a cauliflower. Once you start noticing spirals, visits to your fruit and vegetable store may take on new interest. Why do plants grow in this way? Does the number of spirals have any significance?

How Do Plants Grow?

② Most plants form new organs such as stems, leaves, and flowers from a tiny central growing point called a meristem. Each new structure, called a primordium, develops and grows out from the center in a new direction, forming an angle with the previous growth.* (See figure 2.) Most plants arrange new growths at a unique angle that produces spirals. What angle is it?

Consider this challenge: Imagine trying to engineer a plant so that new growths are compactly arranged around the growing point with no wasted space. Suppose you chose to make each new primordium grow out at an angle of two fifths of a revolution from the previous growth. You would have the problem of every fifth primordium growing from the same spot and in the same direction. They would form rows with wasted space between the rows. (See figure 3.) The truth is, *any* simple fraction of a revolution results in rows rather than optimal packing. Only what has been termed the “golden angle” of approximately 137.5 degrees results in an ideally compact arrangement of growths. (See figure 5.) What makes this angle so special?

* Curiously, the sunflower is unusual in that the florets that become seeds begin to form spirals from the rim of the head rather than the center.

The golden angle is ideal because it cannot be expressed as a simple fraction of a revolution. The fraction $5/8$ is close to it, $8/13$ is closer, and $13/21$ is closer still, but no fraction exactly expresses the golden proportion of a revolution. Thus, when a new growth on the meristem develops at this fixed angle with respect to the preceding growth, no two growths will *ever* develop in exactly the same direction. (See figure 4.) Consequently, instead of forming radial arms, the primordia form spirals.

Remarkably, a computer simulation of primordia growing from a central point produces recognizable spirals only if the angle between new growths is correct to a high degree of accuracy. Straying from the golden angle by even one tenth of a degree causes the effect to be lost.—See figure 5.

How Many Petals on a Flower?

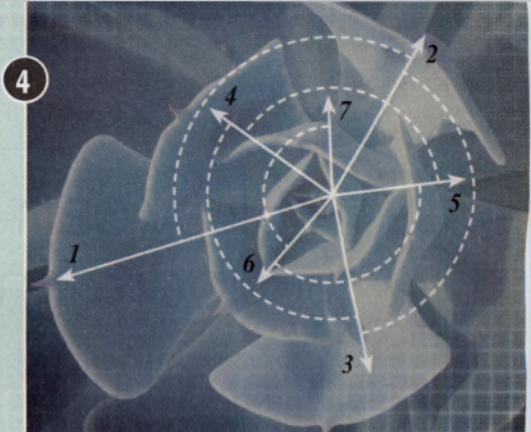
Interestingly, the number of spirals that result from growth based on the golden angle is usually a number from a series called the Fibonacci sequence. This series was first described by the 13th-century Italian mathematician known as Leonardo Fibonacci. In this progression, each number after 1 is equal to the sum of the previous two numbers—1, 1, 2, 3, 5, 8, 13, 21, 34, 55, and so on.

The flowers of many plants that exhibit a spiral growth pattern often have a Fibonacci number of petals. According to some observers, there is a tendency for buttercups to have 5 petals, bloodroots 8, fireweeds 13, asters 21, common field daisies 34, and Michaelmas daisies 55 or 89. (See figure 6.) Fruit and vegetables often have features that correspond to Fibonacci numbers. Bananas, for example, have a five-sided cross section.

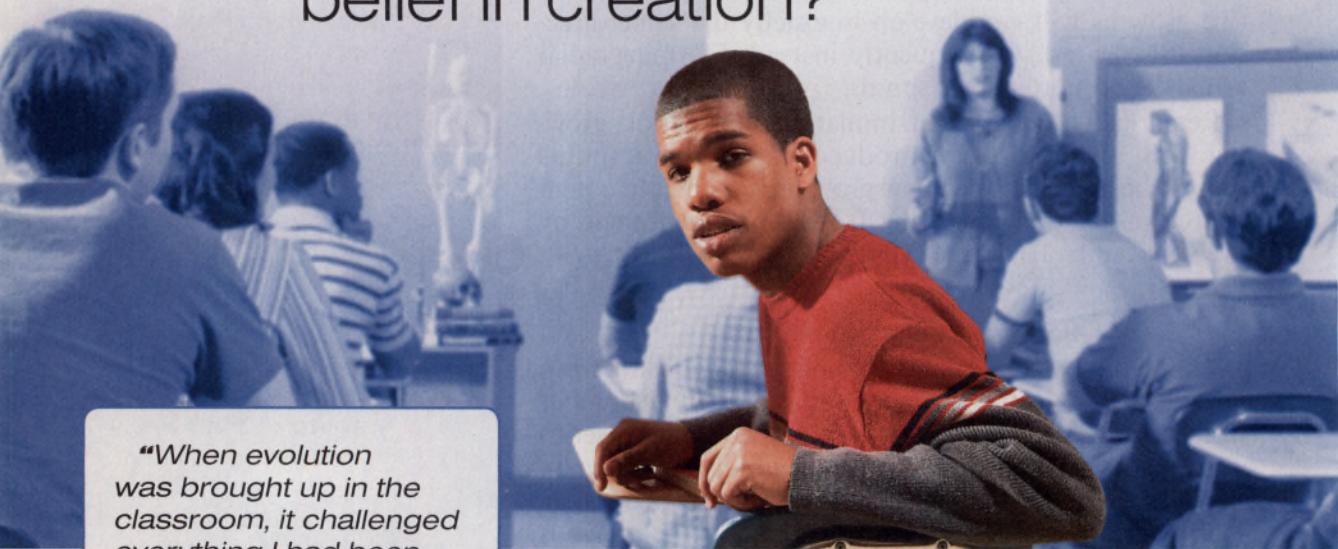
"Everything He Has Made Pretty"

Artists have long recognized the golden proportion as the most pleasing to our eyes. What makes plants form new growths precisely at this intriguing angle? Many people conclude that this is but another example of intelligent design in living things.

In contemplating the design of living things and our capacity to find pleasure in them, many discern the hand of a Creator who wants us to enjoy life. Of our Creator the Bible says: "Everything he has made pretty in its time." —Ecclesiastes 3:11.



How can I defend my belief in creation?



"When evolution was brought up in the classroom, it challenged everything I had been taught. It was presented as a fact, and I found that to be intimidating."

—Ryan, 18.

"When I was about 12, my teacher was a staunch evolutionist. She even had a Darwin sign on her car! That made me reluctant to speak up about my belief in creation." —**Tyler, 19.**

"I was terrified when my social studies teacher said that evolution would be our next lesson. I knew that I'd have to explain in class where I stood on this controversial issue."

—Raquel, 14.

PERHAPS you, like Ryan, Tyler, and Raquel, feel uneasy when the subject of evolution comes up in class. You believe that God "created all things." (Revelation 4:11) You see evidence of intelligent design all around you. But the textbooks say we evolved, and so does your teacher. Who are you to argue with the "experts"? And how will your classmates react if you start talking about ... God?

If questions like these worry you, relax! You are not the only one who believes in creation. The fact is, even a number of scientists don't accept the evolution theory. Many teachers do not either. In the United States, as many as 4 out of 5 students believe in a Creator—despite what the textbooks say!

Still, you might ask, 'What will I say if I have to defend my belief in creation?' Rest assured that even if you are timid, you *can* take a stand. However, it will require some preparation.

Test Your Beliefs!

If you are being raised by Christian parents, you might believe in creation simply because that is what you have

been taught. Now that you are growing older, though, you want to worship God with your "power of reason," having a solid foundation for your beliefs. (Romans 12:1) Paul encouraged first-century Christians to "make sure of all things." (1 Thessalonians 5:21) How can you do so with regard to creation?

First, consider what Paul wrote about God: "His invisible qualities are clearly seen from the world's creation onward, because they are perceived by the things made." (Romans 1:20) With those words in mind, take a close look at the human body, the earth, the vast universe, the ocean depths. Examine the fascinating world of insects, of plants, of animals—whatever field interests *you*. Then, using your "power of reason," ask yourself, 'What convinces me that there is a Creator?'

To answer that question, 14-year-old Sam looks at the human body. "It's so detailed and complex," he says, "and all of its parts work so well together. The human body couldn't have evolved!" Holly, 16, agrees. "Since being diagnosed with diabetes," she says, "I have learned a lot about how the body works. It's amazing, for example, how the pancreas—a little organ that hides behind the stomach—does such a huge job in keeping blood and the other organs working."

Other youths look at the matter from a different angle. "For me," says 19-year-old Jared, "the greatest proof lies in the fact that we have a spiritual side, as well as an appreciation for beauty and a desire to learn. These traits are not needed for survival, as evolution would have us believe. The only explanation that makes sense to me is that we were put here by someone who wanted us to enjoy life." Tyler, mentioned at the outset, has reached a similar conclusion. "When I consider the role plants play in sustaining life and the mind-boggling complexity of their make-up, I'm convinced that there is a Creator."

"THE EVIDENCE IS ABUNDANT"

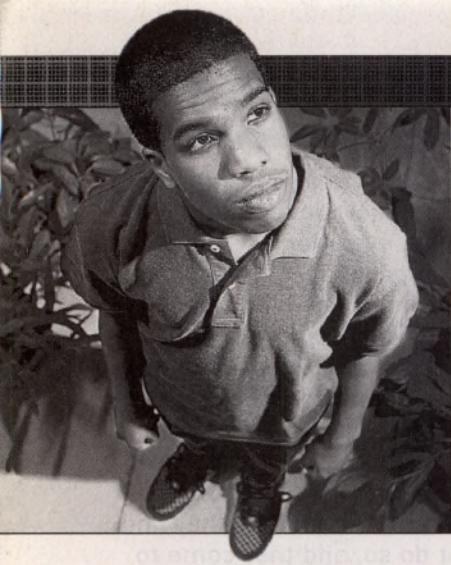
"What would you say to a young person who was raised to believe in a Creator but who is being taught evolution at school?" This question was posed to a microbiologist who is one of Jehovah's Witnesses. Her reply? "You should view it as an opportunity to prove to yourself that God exists—not just because that is what you were taught by your parents but because *you* have examined the evidence and have come to that conclusion. Sometimes when teachers are asked to 'prove' evolution, they find that they cannot do so, and they come to realize that they accept the theory simply because it is what they have been taught. You can fall into the same trap with regard to your belief in a Creator. That's why it is worth your while to *prove to yourself* that God really does exist. The evidence is abundant. It's not difficult to find."

It's easier to speak up about creation if you have thought it through and truly are convinced of it. Therefore, like Sam, Holly, Jared, and Tyler, take some time to consider the wonders of God's handiwork. Then "hear" what these things are "telling" you. No doubt, you will reach the same conclusion as did the apostle Paul—that not only God's existence but also his qualities can be readily "perceived by the things made."*

Know What the Bible Really Teaches

Besides taking a closer look at the things God has made, to defend creation you also need to know what the Bible really teaches about the matter. There's no need to make an issue over things that the Bible does not directly comment on. Consider a few examples.

* Many youths have benefited from reviewing information contained in such publications as *Life—How Did It Get Here? By Evolution or by Creation?* and *Is There a Creator Who Cares About You?* Both books are published by Jehovah's Witnesses.



WHAT CONVINCES YOU?

Below, list three things that convince you that there is a Creator:

1.
2.
3.

■ *My science textbook says that the earth and the solar system have been in existence for billions of years.* The Bible does not comment on the age of the earth or the solar system. What it says is compatible with the thought that the universe may well have been in existence for billions of years before the beginning of the first creative “day.”—Genesis 1:1, 2.

■ *My teacher says that the earth could not have been created in just six days.* The Bible does not state that each of the six creative “days” was a literal 24-hour period. For more information, see pages 18-20 of this magazine.

■ *Our class discussed several examples of how animals and humans have changed over time.* The Bible says that God created living things “according to their kinds.” (Genesis 1:20, 21) It does not support the idea that life arose from nonliving matter or that God started off the process of evolution with a single cell. Still, each “kind” has potential for great variety. So the Bible allows for change to take place *within each “kind.”*

Be Confident of Your Beliefs!

There is no reason to feel awkward or ashamed because you believe in creation. Considering the evidence, it’s entirely reasonable—indeed, *scientific*—to believe that we are the product of intelligent design. In the end it is really evolution—not creation—that requires a huge leap of faith and miracles without a miracle maker. In fact, after considering the other articles in this issue of *Awake!* no doubt you will be convinced that the evidence supports creation. And once you have thought the matter through using your power of reason, you will feel more confident about defending your belief in the classroom.

That is what Raquel, mentioned earlier, found. “It took me a couple of days to realize that I shouldn’t keep my beliefs to myself,” she says. “I gave the book *Life—How Did It Get Here? By Evolution or by Creation?* to my teacher, with certain parts highlighted that I wanted to bring to her attention. Later, she told me that the book gave her a whole new perspective on evolution and that in the future she would take the information into account when teaching the subject!”

TO THINK ABOUT

- What are some ways you can comfortably express your belief in creation at school?
- How can you show your appreciation for the One who created all things?—Acts 17:26, 27.

More articles from the “Young People Ask . . .” series can be found at the Web site
www.watchtower.org/ype

Does It Matter What You Believe?

DO YOU think that life has a purpose? If evolution were true, then the statement quoted in the journal *Scientific American* would be valid: "Our modern understanding of evolution implies . . . that ultimate meaning in life is nonexistent."

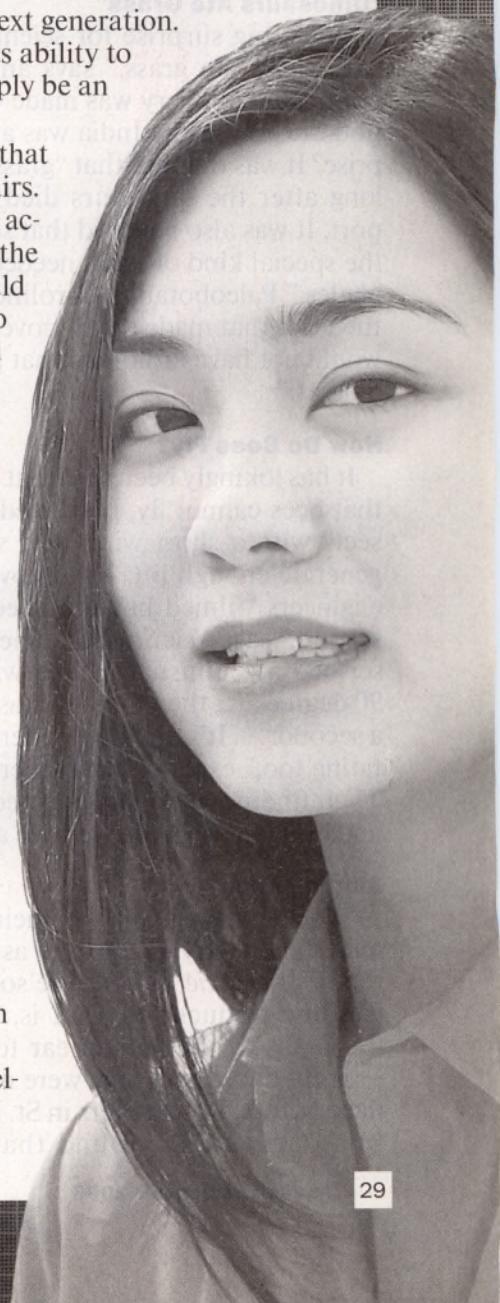
Consider the implications of those words. If ultimate meaning in life were nonexistent, then you would have no purpose in life other than to try to do some measure of good and, perhaps, pass on your genetic traits to the next generation. At death, you would cease to exist forever. Your brain, with its ability to think, reason, and meditate on the meaning of life, would simply be an accident of nature.

That is not all. Many who believe in evolution assert either that God does not exist or that he will not intervene in human affairs. In either case, our future would rest in the hands of political, academic, and religious leaders. Judging from their past record, the chaos, conflict, and corruption that blight human society would continue. If, indeed, evolution were true, there would seem to be ample reason to live by the fatalistic motto: "Let us eat and drink, for tomorrow we are to die."—1 Corinthians 15:32.

Make no mistake about it. Jehovah's Witnesses do not accept the aforementioned statements. Nor do the Witnesses accept the premise upon which those statements are based—evolution. On the contrary, the Witnesses believe that the Bible is true. (John 17:17) Hence, they believe what it says about how we got here: "With you [God] is the source of life." (Psalm 36:9) Those words have profound implications.

Life does have meaning. Our Creator has a loving purpose that extends to all who choose to live in accord with his will. (Ecclesiastes 12:13) That purpose includes the promise of life in a world free of chaos, conflict, and corruption—and even free of death. (Isaiah 2:4; 25:6-8) Millions of Jehovah's Witnesses the world over can testify that learning about God and doing his will give meaning to life as nothing else can!—John 17:3.

What you believe certainly matters, for it can have a bearing not only on your present happiness but also on your future life. The choice is yours. Will you believe a theory that has failed to explain away the increasing evidence for design in the natural world? Or will you accept what the Bible says, namely that the earth and life on it are the product of a marvelous Designer—Jehovah, the God who "created all things"?—Revelation 4:11.



Giant Squid Photographed

Near the Bonin Islands, south of Japan, scientists have for the first time photographed a live giant squid in the wild. They baited hooks with small squid and shrimp pulp and suspended cameras above them. The giant squid that appeared, at a depth of some 3,000 feet, is estimated to have measured about 25 feet in length.

Dinosaurs Ate Grass

"It's a big surprise for scientists" to discover that "dinosaurs ate grass," says an Associated Press report. The discovery was made when fossilized sauropod dung found in India was analyzed. Why the surprise? It was thought that "grasses didn't emerge until long after the dinosaurs died off," explains the report. It was also believed that sauropods "didn't have the special kind of teeth needed to grind up abrasive blades." Paleobotanist Caroline Stromberg, leader of the team that made the discovery, says: "Most people would not have fathomed that [sauropods] would eat grasses."

How Do Bees Fly?

It has jokingly been said that engineers have proved that bees cannot fly. It seemed that such "heavy" insects with a short wing beat should not be able to generate enough lift. To discover the insects' secrets, engineers "filmed hovering bees at 6000 frames per second," says *New Scientist*. The bees' technique is described as "unusual." "The wing sweeps back in a 90-degree arc, then flips over as it returns—230 times a second.... It's like a propeller, where the blade is rotating too," explains a member of the research team. Their findings may help engineers redesign propellers and build more maneuverable aircraft.

Singing Mice

"Mice can sing, and... their songs to prospective mates are nearly as complex as those of birds," reports *New Scientist*. Mouse songs are at ultrasonic frequencies, that is, at a pitch too high for the human ear to hear—likely the reason they were not noticed before. Researchers in St. Louis, Missouri, U.S.A., found that the

■ "The deep sea is by far the largest habitat on the planet. And one of the harshest... Yet everywhere we look we are finding life, sometimes in extraordinary abundance."—*NEW SCIENTIST*, BRITAIN.

■ In a recent test case, a federal court judge in Harrisburg, Pennsylvania, U.S.A., ruled that "it is unconstitutional to teach [intelligent design] as an alternative to evolution in a public school science classroom."

—*NEW YORK TIMES*, U.S.A.

■ According to a news poll in 2005, "51 percent of Americans reject the theory of evolution."

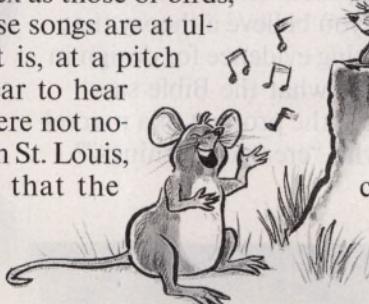
—*NEW YORK TIMES*, U.S.A.

■ At 175 years of age, Harriet, a 330-pound giant Galápagos tortoise that lives at a zoo in Brisbane, Australia, is the "world's oldest known living animal."—AUSTRALIAN BROADCASTING CORPORATION.

■ Swiss researchers have found how some maize varieties defend themselves against western corn rootworm. They emit odors into the ground. These attract minuscule threadworms that kill the larvae of the rootworm.—*DIE WELT*, GERMANY.

vocalizations of male mice
"were arranged into phrases

and motifs, fulfilling the definition of 'song.'" This puts mice in an exclusive club. Other mammals known to sing are whales, dolphins, some bats and, of course, humans.



WHAT IS WRONG WITH THIS PICTURE?

Identify the three things that do not match with the Bible account at Genesis 3:1-5.

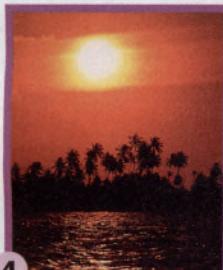
1.
2.
3.

For Discussion: Why did Jehovah tell Adam and Eve not to eat from the tree of the knowledge of good and bad? Why do you think it is important to obey Jehovah's commands?



WHEN IN HISTORY?

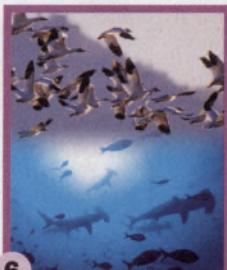
Draw a line connecting the creative event to the "day" it began.



4 Genesis 1:14-16



5 Genesis 1:24



6 Genesis 1:20, 21

Day 1 Day 2 Day 3 Day 4 Day 5 Day 6 Day 7

(Answers on page 12)

First circle: Breck P. Kent; second circle: © Pat Canova/Index Stock Imagery

FROM THIS ISSUE

Answer these questions, and provide the missing Bible verse(s).

Page 5 What creature was known in Bible times for its climbing ability? (Proverbs 30:____)

Page 9 Why is Jehovah worthy of praise? (Revelation 4:____)

Page 20 The advanced knowledge evident in Genesis is proof of what? (2 Timothy 3:____)

Page 25 Everything has been made what "in its time"? (Ecclesiastes 3:____)

WHO AM I?

7. I was the first person on record to build a city.

WHO AM I?

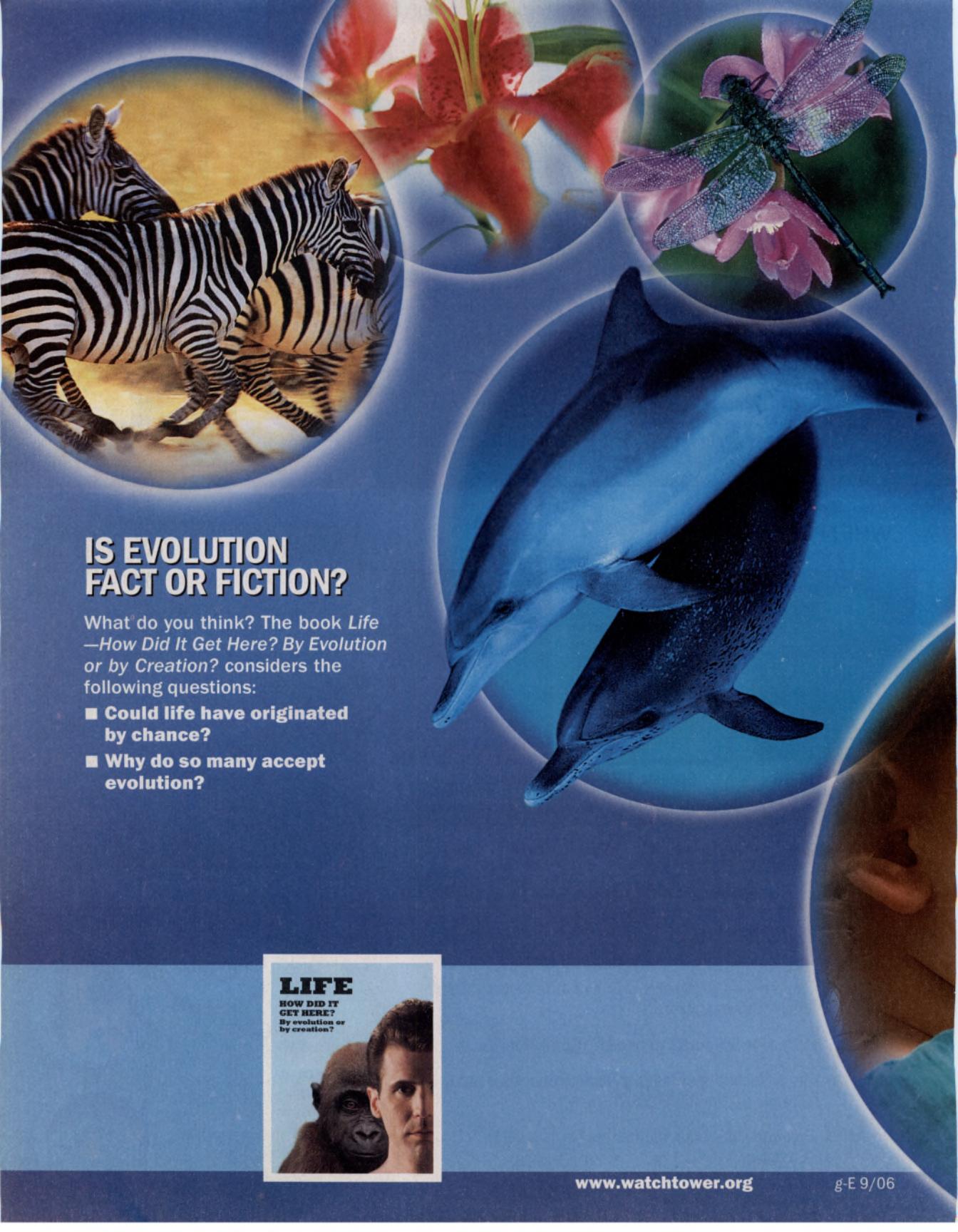
8. I was the first woman after Eve to be named in the Bible.



Children's Picture Search

Can you find these pictures in this issue? In your own words, describe what is happening in each picture.





IS EVOLUTION FACT OR FICTION?

What do you think? The book *Life—How Did It Get Here? By Evolution or by Creation?* considers the following questions:

- Could life have originated by chance?
- Why do so many accept evolution?

