

Creationism in the Public Arena

In this chapter we explore creationism and its originating religious movement, Protestant fundamentalism. The public and political activity of creationists takes place within the context of public education—science classrooms, school boards, and state education boards. Their success in resisting evolutionary theory shows in the numbers of Americans who would never identify themselves as fundamentalists but who, in polls and surveys, give the same answers to questions as fundamentalists do about, for example, the dating of the universe or the creation of human beings.

Creationism has changed names several times in the last century. In the current stage, Intelligent Design (ID) is equivalent to creationism, though without the latter's explicit biblical emphasis. ID still refuses to restrict scientific explanations to natural causes that can and must be verified to be accepted. Scientific method explicitly rules out explanations that appeal to the supernatural, to God. To fundamentalists this restriction is atheism. They do not see its value as a methodological principle necessary for scientific explanation to be a genuine contribution to our knowledge of the natural world.

We will start with some strong criticisms of fundamentalism and then turn to a description of some of its features

and the role of creationism. Our discussion will include an overview of some of the more influential court cases in which creationism has been ruled an unconstitutional violation of the separation of church and state.

Critics of creationism define it harshly. R. Scott Appleby describes it as an “organized, militant religious opposition to secular modernity and its accomplices (pluralism, relativism, feminism).”¹ Peter Hodgson provides an even more sweeping condemnation: “Fundamentalism rejects critical reason and empirical evidence in favor of an ideological and sometimes fanatical faith that horribly distorts the biblical and theological principles to which it appeals. It supports a politics that is driven by aggression, fear, and xenophobia, and a culture that is intolerant of diversity, minority rights, and free inquiry.”²

Barbara Forrest cautions against casually dismissing fundamentalist creationism and the related Intelligent Design (ID) movement: “There is widespread popular misunderstanding of the true nature and goals of the ID creationist movement. In order to counteract it effectively, an accurate understanding of its nature and agenda is imperative. The conception of ID as non-biblical and of its status as an alternative scientific theory—a conception based in ID proponents’

1. Appleby, “History in the Fundamentalist Imagination,” 498. This article is a good introduction to the worldview shared by fundamentalists. See also Appleby and Marty, “Fundamentalism.” They are the editors of the five-volume work, *The Fundamentalism Project*. Among resources for this chapter and sources for further reading is Barr, *Fundamentalism*. This book is described by some as a starting point for understanding fundamentalism although much has been written since its publication. See also Nielsen, *Fundamentalism, Mythos and World Religions*.

2. Hodgson, *Liberal Theology*, 82.

self-description, which has echoed throughout the popular media—is wrong.”³

Fundamentalism has its roots in a theological resistance to modernity. It is not an ancient tradition but a twentieth-century religious movement and the most conservative of Protestant traditions. Donald Dayton locates the emergence of fundamentalism in the contrast between two theological orientations in early twentieth-century Protestantism, “post-millennialism” and “dispensationalism.”⁴ Each is an interpretation of history.

Postmillennial theology holds that Christ will reign for an era (the millennium) through a gradual acceptance of the gospel and the changed lives of those who accept it. It is a literal interpretation of the Lord’s Prayer: “Your will be done on earth, as it is in heaven.” The kingdom of God

3. Forrest, “Understanding the Intelligent Design Creationist Movement,” 2. Forrest argues that Intelligent Design is creationism under a new name. I take this view here, too. Where does all this lead? ID is connected with the Discovery Institute and the Center for Science and Culture in Seattle, Washington. Their “Wedge Strategy” identified their goals as seeing “intelligent design theory as the dominant perspective in science; to see design theory applied in specific fields, including molecular biology, biochemistry, paleontology, physics, and cosmology in the natural sciences and ethics, politics, theology, and philosophy in the humanities; to see its influence in the fine arts; and to see design theory permeate our religious, cultural, moral, and political life.”

The Wedge Strategy is quoted in many places. See, for example, the statement signed by the Duquesne University Department of Biological Sciences. Online: <http://www.science.duq.edu/pdf/BiolDPosPapGeneral.pdf>.

4. Dayton, “Creationism in Twentieth-Century America.” The terms *postmillennialism* and *dispensationalism* are explained in Dayton and the following resources: Sandeen, *The Rise of Fundamentalism*; and Smith, “Postmillennialism and the Work of Renewal in the Theology of Jonathan Edwards.”

will be realized through the work of the church. The names of B. B. Warfield and R. J. Rushdoony (noted in this chapter with Christian Reconstructionism) are associated with two different interpretations of this theology. The belief that Jesus' Second Coming will return after the millennium is the reason for the prefix *post*-. With the idea that the forces of Satan will be defeated and good will triumph over evil, this theology suggests the possibility of progress. For some mainline Protestant traditions, postmillennial ideas contributed to the assimilation of evolutionary theory.

Dispensationalism is a theology of history in which history is envisioned as seven "administrations" or stages of God's dealings with humankind between creation and the second coming of Christ in judgment. It emphasizes differences between Israel and the Church and between law and grace. It is also anti-evolutionist. It is from this theology that the idea emerges of the "rapture of the church at Christ's coming." Christ's coming will establish a worldwide kingdom.

This theology is associated with Dwight L. Moody. It was developed in the "prophecy conferences" after the Civil War, such as the Niagara Bible Conferences, popularized in the Bible School movement, and canonized in the notes of the *Scofield Bible*. This study Bible, annotated by Cyrus I. Scofield, was first published in 1909 and revised in 1917. The 1917 edition is still published by Oxford University Press. The words of Jesus are marked in red.

Dispensationalist theology is also connected with John Nelson Moody. Moody taught that God has different requirements for people in different ages and that some parts of the Bible are not obligatory for believers today. Since divine judgment is ahead, it is necessary to be born again before the

return of Christ. Scofield's Bible is credited with the conviction of fundamentalists that the earth is young. The notes included the calculation of the date of creation as 4004 B.C.E., a date proposed by Archbishop James Ussher. It is also credited with generating creationism.

Dispensationalist theology is accepted by some in various Protestant churches but not by Christian traditions such as Roman Catholicism.

FEATURES OF FUNDAMENTALISM

Those involved in the beginning of fundamentalism were as opposed to liberal Protestant theology as they were to Darwin's evolutionary theory. The movement was propelled by theologians from various denominations associated with Princeton Theological Seminary. Its name came from the 1909 publication of twelve books by Rueben Archer Torrey, *The Fundamentals*, that defined the central beliefs of Christianity as Torrey saw them. The emphasis was on right belief, orthodoxy. Among the fundamental beliefs noted, these five held special importance:

- the inerrancy of the Bible
- the Virgin Birth
- the historicity of Christ's miracles
- the substitutionary atonement of Christ, and
- Christ's bodily resurrection.

The "inerrancy of the Bible" meant the truth of the Bible as a historically factual narrative. Fundamentalists read Genesis 1, the first creation story, as the revelation of an act

whereby God made things essentially as they are today. By “creation,” fundamentalists mean “special creation,” the belief that everything came directly from God. Inerrancy also means that the Bible contains no errors in history or science, including the inferred age of the universe of about 6,000 years.

The authority of the Bible is grounded in the authority of God. Fundamentalism is patriarchal in worldview. The world is structured hierarchically, with God as its head and humankind obedient to God, and with man as the head of woman. Cultural gender patterns are regarded as the order of creation. Just as there is a “fixity of species” in creation, so there is a “fixity of gender roles” in the social world. The separate and unequal gender spheres that characterize the ancient world in which the Bible originated are taken to be normative for today as well. The public sphere is male; the private, domestic sphere is female.

In their deepest desire, fundamentalists would reestablish the religious foundation for American society that they believe once existed and that modernity destroyed. By “religious foundation” they do not intend respect and inclusion of diverse religious traditions but specifically a Christian foundation, and more specifically, the theologically conservative one shaped by the founders of the movement.

This goal, if it were to be realized, would forego one of the principal values underlying democratic society, namely the constitutional separation of church and state. The First Amendment of the U.S. Constitution guarantees the autonomy of religion. The government maintains a position of neutrality that supports religious pluralism, not exclusivism. The diversity of religions is respected, all are considered legitimate, and the government privileges none. As a theological

position, religious pluralism affirms that different religions offer genuine ways of salvation for their adherents. As a political position, pluralism allows all but does not endorse any religious expression.

By contrast, fundamentalists are politically and theologically exclusivist. Reasoning from the authority of the Bible, fundamentalists are exclusivist in their understanding of salvation. Christ is the one means of salvation, as this text from the Acts of the Apostles asserts: “There is salvation in no one else, for there is no other name under heaven given among mortals by which we must be saved” (Acts 4:12).

Fundamentalists have no problem with violating the separation of church and state. They would like for the government not only to privilege Christianity but to be Christian. If there is one way to God, the value of religious diversity is lessened. They are exclusivist even in their view of other Christian denominations—not all are salvific, in fact, there may be only one that is: their own.

In this regard, the most extreme of Christian conservative groups is the Christian Reconstructionists. Its founder, Rousas John Rushdooney (1916–2001), wanted to create a theocracy by replacing constitutional law with a form of biblical law. Obviously, in a theocracy there is no separation of church and state. In contrast to the political affirmation of religious pluralism, one religion is privileged. Although small in numbers, this movement has been influential in the political power of the Christian Right over the last half century.

THE MASTER NARRATIVE

In its twelve volumes, *The Fundamentals* had space not only to identify the foundational beliefs to be accepted but also to specify what was to be rejected. Roman Catholicism was prominent on this list, as were socialism and modern philosophy. Sharing first place for rejection were modern biblical scholarship and Charles Darwin's theory of evolution.

While biblical scholarship and evolutionary science appear to be quite different, in fact, each challenged the "history" revealed in the Bible. This posed a serious problem for fundamentalists. For them, the past is the history of salvation. Salvation history is a story, one starting with the first man, Adam, then moving to the father of the nation of Israel, Abraham, then to the mediator of God's liberation of the Hebrews from slavery, Moses, on up to the culmination of the story with Jesus, the expression of God's own self-communication. Evolutionary science produced a story, too, one of emergence and change, from a single-celled entity, dinosaur fossils, apes, and other kinds of evidence. From the sciences, fundamentalists were confronted with an earth billions of years old, not the six or ten thousand years they inferred from the Bible. The stories of salvation and science were irreconcilable.

Fundamentalists first criticized Darwin's theory of evolution as an insufficient account of origins. Although they may have difficulties acknowledging the fact of evolution, the reality of change over time, it is the method of scientific knowing itself that is of paramount concern. As its first principle, modern empirical science requires that natural explanations be given for natural phenomena. A natural expla-

nation can be tested and verified; a supernatural explanation cannot. Accordingly, scientists “bracket God” in scientific explanation. This methodological principle is impossible for fundamentalists to accept. To them scientific method sounds suspiciously like atheism. How could the *origin* of the world be explained without God? The distinction made by scientists that they are not investigating the origin of *life* but the origin of the world and its development is a subtlety missed by conservatives. To be fair, some scientists are not fully cognizant of the distinction either. Even if the Big Bang is the “first moment” and the “originating event” of the universe, it is so as the origin of development, not being.

In contrast to the scientific account of an evolutionary universe, fundamentalists continued to insist that Genesis 1 be accepted as the revelation of *special creation*. They argue that God intervenes in nature to create each species, that species did not develop such intricate designs through chance, and that creation is revealed through Genesis 1. In this light, evolution and creation are opposing accounts of the development of the natural world. They cannot both be true. They require a choice between them.

Special creation is not a view that is intrinsic to Christian belief, nor is it common to the faith of the early church. There is a diversity among the early church theologians in their views of creation as well as their interpretations of the Genesis accounts. In his work finished in 415 c.e., *On the Literal Meaning of Genesis: A Commentary in Twelve Books*, for example, Augustine dismissed the idea that God actually created in the six days depicted in the Genesis narrative.⁵ Rather, God creates everything simultaneously, in

5. Augustine, 1:154–62.

a single act, including time. Genesis 1 is to be taken metaphorically, not as literal history.

CREATIONISM

Fundamentalists have rejected many aspects of modernity, modern science, and modern biblical scholarship; but they have not formed a separatist community. If anything, the movement has been a very public one with a political agenda. Creationists in particular have opposed evolutionary science by trying to eliminate the teaching of evolution in public schools or trying to integrate the biblical story of creation into the science classroom as an alternative to evolution.

Over the course of the twentieth century, creationists changed their self-designation as well as their strategy. The term *creation science* replaced *creationism*. In turn, *Intelligent Design* replaced *creation science*. A further term, *critical analysis*, has been introduced but has not yet taken on a life of its own. There are slight differences in approach from one designation to the other, but the reason for the changes is solely pragmatic. When courts ruled that the conduct of creationists—in posting disclaimers, and so forth—was unconstitutional, creationists changed their name in order to continue the work but avoid the judgment. The term *Intelligent Design* was introduced after the U.S. Supreme Court ruled in the 1987 case, *Edwards v. Aguillard*, that teaching creation science in public schools was unconstitutional.

Creationists have tried various means to get people to accept the Genesis story—not only as true but also as evidence against evolutionary theory. As noted above, by “creation” fundamentalists mean special creation, the creation

of all life forms essentially as they are today. They take this seriously. Ronald L. Numbers describes fundamentalists home-schooling. "At Christian Liberty Academy in Arlington Heights, Illinois, for example, some 500 students learn that belief in creationism is essential not only for living in a morally acceptable manner but for achieving eternal life as well."⁶ There are 30,000 students in the extended program.

The political aim of creationism is the elimination of "Darwinism." From the start they have focused on the one place where everyone will meet evolution: the high school science classroom. Thus their attention to local and state school boards and state legislators in their role as overseers of the state's educational system.

Creationist strategies have varied. The most extreme proposal advanced—and accepted in the short-term—has been to take the concept of evolution out of states' guidelines for science altogether. Failing that, they have put disclaimers in biology textbooks disputing evolution and mandated that teachers read prepared statements to the effect that evolutionary theory is flawed in some respect. Evolution is "just a theory." Theory is portrayed in common sense terms as a guess or opinion. Because the fossil record does not contain evidence of every single step in the transformation of species or the emergence of new species, they portray the "gaps" in the record as evidence that evolutionary theory is flawed. Debates and differences among scientists are signs that the theory is "falling apart." The consequences of teaching evolution, they argue, have been the breakdown of traditional values and moral behavior. They assign even the spread of

6. Numbers, "Creation Science," May 25, 1995.

HIV/AIDS to “Darwinism,” their diminutive for evolutionary theory.

Creationists have also portrayed the Genesis story as a theory and advocated the inclusion of “creation science” alongside “evolutionary science” as an alternative theory. They call for science teachers to “teach the controversy,” although the controversy is only at their initiation.

Religious conservatives worked hard during the first half of the twentieth century to keep publishers from treating evolution in science textbooks. When publishers did include it, creationists poured their energy into casting doubt on it. Using the strategies described above, they persuaded local school boards, state education boards, and state legislatures to restrict schools from teaching evolution. They tried to change the definition of science in state guidelines by severing the word *natural* from *explanation* in defining science, thereby leaving the way open for supernatural explanation.

Although successful with school boards and with state laws, creationists have failed in the courts. In case after case brought before courts in the last forty years or so, the courts have rebuffed creationist strategies. Courts have consistently ruled that their actions are a political violation of the First Amendment, the separation of church and state, and the Amendment’s Establishment Clause, which restricts the government from favoring the religious beliefs of some over those of others. It is this restriction that fundamentalists want lifted for their particular understanding of the Earth’s origins. They want a local school board or the formulation of state education requirements to mandate the inclusion of the biblical story of creation as they interpret it or to exclude the concept

of evolution because it conflicts with their understanding of the way things have come into being.

INTELLIGENT DESIGN

Leaders of the Intelligent Design (ID) movement constitute a relatively small group. The names of four come up often. All are associated with the Center for Science and Culture, the ID component of the Discovery Institute, in Seattle, Washington:

- Philip Johnson is credited with starting the ID movement. He is professor of law at Boadt Hall, the University of California at Berkeley, and author of *Darwin on Trial*.
- Michael J. Behe is a biochemist and author of *Darwin's Black Box: The Biochemical Challenge to Evolution*.
- William A. Dembski, author of *The Design Inference*, is a mathematician and philosopher.
- Jonathan Wells is a molecular biologist with a doctorate in religious studies. He is author of *Icons of Evolution: Why Much of What We Teach about Evolution Is Wrong*.

As a further reframing of creationism, ID is not new. It is William Paley's *Natural Theology* revived with a mix of evolutionary biology unknown to Paley. But under the ID name biblical references disappear. The seven-day creation story, the garden, the sin of Adam and Eve, Noah, the ark, and the great flood—all these disappear. ID integrates some

aspects of evolutionary theory. Its adherents present ID as a theoretical alternative. ID contrasts Darwin's mechanism for evolution, natural selection, with a different mechanism.

Identifying a *mechanism* of evolution is an answer to the question, "What accounts for the obvious complexity and diversity in the world?" Creationists reject the idea that the constellation of features in complex entities could develop through the natural process of random genetic variation. The biochemist Michael Behe argues that specific life forms are "irreducibly complex" and could not have resulted from natural selection. A cell would be an example of an irreducibly complex form. It is impossible, in his view, that such a complex entity could be produced by small successive modifications.

Behe argues that such complexity can only be explained by the direct intervention of a designer, not by a natural process. The ID argument is simple and familiar: design implies a designer. Design as intricate as the human eye—William Paley's original example—must be the result of intervention in nature by an Intelligent Designer. Behe extends this argument by offering examples on the molecular level. This Intelligent Designer is not explicitly identified with the Christian God, but the association can hardly be missed.⁷

THE RESPONSE OF SCIENTISTS

Scientists distinguish between the claim that we are presently unable to explain something (an epistemological claim) and

7. Helpful explanations and critiques of creationism are: Alters and Alters, *Defending Evolution*; Pennock, ed., *Intelligent Design Creationism and Its Critics*; and Pigliucci, *Denying Evolution*.

the claim that we cannot explain something and must invoke a supernatural cause (a metaphysical claim).

The epistemological claim does not cause any problems. Scientists readily concur that we are unable at the present time to explain many things. Human understanding is always incomplete. Further questions keep scientific knowing “on the move” and ever-expanding.

The metaphysical claim that we must evoke a supernatural explanation for things we cannot explain does cause problems. The physical world is not arbitrary. To put it in terms of being, there are not some physical things that develop naturally and some whose existence requires supernatural intervention. Or to put it in terms of knowing, there are not some physical things that are intelligible and can be known and others that are beyond intelligibility and require a supernatural explanation.

Scientists presume intelligibility. The natural world can be known. What we do not know awaits the right questions to generate insights that grasp just what is there to be grasped. Once the insights occur and the subsequent judgments are verified, the unknown becomes the known. What Behe calls “irreducibly complex” are admittedly complex phenomena. But they are part of the incredibly complex yet intelligible world, not instances of things created by supernatural intervention and excluded from our capacity to understand.

ID adherents portray their program as scientific. But in the judgment of evolutionary scientists, ID is a new version of an old “God of the gaps” argument in which one evokes the divine to explain phenomena not currently understood. The problem with any form of the “God of the gaps” argument is simple. When scientists *do* figure out the natural cause of

whatever has been attributed to divine intervention, the need for God is eliminated. Creationists portray ID as an alternative theory to evolutionary theory. But scientists' critique of them is that they misrepresent scientific facts, have serious conceptual flaws in their formulations, and lack credible scientific evidence for their own proposals.

Scientists and philosophers of science highlight several reasons to withhold the designation "science" from the work of those committed to ID principles.

Scientific method. The first reason regards scientific method. Science is understanding. It results from raising questions, engaging in observation and experimentation, and formulating insights into the data into hypotheses. ID publications are more often critiques of evolutionary theory than reports of results from engagement with scientific method. They have been accused of misrepresenting the theory of evolution or diminishing it by referring to it as "just a theory." (Of course, gravity is "just a theory," too.) Their appeal to "teach the controversy" appears bold, but there is no controversy on the side of scientists.

Scientific concepts. A second reason regards scientific concepts. Published ID materials are often devoid of scientific content. ID advocates are not engaged primarily in scientific research. They do not have work going forward that will, in time, contribute to the advance of scientific knowledge. What concepts have been proposed have drawn direct criticism. For example, scientists do not find the concept of "irreducible complexity" persuasive and have contradicted it by tracing the pathways by which organisms and specific features of organisms develop and change.

Scientific theory. A third reason why ID is not science centers on the character of scientific theory. Appeal to a supernatural reality as the explanation of evolution or complexity cannot be tested. It fails, then, to meet a primary criterion for scientific method. Scientific knowledge results from explaining natural phenomena by their natural causes. In contrast, the ID account explains natural change by the intervention of a transcendent reality.

It would be hard for creationists to produce genuinely scientific results when they reject the methodology of modern science. Trained in graduate programs as mathematicians or scientists, creationists such as Behe, Dembski, and Fell were obviously drawn to theoretical inquiry and had the personal skills to achieve doctorates in highly technical areas. Yet their appropriation of creationism demonstrates a blind spot regarding the nature of theory and the kind of intellectual activity in which contemporary scientists are engaged.

Creationists reject the neutrality that modern science adopts by its restriction of explanations to natural causes and exclusion of any appeal to the supernatural. They see this discipline as a deliberate rejection of God rather than as a methodological means of limiting explanations to what is testable and verifiable. While religious believers promote such appeal to God, it ends up being harmful to religious belief. If God is named the cause of what is scientifically unknown, when the unknown eventually becomes known, God becomes unnecessary.

Here, reference to a prior philosophical framework may prove helpful. In naming the supernatural as the cause of natural events, creationists confuse what Thomas Aquinas distinguished as primary and secondary causality. Secondary

causality refers to the finite system of laws governing the universe. Secondary causality is created. It is the condition for the possibility of the verifiable explanations that contribute cumulatively to our knowledge of reality and that serve as the ground for further prediction and experimentation. Primary causality refers to the ultimate source for secondary causality, to God as the source of the whole, to the ultimate source for the existence of the universe and its intelligibility. Primary causality is infinite, not finite. As the primary cause, God operates not by “making things” or species but as the ground of being itself.

Scientists and religious conservatives go their separate ways not just on what they know, but more fundamentally on how they know and, perhaps most significantly, the very value of knowing itself. Understanding how knowledge figures into this conflict is a major part of grasping the nature of the conflict. But ultimately, the issue is the common good. The concept of evolution is not an incidental or arbitrary concept but a foundational and necessary one for understanding the world in which we live. The world without it is not the real world, the one in which progress and the common good are contingent on meeting problems intelligently and responsibly.

THE OPINION OF COURTS

The first trial pitting science and religion against one another was the famous Scopes trial in 1925.⁸ The state of Tennessee had passed House Bill 185 prohibiting evolution from being taught in the state's schools. Of itself this restriction would not

8. See Linders, “Tennessee vs. John Scopes.”

be a violation of the separation of church and state protected by the First Amendment. The violation was appealing to the Bible as the reason for removal of evolution. The prohibition read:

Section 1. *Be it enacted by the General Assembly of the State of Tennessee*, That it shall be unlawful for any teacher in any of the Universities, Normals and all other public schools of the State which are supported in whole or in part by the public school funds of the State, to teach any theory that denies the story of the Divine Creation of man as taught in the Bible, and to teach instead that man has descended from a lower order of animals.

....

Section 2. *Be it further enacted*, That any teacher found guilty of the violation of this Act, Shall be guilty of a misdemeanor and upon conviction, shall be fined not less than One Hundred \$100.00 Dollars nor more than Five Hundred (\$500.00) Dollars for each offense.

The anti-evolution crusade was led by William Jennings Bryan, a famous attorney and several-times candidate for President. Bryan had been influential in fundamentalist efforts to legislate prohibitions against teaching evolution in fifteen states. The American Civil Liberties Union offered its services to anyone who would challenge the Tennessee law. A biology teacher in the Tennessee school system, John Scopes, agreed to do so.

The defense attorney was Clarence Darrow, a well-known lawyer like Bryan. The defense goal focused not so much on the immediate outcome of this trial—Scopes's acquittal—as

the use of the case later by a higher court in having these state laws prohibiting evolution ruled unconstitutional.

In fact Scopes was not acquitted. He was found guilty and fined. And when the case went to the Tennessee Supreme Court the next year, the decision of this lower court was dismissed on a technicality. What the defense had hoped to gain was not achieved. But in a roundabout way, the fundamentalist cause was undermined. In defending scriptural inerrancy, William Jennings Bryan came off looking like a fool. Of the fifteen states considering similar anti-evolution legislation, only Arkansas and Mississippi went ahead with it at that time.

The Scopes trial received worldwide attention. On the other side of the globe, New Zealanders were kept up-to-date with the trial through newspaper articles in the secular press with titles such as “Tennessee’s heresy hunt: the ‘down with evolution’ comedy” (*New Zealand Free Lance*, July 15, 1925). Ronald Numbers and John Stenhouse write that:

The *New Zealand Free Lance*, a popular illustrated weekly, described the event as “the most amazing trial held since the days of the Spanish Inquisition, or, say, the witchcraft ‘smelling-out’ era in Massachusetts”: The prosecution of Scopes shows “America’s freak laws at their zenith of silliness” and provided the world with “the joke of the decade.” The day after the trial began, the *New Zealand Herald* ran a front-page story captioned “A crusade of darkness: blind fanaticism.” Linking the trial to religious dogmatism and southern racism, the newspaper found it “hard to take the anti-evolution movement seriously.” Such rhetoric established the public image of antievolutionists as

benighted fools, indigenous to the southern United States.⁹

Subsequent cases have exhibited increasing clarity and sophistication by American courts about the issues at stake and the character of the creationist ploy. In suits filed both against them and by them, courts routinely rule against creationists. The following five cases are often cited as the most important.¹⁰

In the 1968 case, *Epperson v. Arkansas*, the United States Supreme Court invalidated an Arkansas statute that prohibited the teaching of evolution because its primary purpose was religious, thus violating the Establishment Clause. The brief opens by summarizing the case:

Appellant Epperson, an Arkansas public school teacher, brought this action for declaratory and injunctive relief challenging the constitutionality of Arkansas' "anti-evolution" statute. That statute makes it unlawful for a teacher in any state-supported school or university to teach or to use a textbook that teaches "that mankind ascended or descended from a lower order of animals." The State Chancery Court held the statute an abridgment of free speech violating the First and Fourteenth Amendments. The State Supreme Court, expressing no opinion as to whether the statute prohibits "explanation" of the theory or only teaching that the theory is true, reversed the Chancery Court. In a two-sentence opinion it sustained the statute as within the State's power to specify the public

9. Numbers and Stenhouse, "Antievolutionism in the Antipodes."

10. See Matsumura and Mead, "10 Significant Court Decisions Regarding Evolution/Creationism."

school curriculum. Held: The statute violates the Fourteenth Amendment, which embraces the First Amendment's prohibition of state laws respecting an establishment of religion.¹¹

By the 1980s, fundamentalists had adopted the language of "creation-science" for their interpretation of the Bible. Arkansas Act 590, titled "Balanced Treatment for Creation-Science and Evolution-Science Act," was signed into law in 1981. The title of the act and the mandate were the same: "Public schools within this State shall give balanced treatment to creation-science and to evolution-science." In *McLean v. Arkansas Board of Education* (1982), a federal court held that this "balanced treatment" statute violated the Establishment Clause of the U.S. Constitution.

In a 1994 California case, a high school biology teacher, John Peloza, sued his school district for requiring him to teach evolution against his religious beliefs and barring him from talking to students about his religious beliefs. In *Peloza v. Capistrano School District*, the U.S. Court of Appeals, Ninth Circuit, upheld a district court finding that a teacher's First Amendment right to free exercise of religion was not violated by a school district's requirement that evolution be taught in biology classes.

In 1994, the Tangipahoa, Louisiana, school board approved a statement asserting that the study of evolution was "not intended to influence or dissuade the Biblical version of Creation or any other concept." Further, it is the "basic right and privilege of each student to form his/her own opinion or maintain beliefs taught by parents on this very important

11. *Epperson v. Arkansas*, 393, U.S. 97 (1968).

matter of the origin of life and matter.”¹² The Louisiana ACLU sued the school board, citing the disclaimer as a violation of the separation of church and state.

On appeal, in 1997, in *Freiler v. Tangipahoa Parish Board of Education*, the United States District Court for the Eastern District of Louisiana rejected this disclaimer, noting that the school board portrayed evolution as a religious viewpoint that runs counter to other religious viewpoints. This decision is also important for noting that proposals for “intelligent design,” a new term, were equivalent to proposals for teaching “creation science.”

The U.S. Fifth Circuit Court of Appeals agreed with the district court decision that the statement violated the First Amendment separation of church and state. These decisions, however, did not stop fundamentalists in Louisiana from trying to approve disclaimers—used in Alabama since 1996—like the one above. A December 13, 2002, *New York Times* article noted that the state’s education board had rejected such a proposal at its December 12 meeting. One board member in favor of the disclaimer opposed evolution by saying, “I don’t believe I evolved from some primate.”

In 2005, in *Tammy Kitzmiller et al. v. Dover School District et al.*, a federal judge, John E. Jones III, offered perhaps the most thorough and sophisticated judicial assessment of the creationist/ID cause and the philosophical, scientific, and constitutional issues it raised. He ruled that the school board’s 1994 requirement that teachers read a statement noting “gaps in evolutionary theory” and mandating discussion

12. Brief for *Freiler v. Tangipahoa Parish Board of Education*. Online: <http://caselaw.lp.findlaw.com/scripts/getcase.pl?navby=search&case=/data2/circs/5th/9830132cv1.html>.

about “Intelligent Design” prior to discussion of evolution in class was unconstitutional. Jones identified Intelligent Design as a religious viewpoint that advances a particular version of Christianity.

Taking up the question of what constitutes science, Judge Jones emphasized that ID is not science. By appealing to a supernatural explanation, ID violates the method of modern empirical science. He cited its “dualism,” whereby evidence discrediting evolution is taken as a confirmation of ID. The argument regarding “irreducible complexity,” Jones wrote, is a negative argument against evolution, not proof of design.

Scientific experts, among them Francisco Ayala, a University of California biologist and philosopher of science, testified that evolutionary theory does not contradict belief in a divine creator. Judge Jones ruled that the disclaimer statement was a constitutional violation of the Establishment Clause. Because ID is not a science, he wrote in his opinion for the trial, its only purpose is the advancement of religion.

The school board members were severely criticized for blindly adopting the proposal of ID adherents while dismissing the views of science teachers and experts in the field. Judge Jones cited the “striking ignorance” of the ID concept by board members. They were quite aware that they were trying to “inject some form of creationism” into science classrooms, however. In a particularly damning judgment, Judge Jones wrote, “Any asserted secular purposes of the board are a sham and are merely secondary to a religious objective.” He noted the “breathtaking inanity” of the board members’ actions judged against the factual backdrop revealed by the trial.

CREATIONISM AND THE SCIENTIFIC COMMUNITY

Creationism has also challenged the scientific community to greater clarity about evolution, science, and science education. Individual scientists, professional organizations, and law courts concur overwhelmingly in the judgment that creationism under any name does not belong in science classrooms in the American public school system. For scientists, creationism violates the integrity of scientific knowledge. For the courts, creationism violates the constitutional separation of church and state. For both, the duplicity of creationists in pretending to be scientific or do science is a particular problem. Dozens of professional scientific organizations have made statements to this effect over the last decade or so.¹³ Their statements offer compact summaries of the importance of evolutionary theory across the board in the sciences. The positions of the American Chemical Society and the Association for the Advancement of Science are two good examples. The statement of the former is quoted in full:

The American Chemical Society (ACS) strongly supports the inclusion of evolution in K–12 science curricula, at an age-appropriate level, because evolution is central to our modern understanding of science. Evolutionary theory is not a hypothesis, but is the scientifically accepted explanation for the origin of species, and explains significant observations in chemistry, biology, geology, and other disciplines. Because of the overwhelming evidence supporting evolution, it has been recognized and endorsed as a key component of science

13. National Center for Science Education, “Statements from Scientific and Scholarly Organizations.”

education by all major scientific societies including the National Academy of Sciences (NAS), the American Association for the Advancement of Science (AAAS), and the National Science Teachers Association (NSTA). The ACS joins these prestigious organizations in recognizing the critical importance of the scientific principles embodied in evolutionary theory.

Science is a human activity that uses the observation of natural phenomena and systems, and the study of modifications to these systems, to develop models that explain the order and function of the universe. The theory of biological evolution is based on hundreds of years of scientific observation and experimentation and tens of thousands of scientific publications. It provides students with a unifying concept that explains the incredibly rich diversity of living things and their capacity to change and evolve over time to adapt to changing environments. It is a central component of modern biology and biotechnology. Evolution is an active field of research in which new discoveries continue to increase our knowledge and understanding of the specific processes and paths that biological evolution has followed over the millions of years that life has existed on earth.

Evolution cannot be dismissed or diminished by characterizing it as mere conjecture or speculation. Scientific explanations of the natural world have been reached through observation and experimentation, are testable through observation and manipulation of natural systems, and can be modified as a result of new information. The inclusion of non-scientific explanations in science

curricula misrepresents the nature and processes of science and compromises a central purpose of public education—the preparation of a scientifically literate workforce.

An early statement of the American Association for the Advancement of Science and its Commission on Science Education (1972) is notable for its clarity. During the past century and a half, the earth's crust and the fossils preserved in it have been intensively studied by geologists and paleontologists. Biologists have intensively studied the origin, structure, physiology, and genetics of living organisms. The conclusion of these studies is that the living species of animals and plants have evolved from different species that lived in the past. The scientists involved in these studies have built up the body of knowledge known as the biological theory of the origin and evolution of life. There is no currently acceptable alternative scientific theory to explain the phenomena.

The various accounts of creation that are part of the religious heritage of many people are not scientific statements or theories. They are statements that one may choose to believe, but if he does, this is a matter of faith, because such statements are not subject to study or verification by the procedures of science. A scientific statement must be capable of test by observation and experiment. It is acceptable only if, after repeated testing, it is found to account satisfactorily for the phenomena to which it is applied.

In 2002, thirty years later, the same society passed this resolution:

Recognizing that the “intelligent design theory” represents a challenge to the quality of science education, the Board of Directors of the AAAS unanimously adopts the following resolution:

Whereas, ID proponents claim that contemporary evolutionary theory is incapable of explaining the origin of the diversity of living organisms;

Whereas, to date, the ID movement has failed to offer credible scientific evidence to support their claim that ID undermines the current scientifically accepted theory of evolution;

Whereas, the ID movement has not proposed a scientific means of testing its claims;

Therefore Be It Resolved, that the lack of scientific warrant for so-called “intelligent design theory” makes it improper to include as a part of science education;

Therefore Be Further It Resolved, that AAAS urges citizens across the nation to oppose the establishment of policies that would permit the teaching of “intelligent design theory” as a part of the science curricula of the public schools . . .

THE COURT OF PUBLIC OPINION

Americans are predisposed toward taking the word of scientists as authoritative. Students will often assign “truth” to scientific statements and “opinion” to non-scientific statements. The burden of proof is on the non-scientific. In popular usage, “to know” is to know scientifically. Except in the case of evolution.

When it comes to evolution, we see a strange and muddled picture. On the one hand, Americans are unquestion-

ably proud of their scientific and technological prowess in the world. Many work in technological fields. Complex scientific research results in new medicines and cures for once-feared diseases. Americans value scientists and science. On the other hand, they devalue and dismiss evolution as “just a theory.” Confusing the meaning of both fact and theory, they describe evolutionary theory “as just a theory and not a fact.” Scientists are no longer authoritative voices when it comes to the development of the universe, although, from the viewpoint of scientists themselves, the evidence for evolution is overwhelming.

Several polls taken over the last several years confirm this fact: many Americans have not integrated scientific views about evolution into their personal understanding of the world.¹⁴ A poll taken in August 2006 by the Pew Forum on Religion and Public Policy found that 42 percent of those polled agreed with the statement that God created human beings essentially as they are today about 10,000 years ago. Slightly more people, 48 percent, believed that human beings had evolved. But 65 percent of white evangelicals polled believe that humans have existed only in their present form. Among those who accept evolution, the Pew poll found that 21 percent thought that evolutionary changes were guided directly by a supreme being. Only 26 percent believed that evolution was due to natural selection, as Darwin and subsequent scientists have argued. A strong majority of those

14. University of California Museum on Paleontology, “Understanding Evolution”; The Pew Forum on Religion and Public Life 2005 survey, “Public Divided on Origins of Life”; Harris Interactive Inc. 2005 survey, “Nearly Two-thirds of U.S. Adults Believe Human Beings Were Created by God.”

polled, 64 percent, thought that both creation and evolution should be taught in schools. And 38 percent agreed with the statement that *only* creationism should be taught. The Gallop and Harris polls have had similar results.

Such results are alarming because they indicate the extent to which creationists have affected all of public opinion. The power of fundamentalist creationists to set the terms of this debate far outweighs their numerical percentage within Christian denominations. Many people who would not identify themselves at all with creationism describe their own views in terms that are virtually identical to the way creationists formulate the issues, affirming, for example, that:

- Evolutionary theory leads to atheism.
- Creation means God's created things in six days.
- Creation and evolution are opposing accounts of "what happened."
- Creation gives purpose and meaning to the world.
- Evolution is random and directionless.
- It is only fair that both sides or both theories be presented.
- A theory is not quite as good as a fact.
- No one was there; we can't say what happened.

Thus, despite the continual efforts of mainline churches, state and federal courts, and eminent scientific guilds, many if not most Americans subscribe to a major misunderstanding of our evolutionary world, the scientific enterprise, and what it means to affirm God as "creator of heaven and earth."

STUDENT MISUNDERSTANDINGS

Similar misunderstanding is evident among American college students. None of the students quoted below are identified with creationism. But their student essays showed an understanding of the issue shaped almost exclusively by the creationist views. Even to refer to the “conflict between creation and evolution” is an indication of this influence. Students often have little with which to counter easy positions picked up from the public airing of fundamentalist views. Their understanding of scientific method and what makes science is often weak. Their conception of evolution rarely reflects a scientific grasp of what scientists consider the unifying concept of the sciences.

Both creationists and evolutionary scientists, for example, speak of the *theory* of creation in Genesis, the latter to embrace it, the former to reject it. Both conceive of *creation* without reference to its technical meaning in the theological tradition. Students are often indifferent to which “theory” is right—creation or evolution. They await proof. This student writes:

Most of the people making decisions about creation v. evolution are more concerned about the separation between church and state rather than the truth (no matter what that may be). Evolution is a theory and Intelligent Design comes from the Bible but neither one have been proven fact. Intelligent Design is not allowed in science classrooms but the theory of evolution is. Each side should be given a fair chance in schools until one has been proved fact. It comes down to open-mindedness. Most Americans chose only to believe what they want to and are not open to hearing other people's

opinions no matter how right or wrong. Atheists don't want to believe. You could prove beyond all doubt that Intelligent Design exists and these people would deny it forever. It is in our nature to question everything and whether or not Intelligent Design exists or not, I don't know but I believe that believers should be allowed to research it and it should be allowed to be taught in our schools.

Creationists often portray evolutionary theory as one step away from disintegration. They portray what scientists do not yet understand as "gaps" or deficiencies in the theory. One student wrote that "because evolution is just a theory, there are many holes in it that are unexplainable at this time," an almost-verbatim criticism found in creationists' writings.

The creationists' disparagement of evolution as "just a theory" suggests there is something wrong with theory or that one comes down from something to theory. Theories are dismissed. What this student says is voiced by students routinely:

Evolution is at heart, a theory, not something gained on hard data. There are gaps in this theory that the scientist fills with things of material origins. Empirical data can be misinterpreted, and no one was there at the beginning, which makes all this conjecture. Evolution is opposed to the Bible. One has a creation of six days; the other is a random set of things. Religion and science contradict one another in this and other issues.

Especially obvious is the creationists' equivalence of Genesis 1 and creation, which then makes creation and evolution opposites. They are two mutually contradictory accounts of what happened. This student writes:

The Bible is involved in the debate over creation and evolution because the Bible claims that God is the one creator of all living things. The debate is over whether all things were created by God or they have come to be over a long period of time. Science and religion cannot agree on this. Moreover, some things are too complicated to have simply evolved. They must have been created by God.

The creationist view that evolutionary theory leads to conflict between evolution and creation also shows up in student thinking. This student writes:

Evolution is the answer for people who don't have faith in a spirit world and who believe that the world is completely due to scientific processes. Evolution is a process in which the world was created by "random atomic collisions." The Bible describes creation occurring over six days. God describes each creation as "good" which describes the importance and value of each creation. Evolution describes things coming to be at "random" implying that this process was perhaps a mistake. The process by which the world was created has been a topic of debate for many years. The issue is whether the process was scientific or the work of God. Were human beings formed by evolution from previous animal-like creatures or by the work of God? Those who believe in God believe the process in the creation story is the sole reason the world and people exist.

Many presume that this conflict is unavoidable. Whatever debate takes place on the issue is formulated in creationists' terms.