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New Views on Religion and Science

MARC MANGEL

In 1955, the theologian Abraham Joshua Heschel wrote,

> It is customary to blame secular science and anti-religious philosophy for the eclipse of religion in modern society. It would be more honest to blame religion for its own defeats. Religion declined not because it was refuted, but because it became irrelevant, dull, oppressive, insipid. When faith is completely replaced by creed, worship by discipline, love by habit; when the crisis of today is ignored because of the splendor of the past; when faith becomes an heirloom rather than a living fountain; when religion speaks only in the name of authority rather than with a voice of compassion—its message becomes meaningless.
>
> *Religion is an answer to man's ultimate questions.* The moment we become oblivious to ultimate questions, religion becomes irrelevant, and its crisis sets in. The primary task of philosophy of religion is to rediscover the questions to which religion is an answer.
>
> There are dead thoughts and there are living thoughts.... (Heschel 1955, p. 3)

Note that the italics are in the original, and that Heschel claims religion is "an" answer and not "the" answer. We should be interested in the dialogue between religion and science because we too are interested in answers to ultimate questions, because so many people erroneously consider that belief in God must mean hostility to science, and because we can make religion an ally in biological conservation. Three recent books address these concerns, each written by a distinguished scientist and intended for a lay reader. Francis S. Collins, at the National Institutes of Health, is a molecular geneticist who took over the human genome project after James Watson stepped down over a conflict concerning patenting of the genome. Joan Roughgarden, on the faculty at Stanford, has made important contributions to both marine and terrestrial evolutionary ecology. Edward O. Wilson, at Harvard, is famous for his work on sociobiology, ants, and conservation. Rougharden's book is the tightest of the three, aimed for a long airplane trip or for a few evenings in the easy chair; those of Collins and Wilson are longer and more rambling.

The cover flap of Wilson's *The Creation: An Appeal to Save Life on Earth* (2006) promises that the book "demonstrates that science and religion need not be warring antagonists." Actually, this is not the case; Wilson seeks a commonality of action against a common enemy—destruction of the environment—but he has no time for belief. The book is written as an overly long letter to the hypothetical pastor of a Baptist church, but writing the occasional "Dear Pastor" or "In my opinion, Pastor" at the start of a chapter does not make this a book about science and religion, especially when the author is clearly on one side of the war between the two.

Collins and Roughgarden set themselves a much tougher task—to show an intellectual consonance between modern biology and religious belief. In this, they agree with the Dalai Lama that "spirituality and science are different but complementary investigative approaches with the same greater goal, of seeking the truth" (Dalai Lama 2005, p. 4). Collins, in fact, argues in his book *The Language of God: A Scientist Presents Evidence for Belief* (2006) that belief in God is an entirely rational choice. More important, both he and Roughgarden argue that the evidence for potential harmony between science and religion (two kinds of answers to our ultimate questions) is too often overshadowed by the screaming of those who have extreme positions.

Wilson was raised in the Baptist Church, which he left in his youth, never to return. To Wilson, science completely replaced religion. His book has much autobiographical material. About 10 years ago, Roughgarden returned to the Episcopal Church of her youth after a personal crisis. In her book *Evolution and Christian Faith: Reflections of an Evolutionary Biologist* (2006), Roughgarden is very brief about her personal history and her return to faith. Collins, on the other hand, is detailed about his personal history (we learn of his youth; of the rape of his daughter; that he rides motorcycles, plays the guitar, and writes songs; and that in 1989 he traveled to Nigeria in the summer to volunteer in a small mission hospital). He was raised without any religious belief, gained it in his mid-20s, and is now an evangelical Christian.

Roughgarden and Wilson were biologists from an early age, but Collins was not. After working toward a PhD in physical chemistry, Collins discovered biochemistry and then enrolled in medical school. There he found ways to combine a love of mathematics and a love of medicine (a good combination indeed!). Also there, he began a systematic study of the rational basis of faith, confident that he

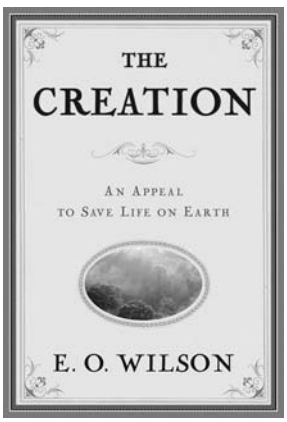
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would find something that "would deny the merits of belief, and reaffirm my atheism." Collins set on the religious course after discovering C. S. Lewis's *Mere Christianity* and in particular "the Moral Law," or the law of right behavior and extreme altruism (*agape*). To Collins, this has no evolutionary explanation and is beyond reductionist understanding.

Wilson assumes that his pastor reads the Bible literally, and he does not water down the differences between the putative pastor's literal reading and his own rejection of the Bible in favor of science. But, as he notes, whichever creation story one chooses to believe (and he takes many opportunities to slam the Bible), humans are latecomers in the history of life. Collins and Roughgarden read the Bible as scientists and are confronted with the problem of many believers, that what we know about the world from scientific studies contradicts the statements of sacred texts. They do not want to simply dismiss biblical literalists, but they recognize that there is a problem of "deciding where to put the reins on skepticism" (Roughgarden 2006) and of starting "the believer down a slippery slope" (Collins 2006). They both emphasize looking at actual Biblical passages and trying to understand the meaning that comes through in any translation.

For modern science, the most controversial parts of the Bible are the first two chapters of Genesis. Those chapters are written in Hebrew without vowels and without punctuation. For this reason, interpretation is crucial, and in the Jewish tradition it is understood that different levels of meaning can be inferred from the text: (a) the simple, literal meaning; (b) the allegorical meaning hinted at above or below the surface; (c) the moral or homiletic meaning; and (d) the secret or Kabbalistic meaning (reserved for bona fide mystics). In the Christian system of interpretation, the four levels are the literal, allegorical, moral, and eschatological (dealing with death and resurrection). To assert both that a book is timeless and that it must be read literally is sophomoric. If a book is timeless—whether it is the Bible or *Shantaram* (Roberts 2003), in which we read that good is any action that increases complexity in the universe—it cannot be literally true. Rather, there must be truth in it, and it is our responsibility to discover the truth in the context of our own situation. Both Roughgarden and Collins note that Jesus was refining traditional (in his time) interpretations of the Jewish Bible in his teaching. The theologian Arthur Green (1992) argued that the Bible and modern molecular biology are two ways through which we may understand creation (and there may be more to come). Collins notes, "The claims that heliocentricity [at the time of Galileo] contradicted the Bible are now seen to have been overstated, and the insistence on a literal interpretation of those particular scripture verses seems wholly unwarranted" (p. 156). Looking back 400 years, will we say the same thing about



the creationism of the 20th and 21st centuries?

It is our responsibility to explain science, and evolutionary biology in particular, to the lay public. Wilson's approach is to lay out the two fundamental laws of biology that (1) all known properties of life are obedient to the laws of physics and chemistry, and (2) all biological processes, and all the differences that distinguish species, have evolved by natural selection (without explaining what that is). He gives a list of the great goals of present-day biology. These are to create life; reconstruct the origin of life; use molecular biology to cure disease and injury; simulate the mind; complete the mapping of Earth's fauna and flora; use information about biodiversity to advance medicine, agriculture, and public health; create a Tree of Life for all species; understand how stable communities are assembled and regulated; and bridge or unify the natural and social sciences and the humanities.

Collins decides to begin with modern physics and cosmology. Here his treatment is superficial; he is no Richard Feynman. Much of his argument is about the statistical improbability of the universe and the physical constants associated with current theories of the origin of the universe. He tries a too-short explanation of Bayesian statistics (but not mentioning that Bayes—a minister—developed his ideas as an attempt to prove the existence of God). My estimate is that well over 99 percent of readers will not be able to follow the arguments (I hope that I am wrong but fear otherwise). Collins's point is that if one gives a nonzero prior probability that a miracle can occur, "there is no logical reason why that force [God, outside of nature] could not on rare occasions stage an invasion."

It takes Collins 85 pages to get to biology, 96 to get to Darwin, and about 100 to get to molecular biology and molecular genetics. The latter material is well written, but the former is better served elsewhere. Collins's argument in this first half of the book is that the complexity of life is indeed reason for awe, which is the beginning of all religion (Green 1992), but that it appears that life is incredibly improbable and wonderfully designed—leaving the question of whether one can find a harmonious synthesis of science and belief.

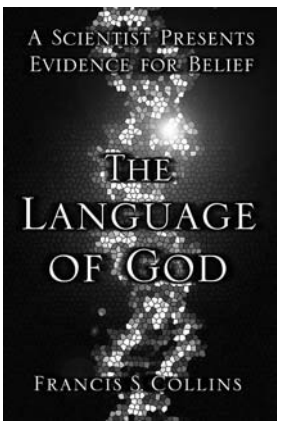
Roughgarden gives the best explanation of evolution. The bottom line of modern evolutionary biology is that (a) all species are related in a great tree of life and (b) species change. She argues that we should separate "natural selection" into survival and natural breeding, and that from the perspective of successful reproduction, the breeding has to come before offspring survival. This has ramifications for how we think about competition and cooperation. She suggests that we delete "survival of the fittest" from the lexicon (something with which Darwin would agree; Desmond and Moore 1991) and concludes, "Not teaching that all life is related in one gigantic

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family tree is like not teaching that the Earth revolves around the sun" (Roughgarden 2006, p. 13). She also emphasizes that a diverse community as one organic body, with each component unique but required for the whole, is a clear component of the Gospels. Roughgarden (2006) offers a to-do list for theoreticians in evolutionary biology; she sees the big problems that remain to be solved as the characterization of breeding and the definition of the individual.

How, then, does one think about the role of God in evolution? Wilson's answer is the simplest and most direct: There is no God—don't bother. Roughgarden allows that God's role may be hands-off (setting up the rules and letting things run) or hands-on (controlling mutations). She notes, "Does my faith in God and in Jesus's teachings have anything to do with miracles? No. Jesus's teachings about generosity, kindness, love and inclusion of all don't depend one whit on miracles." Collins offers "BioLogos," theistic evolution based on the following principles: (a) The universe came into being out of nothingness about 14 billion years ago; (b) despite massive improbabilities, the properties of the universe are precisely tuned for life; (c) the precise mechanism of the origin of life on Earth remains unknown, but once life arose, the processes of evolution by natural selection permitted the development of biological diversity and complexity over very long periods of time (and the same mechanism applies to all organisms); (d) once evolution started, no special supernatural intervention was required; and (e) humans are part of the tree of life shared by all organisms; but (f) humans are also unique in ways that defy evolutionary explanation and point to our spiritual nature. This includes the existence of the moral law and the search for God that characterizes all human cultures throughout history.

These approaches allow for free will and a God who intervenes occasionally or not at all. Neither of them provides an answer to theodicy, which is surely the greatest challenge to any monotheistic religion. Perhaps the best answers to theodicy come from Heschel, who emphasized that the question about the Holocaust is not, where was God? but, where was man? (Heschel 1997), and from the Lubavitcher Rebbe who once told a survivor, "There are no words to console you. But you cannot allow the Holocaust to continue in your life. We are day workers and our task is to shed light. We need not expend our energies in battling darkness. We need only create day and night will fade away" (Jacobson 2002, p. 133). Neither as a firm believer nor as an atheist (or anything in between) will we ever be able to make sense of evil and



suffering in the world, but we must learn to move beyond it.

Neither Roughgarden nor Collins points out that the very first commandment to all of life (Genesis 1:22), repeated specifically to humans (Genesis 1:28), is "Be fruitful and multiply," which is surely consistent with our understanding of the evolutionary imperative. Rashi (Rabbi Shlomo Yitzhaki, 1040–1105), the greatest of all biblical commentators, interprets "Be fruitful" to mean that individuals should replace themselves and "multiply" to mean that population should grow, but presumably not without bound and not to the detriment of all other organisms.

Wilson, Collins, and Roughgarden agree that intelligent design—the idea that evolution occurs but organisms are so complex that evolution must be guided by a supernatural force—is not science. Wilson notes that the evidence for intelligent design is the default argument: Since we cannot *now* explain how something complex (the eye, the human blood-clotting system, or the bacterial flagellum) has happened, it must have a designer. Roughgarden says that "no conceivable data could ever prove the existence of God." She lays out a challenge for intelligent design "scientists": Publish an objective procedure to screen for complexity so that the five best-case candidates for irreducibly complex traits can be defined for analysis; explicitly state and present the direct evidence for specific hypotheses about when traits appeared and in what form; demonstrate that natural breeding acting on random mutations does not account for the best-case complexity candidates; and, finally, show how no modification of existing evolutionary theory can fix the problem. Roughgarden also points out that "saying that God is 'intelligent' invites the sin of idolatry.... Intelligent design says the facts of nature offer a better testimonial to God than the Bible does. It will substitute science for the Gospels" (p. 99).

Collins confronts creationism and young-Earth creationists, concluding that "Young Earth Creationism does even more damage to faith, by demanding that belief in God requires assent to fundamentally flawed claims about the natural world" (p. 177), and then turns to intelligent design. He deals with Paley's watchmaker analogy and points out that because two objects share one characteristic (such as the complexity of life and of a watch, or the electric current in our homes and in lightning) does not mean that they share all (must come from a creator, must come from the power company). Collins is clear that intelligent design fails in a fundamental way as a scientific theory because there is no way to test it. He also points out that many of the examples of "irreducible complexity" are not irreducible after all.

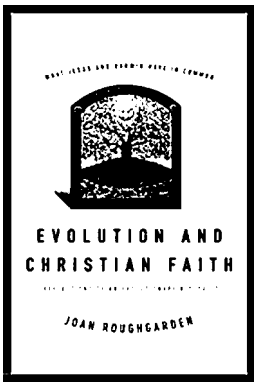
At the pole opposite to intelligent design sits Richard Dawkins, who has made a career out of eloquently stating extreme versions of otherwise reasonable positions and who now surely generates more heat than light. It is important for us in North America to recognize that, among other things, what Darwin did was to demolish the justification for the British class system. With the absence of a supernatural force guiding the structure of society, there was little reason to believe that one was ordained to life in the lower classes, for example. And today in Britain

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it is still very much true that the class system persists and the genotype is more important than the phenotype. Thus, the extreme positions taken by Dawkins may be part of a larger set of social goals. Even so, to assert that the acceptance of evolution in biology requires an acceptance of atheism in theology ("a remarkable marketing ploy," according to Collins) borders on scientism: "the belief that science knows or will soon know all the answers, and it has about it the corrupting smugness of any system of opinions which contains its own antidote to disbelief" (Medawar 1982, p. 60).

Collins notes that Dawkins also appears to subscribe to the moral law but is unable to explain its origin (although Baschetti [2007], Hauser [2006], and Dawkins himself [2006] would claim otherwise). More important, science can neither prove nor disprove the existence of God. Roughgarden is even stronger in her statement: "If one group (selfish-gene advocates) asserts that facts from science refute the existence of God, then another group (intelligent design advocates) is free to conclude the opposite with as much validity. Selfish-gene advocates can't have it both ways—they can't assert that science disproves the existence of God and then turn around and say that anyone with the opposite position isn't doing science. Inasmuch as most scientists think the existence of God can't be proved with data, the nonexistence of God can't either" (p. 132). She concludes that "selfish-gene philosophy distorts evolutionary biology, and the wrathful God theology distorts Christian teaching" (Roughgarden 2006).

Both Collins and Roughgarden believe that if scientists work to identify and avoid polarizing positions, we will be able to raise the level of dialogue between science and religion. One of these polarizing positions, according to Roughgarden, is the secular philosophy that glorifies competition (and is also found in ecology, where there is perhaps an overemphasis on competition relative to predation and mutualism in shaping ecological communities). Neither Collins nor Roughgarden points out that even if one asserts that religion is simply an evolved response to control the behavior



of nonrelated individuals, many smart people have spent a long time thinking about how we can improve our behavior, and we should learn from them.

The success of the advocates of intelligent design is also indicative of the failure of science education. Wilson spends the last 40 pages, about 25 percent of the book, on how to teach biology. This is the best part of the book, and the reason is simple: passion. Wilson's principles for teaching biology are to teach from the top down (from the general to the specific); to reach outside of biology for the reality of interdisciplinary studies; to focus on problem solving and teaching students to dare to think on their own; and to encourage students to commit to a part of biology as soon as possible. As Roughgarden writes, "Science is not just an accumulation of facts, it's *how* to discover facts and how to explain them. We must teach that science depends on stating testable hypotheses, then actually doing the test, and then standing aside while tests are confirmed or refuted by other, independent parties. That process produces facts and explanations, not opinions" (Roughgarden 2006, pp. 100–101). All three authors emphasize the importance of mathematics and quantitative methods in helping biology to advance—I like that. Wilson notes that fear of mathematics is the curse of *Homo sapiens* in training, but that "math phobes are wrong!"

Wilson is puzzled that so many religious leaders have hesitated to make protection of the creation (i.e., the biosphere) part of their work. And he is right in this, which more probably has to do with the suite of beliefs held by those who want to protect the environment than with environmental protection itself. He fears most "the pervasive combination of religious and secular ideology of a kind that sees little or no harm in the destruction of the Creation." Because of his hostility to religion, Wilson must argue his points for conservation on grounds that are either utilitarian ("Humanity must make a decision, and make it right now: conserve Earth's natural heritage, or let future generations adjust to a biologically impoverished world" [p. 91]) or aesthetic ("Each species merits careers of scientific study and celebration by historians and poets.... That, in a nutshell, Pastor, is the compelling moral argument from science for saving the Creation" [p. 123]), arguing, for example, that rare animals (wolves, pandas, giant squid) are the jewels in the crown of the creation who proclaim the mystery of the world. (He is, however, happy to drive *Anopheles gambiae* extinct, but would keep their DNA.) Roughgarden notes that Noah was instructed to save all of the species, not just the ones that have value for mankind. This is a strong theme in the Western tradition: "Nothing that the Lord created in the world was superfluous or in vain; hence, all must be sustained" (Lamm 1986, p. 168).

By polarizing the discussions between science and religion, scientists have lost valuable allies in conservation. Indeed, the more literally one reads the Bible, the more one must support conservation, because "every single thing in our physical world—animal, mineral, and vegetable—has also been charged with divine energy and purpose, and must be treated according. The environment is sacred and no man has a right to destroy it" (Jacobson 2002, p. 158). It is very easy for a believer to come to the conclusion that every species is intrinsically valuable, being part of God's creation. Wilson's hypothetical pastor, being a literalist, has a much easier job of justifying the protection of the creation than Wilson himself does. If humans are simply another evolved species, then it is hard to explain why we should have a special duty to save the creation.

In a recent review of Dawkins's new book (Dawkins 2006), David Baltimore (2007) bemoaned the current situation in

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which scientific evidence is ignored, logic is tossed aside, and minority opinions are not tolerated when faith is involved. To some extent, we helped ourselves get into this situation (Ludwig et al. 2001). Our separation of "basic" and "applied" science (and, too often, our denigration of the latter), lack of interest in science education (which means the public cannot make informed choices), polarization of the dialogue between science and religion (causing us to lose valuable allies), and crossing of the line between environmental science and environmentalism (in our passion for conservationist outcomes; Hilborn 2006) has come fully around to haunt us, so that in policy discussions science is now just another opinion of stakeholders.

In summary, Wilson has written a nice book, but one that does little to advance the dialogue between science and religion. In *The Creation,* he offers the pastor a sermon—"Save the Creation, save all of it!" (pp. 89–90)—that would probably have more effect in the *New York Times* than buried in this book.

Collins has done a better job of advancing the dialogue between science and religion. His book is a bit rambling and filled with long quotations that detract from the main message, which is how believing Christians can understand evolution and molecular biology. He shows that science is not the only way of knowing (nor is religion, as Heschel noted) and provides strong arguments for avoiding scientism. He closes *The Language of God* with a nearly 40-page appendix on bioethics, which he claims rests on the foundation of the moral law: (a) respect for autonomy (individuals should be given freedom in personal decisionmaking); (b) justice (the fair, moral, and impartial treatment of all people); (c) beneficence (the mandate to treat others in their own best interest); and (d) nonmaleficence ("First, do no harm"; Collins 2006, p. 244). In this context, he discusses breast cancer, stem cells and cloning, when human life begins, and genetic enhancement.

Roughgarden has done the best job of advancing the dialogue. Her book is trim and tight. The weakest part is that on gender and sexuality, in which she argues that Darwin was absolutely wrong and that an entirely new theory is needed. Here she ignores a long history of criticism of the theory of sexual selection, beginning at least with Julian Huxley. Because in sexual reproduction parents are from the start "engaged in a joint venture, to raise offspring as a common investment holding genes from both parents," Roughgarden believes that scientists have generally got the order of cooperation and conflict in male–female relations backward and need to fix our understanding of sexual reproduction. Her attempt to reexamine the Bible on homosexuality—for example, arguing that prohibitions in Leviticus are only about what positions a man may assume with another man, and asserting that the Bible is "silent on homosexuality"—is a big stretch. Even with these weaknesses, however, *Evolution and Christian Faith* is a fine volume.

For those who believe, as Collins does, that "it is time to call a truce in the escalating war between science and spirit," the books of Collins and Roughgarden suggest that the future is bright, and that we will continue to see the development and deepening of these differing but complementary ways of answering our ultimate questions.

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