

Evolution and Religion Can Coexist, Scientists Say

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for National Geographic News

October 18, 2004

"Science without religion is lame; religion without science is blind." —Albert Einstein

Joel Primack has a long and distinguished career as an astrophysicist. A University of California, Santa Cruz, professor, he co-developed the cold dark matter theory that seeks to explain the formation and structure of the universe.

He also believes in God.

That may strike some people as peculiar. After all, in some corners popular belief renders science and religion incompatible.

Yet scientists may be just as likely to believe in God as other people, according to surveys. Some of history's greatest scientific minds, including Albert Einstein, were convinced there is intelligent life behind the universe. Today many scientists say there is no conflict between their faith and their work.

"In the last few years astronomy has come together so that we're now able to tell a coherent story" of how the universe began, Primack said. "This story does not contradict God, but instead enlarges [the idea of] God."

Evolution

The notion that science and religion are irreconcilable centers in large part on the issue of evolution. Charles Darwin, in his 1859 book *The Origin of Species*, explained that the myriad species inhabiting Earth were a result of repeated evolutionary branching from common ancestors.

One would be hard pressed to find a legitimate scientist today who does not believe in evolution. As laid out in a cover story in the November issue of *National Geographic* magazine, the scientific evidence for evolution is overwhelming.

Yet in a 2001 Gallup poll 45 percent of U.S. adults said they believe evolution has played no role in shaping humans. According to the creationist view, God produced humans fully formed, with no previous related species.

But what if evolution is God's tool? Darwin never said anything about God. Many scientists—and theologians—maintain that it would be perfectly logical to think that a divine being used evolution as a method to create the world.

Still, science does contradict a literal interpretation of the first chapter of Genesis in the Bible—on the origin of the universe—which says that God created heaven and the Earth and the species on it in six days.

Scientific evidence shows that the universe was actually formed about 13.7 billion years ago, while the

Earth was formed around 4.5 billion years ago. The first humans date back only a hundred thousand years or so.

Like other scientists of faith, Primack, who is Jewish and reads the Bible regularly, argues that the Bible must not be taken literally, but should be read allegorically.

"One simply cannot read the Bible as a scientific text, because it's often contradictory," Primack said. "For example, in the Bible, Noah takes two animals and puts them on the Ark. But in a later section, he takes seven pairs of animals. If this is the literal word of God, was God confused when He wrote it?"

Proving God

Science is young. The term "scientist" may not even have been coined until 1833. Ironically, modern physics initially sought to explain the clockwork of God's creation. Geology grew partly out of a search for evidence of Noah's Flood.

Today few scientists seem to think much about religion in their research. Many are reluctant to stray outside their area of expertise and may not feel a need to invoke God in their work.

"Most scientists like to operate in the context of economy," said Brian Greene, a world-renowned physicist and author of *The Fabric of the Cosmos: Space, Time, and the Texture of Reality*. "If you don't need an explanatory principle, don't invoke it."

There is, of course, no way to prove religious faith scientifically. And it's hard to envision a test that could tell the difference between a universe created by God and one that appeared without God.

"There's no way that scientists can ever rule out religion, or even have anything significant to say about the abstract idea of a divine creator," Greene said.

Instead, Greene said, science and religion can operate in different realms. "Science is very good at answering the 'how' questions. How did the universe evolve to the form that we see?" he said. "But it is woefully inadequate in addressing the 'why' questions. Why is there a universe at all? These are the meaning questions, which many people think religion is particularly good at dealing with."

But is a clean separation between science and religion possible? Some scientific work, including such hot topics as stem cell research, has moral and religious implications.

"Religion is about ethics, or what you should do, while science is about what's true," Primack said. "Those are different things, but of course what you should do is greatly determined by what's true."

Natural Laws

In a 1997 survey in the science journal *Nature*, 40 percent of U.S. scientists said they believe in God—not just a creator, but a God to whom one can pray in expectation of an answer. That is the same percentage of scientists who were believers when the survey was taken 80 years earlier.

But the number may have been higher if the question had simply asked about God's existence. While many scientists seem to have no problem with deism—the belief that God set the universe in motion and then walked away—others are more troubled with the concept of an intervening God.

"Every piece of data that we have indicates that the universe operates according to unchanging, immutable laws that don't allow for the whimsy or divine choice to all of a sudden change things in a manner that those laws wouldn't have allowed to happen on their own," Greene said.

Yet recent breakthroughs in chaos theory and quantum mechanics, for example, also suggest that the workings of the universe cannot be predicted with absolute precision.

To many scientists, their discoveries may not be that different from religious revelations. Science advancements may even draw scientists closer to religion.

"Even as science progresses in its reductionist fashion, moving towards deeper, simpler, and more elegant understandings of particles and forces, there will still remain a 'why' at the end as to why the ultimate rules are the way they are," said Ted Sargent, a nanotechnology expert at the University of Toronto.

"This is where many people will find God, and the fact of having a final unanswerable 'why' will not go away, even if the 'why' gets more and more fundamental as we progress," he said.

Brian Greene believes we are taking giant strides toward understanding the deepest laws of the universe. That, he says, has strengthened his belief in the underlying harmony and order of the cosmos.

"The universe is incredibly wondrous, incredibly beautiful, and it fills me with a sense that there is some underlying explanation that we have yet to fully understand," he said. "If someone wants to place the word God on those collections of words, it's OK with me."