

E.T. AND GOD

*Could earthly religions survive the discovery
of life elsewhere in the universe?*

BY PAUL DAVIES

The recent discovery of abundant water on Mars, albeit in the form of permafrost, has raised hopes for finding traces of life there. The Red Planet has long been a favorite location for those speculating about extraterrestrial life, especially since the 1890s, when H. G. Wells wrote *The War of the Worlds* and the American astronomer Percival Lowell claimed that he could see artificial canals etched into the planet's parched surface. Today, of course, scientists expect to find no more than simple bacteria dwelling deep underground, if even that. Still, the discovery of just a single bacterium somewhere beyond Earth would force us to revise our understanding of who we are and where we fit into the cosmic scheme of things, throwing us into a deep spiritual identity crisis that would be every bit as dramatic as the one Copernicus brought about in the early 1500s, when he asserted that Earth was not at the center of the universe.

Whether or not we are alone is one of the great existential questions that confront us today. Probably because of the high emotional stakes, the search for life beyond Earth is deeply fascinating to the public. Opinion polls and Web-site hits indicate strong support for and interest in space missions that are linked even obliquely to this search. Perceiving the public's interest, NASA has reconfigured its research strategy and founded the NASA Astrobiology Institute, dedicated to the study of life in the cosmos. At the top of the agenda, naturally, is the race to find life elsewhere in the solar system.

Researchers have long focused on Mars in their search for extraterrestrial life because of its relative proximity. But twenty-five years ago, as a result of the 1976 *Viking* mission, many of them became discouraged. A pair of spacecraft had passed through the planet's extremely thin atmosphere, touched down on the surface, and found it to be a freeze-dried desert drenched with deadly ultraviolet rays. The spacecraft, equipped with robotic arms, scooped up Martian dirt so that it could be examined for signs of biological activity. The results of the analysis were inconclusive but generally negative, and hopes faded for finding even simple microbes on the surface of Mars.

The outlook today is more optimistic. Several probes are scheduled to visit Mars in the coming months, and all will be searching for signs of life. This renewed interest is due in part to the discovery of organisms living in some remarkably hostile environments on Earth (which opens up the possibility of life on Mars in places the *Viking* probes didn't examine), and in part to better information about the planet's ancient history. Scientists now believe that Mars once had a much thicker atmosphere, higher

temperatures, rivers, floods, and extensive volcanic activity – all conditions considered favorable to the emergence of life.

The prospects for finding living organisms on Mars remain slim, of course, but even traces of past life would represent a discovery of unprecedented scientific value. Before any sweeping philosophical or theological conclusions could be drawn, however, it would be necessary to determine whether this life was the product of a second genesis – that is, whether its origin was independent of life on Earth. Earth and Mars are known to trade material in the form of rocks blasted from the planets' surfaces by the violent impacts of asteroids and comets. Microbes could have hitched a ride on this detritus, raising the possibility that life started on Earth and was transferred to Mars, or vice versa. If traces of past life were discovered on Mars but found to be identical to some form of terrestrial life, transportation by ejected rocks would be the most plausible explanation, and we would still lack evidence that life had started from scratch in two separate locations.

The significance of this point is crucial. In his theory of evolution Charles Darwin provided a persuasive account of how life evolved over billions of years, but he pointedly omitted any explanation of how life got started in the first place. “One might as well think of origin of matter,” he wrote in a letter to a friend. A century and a half later, scientists still have little understanding of how the first living thing came to be.

Some scientists believe that life on Earth is a freak accident of chemistry, and as such must be unique. Because even the simplest known microbe is breathtakingly complex, they argue, the chances that one formed by blind molecular shuffling are infinitesimal; the probability that the process would occur twice, in separate locations, is virtually negligible. The French biochemist and Nobel laureate Jacques Monod was a firm believer in this view. “Man at last knows he is alone in the unfeeling immensity of the universe, out of which he has emerged only by chance,” he wrote in 1971. He used this bleak assessment as a springboard to argue for atheism and the absurdity and pointlessness of existence. As Monod saw it, we are merely chemical extras in a majestic but impersonal cosmic drama – an irrelevant, unintended sideshow.

But suppose that's not what happened. Many scientists believe that life is not a freakish phenomenon (the odds of life's starting by chance, the British cosmologist Fred Hoyle once suggested, are comparable to the odds of a whirlwind's blowing through a junkyard and assembling a functioning Boeing 747) but instead is written into the laws of nature. “The universe must in some sense have known we were coming,” the physicist Freeman Dyson famously observed. No one can say precisely in what sense the universe might be pregnant with life, or how the general expectancy Dyson spoke of might translate into specific physical processes at the molecular level. Perhaps matter and energy always get fast-tracked along the road to life by what's often called “self-organization.” Or perhaps the power of Darwinian evolution is somehow harnessed at a

pre-biotic molecular stage. Or maybe some efficient and as yet unidentified physical process (quantum mechanics?) sets the gears in motion, with organic life as we know it taking over the essential machinery at a later stage. Under any of these scenarios life becomes a fundamental rather than an incidental product of nature. In 1994, reflecting on this same point, another Nobel laureate, the Belgian biochemist Christian de Duve, wrote, “I view this universe not as a ‘cosmic joke,’ but as a meaningful entity – made in such a way as to generate life and mind, bound to give birth to thinking beings able to discern truth, apprehend beauty, feel love, yearn after goodness, define evil, experience mystery.”

Absent from these accounts is any mention of miracles. Ascribing the origin of life to a divine miracle not only is anathema to scientists but also is theologically suspect. The term “God of the gaps” was coined to deride the notion that God can be invoked as an explanation whenever scientists have gaps in their understanding. The trouble with invoking God in this way is that as science advances, the gaps close, and God gets progressively squeezed out of the story of nature. Theologians long ago accepted that they would forever be fighting a rearguard battle if they tried to challenge science on its own ground. Using the formation of life to prove the existence of God is a tactic that risks instant demolition should someone succeed in making life in a test tube. And the idea that God acts in fits and starts, moving atoms around on odd occasions in competition with natural forces, is a decidedly uninspiring image of the Grand Architect.

The theological battle line in relation to the formation of life is not, therefore, between the natural and the miraculous but between sheer chance and lawlike certitude. Atheists tend to take the first side, and theists line up behind the second; but these divisions are general and by no means absolute. It’s perfectly possible to be an atheist and believe that life is built ingeniously into the nature of the universe. It’s also possible to be a theist and suppose that God engineered just one planet with life, with or without the help of miracles.

Though the discovery of microbes on Mars or elsewhere would ignite a passionate theological debate, the truly difficult issues surround the prospect of advanced alien beings in possession of intelligence and technology. Most scientists don’t think that such beings exist, but for forty years a dedicated band of astronomers has been sweeping the skies with radio telescopes in hopes of finding a message from a civilization elsewhere in the galaxy. Their project is known as SETI (Search for Extraterrestrial Intelligence).

Because our solar system is relatively young compared with the universe overall, any alien civilization the SETI researchers might discover is likely to be much older, and presumably wiser, than ours. Indeed, it might have achieved our level of science and technology millions or even billions of years ago. Just contemplating the possibility of such advanced extraterrestrials appears to raise additional uncomfortable questions for religion.

The world's main faiths were all founded in the pre-scientific era, when Earth was widely believed to be at the center of the universe and humankind at the pinnacle of creation. As scientific discoveries have piled up over the past 500 years, our status has been incrementally diminished. First Earth was shown to be just one planet of several orbiting the Sun. Then the solar system itself was relegated to the outer suburbs of the galaxy, and the Sun classified as an insignificant dwarf star among billions. The theory of evolution proposed that human beings occupied just a small branch on a complex evolutionary tree. This pattern continued into the twentieth century, when the supremacy of our much vaunted intelligence came under threat. Computers began to outsmart us. Now genetic engineering has raised the specter of designer babies with superintellecets that leave ours far behind. And we must consider the uncomfortable possibility that in astrobiological terms, God's children may be galactic also-rans.

Theologians are used to putting a brave face on such developments. Over the centuries the Christian church, for example, has time and again been forced to accommodate new scientific facts that challenge existing doctrine. But these accommodations have usually been made reluctantly and very belatedly. Only recently, for example, did the Pope acknowledge that Darwinian evolution is more than just a theory. If SETI succeeds, theologians will not have the luxury of decades of careful deliberation to assess the significance of the discovery. The impact will be instant.

The discovery of alien superbeings might not be so corrosive to religion if human beings could still claim special spiritual status. After all, religion is concerned primarily with people's relationship to God, rather than with their biological or intellectual qualities. It is possible to imagine alien beings who are smarter and wiser than we are but who are spiritually inferior, or just plain evil. However, it is more likely that any civilization that had surpassed us scientifically would have improved on our level of moral development, too. One may even speculate that an advanced alien society would sooner or later find some way to genetically eliminate evil behavior, resulting in a race of saintly beings.

Suppose, then, that E.T. is far ahead of us not only scientifically and technologically but spiritually, too. Where does that leave mankind's presumed special relationship with God? This conundrum poses a particular difficulty for Christians, because of the unique nature of the Incarnation. Of all the world's major religions, Christianity is the most species-specific. Jesus Christ was *humanity's* savior and redeemer. He did not die for the dolphins or the gorillas, and certainly not for the proverbial little green men. But what of deeply spiritual aliens? Are they not to be saved? Can we contemplate a universe that contains perhaps a trillion worlds of saintly beings, but in which the only beings eligible for salvation inhabit a planet where murder, rape, and other evils remain rife?

Those few Christian theologians who have addressed this thorny issue divide into two camps. Some posit multiple incarnations and even multiple crucifixions – God taking on little green flesh to save little green men, as a prominent Anglican minister once told me. But most are appalled by this idea or find it ludicrous. After all, in the Christian view of the world, Jesus was God’s *only* son. Would God have the same person born, killed, and resurrected in endless succession on planet after planet? This scenario was lampooned as long ago as 1794, by Thomas Paine. “The Son of God,” he wrote in *The Age of Reason*, “and sometimes God himself, would have nothing else to do than to travel from world to world, in an endless succession of death, with scarcely a momentary interval of life.” Paine went on to argue that Christianity was simply incompatible with the existence of extraterrestrial beings, writing, “He who thinks he believes in both has thought but little of either.”

Catholics tend to regard the idea of multiple incarnations as verging on heresy, not because of its somewhat comic aspect but because it would seem to automate an act that is supposed to be God’s singular gift. “God chose a very specific way to redeem human beings,” writes George Coyne, a Jesuit priest and the director of the Vatican Observatory, whose own research includes astrobiology. “He sent his only son, Jesus, to them, and Jesus gave up his life so that human beings would be saved from their sin. Did God do this for extraterrestrials? ... The theological implications about God are getting ever more serious.”

Paul Tillich, one of the few prominent Protestant theologians to give serious consideration to the issue of alien beings, took a more positive view. “Man cannot claim to occupy the only possible place for incarnation,” he wrote. The Lutheran theologian Ted Peters, of the Center for Theology and the Natural Sciences, in Berkeley, California, has made a special study of the impact on religious faith of belief in extraterrestrials. In discussing the tradition of debate on this topic, he writes, “Christian theologians have routinely found ways to address the issue of Jesus Christ as God incarnate and to conceive of God’s creative power and saving power exerted in other worlds.” Peters believes that Christianity is robust enough and flexible enough to accommodate the discovery of extraterrestrial intelligence, or ETI. One theologian who is emphatically not afraid of that challenge is Robert Russell, also of the Center for Theology and the Natural Sciences. “As we await ‘first contact,’” he has written, “pursuing these kinds of questions and reflections will be immensely valuable.”

Clearly, there is considerable diversity – one might even say muddle – on this topic in theological circles. Ernan McMullin, a professor emeritus of philosophy at Notre Dame University, affirms that the central difficulty stems from Christianity’s roots in a pre-scientific cosmology. “It was easier to accept the idea of God’s becoming man,” he has written, “when humans and their abode both held a unique place in the universe.” He acknowledges that Christians especially face a stark predicament in relation to ETI, but

feels that Thomas Paine and his like-minded successors have presented the problem too simplistically. Pointing out that concepts such as original sin, incarnation, and salvation are open to a variety of interpretations, McMullin concludes that there is also widespread divergence among Christians on the correct response to the ETI challenge. On the matter of multiple incarnations he writes, “Their answer could range ... from ‘yes, certainly’ to ‘certainly not.’ My own preference would be a cautious ‘maybe.’”

Even for those Christians who dismiss the idea of multiple incarnations there is an interesting fallback position: perhaps the course of evolution has an element of directionality, with humanlike beings the inevitable end product. Even if *Homo sapiens* as such may not be the unique focus of God’s attention, the broader class of all humanlike beings in the universe might be. This is the basic idea espoused by the philosopher Michael Ruse, an ardent Darwinian and an agnostic sympathetic to Christianity. He sees the incremental progress of natural evolution as God’s chosen mode of creation, and the history of life as a ladder that leads inexorably from microbes to man.

Most biologist regard a “progressive evolution,” with human beings its implied preordained goal, as preposterous. Stephen Jay Gould once described the very notion as “noxious.” After all, the essence of Darwinism is that nature is blind. It cannot look ahead. Random chance is the driving force of evolution, and randomness by definition has no directionality. Gould insisted that if the evolutionary tape were replayed, the result would be very different from what we now observe. Probably life would never get beyond microbes next time around.

But some respected biologists disagree sharply with Gould on this point. Christian de Duve does not deny that the fine details of evolutionary history depend on happenstance, but he believes that the broad thrust of evolutionary change is somehow innately predetermined – that plants and animals were almost destined to emerge amid a general advance in complexity. Another Darwinian biologist, Simon Conway Morris, of Cambridge University, makes his own case for a “ladder of progress,” invoking the phenomenon of convergent evolution – the tendency of similar-looking organisms to evolve independently in similar ecological niches. For example, the Tasmanian tiger (now extinct) played the role of the big cat in Australia even though, as a marsupial, it was genetically far removed from placental mammals. Like Ruse, Conway Morris maintains that the “humanlike niche” is likely to be filled on other planets that have advanced life. He even goes so far as to argue that extraterrestrials would have a humanoid form. It is not a great leap from this conclusion to the belief that extraterrestrials would sin, have consciences, struggle with ethical questions, and fear death.

The theological difficulties posed by the possibility of advanced alien beings are less acute for Judaism and Islam. Muslims, at least, are prepared for ETI: the Koran states explicitly, “And among His Signs is the creation of the heavens and the earth, and the

living creatures that He has scattered through them.” Nevertheless, both religions stress the specialness of human beings – and, indeed, of specific, well-defined groups who have been received into the faith. Could an alien become a Jew or a Muslim? Does the concept even make sense? Among the major religious communities, Buddhists and Hindus would seem to be the least threatened by the prospect of advanced aliens, owing to their pluralistic concept of God and their traditionally much grander vision of the cosmos.

Among the world’s minority religions, some would positively welcome the discovery of intelligent aliens. The Raëlians, a Canada-based cult recently propelled to fame by its claim to have cloned a human being, believe that the cult’s leader, Raël, a French former journalist originally named Claude Vorilhon, received revelations from aliens who briefly transported him inside a flying saucer in 1973. Other fringe religious organizations with an extraterrestrial message include the ill-fated Heaven’s Gate cult and many UFO groups. Their adherents share a belief that aliens are located further up not only the evolutionary ladder but also the spiritual ladder, and can therefore help us draw closer to God and salvation. It is easy to dismiss such beliefs as insignificant to serious theological debate, but if evidence for alien beings were suddenly to appear, these cults might achieve overnight prominence while established religions floundered in doctrinal bewilderment.

Ironically, SETI is often accused of being a quasi-religious quest. But Jill Tarter, the director of the SETI Institute’s Center for SETI Research, in Mountain View, California, has no truck with religion and is contemptuous of the theological gymnastics with which religious scholars accommodate the possibility of extraterrestrials. “God is our own invention,” she has written. “If we’re going to survive or turn into a long-lived technological civilization, organized religion needs to be outgrown. If we get a message [from an alien civilization] and it’s secular in nature, I think that says that they have no organized religion – that they’ve outgrown it.” Tarter’s dismissal is rather naive, however. Though many religious movements have come and gone throughout history, some sort of spirituality seems to be part of human nature. Even atheistic scientists profess to experience what Albert Einstein called a “cosmic religious feeling” when contemplating the awesome majesty of the universe.

Would advanced alien beings share this spiritual dimension, even though they might long ago have “outgrown” established religion? Steven Dick, a science historian at the U.S. Naval Observatory, believes they would. Dick is an expert on the history of speculation about extraterrestrial life, and he suggests that mankind’s spirituality would be greatly expanded and enriched by contact with an alien civilization. However, he envisages that our present concept of God would probably require a wholesale transformation. Dick has outlined what he calls a new “cosmotheology,” in which human spirituality is placed in a full cosmological and astrobiological context. “As we learn more about our place in the universe,” he has written, “and as we physically move away

from our home planet, our cosmic consciousness will only increase.” Dick proposes abandoning the transcendent God of monotheistic religion in favor of what he calls a “natural God” – a superbeing located within the universe and within nature. “With due respect for present religious traditions whose history stretches back nearly four millennia,” he suggests, “the natural God of cosmic evolution and the biological universe, not the supernatural God of the ancient Near East, may be the God of the next millennium.”

Some form of natural God was also proposed by Fred Hoyle, in a provocative book titled *The Intelligent Universe*. Hoyle drew on his work in astronomy and quantum physics to sketch the notion of a “superintellect” – a being who had, as Hoyle liked to say, “monkeyed with physics,” adjusting the properties of the various fundamental particles and forces of nature so that carbon-based organisms could thrive and spread across the galaxy. Hoyle even suggested that this cosmic engineer might communicate with us by manipulating quantum processes in the brain. Most scientists shrug off Hoyle’s speculations, but his ideas do show how far beyond traditional religious doctrine some people feel they need to go when they contemplate the possibility of advanced life forms beyond Earth.

Though in some ways the prospect of discovering extraterrestrial life undermines established religions, it is not all bad news for them. Astrobiology has also led to a surprising resurgence of the so-called “design argument” for the existence of God. The original design argument, as articulated by William Paley in the eighteenth century, was that living organisms’ intricate adaptation to their environments pointed to the providential hand of a benign Creator. Darwin demolished the argument by showing how evolution driven by random mutation and natural selection could mimic design. Now a revamped design argument has emerged that fully embraces the Darwinian account of evolution and focuses instead on the origin of life. (I must stress that I am not referring here to what has recently become known as the Intelligent Design movement, which relies on an element of the miraculous.) If life is found to be widespread in the universe, the new design argument goes, then it must emerge rather easily from nonliving chemical mixtures, and thus the laws of nature must be cunningly contrived to unleash this remarkable and very special state of matter, which itself is a conduit to an even more remarkable and special state: mind. This sort of exquisite bio-friendliness would represent an extraordinary and unexpected bonus among nature’s inventory of principles – one that could be interpreted by those of a religious persuasion as evidence of God’s ingenuity and foresight. In this version of cosmic design, God acts not by direct intervention but by creating appropriate natural laws that guarantee the emergence of life and mind in cosmic abundance. The universe, in other words, is one in which there are no miracles except the miracle of nature itself.

The E.T. debate has only just begun, but a useful starting point is simply to acknowledge that the discovery of extraterrestrial life would not have to be theologically devastating. The revamped design argument offers a vision of nature distinctly inspiring to the spiritually inclined – certainly more so than that of a cosmos sterile everywhere but on a single planet. History is instructive in this regard. Four hundred years ago Giordano Bruno was burned at the stake by the Church in Rome for, among other things, espousing the notion of a plurality of inhabited worlds. To those whose theological outlook depended on a conception of Earth and its life forms as a singular miracle, the very notion of extraterrestrial life proved deeply threatening. But today the possibility of extraterrestrial life is anything but spiritually threatening. The more one accepts the formation of life as a natural process (that is, the more deeply embedded one believes it is in the overall cosmic scheme), the more ingenious and contrived (dare one say “designed”?) the universe appears to be.

Paul Davies is a professor of natural philosophy at the Australian Center for Astrobiology, at Macquarie University, in Sydney. He is the author of twenty-five books, including Are We Alone? (1995) and The Fifth Miracle: The Search for the Origin and Meaning of Life (1998). Davies won the 1995 Templeton Prize for Progress in Religion.