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What Scientists Believe

Peter Lopatin

The notion that science and religion are at war is one of the great dogmas of the present age. For journalists, it is a prism through which to understand everything from the perennial kerfuffles over teaching evolution to the ethics of destroying human embryos for research. To many scientists, religious belief seems little more than a congeries of long-discredited pre-modern superstitions. For many religious believers, modern science threatens a deeply held faith that man is more than a mere organism and that our status as free beings bound by natural law implies the existence of a transcendent deity.

But this is not the whole story. Every year, countless new books try to reconcile the claims of truths revealed by divine inspiration and those that are the product of earthly reason. Foundational developments and arcane speculations from theoretical physics—from the latest findings of quantum mechanics to the search for a "Theory of Everything"—take on a metaphysical import in the popular mind. One of the best known examples involves the cosmologist Stephen Hawking, who famously concluded his 1988 bestseller *A Brief History of Time* with the suggestion that our search for scientific meaning may someday allow us to "know the mind of God." More recently, Hawking has backed away from this statement. His new book, *The Grand Design*, which posits that the universe may have created itself out of quantum fluctuations, is but the latest in a long line of volumes by prominent physicists and cosmologists translating scientific theory for a popular audience. Along with volumes by biologists with a flair for explaining complex concepts, these books have become a locus of debate about the place of God and man in our understanding of the universe.

Science vs. Religion: What Scientists Really Think
By Elaine Howard Ecklund
Oxford ~ 2010 ~ 240 pp.
$27.95 (cloth)

The Faith of Scientists: In Their Own Words
By Nancy K. Frankenberry
Princeton ~ 2008 ~ 542 pp.
$29.95 (paper)

One writer who has brought ambassadorial finesse to this contentious subject is John Polkinghorne. Since leaving his Cambridge physics professorship in 1979 to become an Anglican priest, he has written some two dozen books about science and religion. In one such book, *Science*

and Theology (1998), Polkinghorne proposes a taxonomy (based on the work of scholar Ian G. Barbour) of the various ways science and religion can relate. The most familiar is the stance of *conflict*, in which science and religion are irreconcilably opposed, each challenging the other's legitimacy. Sometimes, however, science and religion can be considered *independent*, two distinct realms of inquiry. Sometimes they are considered to be in *dialogue* (or are *consonant*), overlapping but not necessarily conflicting, especially as regards the deepest of mysteries, such as creation and consciousness. And sometimes the two are *integrated* (or one *assimilates* the other), and they are unified into a common quest for understanding the universe and our place in it.

This taxonomy is worth keeping in mind while considering two recent books, each of which takes up the subject from the perspective of scientists. The first is a nuanced portrait of the religious beliefs of scientists working in the United States today; the second is a collection of writings from scientific luminaries, both historical and contemporary, laying out their thoughts on religion. Taken together, these books proffer an answer to the following question: Just what do scientists—including the most influential scientists—actually believe concerning religion?

In *Science vs. Religion: What Scientists Really Think*, Rice University sociologist Elaine Howard Ecklund comes at this question by means of a statistical survey. Between 2005 and 2008, Ecklund and her associates randomly selected researchers from across seven natural and social science disciplines at twenty-one elite U.S. research universities. Of the 2,200 faculty members to whom Ecklund sent questionnaires, 1,646 responded. The respondents answered detailed questions about their religious beliefs and their views of the relationship between religion and science. Ecklund and her associates then conducted in-depth interviews with 275 of the surveyed scientists, again selected at random. In these interviews, the scientists were asked to address their understandings of "religion" and "spirituality" and to comment on the extent to which their religious beliefs—if any—influenced their specific discipline or their particular research. (Both the questionnaire and the interview guide are included as appendices to the book.)

In broad statistical terms, Ecklund's results are unsurprising: Scientists tend as a group to be less religious (however that term might be construed) than the general population. About 64 percent of the respondents described themselves as atheists or agnostics, as against only about 6 percent of the general public. "Looked at the other way around," Ecklund writes, "only about 9 percent of scientists say they have no doubt that God exists, compared to

well over 60 percent of the general public." As far as religious practice is concerned, "about 18 percent of scientists attend religious services at least once a month or more, compared to about 46 percent of those in the general population."

However, the views of many scientists turn out to be less rigidly doctrinaire and hostile to religious belief than the raw statistics might suggest:

> After four years of research, at least one thing became clear: Much of what we believe about the faith lives of elite scientists is wrong. The "insurmountable hostility" between science and religion is a caricature, a thought-cliché, perhaps useful as a satire on groupthink, but hardly representative of reality.

Ecklund's study serves as a corrective to that caricature. In the first section of her book, which focuses on religion and spirituality in scientists' personal lives, she finds that only 15 percent of scientists hold firmly to the "conflict paradigm"—believing there is "no hope for achieving a common ground of dialogue between scientists and religious believers." Meanwhile, a significant minority of the respondents, 36 percent, acknowledged holding at least some sort of belief in God. These ranged from "I believe in a higher power, but it is not God" (8 percent) to "I believe in God sometimes" (5 percent) to "I have some doubts, but I believe in God" (14 percent) to "I have no doubts about God's existence" (9 percent). Ecklund concludes from her research that most scientists do not become irreligious as a *consequence* of their becoming scientists. "Rather, their reasons for unbelief mirror the circumstances in which other Americans find themselves: they were not raised in a religious home; they have had bad experiences with religion; they disapprove of God or see God as too changeable." The disproportionately high percentage of nonbelievers among scientists (as compared to the general population) would appear to be the result of self-selection: the irreligious seem more likely to become scientists in the first place.

In light of the fact that religious scientists constitute a minority—albeit a large minority—of academic scientists, how do they conduct themselves professionally? To what extent, if at all, do their religious beliefs affect and inform their professional lives? Ecklund reports that the prevailing view among scientists of faith is that it is best not to discuss their beliefs openly because of the generally negative opinion of religion held by most of their colleagues. They tend to practice a "closeted faith" in the face of "a strong culture of suppression surrounding discussions of religion" within their academic departments.

Here again, however, Ecklund finds the lived reality to be more nuanced than the raw statistics might suggest. She identifies a class of "boundary pioneers," scientists who have succeeded in reconciling their religious beliefs with a scientific worldview. Prominent among them is Francis Collins, director of the National Institutes of Health, a born-again Christian. (His bestselling book on science and faith, *The Language of God*, was reviewed in these pages by Thomas W. Merrill ["C.S. Lewis Goes to the Laboratory," Fall 2006].) Collins is cited with considerable deference by a number of the nonreligious surveyed scientists because of his impeccable scientific credentials and his willingness to speak openly about what he believes. Whether a less accomplished—and untenured—openly religious scientist would be treated as deferentially by his colleagues is another matter.

Young boundary pioneers may sometimes be helped along by nonbelieving scientists who are willing to engage religious students and to show them "how different religious scientists have reconciled their faith with their lifework"—indeed, how a "full commitment to science can be held alongside full commitment to Christianity (of a certain kind)." Ecklund speculates that "as religious scientists [become] more outspoken within their departments about their faith, prejudice among scientists against religious groups as a whole ought to decrease." Whether she is correct or overly optimistic on this point remains to be seen. At the very least, the existence of these boundary pioneers represents the potential for a truce between academic scientists and the religious.

Ecklund also describes a category she calls "spiritual entrepreneurs"—scientists who, even though they are not actively religious, still consider themselves seriously spiritual and seek "new ways to hold science and faith together." More than 40 percent of the spiritual-but-not-religious scientists she interviewed fall in this category. They shun organized religion, or even denounce it as "institutionalized dogma." Instead, they allow their spirituality to be "shaped by personal inquiry," which gives it "more potential to align with scientific thinking and reasoning." They are not to be confused with the "spiritual atheists," a category nearly exclusive to scientists. This godless group's spirituality emphasizes a sense of wonder at the grandness and harmony of nature. These scientists feel free to "admire the complexity of the natural world and praise it," sometimes lifting concepts from Buddhism.

In her examination of the interactions between scientists and nonscientists, Ecklund discerns two distinct ways of talking about religion—what she calls "cultural scripts." These she dubs "suppression" and "engagement," clearly preferring the latter. Not simply a

neutral observer, Ecklund hopes to see "more productive dialogue," leading religious people to "more acceptance of some parts of science" and leading scientists to "a better understanding of the diversity of religion." Toward that conciliatory end, she concludes her book by explicitly critiquing myths that some scientists hold about religion (like the notion that all religious people are rubes and fundamentalists) and myths that some believers hold about science (like the notion that scientists are all religion-hating atheists).

Ecklund's study of today's researchers is complemented by Nancy K. Frankenberry's book *The Faith of Scientists*, which treats the relationship between religion and science as a theme in the history of ideas. Dartmouth religion professor Frankenberry has edited a compendium of excerpts from the writings of twenty-one influential figures in the history of scientific thought, from the sixteenth century through the present day. She limited her selection to "working scientist[s] of some eminence" in the "natural or mathematical sciences" who are regarded as major historical figures or public intellectuals and "whose reflections on God or religious faith or the spiritual value of nature could be expected to hold wide interest for…nonspecialists and the general public." She also chose only those who have left a body of written material on these subjects. She begins with the "Founders of Modern Science": Galileo, Kepler, Bacon, Pascal, Newton, Darwin, Einstein, and Whitehead. She then moves on to "Scientists of Our Time": Rachel Carson, Carl Sagan, Stephen Jay Gould, Richard Dawkins, Jane Goodall, Steven Weinberg, John Polkinghorne, Freeman Dyson, Stephen Hawking, Paul Davies, Edward O. Wilson, Stuart A. Kauffman, and Ursula Goodenough. The reader might quibble with some of Frankenberry's picks—as well as the decision to include Einstein and Whitehead among the "Founders"—but these decisions do not significantly detract from the aims of her project.

Among the early "Founders," none believed that science and reason had simply supplanted faith as a source of truth. The legend of Galileo's persecution at the hands of a Church hostile to the Copernican worldview has led to the common misconception that he harbored hostility to faith itself. But this is simply not so. For Galileo, truth is a unity available to us through the avenues of both religion and science. When there appears to be a conflict between scripture and the evidence provided by one's observations of the world, Galileo asserts: "We can easily eliminate inconsistency with Scripture simply by admitting that we have not penetrated into its true meaning."

Kepler shared Galileo's belief that there could be no conflict between the "book of Scripture" and "the book

of Nature." For Kepler, a devout if unorthodox Lutheran, understanding the laws that govern the physical universe is tantamount to a refinement of worship: "Our piety is the deeper, the greater is our awareness of creation and its grandeur." In a barbed passage in his 1609 work *Astronomia Nova*, he challenged those who refused on religious grounds to accept the truths of Copernican astronomy: "As for the opinions of the pious on these matters of nature, I have just one thing to say: while in theology it is authority that carries the most weight, in philosophy it is reason."

Though not strictly speaking a scientist, Francis Bacon "gave classic expression to empiricism as science's own philosophy and method," as Frankenberry puts it. He inveighed against the illicit commingling of theology and science—not to pit the latter against the former, but to foreclose the possibility that either might transgress on the proper domain of the other. In this respect, Bacon may be seen as a precursor of Stephen Jay Gould, who famously asserted that science and religion constitute "Non-Overlapping Magisteria" whose respective spheres of influence are distinct:

> The net, or magisterium, of science covers the empirical realm: what is the universe made of (fact) and why does it work this way (theory). The magisterium of religion extends over questions of ultimate meaning and moral value. These two magisteria do not overlap.

Channeling Galileo, Gould continued:

> The natural world cannot contradict scripture (for God, as author of both, cannot speak against himself). So—and now we come to the key point—if some contradiction seems to emerge between a well-validated scientific result and a conventional reading of scripture, then we had better reconsider our exegesis.

This accommodationist view—representative of the *independence* stance in Polkinghorne's taxonomy—might appeal to the agnostic scientist (as Gould identified himself) as well as to the believer who holds a generally sympathetic attitude toward scientific explanation and does not insist on a literal reading of scripture. But it will not satisfy either the biblical literalist or the resolute atheist, such as Richard Dawkins, who has criticized Gould's notion of non-overlapping magisteria as "dishonest" because "it founders on the undeniable fact that religions still make claims about the world that on analysis turn out to be scientific claims."

For Dawkins—firmly in Polkinghorne's *conflict* category—believers have, in effect, stacked the deck by defining God as "simple," even

though His creation is extraordinarily complex. Dawkins says that, when challenged for an explanation of how a simple being could design a complex universe, believers insist that this very demand represents the illicit imposition of a scientific desideratum on a God who resides outside of science. Those who embrace such an argument, Dawkins says, are unilaterally declaring themselves to be in "an epistemological Safe Zone," untouchable by "rational argument."

Presumably, Dawkins would level the same charge at physicist Freeman Dyson, who makes this distinction between science and teleological thinking:

> Within science, all causes must be local and instrumental. Purpose is not acceptable as an explanation of scientific phenomena. Action at a distance, either in space or time, is forbidden. Especially, teleological influences of final goals upon phenomena are forbidden. How do we reconcile this prohibition with our human experience of purpose and with our faith in a universal purpose? I make the reconciliation possible by restricting the scope of science. The choice of laws of nature, and the choice of initial conditions for the universe, are questions belonging to metascience and not to science. Science is restricted to the explanation of phenomena within the universe. Teleology is not forbidden when explanations go beyond science.

For Dyson, this is not stacking the deck; it is a move legitimated—even mandated—by the fact that *mind* is a fundamental feature of the universe on three levels: one, that of subatomic physics, where "the observer is inextricably involved in the definition of the objects of his observations"; two, that of our direct awareness of our own minds; and three, the "peculiar harmony between the structure of the universe and the needs of life and intelligence." Dyson finds the latter so compelling that he goes so far as to say: "The more I examine the universe and study the details of its architecture, the more evidence I find that the universe in some sense must have known that we were coming." Echoing Gould and Galileo, Dyson calls for religion and science not to overstep the jurisdiction proper to each. And on this score—and notwithstanding his scientific credentials and achievements—Dyson asserts that "religion lies closer to the heart of human nature and has a wider currency than science."

With the possible exception of Charles Darwin, there is no historical scientist whose religious views arouse as much curiosity as Albert Einstein. He is often cited favorably by people of faith as an example of a scientist of distinction who believed in God. Yet the nature of Einstein's faith is elusive. He was certainly not religious in any conventional sense as an adult, but

some of his pronouncements suggest that he was a believer of *some* sort. He strongly denied being an atheist, instead saying his "position concerning God is that of an agnostic." Einstein unquestionably rejected the personal God of Jewish scripture, as well as the use of fear of divine retribution as the basis for moral law—a practice he characterized as "regrettable and discreditable."

More interesting than the great scientist's personal religious beliefs, however, are his numerous attempts to explain the proper relationship between science and religion. In a 1930 *New York Times* essay, he described a "cosmic religious sense," a deep appreciation for "the totality of existence as a unity full of significance." Not only have "the religious geniuses of all times" shared this cosmic religious feeling, he wrote, but it also is "the strongest and noblest motive for scientific research." A few years later, in a letter to a Sunday-school student who had written to ask him whether scientists pray—and if so, for what—Einstein observed that all serious scientists believe that "a spirit is manifest in the laws of the Universe—a spirit vastly superior to that of man, and one in the face of which we with our modest powers must feel humble." And most famously, he argued in 1941 that "Science can only be created by those who are thoroughly imbued with the aspiration toward truth and understanding. This source of feeling, however, springs from the sphere of religion.... Science without religion is lame, religion without science is blind."

This is hardly a ringing call to worship. But neither is it a call to arms. The nonbelieving scientist may never share the believer's awe before a personal God. But Einstein gently reminds us that the highest achievements of the intellect cannot inspire or sustain themselves. The true scientist finds inspiration beyond science—in a sense of reverence for the order of the universe and wonderment at its mysteries.

Peter Lopatin *teaches at the University of Connecticut at Stamford.*