

Cover Story



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God vs. Science

We revere faith and scientific progress, hunger for miracles and for MRIs. But are the worldviews compatible? TIME convenes a debate

By [DAVID VAN BIEMA](#)

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There are two great debates under the broad heading of Science vs. God. The more familiar over the past few years is the narrower of the two: Can Darwinian evolution withstand the criticisms of Christians who believe that it contradicts the creation account in the Book of Genesis? In recent years, creationism took on new currency as the spiritual progenitor of "intelligent design" (I.D.), a scientifically worded attempt to show that blanks in the evolutionary narrative are more meaningful than its very convincing totality. I.D. lost some of its journalistic heat last December when a federal judge dismissed it as pseudoscience unsuitable for teaching in Pennsylvania schools.

But in fact creationism and I.D. are intimately related to a larger unresolved question, in which the aggressor's role is reversed: Can religion stand up to the progress of science? This debate long predates Darwin, but the antireligion position is being promoted with increasing insistence by scientists angered by intelligent design and excited, perhaps intoxicated, by their disciplines' increasing ability to map, quantify and change the nature of human experience. Brain imaging illustrates--in color!--the physical seat of the will and the passions, challenging the religious concept of a soul independent of glands and gristle. Brain chemists track imbalances that could account for the ecstatic states of visionary saints or, some suggest, of Jesus. Like Freudianism before it, the field of evolutionary psychology generates theories of altruism and even of religion that do not include God. Something called the multiverse hypothesis in cosmology speculates that ours may be but one in a cascade of universes, suddenly bettering the odds that life could have cropped up here accidentally, without divine intervention. (If the probabilities were 1 in a billion, and you've got 300 billion universes, why not?)

Roman Catholicism's Christoph Cardinal Schönborn has dubbed the most fervent of faith-challenging scientists followers of "scientism" or "evolutionism," since they hope science, beyond being a measure, can replace religion as a worldview and a touchstone. It is not an epithet that fits everyone wielding a test tube. But a growing proportion of the profession is experiencing what one major researcher calls "unprecedented outrage" at perceived insults to research and rationality, ranging from the alleged influence of the Christian right on Bush Administration science policy to the fanatic faith of the 9/11 terrorists to intelligent design's ongoing claims. Some are radicalized enough to publicly pick an ancient scab: the idea that science and religion, far from being complementary responses to the unknown, are at utter odds--or, as Yale psychologist Paul Bloom has written bluntly, "Religion and science will always clash." The market seems flooded with books by scientists describing a caged death match between science and God--with science winning, or at least chipping away at faith's underlying verities.

Finding a spokesman for this side of the question was not hard, since Richard Dawkins, perhaps its foremost polemicist, has just come out with *The God Delusion* (Houghton Mifflin), the rare volume whose position is so clear it forgoes a subtitle. The five-week New York Times best seller (now at No. 8) attacks faith philosophically and historically as well as scientifically, but leans heavily on Darwinian theory, which was Dawkins' expertise as a young scientist and more recently as an explicator of evolutionary psychology so lucid that he occupies the Charles Simonyi professorship for the public understanding of science at Oxford University.

Dawkins is riding the crest of an atheist literary wave. In 2004, *The End of Faith*, a multipronged indictment by neuroscience grad student Sam Harris, was published (over 400,000 copies in print). Harris has written a 96-page follow-up, *Letter to a Christian Nation*, which is now No. 14 on the Times list. Last February, Tufts University philosopher Daniel Dennett produced *Breaking the Spell: Religion as a Natural Phenomenon*, which has sold fewer copies but has helped usher the discussion into the public arena.

If Dennett and Harris are almost-scientists (Dennett runs a multidisciplinary scientific-philosophic program), the authors of half a dozen aggressively secular volumes are card carriers: In *Moral Minds*, Harvard biologist Marc Hauser explores the--nondivine--origins of our sense of right and wrong (September); in *Six Impossible Things Before Breakfast* (due in January) by self-described "atheist-reductionist-materialist" biologist Lewis Wolpert, religion is one of those impossible things; Victor Stenger, a physicist-astronomer, has a book coming out titled *God: The Failed Hypothesis*. Meanwhile, Ann Druyan, widow of archskeptical astrophysicist Carl Sagan, has edited Sagan's unpublished lectures on God and his absence into a book, *The Varieties of Scientific Experience*, out this month.

Dawkins and his army have a swarm of articulate theological opponents, of course. But the most ardent of these don't really care very much about science, and an argument in which one party stands immovable on Scripture and the other immobile on the periodic table doesn't get anyone very far. Most Americans occupy the middle ground: we want it all. We want to cheer on science's strides and still humble ourselves on the Sabbath. We want access to both MRIs and miracles. We want debates about issues like stem cells without conceding that the positions are so intrinsically inimical as to make discussion fruitless. And to balance formidable standard bearers like Dawkins, we seek those

who possess religious conviction but also scientific achievements to credibly argue the widespread hope that science and God are in harmony--that, indeed, science is of God.

Informed conciliators have recently become more vocal. Stanford University biologist Joan Roughgarden has just come out with *Evolution and Christian Faith*, which provides what she calls a "strong Christian defense" of evolutionary biology, illustrating the discipline's major concepts with biblical passages. Entomologist Edward O. Wilson, a famous skeptic of standard faith, has written *The Creation: An Appeal to Save Life on Earth*, urging believers and non-believers to unite over conservation. But foremost of those arguing for common ground is Francis Collins.

Collins' devotion to genetics is, if possible, greater than Dawkins'. Director of the National Human Genome Research Institute since 1993, he headed a multinational 2,400-scientist team that co-mapped the 3 billion biochemical letters of our genetic blueprint, a milestone that then President Bill Clinton honored in a 2000 White House ceremony, comparing the genome chart to Meriwether Lewis' map of his fateful continental exploration. Collins continues to lead his institute in studying the genome and mining it for medical breakthroughs.

He is also a forthright Christian who converted from atheism at age 27 and now finds time to advise young evangelical scientists on how to declare their faith in science's largely agnostic upper reaches. His summer best seller, *The Language of God: A Scientist Presents Evidence for Belief* (Free Press), laid out some of the arguments he brought to bear in the 90-minute debate TIME arranged between Dawkins and Collins in our offices at the Time & Life Building in New York City on Sept. 30. Some excerpts from their spirited exchange:

TIME: Professor Dawkins, if one truly understands science, is God then a delusion, as your book title suggests?

DAWKINS: The question of whether there exists a supernatural creator, a God, is one of the most important that we have to answer. I think that it is a scientific question. My answer is no.

TIME: Dr. Collins, you believe that science is compatible with Christian faith.

COLLINS: Yes. God's existence is either true or not. But calling it a scientific question implies that the tools of science can provide the answer. From my perspective, God cannot be completely contained within nature, and therefore God's existence is outside of science's ability to really weigh in.

TIME: Stephen Jay Gould, a Harvard paleontologist, famously argued that religion and science can coexist, because they occupy separate, airtight boxes. You both seem to disagree.

COLLINS: Gould sets up an artificial wall between the two worldviews that doesn't exist in my life. Because I do believe in God's creative power in having brought it all into being in the first place, I find that studying the natural world is an opportunity to observe the majesty, the elegance, the intricacy of God's creation.

DAWKINS: I think that Gould's separate compartments was a purely political ploy to win middle-of-the-road religious people to the science camp. But it's a very empty idea. There are plenty of places

where religion does not keep off the scientific turf. Any belief in miracles is flat contradictory not just to the facts of science but to the spirit of science.

TIME: Professor Dawkins, you think Darwin's theory of evolution does more than simply contradict the Genesis story.

DAWKINS: Yes. For centuries the most powerful argument for God's existence from the physical world was the so-called argument from design: Living things are so beautiful and elegant and so apparently purposeful, they could only have been made by an intelligent designer. But Darwin provided a simpler explanation. His way is a gradual, incremental improvement starting from very simple beginnings and working up step by tiny incremental step to more complexity, more elegance, more adaptive perfection. Each step is not too improbable for us to countenance, but when you add them up cumulatively over millions of years, you get these monsters of improbability, like the human brain and the rain forest. It should warn us against ever again assuming that because something is complicated, God must have done it.

COLLINS: I don't see that Professor Dawkins' basic account of evolution is incompatible with God's having designed it.

TIME: When would this have occurred?

COLLINS: By being outside of nature, God is also outside of space and time. Hence, at the moment of the creation of the universe, God could also have activated evolution, with full knowledge of how it would turn out, perhaps even including our having this conversation. The idea that he could both foresee the future and also give us spirit and free will to carry out our own desires becomes entirely acceptable.

DAWKINS: I think that's a tremendous cop-out. If God wanted to create life and create humans, it would be slightly odd that he should choose the extraordinarily roundabout way of waiting for 10 billion years before life got started and then waiting for another 4 billion years until you got human beings capable of worshipping and sinning and all the other things religious people are interested in.

COLLINS: Who are we to say that that was an odd way to do it? I don't think that it is God's purpose to make his intention absolutely obvious to us. If it suits him to be a deity that we must seek without being forced to, would it not have been sensible for him to use the mechanism of evolution without posting obvious road signs to reveal his role in creation?

TIME: Both your books suggest that if the universal constants, the six or more characteristics of our universe, had varied at all, it would have made life impossible. Dr. Collins, can you provide an example?

COLLINS: The gravitational constant, if it were off by one part in a hundred million million, then the expansion of the universe after the Big Bang would not have occurred in the fashion that was necessary for life to occur. When you look at that evidence, it is very difficult to adopt the view that this was just chance. But if you are willing to consider the possibility of a designer, this becomes a

rather plausible explanation for what is otherwise an exceedingly improbable event--namely, our existence.

DAWKINS: People who believe in God conclude there must have been a divine knob twiddler who twiddled the knobs of these half-dozen constants to get them exactly right. The problem is that this says, because something is vastly improbable, we need a God to explain it. But that God himself would be even more improbable. Physicists have come up with other explanations. One is to say that these six constants are not free to vary. Some unified theory will eventually show that they are as locked in as the circumference and the diameter of a circle. That reduces the odds of them all independently just happening to fit the bill. The other way is the multiverse way. That says that maybe the universe we are in is one of a very large number of universes. The vast majority will not contain life because they have the wrong gravitational constant or the wrong this constant or that constant. But as the number of universes climbs, the odds mount that a tiny minority of universes will have the right fine-tuning.

COLLINS: This is an interesting choice. Barring a theoretical resolution, which I think is unlikely, you either have to say there are zillions of parallel universes out there that we can't observe at present or you have to say there was a plan. I actually find the argument of the existence of a God who did the planning more compelling than the bubbling of all these multiverses. So Occam's razor--Occam says you should choose the explanation that is most simple and straightforward--leads me more to believe in God than in the multiverse, which seems quite a stretch of the imagination.

DAWKINS: I accept that there may be things far grander and more incomprehensible than we can possibly imagine. What I can't understand is why you invoke improbability and yet you will not admit that you're shooting yourself in the foot by postulating something just as improbable, magicking into existence the word God.

COLLINS: My God is not improbable to me. He has no need of a creation story for himself or to be fine-tuned by something else. God is the answer to all of those "How must it have come to be" questions.

DAWKINS: I think that's the mother and father of all cop-outs. It's an honest scientific quest to discover where this apparent improbability comes from. Now Dr. Collins says, "Well, God did it. And God needs no explanation because God is outside all this." Well, what an incredible evasion of the responsibility to explain. Scientists don't do that. Scientists say, "We're working on it. We're struggling to understand."

COLLINS: Certainly science should continue to see whether we can find evidence for multiverses that might explain why our own universe seems to be so finely tuned. But I do object to the assumption that anything that might be outside of nature is ruled out of the conversation. That's an impoverished view of the kinds of questions we humans can ask, such as "Why am I here?", "What happens after we die?", "Is there a God?" If you refuse to acknowledge their appropriateness, you end up with a zero probability of God after examining the natural world because it doesn't convince you on a proof basis. But if your mind is open about whether God might exist, you can point to aspects of the universe that are consistent with that conclusion.

DAWKINS: To me, the right approach is to say we are profoundly ignorant of these matters. We need to work on them. But to suddenly say the answer is God--it's that that seems to me to close off the discussion.

TIME: Could the answer be God?

DAWKINS: There could be something incredibly grand and incomprehensible and beyond our present understanding.

COLLINS: That's God.

DAWKINS: Yes. But it could be any of a billion Gods. It could be God of the Martians or of the inhabitants of Alpha Centauri. The chance of its being a particular God, Yahweh, the God of Jesus, is vanishingly small--at the least, the onus is on you to demonstrate why you think that's the case.

TIME: The Book of Genesis has led many conservative Protestants to oppose evolution and some to insist that the earth is only 6,000 years old.

COLLINS: There are sincere believers who interpret Genesis 1 and 2 in a very literal way that is inconsistent, frankly, with our knowledge of the universe's age or of how living organisms are related to each other. St. Augustine wrote that basically it is not possible to understand what was being described in Genesis. It was not intended as a science textbook. It was intended as a description of who God was, who we are and what our relationship is supposed to be with God. Augustine explicitly warns against a very narrow perspective that will put our faith at risk of looking ridiculous. If you step back from that one narrow interpretation, what the Bible describes is very consistent with the Big Bang.

DAWKINS: Physicists are working on the Big Bang, and one day they may or may not solve it. However, what Dr. Collins has just been--may I call you Francis?

COLLINS: Oh, please, Richard, do so.

DAWKINS: What Francis was just saying about Genesis was, of course, a little private quarrel between him and his Fundamentalist colleagues ...

COLLINS: It's not so private. It's rather public. [Laughs.]

DAWKINS: ... It would be unseemly for me to enter in except to suggest that he'd save himself an awful lot of trouble if he just simply ceased to give them the time of day. Why bother with these clowns?

COLLINS: Richard, I think we don't do a service to dialogue between science and faith to characterize sincere people by calling them names. That inspires an even more dug-in position. Atheists sometimes come across as a bit arrogant in this regard, and characterizing faith as something only an idiot would attach themselves to is not likely to help your case.

TIME: Dr. Collins, the Resurrection is an essential argument of Christian faith, but doesn't it, along with the virgin birth and lesser miracles, fatally undermine the scientific method, which depends on the constancy of natural laws?

COLLINS: If you're willing to answer yes to a God outside of nature, then there's nothing inconsistent with God on rare occasions choosing to invade the natural world in a way that appears miraculous. If God made the natural laws, why could he not violate them when it was a particularly significant moment for him to do so? And if you accept the idea that Christ was also divine, which I do, then his Resurrection is not in itself a great logical leap.

TIME: Doesn't the very notion of miracles throw off science?

COLLINS: Not at all. If you are in the camp I am, one place where science and faith could touch each other is in the investigation of supposedly miraculous events.

DAWKINS: If ever there was a slamming of the door in the face of constructive investigation, it is the word miracle. To a medieval peasant, a radio would have seemed like a miracle. All kinds of things may happen which we by the lights of today's science would classify as a miracle just as medieval science might a Boeing 747. Francis keeps saying things like "From the perspective of a believer." Once you buy into the position of faith, then suddenly you find yourself losing all of your natural skepticism and your scientific--really scientific--credibility. I'm sorry to be so blunt.

COLLINS: Richard, I actually agree with the first part of what you said. But I would challenge the statement that my scientific instincts are any less rigorous than yours. The difference is that my presumption of the possibility of God and therefore the supernatural is not zero, and yours is.

TIME: Dr. Collins, you have described humanity's moral sense not only as a gift from God but as a signpost that he exists.

COLLINS: There is a whole field of inquiry that has come up in the last 30 or 40 years--some call it sociobiology or evolutionary psychology--relating to where we get our moral sense and why we value the idea of altruism, and locating both answers in behavioral adaptations for the preservation of our genes. But if you believe, and Richard has been articulate in this, that natural selection operates on the individual, not on a group, then why would the individual risk his own DNA doing something selfless to help somebody in a way that might diminish his chance of reproducing? Granted, we may try to help our own family members because they share our DNA. Or help someone else in expectation that they will help us later. But when you look at what we admire as the most generous manifestations of altruism, they are not based on kin selection or reciprocity. An extreme example might be Oskar Schindler risking his life to save more than a thousand Jews from the gas chambers. That's the opposite of saving his genes. We see less dramatic versions every day. Many of us think these qualities may come from God--especially since justice and morality are two of the attributes we most readily identify with God.

DAWKINS: Can I begin with an analogy? Most people understand that sexual lust has to do with propagating genes. Copulation in nature tends to lead to reproduction and so to more genetic copies.

But in modern society, most copulations involve contraception, designed precisely to avoid reproduction. Altruism probably has origins like those of lust. In our prehistoric past, we would have lived in extended families, surrounded by kin whose interests we might have wanted to promote because they shared our genes. Now we live in big cities. We are not among kin nor people who will ever reciprocate our good deeds. It doesn't matter. Just as people engaged in sex with contraception are not aware of being motivated by a drive to have babies, it doesn't cross our mind that the reason for do-gooding is based in the fact that our primitive ancestors lived in small groups. But that seems to me to be a highly plausible account for where the desire for morality, the desire for goodness, comes from.

COLLINS: For you to argue that our noblest acts are a misfiring of Darwinian behavior does not do justice to the sense we all have about the absolutes that are involved here of good and evil. Evolution may explain some features of the moral law, but it can't explain why it should have any real significance. If it is solely an evolutionary convenience, there is really no such thing as good or evil. But for me, it is much more than that. The moral law is a reason to think of God as plausible--not just a God who sets the universe in motion but a God who cares about human beings, because we seem uniquely amongst creatures on the planet to have this far-developed sense of morality. What you've said implies that outside of the human mind, tuned by evolutionary processes, good and evil have no meaning. Do you agree with that?

DAWKINS: Even the question you're asking has no meaning to me. Good and evil--I don't believe that there is hanging out there, anywhere, something called good and something called evil. I think that there are good things that happen and bad things that happen.

COLLINS: I think that is a fundamental difference between us. I'm glad we identified it.

TIME: Dr. Collins, I know you favor the opening of new stem-cell lines for experimentation. But doesn't the fact that faith has caused some people to rule this out risk creating a perception that religion is preventing science from saving lives?

COLLINS: Let me first say as a disclaimer that I speak as a private citizen and not as a representative of the Executive Branch of the United States government. The impression that people of faith are uniformly opposed to stem-cell research is not documented by surveys. In fact, many people of strong religious conviction think this can be a morally supportable approach.

TIME: But to the extent that a person argues on the basis of faith or Scripture rather than reason, how can scientists respond?

COLLINS: Faith is not the opposite of reason. Faith rests squarely upon reason, but with the added component of revelation. So such discussions between scientists and believers happen quite readily. But neither scientists nor believers always embody the principles precisely. Scientists can have their judgment clouded by their professional aspirations. And the pure truth of faith, which you can think of as this clear spiritual water, is poured into rusty vessels called human beings, and so sometimes the benevolent principles of faith can get distorted as positions are hardened.

DAWKINS: For me, moral questions such as stem-cell research turn upon whether suffering is caused. In this case, clearly none is. The embryos have no nervous system. But that's not an issue discussed publicly. The issue is, Are they human? If you are an absolutist moralist, you say, "These cells are human, and therefore they deserve some kind of special moral treatment." Absolutist morality doesn't have to come from religion but usually does.

We slaughter nonhuman animals in factory farms, and they do have nervous systems and do suffer. People of faith are not very interested in their suffering.

COLLINS: Do humans have a different moral significance than cows in general?

DAWKINS: Humans have more moral responsibility perhaps, because they are capable of reasoning.

TIME: Do the two of you have any concluding thoughts?

COLLINS: I just would like to say that over more than a quarter-century as a scientist and a believer, I find absolutely nothing in conflict between agreeing with Richard in practically all of his conclusions about the natural world, and also saying that I am still able to accept and embrace the possibility that there are answers that science isn't able to provide about the natural world--the questions about why instead of the questions about how. I'm interested in the whys. I find many of those answers in the spiritual realm. That in no way compromises my ability to think rigorously as a scientist.

DAWKINS: My mind is not closed, as you have occasionally suggested, Francis. My mind is open to the most wonderful range of future possibilities, which I cannot even dream about, nor can you, nor can anybody else. What I am skeptical about is the idea that whatever wonderful revelation does come in the science of the future, it will turn out to be one of the particular historical religions that people happen to have dreamed up. When we started out and we were talking about the origins of the universe and the physical constants, I provided what I thought were cogent arguments against a supernatural intelligent designer. But it does seem to me to be a worthy idea. Refutable--but nevertheless grand and big enough to be worthy of respect. I don't see the Olympian gods or Jesus coming down and dying on the Cross as worthy of that grandeur. They strike me as parochial. If there is a God, it's going to be a whole lot bigger and a whole lot more incomprehensible than anything that any theologian of any religion has ever proposed.

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