

Should Creationism and Evolution Get Equal Time in Schools?

YES: Richard J. Clifford, from "Creationism's Value?" *America* (March 11, 2000)

NO: Evan Ratliff, from "The Crusade Against Evolution," *Wired* (October 2004)

ISSUE SUMMARY

YES: Richard J. Clifford, a professor of biblical studies, argues that although modern creationism is flawed, excluding the Bible and religion from American public education is indefensible. He maintains that schools should be places where religious beliefs are treated with respect.

NO: Journalist Evan Ratliff describes the current debate over introducing creationism, in its "Intelligent Design" guise, into the schools and concludes that "in science, not all theories are equal." Science education should not be decided by rhetoric, but by scientific scrutiny.

It has long been an article of faith for scientists that teleological questions ("why" questions that presume there is an intent behind the phenomena they study) should not be asked, largely because "intent" implies an interder, which is generally taken to mean divine will. As a result, there is a continuing conflict between the forces of faith and the forces of reason. Conservative Christians in the southern United States, Texas, and California have mounted vigorous campaigns to require public school biology classes to give equal time to both biblical creationism and Darwinian evolution. For many years, this meant that evolution was hardly mentioned in high school biology textbooks.

For a time, it looked like evolution had scored a decisive victory. In 1982 federal judge William K. Overton struck down an Arkansas law that would have required the teaching of straight biblical creationism, with its explicit talk of God the Creator, as an unconstitutional intrusion of religion into a government activity: education. But the creationists have not given

the research community should work closely with the federal government to determine which presently unclassified research should be classified. Early in 2003, the National Academies and the Center for Strategic and International Studies hosted a meeting that concluded researchers had better exercise self-restraint before the government imposes restraint. At the workshop, the editors of a number of major scientific journals indicated that they were following the American Society for Microbiology's lead in watching for security issues, and a group of editors and prominent scientists issued a "Statement on Scientific Publication and Security" that stressed that while both editors and authors bear responsibility to the public for the consequences of publication, scientific publication must include sufficient details for replication of the work; the very research that may be most helpful to terrorists is also likely to be most helpful to fighting terrorists; and when "on occasion an editor may conclude that the potential harm of publication outweighs the potential societal benefits ... the paper should be modified, or not be published." [See Donald Kennedy, "Two Cultures" (editorial), *Science* (February 21, 2003).] James B. Petro and David A. Relman, "Understanding Threats to Scientific Openness," *Science* (December 12, 2003), added that life scientists should assist the security community with identifying "research of concern." In October 2003, the National Research Council issued a report calling for increased oversight of unclassified research with the potential to aid terrorists. Within a few months, one of the report's recommendations—a new advisory panel for the National Institutes of Health, the National Science Advisory Board for Biosecurity—was already being implemented. The government was "so far seeking only voluntary guidelines to control research and the dissemination of results that could conceivably aid bioterrorists." See Jennifer Couzin, "U.S. Agencies Unveil Plan for Biosecurity Peer Review," *Science* (March 12, 2004).

Are there other possible answers besides restricting—voluntarily or otherwise—publication of potentially hazardous work? John D. Steinbruner and Elisa D. Harris ["Controlling Dangerous Pathogens," *Issues in Science and Technology* (Spring 2003)] call for a global body that could oversee and regulate potentially dangerous disease research. Robert H. Sprinkle proposes "The Biosecurity Trust" (*Bioscience*, March 2003): The Trust would be "a transnational, nongovernmental life-sciences organization" whose goals would be "First, to keep safe, or to make safe, the work of well-intentioned life scientists. Second, to maximize the chance that directors of malicious research-and-development efforts worldwide would cite as chief among their frustrations chronic trouble attracting and retaining, or even successfully coercing, sufficient numbers of life scientists willing to pursue illegal and immoral ends or to keep completely quiet about the true purpose of efforts assisted or observed. Third, to complement existing and evolving legal safeguards, rather than to replace or preempt them. Fourth, to foster the adaptation of the most forceful elements of the modern life-sciences ethical tradition, the Nuremberg principles, to non-medical situations, specifically to weaponizing by life scientists and to environmental endangerment. Fifth, to enrich the capacity to understand and manage biosecurity compromise, such as through the promotion of microbial-ecological education and research."

Creationism's Value?

The whole battle is hotting up," declared Ken Ham to The New York Times (12/1/99). A disillusioned science teacher turned creationist, Ham opposes the theory of evolution. He proposes instead a literal reading of the first chapter of the Book of Genesis: God created the world in six days. This interpretation has broader implications, for there is "a culture war hotting up in America between Christian morality and relative morality, which is really the difference between a creation-based philosophy and an evolution-based one." To a creationist like Ken Ham, even the common conservative view that a "day" in Genesis 1 stands for a time-span of eons is unacceptable, for it would attribute error to the Bible and reduce morality to human whim.

Creationists, who have been in and out of the public eye since the Scopes trial in 1925, had some major successes [recently]. In August 1999 the Kansas Board of Education deleted almost every mention of evolution from the state's science curriculum, and in October the Kentucky Board of Education voted to substitute the phrase "change over time" for "evolution." Oklahoma officials recently decreed that textbooks must include a disclaimer on the certainty of evolution.

What, then, should be thought of creationism? Is it a courageous stand for open-mindedness toward the Bible in an educational culture that excludes the biblical perspective? Or is it an attempt to impose an idiosyncratic view of the Bible and of science? At first glance, the creationist proposal seems reasonable: Present students with two theories, evolution and creationism, and let them make up their own minds. A second look, however, shows that the proposal contains two assumptions that virtually all professionally trained biblical scholars and scientists completely reject: that Genesis 1, interpreted literally, is the only or at least the standard biblical creation account, and that the six-day creation story in Genesis 1 is a rival to the modern theory of evolution. These assumptions show that creationism fundamentally misunderstands the Bible and the relation of science and religion.

The majority of biblical scholars, theologians of the mainstream churches, and philosophers of science hold an alternative view that will be summarized here under three headings: creation in the Bible, the differences

up. They have returned to the fray with something they call "scientific creationism" or "Intelligent Design" (ID), and they have shifted their campaigns from state legislatures and school boards to local school boards, where it is harder for lawyers and biologists to mount effective counterattacks. "Scientific creationism" tries to show that the evolutionary approach is incapable of providing satisfactory explanations. For one thing, it says that natural selection relies on random chance to produce structures whose delicate intricacy really could only be the product of deliberate design. Therefore, there must have been a designer. There is no mention of God—but, of course, that is the only possible meaning of "designer" (unless one believes in ancient extraterrestrial visitors). For an excellent presentation of the various threads in the debate over intelligent design, see Robert T. Pennock, *Intelligent Design Creationism and Its Critics: Philosophical, Theological, and Scientific Perspectives* (MIT Press, 2001), and Eugenie C. Scott and Glenn Branch, "Antievolutionism Changes and Continuities," *BioScience* (March 2003).

William Johnson, associate dean of academic affairs at Ambassador University in Big Sandy, Texas, offered another argument for replacing the theory of evolution in a 1994 speech reprinted in "Evolution: The Past, Present, and Future Implications," *Vital Speeches of the Day* (February 15, 1995). He argued that the triumph of Darwin's theory "meant the end of the traditional belief in the world as a purposeful created order . . . and the consequent elimination of God from nature has played a decisive role in the secularization of Western society. Darwinian theory broke man's link with God and set him adrift in a cosmos without purpose or end." Johnson suggested that evolution—and perhaps the entire scientific approach to nature—should be abandoned in favor of a return to religion because of the untold damage it has done to the human values that underpin society.

In the following selections, Richard J. Clifford argues that modern creationism is flawed in that it fails to recognize both that the Bible holds many versions of creation and that those who composed those versions did not think the same way as modern scientists. However, he maintains that excluding the Bible and religion from American public education is indefensible. Evan Ratliff describes the current debate over introducing creationism, in its "Intelligent Design" guise, into the schools and concludes that "in science, not all theories are equal." What is taught in science education should be those ideas that have survived scientific scrutiny, not those supported by rhetoric alone.

between biblical and modern views of creation and the relation of religion and science.

Creation in the Bible

The strongest biblical argument against creationism is that Genesis 1 is only one of many creation accounts in the Bible, and these biblical accounts are too distinctive to be harmonized. The cosmogony found in the second and third chapters of Genesis tells a very different story than Genesis 1. Here are a few of these differences. Creation in Genesis 2 proceeds at an unspecified pace that surely lasts longer than a week, whereas in Genesis 1 all takes place within six days. In Genesis 1, the man and the woman are created at the same time, whereas in Genesis 2 the man is created earlier than the woman. In Genesis 1, the animals are created before the man, which is the opposite of the order in Genesis 2.

Other creation accounts—in the Psalms, Isaiah 40–66, Job and Proverbs—also differ from one another and from Genesis 1. Psalms 77, 89 and 93, for example, depict creation as a cosmic battle with the forces of chaos; God's victory is the act of creation. Isaiah 40–55 uses creation-by-combat to interpret the reconstruction of Israel after the sixth-century exile. Israel's new creation is portrayed through a grand analogy—just as in olden times God brought Israel into being by vanquishing Sea (the Red or Reed Sea) and bringing the people to Canaan, so today he is bringing Israel into being by vanquishing Desert and bringing the people to Zion (see especially Isa. 43:16–21). Creation-by-combat is common in the Bible (and in the literature of Israel's neighbors). The creation-by-word in Genesis 1 is unique in the Old Testament and to make it the biblical standard, as creationists do, is gratuitous on purely biblical grounds.

Biblical and Modern Views of Creation

As the above examples suggest, creation in the Bible differs markedly from modern conceptions—a point that is neglected by creationism. There are important differences in the process, in the world that emerges and in the manner of reporting.

1. *The process of creation.* Ancient Near Eastern writers imagined creation on the model of human making or of natural activity. For example, the gods formed the world as an artisan works clay, or as a king's word makes things happen, or as a warrior defeats an enemy. Biblical writers did not draw the modern dichotomous distinction between "nature" and human beings, and they used psychic and social analogies to explain non-human phenomena. Today, influenced by scientific and evolutionary thinking, we understand creation as the (impersonal) interaction of physical forces extending over eons.
2. *The product or world that emerges.* For the ancients, creation issued in a populated universe. Human society was normally the term of biblical

accounts. Ancient cosmogonies explained the institutions and practices of contemporary society. The first appearance of a reality was a privileged time when the imprint of the divine maker was freshest. Hence, to know the origin of a thing was in some sense to know its essence. For moderns, on the other hand, creation is usually thought of in terms of the planets and stars. If life is mentioned, it is usually life in its most primitive forms. Human society and culture do not usually come into consideration.

3. *The manner of reporting and the criteria of truth.* The Bible often describes creation as a drama, whereas contemporary thinkers write scientific reports. The description in each case follows upon a particular conceptualization of creation, either "impersonal" or "dramatic." Each has its own criteria of truth. Scientific reports explain new data by new hypotheses, discarding old hypotheses when they do not adequately explain the data. There can be only *one* true account. Ancients, on the other hand, had many cosmogonies. They were not bothered, for example, by the impossibility of harmonizing the first and second chapters of Genesis. Their only requirement was verisimilitude—does the cosmogony make sense as a story? Ancients were less interested in how creation happened than in what the gods or God intended.

The Bible must be read in light of its difference—"The past is a foreign country; they do things differently there." Biblical cosmologists were not scientists or historians in the current meaning of those terms. They were people of faith seeking understanding by exploring the *origins* of their world. Instead of using the genre of the scientific essay that we would employ, they told and retold stories of origin, altering details or even recasting them entirely for the one purpose of explaining the world that God made. To read their stories of origins as if they were modern scientific reports is to misinterpret both the Bible and science.

Relation of Science and Theology

The third problem with creationism is that it reads biblical cosmogonies and scientific reports with the same literalness. Ian G. Barbour, who is professor of physics, professor of religion and Bean Professor of Science, Technology and Society at Carleton College in Minnesota, criticized such undifferentiated reading in his Gifford Lectures of 1989–91, published as *Religion and Science: Historical and Contemporary Issues* (1997, Part II, No. 4). Barbour argues that the models for relating science and religion are ultimately four: 1) conflict, 2) independence, 3) dialogue and 4) integration. Under the conflict model, Barbour groups both creationism and its great nemesis, the scientific materialism that holds that the scientific method is the *only* method and that matter is the fundamental reality. Each of these claims that science and theology make competing literal statements about the same domain, the history of nature. But, says Barbour, this mixes different levels of discourse. Scientific materialism starts from science but ends up making broad philosophical claims without acknowledging its shift. Biblical creationism moves from theology to make claims about science,

again without recognizing its jump to a new level of discourse. Neither school owns up to its shifting methodology.

The models most commonly used in mainstream Christian theology are the third and the fourth, dialogue and integration. It turns out that dialogue is the model favored by many contemporary Roman Catholic thinkers—for example, John Paul II, Eran McMullin, David Tracy, and the late Karl Rahner. Dialogue notices the presuppositions and the limit-questions of each area, and it is careful about methodology. Integration goes a step further, seeking some kind of integration between the content of theology and the content of science. The writings of Pierre Teilhard de Chardin (1881–1955) provide examples of this model. Whether we prefer the model of dialogue or integration, we have to be aware of the differences between the aims and methods of science and of theology. We cannot flatten out these differences as creationists do, nor can we do away with the differences between biblical literature and our own.

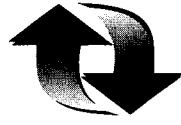
Value of Creationism

What ought one to think, then, of creationists and their project? First of all, we should recognize that creationists are human beings like ourselves, who earnestly seek religious meaning in the Bible. Moreover, if we are to be practical, we need to be aware that criticizing them will likely have no effect whatsoever. Creationists are constantly attacked and have become inured to it. The best approach, therefore, is positive—to show how a non-fundamentalist reading of the creation accounts can be religiously meaningful. Biblical creation stories reveal a God who is intent on making the world beautiful for the human race and also reveal what the world will be like at the end of time. God defeats chaos and is shown as the God of life, order and beauty.

Nonetheless, we must criticize the creationist project, even as we recognize its sincerity. This criticism will have a political dimension in addition to its epistemological one. As George Marsden has pointed out in *Fundamentalism and American Culture: The Shaping of Twentieth-Century Evangelicalism 1870–1925* (1980), American fundamentalism has a political goal—the preservation or restoration of a nondenominational conservative Christian culture. It is clear from the pressure they have exerted on state school boards that creationists share that political agenda. Opponents of creationism must, therefore, not only criticize it as an idea but also actively oppose creationists' strategy of imposing their religious views on others.

The debate about creationism in public schools can, however, have a happy outcome. American public education has traditionally excluded the Bible and religion from its curriculum. This exclusion of so central an aspect of human life and history has always been indefensible on purely academic grounds. The attempt to force schools to teach creationism can be a wake-up call to public educators. In November 1999 the National Bible Association and the First Amendment Center, with the support of 20 national organizations, ranging from the American Association of School Administrators to the Union of American Hebrew Congregations, published a booklet on

teaching the Bible in public schools. Avoiding what it calls “two failed models”—advocacy of one religion or making schools into “religion-free zones”—the booklet suggests an approach in which “public schools neither inculcate nor inhibit religion but become places where religion and religious conviction are treated with fairness and respect.” That approach is the best response to creationism.



The Crusade Against Evolution

On a spring day two years ago, in a downtown Columbus auditorium, the Ohio State Board of Education took up the question of how to teach the theory of evolution in public schools. A panel of four experts—two who believe in evolution, two who question it—debated whether an antievolution theory known as intelligent design should be allowed into the classroom.

This is an issue, of course, that was supposed to have been settled long ago. But 140 years after Darwin published *On the Origin of Species*, 75 years after John Scopes taught natural selection to a biology class in Tennessee, and 15 years after the US Supreme Court ruled against a Louisiana law mandating equal time for creationism, the question of how to teach the theory of evolution was being reopened here in Ohio. The two-hour forum drew chanting protesters and a police escort for the school board members. Two scientists, biologist Ken Miller from Brown University and physicist Lawrence Krauss from Case Western Reserve University two hours north in Cleveland, defended evolution. On the other side of the dais were two representatives from the Discovery Institute in Seattle, the main sponsor and promoter of intelligent design: Stephen Meyer, a professor at Palm Beach Atlantic University's School of Ministry and director of the Discovery Institute's Center for Science and Culture, and Jonathan Wells, a biologist, Discovery fellow, and author of *Icons of Evolution*, a 2000 book castigating textbook treatments of evolution. Krauss and Miller methodically presented their case against ID. "By no definition of any modern scientist is intelligent design science," Krauss concluded, "and it's a waste of our students' time to subject them to it."

Meyer and Wells took the typical intelligent design line: Biological life contains elements so complex—the mammalian blood-clotting mechanism, the bacterial flagellum—that they cannot be explained by natural selection. And so, the theory goes, we must be products of an intelligent designer. Creationists call that creator God, but proponents of intelligent design studiously avoid the G-word—and never point to the Bible for answers. Instead, ID believers speak the language of science to argue that Darwinian evolution is crumbling.

The debate's two-on-two format, with its appearance of equal sides, played right into the ID strategy—create the impression that this very complicated

issue could be seen from two entirely rational yet opposing views. "This is a controversial subject," Meyer told the audience. "When two groups of experts disagree about a controversial subject that intersects with the public-school science curriculum, the students should be permitted to learn about both perspectives. We call this the 'teach the controversy' approach."

Since the debate, "teach the controversy" has become the rallying cry of the national intelligent-design movement, and Ohio has become the leading battleground. Several months after the debate, the Ohio school board voted to change state science standards, mandating that biology teachers "critically analyze" evolutionary theory. This fall, teachers will adjust their lesson plans and begin doing just that. In some cases, that means introducing the basic tenets of intelligent design. One of the state's sample lessons looks as though it were lifted from an ID textbook. It's the biggest victory so far for the Discovery Institute. "Our opponents would say that these are a bunch of know-nothing people on a state board," says Meyer. "We think it shows that our Darwinist colleagues have a real problem now."

But scientists aren't buying it. What Meyer calls "biology for the information age," they call creationism in a lab coat. ID's core scientific principles—laid out in the mid-1990s by a biochemist and a mathematician—have been thoroughly dismissed on the grounds that Darwin's theories can account for complexity, that ID relies on misunderstandings of evolution and flimsy probability calculations, and that it proposes no testable explanations.

As the Ohio debate revealed, however, the Discovery Institute doesn't need the favor of the scientific establishment to prevail in the public arena. Over the past decade, Discovery has gained ground in schools, op-ed pages, talk radio, and congressional resolutions as a "legitimate" alternative to evolution. ID is playing a central role in biology curricula and textbook controversies around the country. The institute and its supporters have taken the "teach the controversy" message to Alabama, Arizona, Minnesota, Missouri, Montana, New Mexico, and Texas.

The ID movement's rhetorical strategy—better to appear scientific than holy—has turned the evolution debate upside down. ID proponents quote Darwin, cite the Scopes monkey trial, talk of "scientific objectivity," then in the same breath declare that extraterrestrials might have designed life on Earth. It may seem counterintuitive, but the strategy is meticulously premeditated, and it's working as planned. The debate over Darwin is back, and coming to a 10th-grade biology class near you.



At its heart, intelligent design is a revival of an argument made by British philosopher William Paley in 1802. In *Natural Theology*, the Anglican archdeacon suggested that the complexity of biological structures defied any explanation but a designer: God. Paley imagined finding a stone and a watch in a field. The watch, unlike the stone, appears to have been purposely assembled and wouldn't function without its precise combination of parts. "The inference," he wrote, "is inevitable, that the watch must have a maker." The

same logic, he concluded, applied to biological structures like the vertebrate eye. Its complexity implied design.

Fifty years later, Darwin directly answered Paley's "argument to complexity." Evolution by natural selection, he argued in *Origin of Species*, could create the appearance of design. Darwin—and 100-plus years of evolutionary science after him—seemed to knock Paley into the dustbin of history.

In the American public arena, Paley's design argument has long been supplanted by biblical creationism. In the 1970s and 1980s, that movement recast the Bible version in the language of scientific inquiry—as "creation science"—and won legislative victories requiring "equal time" in some states. That is, until 1987, when the Supreme Court struck down Louisiana's law. Because creation science relies on biblical texts, the court reasoned, it "lacked a clear secular purpose" and violated the First Amendment clause prohibiting the establishment of religion. Since then, evolution has been the law of the land in US schools—if not always the local choice.

Paley re-emerged in the mid-1990s, however, when a pair of scientists reconstituted his ideas in an area beyond Darwin's ken: molecular biology. In his 1996 book *Darwin's Black Box*, Lehigh University biochemist Michael Behe contended that natural selection can't explain the "irreducible complexity" of molecular mechanisms like the bacterial flagellum, because its integrated parts offer no selective advantages on their own. Two years later, in *The Design Inference*, William Dembski, a philosopher and mathematician at Baylor University, proposed that any biological system exhibiting "information" that is both "complex" (highly improbable) and "specified" (serving a particular function) cannot be a product of chance or natural law. The only remaining option is an intelligent designer—whether God or an alien life force. These ideas became the cornerstones of ID, and Behe proclaimed the evidence for design to be "one of the greatest achievements in the history of science."

The scientific rationale behind intelligent design was being developed just as antievolution sentiment seemed to be bubbling up. In 1991, UC Berkeley law professor Phillip Johnson published *Darwin On Trial*, an influential antievolution book that dispensed with biblical creation accounts while uniting antievolutionists under a single, secular-sounding banner: intelligent design. In subsequent books, Johnson presents not just antievolution arguments but a broader opposition to the "philosophy of scientific materialism"—the assumption (known to scientists as "methodological materialism") that all events have material, rather than supernatural, explanations. To defeat it, he offers a strategy that would be familiar in the divisive world of politics, called "the wedge." Like a wedge inserted into a tree trunk, cracks in Darwinian theory can be used to "split the trunk," eventually overturning scientific materialism itself.

That's where Discovery comes in. The institute was founded as a conservative think tank in 1990 by longtime friends and former Harvard roommates Bruce Chapman—director of the census bureau during the Reagan administration—and technofuturist author George Gilder. "The institute is futurist and rebellious, and it's prophetic," says Gilder. "It has a science and technology orientation in a contrarian spirit." In 1994, Discovery added ID to

its list of contrarian causes, which included everything from transportation to bioethics. Chapman hired Meyer, who studied origin-of-life issues at Cambridge University, and the institute signed Johnson—whom Chapman calls "the real godfather of the intelligent design movement"—as an adviser and adopted the wedge.

For Discovery, the "thin end" of the wedge—according to a fundraising document leaked on the Web in 1999—is the scientific work of Johnson, Behe, Dembski, and others. The next step involves "publicity and opinion-making." The final goals: "a direct confrontation with the advocates of material science" and "possible legal assistance in response to integration of design theory into public school science curricula."

Step one has made almost no headway with evolutionists—the near-universal majority of scientists with an opinion on the matter. But that, say Discovery's critics, is not the goal. "Ultimately, they have an evangelical Christian message that they want to push," says Michael Ruse, a philosopher of science at Florida State. "Intelligent design is the hook."

It's a lot easier to skip straight to steps two and three, and sound scientific in a public forum, than to deal with the rigor of the scientific community. "It starts with education," Johnson told me, referring to high school curricula. "That's where the public can have a voice. The universities and the scientific world do not recognize freedom of expression on this issue." Meanwhile, like any champion of a heretical scientific idea, ID's supporters see themselves as renegades, storming the gates of orthodoxy. "We all have a deep sense of indignation," says Meyer, "that the wool is being pulled over the public's eyes."

The buzz phrase most often heard in the institute's offices is *academic freedom*. "My hackles go up on the academic freedom issue," Chapman says. "You should be allowed in the sciences to ask questions and posit alternative theories."

None of this impresses the majority of the science world. "They have not been able to convince even a tiny amount of the scientific community," says Ken Miller. "They have not been able to win the marketplace of ideas."

And yet, the Discovery Institute's appeals to academic freedom create a kind of catch-22. If scientists ignore the ID movement, their silence is offered as further evidence of a conspiracy. If they join in, they risk reinforcing the perception of a battle between equal sides. Most scientists choose to remain silent. "Where the scientific community has been at fault," says Krauss, "is in assuming that these people are harmless, like flat-earthers. They don't realize that they are well organized, and that they have a political agenda."



Taped to the wall of Eugenie Scott's windowless office at the National Center for Science Education on the outskirts of Oakland, California, is a chart titled "Current Flare-Ups." It's a list of places where the teaching of evolution is under attack, from California to Georgia to Rio de Janeiro. As director of the center, which defends evolution in teaching controversies around the country, Scott has watched creationism up close for 30 years.

ID, in her view, is the most highly evolved form of creationism to date. "They've been enormously effective compared to the more traditional creationists, who have greater numbers and much larger budgets," she says.

Scott credits the blueprint laid out by Johnson, who realized that to win in the court of public opinion, ID needed only to cast reasonable doubt on evolution. "He said, 'Don't get involved in details, don't get involved in fact claims,'" says Scott. "Forget about the age of Earth, forget about the flood, don't mention the Bible." The goal, she says, is "to focus on the big idea that evolution is inadequate. Intelligent design doesn't really explain anything. It says that evolution can't explain things. Everything else is hand-waving."

The movement's first test of Johnson's strategies began in 1999, when the Kansas Board of Education voted to remove evolution from the state's science standards. The decision, backed by traditional creationists, touched off a fiery debate, and the board eventually reversed itself after several antievolution members lost reelection bids. ID proponents used the melee as cover to launch their own initiative. A Kansas group called IDNet nearly pushed through its own textbook in a local school district.

Two years later, the Discovery Institute earned its first major political victory when US senator Rick Santorum (R-Pennsylvania) inserted language written by Johnson into the federal No Child Left Behind Act. The clause, eventually cut from the bill and placed in a nonbinding report, called for school curricula to "help students understand the full range of scientific views" on topics "that may generate controversy (such as biological evolution)."

As the institute was demonstrating its Beltway clout, a pro-ID group called Science Excellence for All Ohioans fueled a brewing local controversy. SEOA—consisting of a few part-time activists, a Web site, and a mailing list—began agitating to have ID inserted into Ohio's 10th-grade-biology standards. In the process, they attracted the attention of a few receptive school board members.

When the board proposed the two-on-two debate and invited Discovery, Meyer and company jumped at the opportunity. Meyer, whom Gilder calls the institute's resident "polymath," came armed with the Santorum amendment, which he read aloud for the school board. He was bringing a message from Washington: Teach the controversy. "We framed the issue quite differently than our supporters," says Meyer. The approach put pro-ID Ohioans on firmer rhetorical ground: Evolution should of course be taught, but "objectively." Hearing Meyer's suggestion, says Doug Rudy, a software engineer and SEOA's director, "we all sat back and said, Yeah, that's the way to go."



Back in Seattle, around the corner from the Discovery Institute, Meyer offers some peer-reviewed evidence that there truly is a controversy that must be taught. "The Darwinists are bluffing," he says over a plate of oysters at a downtown seafood restaurant. "They have the science of the steam engine era, and it's not keeping up with the biology of the information age."

Meyer hands me a recent issue of *Microbiology and Molecular Biology Reviews* with an article by Carl Woese, an eminent microbiologist at the University of Illinois. In it, Woese decries the failure of reductionist biology—the tendency to look at systems as merely the sum of their parts—to keep up with the developments of molecular biology. Meyer says the conclusion of Woese's argument is that the Darwinian emperor has no clothes.

It's a page out of the antievolution playbook: using evolutionary biology's own literature against it, selectively quoting from the likes of Stephen Jay Gould to illustrate natural selection's downfalls. The institute marshals journal articles discussing evolution to provide policymakers with evidence of the raging controversy surrounding the issue.

Woese scoffs at Meyer's claim when I call to ask him about the paper. "To say that my criticism of Darwinists says that evolutionists have no clothes," Woese says, "is like saying that Einstein is criticizing Newton, therefore Newtonian physics is wrong." Debates about evolution's mechanisms, he continues, don't amount to challenges to the theory. And intelligent design "is not science. It makes no predictions and doesn't offer any explanation whatsoever, except for 'God did it.'"

Of course Meyer happily acknowledges that Woese is an ardent evolutionist. The institute doesn't need to impress Woese or his peers; it can simply co-opt the vocabulary of science—"academic freedom," "scientific objectivity," "teach the controversy"—and redirect it to a public trying to reconcile what appear to be two contradictory scientific views. By appealing to a sense of fairness, ID finds a place at the political table, and by merely entering the debate it can claim victory. "We don't need to win every argument to be a success," Meyer says. "We're trying to validate a discussion that's been long suppressed."

This is precisely what happened in Ohio. "I'm not a PhD in biology," says board member Michael Cochran. "But when I have X number of PhD experts telling me this, and X number telling me the opposite, the answer is probably somewhere between the two."

An exasperated Krauss claims that a truly representative debate would have had 10,000 pro-evolution scientists against two Discovery executives. "What these people want is for there to be a debate," says Krauss. "People in the audience say, Hey, these people sound reasonable. They argue, 'People have different opinions, we should present those opinions in school.' That is nonsense. Some people have opinions that the Holocaust never happened, but we don't teach that in history."

Eventually, the Ohio board approved a standard mandating that students learn to "describe how scientists continue to investigate and critically analyze aspects of evolutionary theory." Proclaiming victory, Johnson barnstormed Ohio churches soon after notifying congregations of a new, ID-friendly standard. In response, anxious board members added a clause stating that the standard "does not mandate the teaching or testing of intelligent design." Both sides claimed victory. A press release from IDNet trumpeted the mere inclusion of the phrase *intelligent design*, saying that "the implication of the statement is that the 'teaching or testing of intelligent

"We think it's deeply destructive, and we think it's false. And we mean to overturn it."

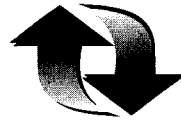


It's mid-July, and the Ohio school board is about to hold its final meeting before classes start this year. There's nothing about intelligent design on the agenda. The debate was settled months ago. And yet, Princehouse, Rissing, and two other scientists rise to speak during the "non-agenda" public testimony portion.

One by one, the scientists recite their litany of objections: The model lesson plan is still based on concepts from ID literature; the ACLU is considering sue to stop it; the National Academy of Sciences opposes it as unscientific. "This is my last time," says Rissing, "as someone who has studied science and the process of evolution for 25 years, to say I perceive that my children and I are suffering injuries based on a flawed lesson plan that this board has passed."

During a heated question-and-answer session, one board member accuses the scientists of posturing for me, the only reporter in the audience. Michael Cochran challenges the scientists to cite any testimony that the board hadn't already heard "ad infinitum." Another board member, Deborah Owens-Fink, declares the issue already closed. "We've listened to experts on both sides of this for three years," she says. "Ultimately, the question of what students should learn 'is decided in a democracy, not by any one group of experts.'"

The notion is noble enough: In a democracy, every idea gets heard. But in science, not all theories are equal. Those that survive decades—centuries—of scientific scrutiny end up in classrooms, and those that don't are discarded. The intelligent design movement is using scientific rhetoric to bypass scientific scrutiny. And when science education is decided by charm and stage presence, the Discovery Institute wins.



design' is permitted." Some pro-evolution scientists, meanwhile, say there's nothing wrong with teaching students how to scrutinize theory. "I don't have a problem with that," says Patricia Princehouse, a professor at Case Western Reserve and an outspoken opponent of ID. "Critical analysis is exactly what scientists do."

The good feelings didn't last long. Early this year, a board-appointed committee unveiled sample lessons that laid out the kind of evolution questions students should debate. The models appeared to lift their examples from Wells' book *Icons of Evolution*. "When I first saw it, I was speechless," says Princehouse.

With a PhD in molecular and cell biology from UC Berkeley, Wells has the kind of cred that intelligent design proponents love to cite. But, as ID opponents enjoy pointing out, he's also a follower of Sun Myung Moon and once declared that Moon's prayers "convinced me that I should devote my life to destroying Darwinism." *Icons* attempts to discredit commonly used examples of evolution, like Darwin's finches and peppered moths. Writing in *Nature*, evolutionary biologist Jerry Coyne called *Icons* stealth creationism that "strives to debunk Darwinism using the familiar rhetoric of biblical creationists, including scientific quotations out of context, incomplete summaries of research, and muddled arguments."

After months of uproar, the most obvious *Icons*-inspired lessons were removed. But scientists remain furious. "The ones they left in are still arguments for special creation—but you'd have to know the literature to understand what they are saying. They've used so much technical jargon that anybody who doesn't know a whole lot of evolutionary biology looks at it and says 'It sounds scientific to me, what's the matter with it?'" says Princehouse. "As a friend of mine said, it takes a half a second for a baby to throw up all over your sweater. It takes hours to get it clean."

As Ohio teachers prepare their lessons for the coming year, the question must be asked: Why the fuss over an optional lesson plan or two? After all, both sides agree that the new biology standards—in which 10 evolution lessons replace standards that failed to mention evolution at all—are a vast improvement. The answer: In an era when the government is pouring billions into biology, and when stem cells and genetically modified food are front-page news, spending even a small part of the curriculum on bogus criticisms of evolution is arguably more detrimental now than any time in history. Ironically, says Ohio State University biology professor Steve Rissing, the education debate coincides with Ohio's efforts to lure biotech companies. "How can we do that when our high school biology is failing us?" he says. "Our cornfields are gleaming with GMO corn. There's a fundamental disconnect there."

Intelligent design advocates say that teaching students to "critically analyze" evolution will help give them the skills to "see both sides" of all scientific issues. And if the Discovery Institute execs have their way, those skills will be used to reconsider the philosophy of modern science itself—which they blame for everything from divorce to abortion to the insanity defense. "Our culture has been deeply influenced by materialist thought," says Meyer.



Should Creationism and Evolution Get Equal Time in Schools?

In 1999, the Kansas Board of Education deleted evolution—as well as much other science that would support the idea of an Earth and universe older than 6,000 years—from coverage in state competency tests. Since most teachers could be expected to focus their efforts on material, their students would need to score well on the tests, and since the board had vocal anti-evolution, pro-creation members, the board's move was widely seen as supporting the anti-evolution, pro-creation agenda. See Marjorie George, "And Then God Created Kansas . . ." *University of Pennsylvania Law Review* (January 2001). Early in 2001, a new Kansas Board of Education took office and promptly put evolution back in the curriculum. See Eugene Russo, "Fighting Darwin's Battles," *The Scientist* (March 19, 2001). Yet the battle is hardly won. Not even Pope John Paul II's 1996 announcement that "new knowledge leads us to recognize that the theory of evolution is more than a hypothesis" had much impact. Indeed, in November 2004, the balance of power on the Kansas Board of Education had changed again, and an effort to move "Intelligent Design" into the curriculum was growing. See Yudhijit Bhattacharjee, "Kansas Gears Up for Another Battle Over Teaching Evolution," *Science* (April 29, 2005). A similar battle was raging in Dover, Pennsylvania; see Jeffrey Mervis, "Dover Teachers Want No Part of Intelligent-Design Statement," *Science* (January 28, 2005).

The debate has at times turned abusive, as it did in May 1996, when biologists attempting to inform the Ohio House Education Committee of how thoroughly the evidence supports the theory of evolution were heckled, jeered, and shouted down. See Karen Schmidt, "Creationists Evolve New Strategy," *Science* (July 26, 1996). The rhetoric on the other side is not always much better. Virginia Barbour, "Science and Myth," *Lancet* (April 20, 2002), says that "intellectual laziness is the most charitable explanation for not accepting the evidence for evolution." See also John Rennie, "15 Answers to Creationist Nonsense" (*Scientific American*, July 2002).

The late Stephen Jay Gould, in "The Persistently Flat Earth," *Natural History* (March 1994), makes the point that irrationality and dogmatism serve the adherents of neither science nor religion well: "The myth of a war between science and religion remains all too current and continues to impede a proper bonding and conciliation between these two utterly different and powerfully important institutions of human life."

Many Americans appear to agree with Gould. For example, Dudley Barlow, in "The Teachers' Lounge: Kansas Junta Repudiated," *Education Digest* (May 2000), contends that most Americans are willing to give creationism space in public education because "it is good to expose students to several

different ways of thinking about complex ideas." However, the battle continues (see Mano Singham, "The Science and Religion Wars," *Phi Delta Kappan* [February 2000] and Randy Moore, "The Revival of Creationism in the United States," *Journal of Biological Education* [Winter 2000]) and even shows signs of spreading abroad. In Turkey, for instance, teachers of evolution are receiving e-mailed death threats, and a legislator is trying to get evolution taken out of the schools. See Robert Koenig, "Creationism Takes Root Where Europe, Asia Meet," *Science* (May 18, 2001).

Among recent books on this issue, Thomas Woodward's *Doubts About Darwin: A History of Intelligent Design* (Baker Books, 2003) argues the case in favor of "Intelligent Design." Michael Ruses *Darwin and Design: Does Evolution Have a Purpose?* (Harvard University Press, 2003) also covers the history but concludes that those who study evolution have an almost religious response to the marvels they find. More critical efforts include Niall Shanks, *God, the Devil, and Darwin: A Critique of Intelligent Design Theory* (Oxford University Press, 2004); Barbara Forrest and Paul R. Gross, *Creationism's Trojan Horse: The Wedge of Intelligent Design* (Oxford University Press, 2004); and Matt Young and Taner Edis, eds., *Why Intelligent Design Fails: A Scientific Critique of the New Creationism* (Rutgers University Press, 1984).

