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# WHERE DARWIN MEETS THE BIBLE

**CREATIONISTS AND EVOLUTIONISTS IN AMERICA**

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OXFORD  
UNIVERSITY PRESS

2002

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## INTRODUCTION: WAYS OF KNOWING

“Will it never end?”

This lament may be heard at every new eruption of the evolution-creation debate in America. Begun in 1859 with Charles Darwin’s *On the Origin of Species*, the debate has come and gone like a storm. From time to time modern science claims victory in the debate: the scientific “way of knowing” has settled the question. But after a calm, the gale returns.

Darwin meets the Bible just about everywhere in America, at the great intersections where creationism meets evolutionism and where science meets religion. They are daunting crossroads, congested with technical science, sacred theologies, moral concerns, ideological agendas, and political hardball. Most Americans, according to opinion polls, know little of what they might find there. Generally, they have avoided these points of contact like giant traffic jams.

Darwin hinted at what was to come. He called his *Origin of Species* “one long argument.” Across its pages, he pressed that argument: nature itself, by the gradual “natural selection” of beneficial traits in organisms, has produced the complexity of the natural world, including the human mind.<sup>1</sup> He explained in naturalistic terms what had hitherto been viewed as a “special creation,” a complex and wondrous world put here by the heavenly Ideas believed in by Plato, the aloof Clock Maker of deism, or the personal God of the Bible. When Darwin’s argument leapt from the pages of the *Origin* into society, both science and religion became arenas of debate. Still today, science is in polite turmoil over whether Darwin’s mechanism of “natural selection” can explain how all things came to be. Religion, too, continues to ask: Does evolution do away with God or refute the Scriptures? What kind of God could coexist with evolution’s sweeping claims?

Amid this rollicking debate, some have argued vigorously that the exchange is fruitless and counterproductive. When *Scientific American* reported on religion and scientists, a slew of letters expressed the wish that “the same energy that goes into the science-religion debate could be redirected to improving the world.”<sup>2</sup> One popular solution has been simply to separate science and religion entirely. One is about facts, the other about beliefs. The two “ways of knowing” are said to exist side by side—separate and in peace. Not surprisingly, this partition is happily welcomed by most scientists, most theologians, and the general public.

The National Academy of Sciences has promoted this solution, saying science and religion are “mutually exclusive” kinds of knowledge. In his president’s address to the American Association for the Advancement of Science in 2000, Harvard paleontologist Stephen J. Gould proposed a “respectful separation.” He allowed that the spheres of science and religion should meet in “frequent and searching dialogue,” which for strategic reasons is essential in a nation so religious as America. “It’s the only way we’ll ever talk to the majority of Americans,” Gould said. “If they think that science opposes religion intrinsically, how can we ever prevail?”<sup>3</sup>

This simple map for “two ways of knowing,” however, does not keep the crossroads flowing smoothly. Science and religion can easily operate in their two separate modes in the laboratory and in the sanctuary, but in society they actively mingle. They meet in culture, education, and politics, and the debate continues: Who draws the line between facts and values? How do we decide what is scientific knowledge and what is religious or philosophical knowledge? Which is more valid—expert opinion or common sense?

When the appeal to separate “ways of knowing” is not enough, those who would end the evolution-creation argument make another case. The debate is an anomaly, they say. It has arisen in only one spot of all humanity, a small enclave of Bible fundamentalism in America.

But clearly, Bible literalism is not the only force rocking the boat of evolution. “The desire to escape Darwinism is a common theme of contemporary thought,” naturalist philosopher David Papineau wrote in 1995. “It spreads far beyond creationist circles into the strongholds of secular rationalism. . . . To official Darwinians, this kind of secular skepticism is almost worse than creationism. It is bad enough that people who believe the Bible literally should dismiss Darwin. But members of the scientific community ought to know better.”<sup>4</sup>

There is still one more plank in the “argument-is-over” platform. Darwinian evolution states only the obvious—and its triumph is therefore a *fait accompli*. Evolution rests on the indisputable fact that gene mutations or mixing, called “changes in gene frequency,” produce “populations” different from their parents. The beaks of surviving birds have indeed evolved in size; surviving insects and their progeny have without a doubt evolved immunities to insecticides. Since the 1940s, however, even the most literal creationists have granted this power, and even more, to “microevolution,” says historian Ronald L. Numbers. To corroborate Genesis, he says, “These people have to get the entire earth populated with all its diversity through microevolution, and they’re willing to allow for natural selection to be one of the principal mechanisms.”<sup>5</sup>

What the creationists reject are evolution’s higher claims on nature—that the human mind, for example, evolved from aimless molecules. They object to the way evolution has defined science, and to the way it influences society.

These grander evolutionary claims have many articulate theorists, among them biologist Ernst Mayr. At his home near Harvard one spring morning, Mayr

told me that he was all for separating science from religion. “No scientist would interfere with any believer and what they do with the Bible,” said Mayr, whose mother tried unsuccessfully to rear him as a Lutheran. “But believers shouldn’t use that to try to undermine or refute scientific statements.” With no malice toward religion, Mayr nevertheless says it, too, falls under “the influence of Darwin on modern thought,” the topic of his 2000 *Scientific American* article. “Almost every component in modern man’s belief system,” Mayr said, “is somehow affected by Darwinian principles.” He says elsewhere, in fact, that scientists who merely pursue discoveries or “technological innovation” have missed the whole point of Darwin’s scientific genius.<sup>6</sup>

That genius has been central to the rise of philosophical materialism, which has aimed to dethrone God and the supernatural. It tells people that only matter in motion is worthy of belief. While this philosophical overthrow turns many religious people against every aspect of Darwinism, other believers will reject the philosophy but take the Darwinian science. A significant group of Christians in the sciences posit that God works through the evolutionary mechanism to “create.” They believe that science has improved on ideas about God, yielding a new and improved “theology after Darwin.” Evolution is the backdrop for “finding Darwin’s God,” says biologist Kenneth Miller, who assures fellow theists that there is “no reason for believers to draw a line in the sand between God and Darwin.”<sup>7</sup>

Americans like the idea of reconciling God to evolution, according to some surveys. They also like to think that God can intervene in the world he created. Yet here is where Darwin, in his writings and credo “*Natura non facit saltum*”—nature does not make leaps—presents a challenge.<sup>8</sup> How do biblical faiths live with science’s rule that God may not intervene in nature? Prayer is often a request that God do just that. The reconciling gets even more complex, moving from God and nature to mind and matter, fact and revelation, freedom and necessity, morality and determinism.

These sorts of brain twisters have often made Americans want to postpone the evolution-creation debate for another day. In fact, American literacy on the topic is surprisingly low. Many Americans think evolution primarily states that humans evolved from apes. Only 15 percent know what Darwin meant by “natural selection.” On the other hand, half of Americans say they have never heard the term “creationism”; just two in ten are “very familiar” with creationist claims. Only four in ten adult citizens, moreover, can name the four Gospels or say who delivered the Sermon on the Mount. It is more than likely that very few Americans know that Genesis has two creation stories.<sup>9</sup>

Despite such ignorance of the issues, nowhere does the debate reach such dizzying heights, and political lows, as in the United States. A general loyalty to the Bible seems to be the catalyst. “The creation story is not going to go away as a political issue, for the obvious cultural reason that the Bible is not going to stop being the central book in our intellectual heritage,” says historian Gary Wills.

When Americans are asked to name the most important book in history, they pick the Bible over Darwin's *Origin of Species* by twenty to one.<sup>10</sup>

They also hold the scientific profession in high esteem—more than in any other industrialized nation—and may know that science has fueled half of America's economic prosperity since the 1950s.<sup>11</sup> Naturally, the struggle to balance such fruitful enterprises as science and religious belief has drawn in every other social sector. Under the duress of the evolution-creation debate, judges are pitted against legislators and school boards against courts. The priorities of applied scientists can clash with those of theoretical scientists. In public education, most Americans want both evolution and creation taught evenhandedly, but teachers despair at such juggling. How do we teach academic traditions and academic freedom, and how may religious freedom exist in a bureaucratic society?

So broad is the sweep of the evolution-creation debate that it seems likely to be perennial. But is it helpful? Opinion is obviously divided. But when accepted as inevitable, it certainly can stimulate learning and also test various important social claims. For example, science leaders assert that only evolution education can produce the scientific minds necessary for America to compete in the world economy. Moralists, in turn, argue that mere technical training, or the propagation of a materialist worldview, robs young people of moral values and the nation of moral capital. Ideally, a society should have moral, enlightened people. How to get there seems worth arguing over.

While Americans hotly debate evolution, it is almost unanimously accepted in Western Europe and Japan, the former being the most secular part of the world, and the latter a Buddhist society that has developed scientifically. Still, this does not make America the only nation with beliefs that seem at odds with evolutionary theory. Japan was a secular nation before the Darwinian revolution, and though polls show it is evolutionist today, its people still maintain a moderate mysticism about ancestors and are liberally open to nonmechanistic medicine. Neither has post-Christian Europe bled away all its supernatural and nonrational beliefs under a Darwinian triumph. To be sure, evolution is the view officially held in research universities and science academies the world over. But the argument is unsettled for the masses, from Muslims in Indonesia to Roman Catholics in Latin America.<sup>12</sup>

The United States will not settle this argument for other cultures. Yet what better place is there to keep the argument going? Europe once provided a society where religion gave “presupposition, sanction, and even motivation for science,” says historian John Hedley Brooke. But perhaps only the American configuration will allow that interaction to continue. “Neither science nor religion has had a stable and permanent definition in American culture,” argues historian James Gilbert. “They continually shift in meaning and in their relation to each other.”<sup>13</sup>

The forces for evolutionism and creationism in America have both emerged from the 1990s with powerful new tools and constituencies. For evolution, institutional science has led the way with calls for a new “civic scientist” who can win

public confidence. For the first time since its founding in 1946, the Society for the Study of Evolution created a public outreach arm. The National Academy of Sciences established a Web site on evolution, issued the lengthy guidebook *Teaching Evolution and the Nature of Science*, and updated its 1984 criticism of “scientific” creationism. School textbooks, once thin on evolution, since the 1990s have given it “unabashed” coverage. The new science standards movement, which identifies evolution as one of five “unifying concepts and processes in science,” was making its mark in all the states; the National Science Teachers Association heard in a 2000 report, “The century-long struggle to have evolution emphasized in the science classrooms of this nation has reached a significant and new stage.”<sup>14</sup>

More Americans have entered higher education, and a college education is a significant indicator—though no guarantee—that a person will accept the theory of evolution. From 1971 to 1997, enrollment at a college or university had jumped from 44 to 65 percent of all high school graduates. Evolution has been protected in public education by U.S. Supreme Court rulings in 1968 and 1987, a status confirmed again by the Court in 2000. Eight of the nine high court justices, with Antonin Scalia dissenting, had no interest in reversing a federal court ruling against Louisiana’s 1994 disclaimer law. Louisiana had required biology or earth science teachers to say that instruction in the “scientific theory of evolution” was “not intended to influence or dissuade the Biblical version of Creation or any other concept,” and to encourage students to “exercise critical thinking” on the subject. Once again, the federal courts put evolution virtually beyond criticism in classrooms.<sup>15</sup>

Federal science is also keen to educate the public about evolution in the wake of the human genome revolution. In 2000, the National Human Genome Research Institute made one of its five-year research goals the question: “As new genetic technologies and information provide additional support for the central role of evolution in shaping the human species, how will society accommodate the challenges that this may pose to traditional religious and cultural views of humanity?”<sup>16</sup>

The popular culture has smiled on evolution as well. News coverage of the antievolution vote of the Kansas school board in 1999 would have pleased H. L. Mencken, who in the 1920s had pilloried Bible-thumping creationists. Public television’s Bill Nye “the Science Guy” called the Kansas decision “nutty,” and sister program *NOVA* began to publicize its fall 2001 showing of *Evolution*, a seven-part documentary—and mother of all Darwinian telecasts. Evolution has meanwhile expanded its reach into the liberal arts and the world of television talk shows with the eye-catching new field of evolutionary psychology. This new mode of Darwinian interpretation has opened every quirk of humanity—from fashion and sex to sports and Wall Street—to speculation on what “survival value” it had in man’s “evolutionary past.”<sup>17</sup>

This apparent “triumph of evolution,” however, has not hindered similar new strides for the creationists. As early as 1981, the magazine *Science* remarked on the

“increasing philosophical skill” of those who attack evolution. Two decades later, science philosopher Robert T. Pennock warned of “the size and renewed power of the movement,” now labeled the “new antievolutionists” or the “new creationists.” In his book *Tower of Babel* (1999), Pennock launched a highbrow attack on what has become an equally highbrow creationism, which uses mathematics, biochemistry, and philosophy to argue for design in nature.<sup>18</sup>

More than ever, it is clear that Bible fundamentalists hardly exhaust the spectrum of antievolutionists. One of the new critics is law school professor Phillip E. Johnson, a prolific author and speaker who, by putting Darwin “on trial,” has demanded a new vigilance on the part of evolutionists. “The basic controversy is the definition of science,” Johnson told me in his Berkeley home one summer. “For evolutionists, science explains the world in materialistic terms. If something is outside of science, it is outside of reality.”<sup>19</sup>

Biochemist Michael Behe is a tenured professor and Roman Catholic who has no problem with evolution in general. But he angered American science with his *Darwin’s Black Box* (1996), a book that said evolution failed to explain the complexity of molecular life. The book received an astounding eighty reviews, most of them in science journals, where its challenge to Darwinism was generally attacked. When his book was still a controversy, Behe gave me a tour of his Lehigh University laboratory, wearing his trademark blue jeans and flannel shirt. “They say to me, ‘Well, of course! You’re a biochemist. You don’t know how to think like an evolutionist,’” he said. “And I say, ‘Yes, you’re right, because I see these difficulties that nobody has addressed.’”<sup>20</sup>

Behe represents a new criticism of Darwinism, a criticism that sidesteps Genesis and the age of the earth. It uses terms such as “intelligent design” and the “anthropic principle,” which states that nature seems to have been fine-tuned for the arrival of human existence. The debate has switched from defending religious scripture to making scientists explain the holes in evolutionary theory. The debate has switched, what is more, to asking why, if Darwinian science is not a philosophy, does it so often lead to disbelief?

These two lines of attack are hardly the invention of creationists alone. Readers of Michael Crichton’s novel *The Lost World* (1995) heard the hero Ian Malcolm, a brilliant mathematician enamored of chaos theory, saying, “Everybody agrees evolution occurs, but nobody understands how it works. There are big problems with the theory. And more and more scientists are admitting it.” Scientists do not openly advertise the “big problems” with evolution, correctly assuming that creationists will use them for political advantage. Science historian William Provine, meanwhile, is far more candid in spreading his Darwinian gospel that evolution logically leads to atheism. “And that’s why the vast majority of working evolutionists are in fact atheists,” he says, pacing a University of Tennessee stage.<sup>21</sup>

The bulwark of creationism, of course, is America’s religiosity and belief in God. Creationists have long resorted to saying “God did it” wherever science has



no answer, and have routinely been criticized for bringing their “God of the gaps” into empirical science.

Yet creationists are finding new metaphors. Just as Bill Gates says, “DNA is like a computer program, but far, far more advanced than any software we’ve ever created,” creationists make a theological argument for “intelligent information” that shapes biological life. In early 2001, the U.S. government and the private company Celera Genomics together released a full DNA sequence of the human genome, the “code of life,” and Celera’s top computer scientist mused that its complexity suggested “design.” He was not thinking of “God or gods,” he clarified, but “there’s a huge intelligence there. I don’t see that as being unscientific. Others may, but not me.” Theists have long been inspired by technology, but now they are likening hardware and software to matter and spirit. A generation of computer-literate Americans soon may ask, Is the universe self-running, or functioning on DOS, a divine operating system?<sup>22</sup>

From another direction, moreover, Americans have shown increased reluctance to give science a blank check on every question of the day. A *Science* headline in 1980 told that story: “Public Doubts about Science.” It hinted at a troubled love affair; America was becoming disillusioned with scientific progress, an aloof profession, or a “way of knowing” that seems to put more frustrating technical and mathematical demands on life. Doubts about science have also grown as more people are persuaded that knowledge is mere opinion, the cultural relativism commonly termed “postmodern.” “The postmodernism movement hasn’t been particularly warm and receptive to religions,” a humanities professor told a U.S. government commission in 1998. But it did “make clear that the old emphasis on a kind of scientific way of understanding the world is somewhat naive.” While the U.S. Senate is anything but antiscience, in 2001 it almost unanimously urged teachers of biological evolution to “prepare students to distinguish the data and testable theories of science from philosophical or religious claims that are made in the name of science.” All of these second thoughts about science may add up to a cultural boost for creationism.<sup>23</sup>

Long before DNA, computers, and postmodernism, stories of religion and science have been among the greatest ever told. Genesis narrates how God formed an entire universe. In late Renaissance Italy, Pope Urban VIII brought his friend Galileo Galilei before the Inquisition over how science, philosophy, and theology may view the world. Two centuries later, in Victorian England, Darwin was born, traveled the world as a creationist, and left behind a revolution in science. On American soil, the Scopes “Monkey Trial” of 1925 became a duel of titans: the Bible-believing William Jennings Bryan and the agnostic rationalist Clarence Darrow. Thanks to Scopes, the evolution-creation debate has become America’s IQ test. Where you stand can be an instant pass or fail on being modern or backward, faithful or apostate. The snap-quiz approach, of course, is hardly conducive to a healthy conversation.

At a paleontology convention in Washington, I caught up one day with David Raup, a “devout evolutionist” and former senior scientist at the Field Museum of Natural History, and asked him about the debate. “There are fanatics on both sides,” he offered. He said that neither evolutionists nor creationists seem willing to learn from an opponent’s criticisms. “Unfortunately, since the two sides don’t generally talk to each other, there’s no decent devil’s advocate,” he said.<sup>24</sup> Some creationists have closed off the discussion by declaring evolution “the malignant influence of ‘that old serpent, called the Devil.’” Some evolutionists have shut it down by warning that the man who doubts evolution “inevitably attracts the speculative psychiatric eye to himself.”<sup>25</sup>

The story that follows welcomes devil’s advocates on either side. It places where Darwin meets the Bible in the open sunlight. Though a contemporary story, it will frequently reach back to the past. The last chapter will gaze speculatively into the future.

# 1. DARWIN'S LEGACY IN AMERICA

The Appalachian Mountains run an arching course from Maine to Alabama like a parenthesis on the American East. The second-tallest peak in that gigantic wrinkle of upturned stone, Virginia's Mount Rogers, is named for a contemporary of Charles Darwin who, like Darwin, was intrigued by nature's beginnings. Geologist William Barton Rogers looked out over his state's folkloric ridges and valleys and asked how they had come to be. His answer, though later proved incorrect, was an early step in a revolution in geology that gave birth to the revolution in biology fathered by Darwin's *On the Origin of Species*.

The formation of the Appalachians was not understood until the 1960s, more than a century after Rogers hypothesized that volcanic eruptions deep in the earth had pushed the mountains into being. Since then, most scientists have agreed that the movement of colossal plates on the ocean floor buckled the land, forming the great mountain range. When the root idea of plate tectonics—that continents move—was proposed early in the century, most scientists reproached it as an “impossible hypothesis” that was “very dangerous” for science, but the public had no emotional stake in the debate.<sup>1</sup> Not so with Darwin's theory that species, including humans, arose from natural selection acting on variations in organisms, now attributed to genetic mutations. Darwin's “descent with modification” proposed that simpler forms evolved into more complex ones, an idea that probed into human origins—our arrival, our nature, and our place in the universe. The resulting cultural debate makes plate tectonics pale by comparison.

“It is curious how nationality influences opinion,” Darwin wrote to a friend soon after he learned of the German and French reactions to his *Origin of Species*.<sup>2</sup> But the national character of Americans assured that the tumult over Darwinism would escalate most on this side of the Atlantic. The nation began with a strong religious bent, but treacherous oceans and wilderness added a twist, turning American minds to “nature's God” and making it natural to see the Creator in creation. When it came to science, moreover, the nation has tended to value the practical over the theoretical, which was a more European affection; America's sense of egalitarian social beginnings has also made its society wary of elites, whether clerical or scientific. Finally, the nation was born with an insistence that taxes not be used to spread ideas with which the taxpayer may disagree—ideas of religion, politics, or science, especially in public schools.<sup>3</sup>

These national traits have profoundly influenced the evolution-creation debate. Over the years, this story has played out in many American locations, but it is summarized particularly well by visits to Virginia, Massachusetts, and Tennessee.

. . .

The Appalachians in southwest Virginia cross over the Cumberland Plateau, a landmass whose edge rises up twelve hundred feet like a giant doorstep to the city of Blacksburg. Since 1870, the old coal town has been home to Virginia Polytechnic Institute and State University, better known as Virginia Tech, the state's largest research institution. When the plateau bursts with springtime flowers, Virginia Tech botany professor Duncan Porter reaches an apotheosis in his course on plant taxonomy. "We begin working in the lab in January," said Porter, who, when I visited him in 1996, was an avuncular fifty-nine-year-old with a fair beard and gray, thinning hair. "It's only in the last four weeks that we go out in the field, when it starts flowering. And they get very excited about that." Porter hopes his hundreds of students carry away the evolutionary idea that all things are related. "I take evolution as a fact," he said. "Where the theory comes in is not the theory of evolution, it's the theory of evolution by natural selection. Natural selection has some problems, not evolution. All you have to do is look around you, and I don't see how anyone can not accept that evolutionary change takes place."

When Darwin traveled to South America on a sea journey that lasted from 1831 to 1836, he shipped back a cache of plant specimens, on which Porter is the leading authority. Traveling to England to catalogue Darwin's plants, Porter also became an authority on Darwin's writings and the most recent director of the Darwin Correspondence Project. The project will not reach its initial goal—to publish Darwin's fifteen thousand letters in thirty-three volumes by 2009, the bicentenary of Darwin's birth—but Porter realized more than ever the social and philosophical depth of Darwin's revolution. In 1984 he teamed up with Virginia Tech English professor Peter Graham, a tall Connecticut native, to teach a humanities course on Darwin; then they instigated the honors course "Darwin: Myths and Reality."

If the average American student is unfamiliar with Darwin and the Victorian age, said Professor Graham, they are not much better on literature, including the Bible. Only a few of his students know the story of Job, the Old Testament treatise on suffering, natural evil, and justice in a God-made world; it is the very conundrum Darwinism answers by saying the laws of nature are what dictate the suffering. Students have a "cluster of ideas" about Darwin, some sound and others not, Graham said. "That he was a bald man with a big bushy white beard, looking like your stereotypical Victorian patriarch, and that he was an invalid. That he was a recluse. That he had these atheistical scientific ideas that were this enormous challenge to a very rigid and orthodox religious world." The students learn the

family history—that the Darwin and Wedgwood families often intermarried, and that the men were freethinkers, but the women were pious.

“Another myth that students have is this idea of the scientist as isolated genius, working alone and coming up with world-changing ideas,” said Professor Graham. “The effort for Darwin was collaboration, all his life long. Gathering information from people all over the world, and bouncing his ideas off of his friends.” Students are also astonished that Darwin, being independently wealthy, could return from the Galapagos Islands adventure and abruptly retire to a rural home outside London, spending his remaining forty years in quiet research and voluminous writing. “That really surprises them that having to work for a living was an obstacle to someone’s scientific interests.” In their introduction to a later book, *The Portable Darwin*, Porter and Graham explained quite plainly what questions Darwin had grappled with, questions that he bequeathed to each new generation: “Is there a place for God in a naturally evolving world? If so, what kind of God?”

Nearly a century and a half after publication of Darwin’s *Origin of Species*, Porter represents another Darwin legacy: the career evolutionary biologist. A native of the California Central Valley, Porter loved nature, studied at Stanford and Harvard, taught biology at the University of San Francisco, and then became a curator at the Missouri Botanical Garden. His eastward drift finally carried him to Washington, D.C., where for a year at the Smithsonian Institution’s National Museum of Natural History he was editor in chief of the Flora North America project. Then he joined the National Science Foundation, where in the early 1970s the panel he served on awarded \$5 million in grants each year for research. Most of it went for “getting data on evolutionary changes.”

The field of biology itself has changed dramatically since Porter entered the guild. Hands-on scrutiny of specimens has given way to mechanical analysis of the molecular structure of tiny DNA samples or the running of mathematical models on a supercomputer. “When molecular biology arose in the 1960s, natural history sort of became passé,” said Porter. In thirty years of classroom experience, he has been struck more profoundly by these scientific changes than by the perennial evolution-creation debate. “I’ve never had a student come up and argue evolution or creationism with me,” he said. When dissent arises—infrequently—it is reflected in teacher evaluations. “It has happened only a couple of times, but a student may write, ‘Dr. Porter better look out and give up this evolution and go back to God.’”

He takes no offense. Since his arrival at Virginia Tech in 1975, he and his wife have nurtured their four children in the Episcopal Church, in which he is a communicant. “Well, I believe you can be a Christian and an evolutionist,” said Porter, who was reared a Methodist but professed to be an agnostic during most of his career. “In fact, I am a Christian, and I am an evolutionist.”

In this, Porter differs from most evolutionary biologists, who generally are agnostics, as Darwin became, or atheists. Porter’s greatest affinity is to the 87 percent of Americans who say they are Christian. That affinity narrows down, however,

when it comes to evolution, for only about 40 percent of Americans would agree roughly with Porter that God has “guided” evolution over millions of years (which he personally qualifies as “in the sense that natural selection is one of God’s laws that regulate the universe”). Another 44 percent of Americans, according to a 1997 Gallup poll, embrace the creationist stumbling block to science: they believe God brought humans, and perhaps the earth itself, into being by a “special creation” only thousands of years ago.<sup>4</sup> At the time that the HMS *Beagle* sailed, every American believer was a creationist, and so was the young Darwin.

• • •

Darwin never visited the United States. If, on his journey, he had docked in America, it would have been during a “golden age” of geology. Despite our association of Darwin with tortoises and finches in the Galapagos Islands, he considered himself a geologist. As he wrote to his sister, “There is nothing like geology; the pleasure of the first days partridge shooting or first days hunting cannot be compared to finding a fine group of fossil bones, which tell their story of former times.”<sup>5</sup>

In Virginia at that time, the premier name in geology was William Barton Rogers. A Scotch-Irishman born to a Presbyterian family in Philadelphia, Rogers began his career as a professor of natural philosophy, or science, at the University of Virginia. No naturalist is more famous than Darwin, but a look at the careers of the two contemporaries illustrates the contrast between the European and American ways of doing science.

Rogers’s father was also a science teacher, who so admired Erasmus Darwin, grandfather of Charles, for his book on organic evolution that he named his third son Henry Darwin Rogers. William, the second son, had at his father’s knee met former president Thomas Jefferson, who was building his university down the hill from his home at the Appalachian-hugging Monticello. In 1835, while Darwin was on the high seas, William Rogers was appointed Geologist of Virginia and began a five-year geological survey of the state, which then was twice its modern size. Contemporaries claimed that he took the “first broad reading of American geology.”<sup>6</sup>

In the 1830s, state geologists were the captains of American science. The American Association of Geologists and Naturalists was the first national scientific body. William Rogers was its chairman in 1847, when the group dissolved, to be reborn the next year as the American Association for the Advancement of Science, now the world’s largest science federation. Rogers married into a Boston family and, with his wife, took a first European tour to attend the 1849 British Association meeting in Birmingham, England. There he met Charles Darwin. By that time, Darwin had written down his theory of evolution by natural selection, but he was circumspect with both the earliest sketch of 1842 and also the longer *Essay* of 1844, in which he had elaborated on his theories, leaving his wife money to publish the *Essay* after his death.<sup>7</sup>

In the year of the *Essay*, Darwin joked in a letter about what his theory meant: “Species are not (it is like confessing a murder) immutable.”<sup>8</sup> Before and immediately after the *Beagle* voyage, Darwin still believed that God had laid down the species by special acts of creation. Seven months after he returned home, he “firmly believed in the gradual origin of new species.”<sup>9</sup> By 1838 he believed that nature alone, without divine action, could create new species. The power to create, he said, was found mostly in the mechanism of natural selection, which is “daily and hourly scrutinizing, throughout the world, every variation, even the slightest; rejecting that which is bad, preserving and adding up all that is good.”<sup>10</sup> This was not an idea necessarily seen in nature. Darwin was drawing as much on the economic treatise of Thomas Malthus. The Malthusian viewpoint helped Darwin cast nature in terms of hungry, multiplying mouths amid limited food. It was truly a “struggle for existence.”

When Rogers met Darwin, however, all this was still in the Englishman’s head. Describing the Birmingham meeting in a letter home, Darwin wrote of his boredom and “all the spouting” at the sessions. He also said he had gotten sick. Rogers’s letter home was written in exultation. “I made quite a respectable speech, which was often loudly applauded,” he told his three brothers. Four days later Rogers presented his “law of flexures” theory, which proposed that the Appalachian ridges and valleys had been pushed up or folded over by volcanic pressures below. “They laid on the compliments so thick that I could hardly stand up under them.”<sup>11</sup>

Having observed the Andes Mountains, Darwin also thought that volcanic pressure had raised them. He and Rogers, whose wives were both named Emma, had also shared a view of geology that, unaware of tectonic plates, was wrong. But it mattered little. The greater revolution in geology was taking place around the question of time—and its vastness in natural history.

The new view of time was epitomized in the 1830 work *Principles of Geology* by lawyer-turned-geologist Charles Lyell, a friend of Darwin. Lyell posited that the same laws of erosion and accumulation observed working so gradually in nature during his lifetime had shaped the earth eons earlier. Natural history, said Lyell, was ruled by the “undeviating uniformity of secondary causes,” an explanation that came to be described as “uniformitarian.” Nature, Lyell said, needed no intervention by the primary cause—except in the divine creation of the human mind. Darwin said the new outlook “altered the whole tone of one’s mind.” Lyell’s idea paved the way for the demise of the preferred belief of Victorian Anglican religion, God as designer.<sup>12</sup>

In triumph, uniformitarian thinking eclipsed the scriptural view of Creation by cataclysm, followed by a global flood. Darwin, a former theology student—and Anglican priest, if not for the *Beagle* voyage—waxed eloquent about the new view of time and nature. It “impresses my mind almost in the same manner as does the vain endeavor to grapple with the idea of eternity,” he said. Boundless time could create boundless natural variety, and so Darwin asked rhetorically,

“What may not nature effect?” Time was the Creator. “The belief that species were immutable productions was almost unavoidable as long as the history of the world was thought to be of short duration.” A revolution in geology had spawned a revolution in biology.<sup>13</sup>

In the United States of the 1840s, the Darwinian revolution was still on a far horizon. Funding for Rogers’s geological survey of Virginia, begun in 1835, had come only with a struggle. The state’s economic depression had caused a brain drain, and the tensions that would erupt into the Civil War were building. Rogers looked north. His in-laws lived in Boston, as did his younger brother, Henry Darwin, with whom he had long shared his dream of opening a “polytechnic school” in the city. In Virginia, Rogers had seen riots and murders at the university, and he envisioned a more studious atmosphere. The polytechnic would have a practical focus, the brothers had said, but equally important, it would be free of the kind of political purse strings that thwarted scientific research in Virginia. Their dream was realized in 1862, when William founded the Massachusetts Institute of Technology and became its first president and first professor of physics. Henry by then had moved to Scotland to teach.

The Civil War erupted in 1861, two years after publication of *Origin of Species*, and while the war stalled the wider American debate, the Rogers brothers were privy to Darwinian claims from the start. Henry was in Scotland at the time and was witness to British naturalist Thomas H. Huxley’s agitation for a priesthood of scientists to supersede the religious aristocracy. “‘Darwin’ is the great subject just at present, and everybody is talking about it,” Huxley wrote to Henry Rogers. “The thoroughly orthodox hold up their hands and lift up their eyes, but know not how to crush the enemy.” Henry agreed with Huxley that though Darwin doubtless was correct, he had not proved his theory by demonstration. “Development of species from species, firmly as I believe in it,” Henry wrote his brother, “I think it will never be capable of a strictly scientific proof. No more can the opposite doctrine of supernatural creations, and therefore the main point to insist on now is toleration, and no dogmatizing.”<sup>14</sup>

His brother William also believed before 1859 in the transmutation of species by means of either “violent and sudden physical changes” or “the gradual modification of species through external conditions.”<sup>15</sup> And in Boston in 1860, William Rogers’s opinions of *Origin of Species* were as conciliatory as Henry’s. Reviewing the *Origin* in the *Boston Courier*, Rogers said that “probably a large majority” of naturalists would hold to the biblical doctrine of immutable species in the face of Darwin’s claims. “It is, however, certain that arguments emanating from so philosophical a thinker, and presented with such fairness and simplicity, will . . . in many cases win, at least, their partial assent.”<sup>16</sup>

Boston became the first American center of Darwinian debate. In the year of the *Origin*, Harvard regally opened the Museum of Comparative Zoology with a long procession from the museum to the church, with the governor at the front. The museum was founded by the Swiss naturalist Louis Agassiz, the son of



Calvinist clergy—though now a Unitarian—and perhaps the biggest name in American natural science. Agassiz rejected evolution for its failure to explain the building up of complexity in organisms. As a European he also was wedded to the Continent’s philosophical idealism and viewed organisms as ideas in the mind of God.

In Boston’s first public debates on the evolution topic, presented in four sessions in the spring of 1860, William Rogers held forth as Darwin’s ally and Agassiz as his critic. They packed the Boston Society for Natural History. According to historian Edward J. Pfeifer, “When Agassiz and Rogers clashed, the show was worth seeing. Agassiz was handsome, impetuous, and eloquent, but unguarded in speech. Rogers had sharper features, was always alert, and possessed a keener sense of logic.”<sup>17</sup> They argued about “persistent types” in nature, geological layers in North America, the alleged migration of species between continents, and the uplift of rocks.<sup>18</sup> William Rogers recounted these “friendly contests” with Agassiz, but he perceived accurately that besides Asa Gray, the Harvard botanist and friend of Darwin, he was having “to do battle almost unaided.”<sup>19</sup> Other American naturalists were mum. “The real issue at stake was whether Agassiz’s or Darwin’s principles would guide future scientific research,” says Pfeifer. “Each provided a coherent view, but both could not be right.”<sup>20</sup> Agassiz, who died in 1873, was the last great antievolutionist of the American scientific establishment.

Darwin, like Agassiz, did not live to see how the contest fully played out. Darwin died in 1882 at his home, Down House, where according to the custom of the gentry, he had retired in 1842 at age thirty-six. From there he led a busy life of writing, experimenting, and taking trips with his family. The retching illness he had complained of in his Birmingham letter of 1849 was an early sign of ailments, still mysterious to modern doctors, that increasingly afflicted his life. One April night in 1882 he was overtaken by convulsions; the next day, unconscious, he took his last breath in the arms of his wife, Emma. His cousin Francis Galton urged an entombment in Westminster Abbey. Seeing a boon to the scientific priesthood, Huxley shepherded such a petition through the House of Commons. “Getting a free thinker in the Abbey was not easy,” say historians Adrian Desmond and James R. Moore. But it worked. The Unitarians, that freethinking wing of British Christianity in which Darwin felt most at home, predominated as pallbearers. But it was from the Anglican pulpit of Saint Paul’s Church in London that the abbey burial was declared a sign of “the reconciliation between faith and science.”<sup>21</sup>

News of Darwin’s death reached the United States, where William Rogers, a nominal Presbyterian with ties to Unitarians, was spending his last years at his Rhode Island cottage. His final project was a small geological map of Virginia. He, like Darwin, had battled illness for years, but on graduation day at MIT in 1882, Rogers climbed the steps of the institute in the back bay of Boston to speak at the outdoor commencement. It was a cloudless Tuesday, May 30, not five weeks after Darwin had been lowered into the abbey crypt. When Rogers stood to give a

“short address” at noon, his weak voice rose to “thrilling tones” but then fell silent. “That stately figure suddenly drooped,” a witness recalled. “He fell to the platform instantly dead.”<sup>22</sup> In his last words Rogers was saying that theory had long been separated from application. “Now . . .” he said, “the practical is based upon the scientific, and the scientific is solidly built upon the practical.”<sup>23</sup>

In a simple funeral at the institute on Friday, June 2, Rogers’s friend the Reverend George Ellis read the liturgy. He said that science could not speak on the body and soul. Even science’s cunning devices were “baffled when they touch that mystery.” Yet he likened Rogers—who was called the “Nestor of American Science” as president of the National Academy of Sciences—to a high priest in the temple of science. “He ministered at its altar of nature, unrobed indeed, yet anointed with a full consecration.”<sup>24</sup> The next year Virginia’s highest mount was given his name.

Rogers today is better known at MIT than in Virginia, where few seem to know who is commemorated by Mount Rogers, which borders North Carolina. In the spirit of science, Rogers and Darwin were united as fellow practitioners. They both accepted transmutation of species, though differently—Rogers by catastrophism and Darwin by natural selection and gradualism. Their greater difference was between the American and European mind-set, one inclined to practical science, the other the theoretical. Hardly a year passes without a speaker at MIT quoting Rogers on “useful knowledge.” In contrast, Darwin tried to answer the “mystery of mysteries” with the *Origin of Species* and, in 1871, the *Descent of Man*. In America Rogers pondered how to use Virginia’s chemical deposits for fertilizer. He was Massachusetts’s first gas meter inspector, and he set scientific standards for the readings. The National Academy of Sciences was founded amid a debate between elite science and its freelance practitioners, and if its first presidents favored a European and purist approach in the academy, Rogers as president emphasized its “obligation to bring to the attention of the government scientific matters relevant to the public welfare.”<sup>25</sup>

In modern America this older divide between applied and theoretical science has blurred, though it still adds fuel to the evolution-creation debate. Many creationist elites are in the applied sciences. They look askance at so much evolutionist philosophizing in natural history. Evolutionists argue that pure science is profoundly different from mere technology. Modern science is seamless with nature’s past, the elites of evolution say, suggesting that “creationist engineers” lack the scientific imagination to understand.<sup>26</sup>

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The elites of Thomas Jefferson’s day were the established clergy. Ousting them from government power, in fact, was his way of addressing two more American issues that today drive the evolution-creation debate: the control of knowledge by a special class and the collection of taxes.

Tax battles in the states were first waged to end church hegemony, such as Anglican levying of taxes, or curtailing of dissenters like Baptists, in Virginia. The enactment of Jefferson's Bill for Establishing Religious Liberty in Virginia in 1786 solved the immediate problem. Jefferson's words, however, remain problematic for the teaching of evolution, let alone sectarian religion, in tax-supported schools: "To compel a man to furnish contributions of money for the propagation of opinions which he disbelieves and abhors, is sinful and tyrannical."<sup>27</sup>

By unseating the religious elites, Jefferson also sought to secularize education—and put it under new arbiters of culture. His vision for the "diffusion of knowledge" is applauded today by the National Academy of Sciences, which quotes his assertion that "no other sure foundation can be devised for the preservation of freedom and happiness."<sup>28</sup> Jefferson had begun his secularization attempt when, on the board of governors at William and Mary College, he succeeded in "erasing theology from the curriculum." He founded the University of Virginia in 1825 as an "academical village." When its secular vision was met with social protests, an ethics professor was hired to teach "the proofs of the being of a God, the creator [and] author of all the relations of morality."<sup>29</sup>

Jefferson's secular ideal would not blanket American colleges and universities until the 1960s, when the natural sciences and evolution were already firmly established in higher education. By then, of course, the sage of Monticello's concession to what one historian calls a "nonsectarian religious education and moral formation" on campus was viewed as incredible. Yet soon after Jefferson's death, a spirit akin to the French Revolution swept Virginia, curtailing the role of theology professors in education, clergy in politics, and churches in landholding. "The Jeffersonian tradition in Virginia, while admirably zealous for the separation of church and state, often treats religion as so much a private matter that it should have little to say in the public realm," lamented the white-haired Episcopal bishop Peter Lee of the Diocese of Virginia in 1998. He could have spoken for all of America when he described a cultural tension in his own state—"independent, Bible-centered congregations with inherited suspicion of cities, universities, and contemporary culture."<sup>30</sup>

By the 1970s, America as a whole nurtured the same cultural atmosphere. It spawned an evangelical Christian revival and a new evolution-creation debate. The ferment put Jimmy Carter, the nation's first "born-again" candidate, in the White House and prompted *Newsweek* to dub 1976 the "Year of the Evangelical." On the conservative wing of the revival, meanwhile, was born the new Christian right, the new creationism, and a mass media vehicle for both—religious broadcasting. Virginia was center stage. Baptist pastor and broadcaster Jerry Falwell, born on the banks of the James River, founded the short-lived Moral Majority in 1979. Pat Robertson, the son of a U.S. senator from Virginia, built up his Christian Broadcasting Network audience to the point where he could run in the 1988 presidential primaries. "When people ask me if I believe in teaching creationism in

schools, I ask them, ‘Do you believe in teaching the Constitution?’” Robertson said during the New Hampshire primary. “Just imagine how it would sound, ‘All men are endowed by the primordial slime with certain inalienable rights.’”<sup>31</sup>

Though the Robertson allusion had a generic quality to it, a very specific kind of creationism was in prominence at the outset of this politically colorful period. Its trademark names varied, from “flood geology” and “young earth creationism” to “creation science.” But the common point was that science could corroborate an earth only several thousand years in age and a global flood as described in Genesis. First advocated by a Seventh-day Adventist teacher in *The Modern Flood Theory of Geology* (1935), this model of creationism was revived by an engineering professor, Henry Morris. His book *The Genesis Flood* (1961), coauthored with an Old Testament theologian, carried what Morris called a “strict creationism” to an ever wider Protestant audience.

That turning point came when Morris was professor of hydraulic engineering at Virginia Tech. He finally became chairman of the university’s civil engineering department. “When I came in 1957, Virginia Tech was pretty small,” said Morris. “It did grow quite a bit while I was there. We did get a lot of government funding.” Morris had moved from being a lukewarm Southern Baptist evolutionist in Texas to national leader for “creation science.”

Ever since his first book, *That You Might Believe*—published in 1946 to help students reconcile the Bible with history and science—Morris had worried over students’ souls. “I’d seen the devastating effect that evolutionary teaching had had on so many young people from Christian homes,” Morris told me in his office at the Institute for Creation Research in Santee, California, outside San Diego.<sup>32</sup> When at Virginia Tech, “I tried to help by forming a church.” He also met the young Falwell, who in Lynchburg, just east of the university, founded a Baptist congregation in 1956 and gave his first radio sermon six years later. When Falwell’s Bible college became a university in 1985, it also opened a creationist museum. And while the Baptist pastor was nothing if not political after 1979, it was other activists in the new Christian right who carried the creationist cause into politics and public schools.

Morris did not see politics as the best antidote for the godless times. “My dream, as I used to call it, was a Christian university something like Virginia Tech, with all the external outreaches and research programs, and from a Christian creationist point of view.” Never shy in professing his outlook, Morris once packed a Virginia Tech science hall to present the case for a young earth, which ascribed the Appalachians to a global flood and the massive earth movements linked to it. By insisting that God could act directly upon nature, he defied the uniformitarianism of modern geology and revived the catastrophism that had dominated Western science until 1830.

Morris’s controversial lecture at Virginia Tech was no catastrophe. “Even that kind of confrontation did not hurt anything,” he said. “It might have crystallized the opposition among the faculty. I do think that all led to the reasons I left Vir-

ginia Tech.” Morris departed in 1970 after thirteen years on the faculty to found his institute, a place where he could write and publish and train a hoped-for army of future flood geologists.

. . .

Traveling southwest from Virginia Tech, the rolling Interstate 81 crosses the Appalachians, intersecting Interstate 40, which leads to the university town of Knoxville. Deeper still into the Tennessee River Valley is the city of Dayton, with its courthouse-turned-museum.

Back in 1925, when the city’s iron and coal smelting suffered an economic slump, the town fathers pulled off one of the great feats of American boosterism. They staged the John T. Scopes “Monkey Trial” to attract attention—and business. The economic benefit was negligible, but the “sleepy little town among the hills” gave America its “trial of the century.”<sup>33</sup> The trial also gave America its historic memory of antievolution laws. Tennessee got its law in 1925, and it lasted until 1968, when the Supreme Court struck down a similar Arkansas statute.

But Tennessee is 43 percent Baptist. It was a dissenting minority when Jefferson had defended it but now is America’s largest single Protestant group. Baptists make up the largest cluster of religious identity in twenty states, giving creationism a boost by geography, including in Tennessee.<sup>34</sup> So the lawmakers reinstated a Tennessee antievolution law in 1973—an action vacated by the courts—and then tried again in 1996. This time they pushed a provision to discipline teachers who taught evolution “as more than a theory.” That effort was killed by a committee vote. But it brought to Tennessee an army of lobbyists and film crews, stirred a slumbering national media, generated a month of headlines about “Scopes II”—and drew some famous names in evolution.

Days before the vote was to take place, the British evolutionist Richard Dawkins rolled into Knoxville as part of a three-stop U.S. speaking tour. He ended up in Atlanta to receive the 1996 Humanist of the Year Award. “Science has all the virtues of religion, but none of its vices,” he exhorted the assembled members of the American Humanist Association. “The main vice is faith.”<sup>35</sup> The short and dapper Dawkins, whose good breeding and Oxford University chair prompted someone to call him “Darwin’s greyhound,” conveyed to America the Old World esteem for theoretical science. “I shall be making lots of such tours,” he told me in the Atlanta hotel lobby after accepting his award, conjuring images of a bygone era, the Gilded Age when Thomas H. Huxley’s 1876 tour between Boston and Washington, D.C., was celebrated as a “royal walkabout.”

Huxley had been called “Darwin’s bulldog,” and he had spread the newly minted concept of agnosticism. “The evangelism of science was beginning to produce its own Great Awakening,” says historian Desmond.<sup>36</sup> But Dawkins did Huxley one better. “I mean, you have to be agnostic about fairies,” he said, “but we all know they don’t exist, and that’s the way I feel about a deity.”<sup>37</sup>

One hundred and twenty years separate Huxley's and Dawkins's tours of the United States, but both men stand as popularizers of evolution for their age. Huxley played his evangelistic role at Chickering Hall in New York City, where he famously rolled out four fossil horses from small to big as "the demonstrative evidence of evolution." British science was viewed then as far superior to the American version, so it was no small prize that "Huxley was applauding the United States" for unearthing in Nebraska the best proof to date of evolution—the horses. The American awe of British science has waned, of course. And so while a prominent citizen gushed that "the whole nation is electrified" about Huxley's visit during America's centennial in 1876, the proper metaphor for Dawkins's tour in 1996 was the computer age.<sup>38</sup>

Dawkins's popular book *The Blind Watchmaker* (1986) included a coupon for a computer program to produce "biomorphs"—creature shapes that evolved on the computer screen as the viewer selected a particular crossbreeding and number of gene mutations. It was evolution by computer selection. I asked Dawkins what he thought of the assertion by the U.S. National Academy of Sciences that religion and science were "mutually exclusive" ways of knowing the world but were not in conflict. "I think it's a cop-out," he said. "And it's a cowardly cop-out." The evolutionist concession that religion is a valid kind of knowledge is simply "an attempt to woo the sophisticated theological lobby and to get them into our camp and put the creationists into another camp." It may be good politics. "But it's intellectually disreputable."<sup>39</sup>

Soon after the Scopes II spectacle had died down, the Tennessee Darwin Coalition organized itself and gave birth to its centerpiece event, a statewide Darwin Day on February 12, 1997, the 188th anniversary of Darwin's birth. On the second Darwin Day in 1998, a promotional flyer deemed evolution "part of our common cultural and educational heritage—not just the domain of an elite group of scientists. We need to be sure that evolution is freely discussed in classrooms and at the dinner table, and not just locked up in an ivory tower."<sup>40</sup> For its second commemoration, financial support flowed from the federally chartered American Institute of Biological Sciences. Evolutionists at other universities inquired about imitating the University of Tennessee model—films at the student union, publicity on twenty-three evolutionary biology courses in its curriculum, and a high school essay contest that asked, "Why should all Tennesseans support teaching and learning about evolution?"

To cap Darwin Day 1998, Cornell University historian of biology William Provine was the keynote speaker but not the only major name in evolution drawn to Knoxville for the celebration. On Darwin Day eve, high school teachers were invited for a training session that included Eugenie Scott, a midwesterner who was director of the National Center for Science Education near Berkeley, California, the leading anticreationist group. Creationism, she explained in her overview, evolves strategically. Once calling itself "creation science" or "abrupt appearance" theory, it may now show up as a demand for textbook disclaimers that

evolution “is only a theory” or a request that the “intelligent design” idea be included in classroom biology. She and Provine are peerless as naturalists in science who promote the grand theme of evolution. But at the Knoxville crossroads, they parted ways on how evolutionists should deal with America’s religious culture, its populist politics, and the uneasy status of scientific elites.

Scott represents the first approach. By 2000 she had spent a quarter century in this debate and had worked closely with science and educational groups, from the National Academy of Sciences to state teachers’ unions. She tells them that in America people cannot be forced to make an “either-or choice” between religious belief and evolution. “That’s part of my message to scientists,” she said. “You have to allow people to accommodate their religious views to science; otherwise science is going to lose its attraction.” She calls this a “statesmanlike” approach. It grants respect to religious faith in hopes that religion need not enter the public science classroom—where it can only slow that learning process. “In my opinion,” she writes, “using creation and evolution as topics for critical-thinking exercises in primary and secondary schools is virtually guaranteed to confuse students about evolution and may lead them to reject one of the major themes of science.”<sup>41</sup>

At the conclusion of Darwin Day 1998, the university auditorium filled for the address by Provine, a Tennessee native reared as a Presbyterian and son of a philosopher. As one of America’s most candid evolutionists, he represents the second evolutionist approach. Seeing Scott in the audience, he points out the contrast. “She works tirelessly for evolution,” he says of Scott. “And since she’s here with us on Darwin Day, she will tell you there is no conflict between ‘good religions’ and science.” Provine’s colorful PowerPoint projection, seasoned with humor and musical ditties, shows the Gallup poll finding that just four in ten Americans say God “guided” evolution. Nearly half of Americans, however, are creationists who could not possibly reconcile evolutionist science and religion, as the Scott approach prescribes. So Provine recommends brutal honesty.

“Evolution is the greatest engine of atheism,” he says. Attempts to join evolution with God are futile, as seen in beliefs that God is simply natural law itself or that God created but now is silent. “Those gods, frankly, are worthless,” Provine says. “They don’t give life after death, they don’t answer prayers, they don’t give you foundations for ethics. In fact they give you nothing.” In case the audience still was unclear about the meaning of evolution, Provine shows an image with cheerful banjo accompaniment: “When you’re dead, dead, dead, you are gone, gone, gone.” About 10 percent of Americans are at home with this belief: that there is evolution, but there is no God.

Following Provine’s view, the public should know that evolution is a slippery slope to disbelief, but in a democracy, such ideas must win by evidence and persuasion, not scientific dogma. So the best classroom pedagogy is to let creationist students speak out and let the youthful debate begin: it only makes dull science class exciting, Provine told me. “You can’t shut up a half or three-fourths of the

kids in your class,” he said. “The creationist kid can go home and say, ‘Mom and Dad, you should have seen how I put down that evolutionist in class today!’ Why should creationist parents be upset at that? Why should the parents of kids who believe in evolution be upset with that, when they haven’t brought up their kid to know enough about evolution so their kid could refute the creationist?”

A scientific optimist, Provine believes evolution will win in the end. Scott worries that stirring such classroom conflict will only baffle students and rob America of its future scientific minds. She, too, has an idealistic goal: that Americans understand the scientific method and its bona fide theories, from gravity to evolution. Provine would not disagree, but he is not the kind of person who is asked to sit on diplomatic federal science panels, a common experience for Scott.

Before his keynote address at Darwin Day, I asked Provine, “What truths about evolution must be taught in school?” He said, “I think you’d be very hard-pressed to tell me the uncontested truths of modern evolutionary biology.” What about the fact, then, that nature must come from nature? “Oh, OK,” he said, pretending he was impressed. “Does that solve the problem of species?” Evolutionists still do not agree on what a species is, he said, and speciation in the wild has hardly been observed. “A book about that would occupy maybe ten pages. A book about all we know about natural selection in the field, with best examples now, would be a book about yea thick.” He showed a gap between his fingers. “Less than a half-inch thick. Big print!”<sup>42</sup>

The evolution-creation debate in the United States began with a book, *On the Origin of Species*. To chart the relationship between the Darwinian legacy in biology and religious belief in twentieth-century America, two greater books of the Western mind take prominence: the book of Scripture and the book of nature.