

study Business Management. Or, he could have declared only the Business Management major at Northwest College and taken the same theology courses as electives.” Susanna Dukupil, *Function Follows Form: Locke v. Davey’s Unnecessary Parsing*, 2004 *Cato Sup. Ct. Rev.* 327, 330.

8. Did the Washington program place an unconstitutional condition on Davey’s free exercise of religion by forcing him to give up his religious choice in order to receive a government benefit? *Davey* raises a classic question about the government’s relationship to constitutional rights, namely, “whether the government has an affirmative obligation to facilitate the exercise of a constitutional right, rather than restrain itself from interfering in the exercise of that right.” Do you think the government has such an affirmative obligation to fund devotional theology? Does it have an affirmative obligation to fund abortion or artistic work? See Jason S. Marks, *Spackle for the Wall? Public Funding for School Vouchers After Locke v. Davey*, *J. Missouri Bar*, May–June 2005 (“In every situation, the Court has answered this question in the negative.”).

The scholars of religion were eager to design a scientific study of religion that was distinguishable from unscientific subjects such as theology, divinity or evangelism. They believed that the scientific study of religion in public schools was constitutional, while unscientific approaches were not. In the next section, we examine how science can be taught in public schools. The debate arises from the teaching of Darwinian evolution in public school science classes. If the scientific study of evolution is permissible, may schoolteachers teach biblical creation, creation-science or intelligent design? Must schoolteachers introduce these subjects wherever evolution is taught? Are evolution, creationism and intelligent design science, religion or both?

B. CREATION, EVOLUTION AND INTELLIGENT DESIGN

1. CREATION

The Book of Genesis contains two accounts of creation, which biblical scholars refer to as the Priestly and Yahwist stories, names based on the words that the different authors use for God and the style of their writing. See John J. Collins, *Introduction to the Hebrew Bible* 49–50 (2004). What are the differences between the two accounts of creation that follow?

The Book of Genesis

The Priestly Author, 1:1–2:3
New Revised Standard Version Bible

1 In the beginning when God created the heavens and the earth, **2** the earth was a formless void and darkness covered the face of the deep, while

a wind from God swept over the face of the waters. **3** Then God said, “Let there be light”; and there was light. **4** And God saw that the light was good; and God separated the light from the darkness. **5** God called the light Day, and the darkness he called Night. And there was evening and there was morning, the first day.

6 And God said, “Let there be a dome in the midst of the waters, and let it separate the waters from the waters.” **7** So God made the dome and separated the waters that were under the dome from the waters that were above the dome. And it was so. **8** God called the dome Sky. And there was evening and there was morning, the second day.

9 And God said, “Let the waters under the sky be gathered together into one place, and let the dry land appear.” And it was so. **10** God called the dry land Earth, and the waters that were gathered together he called Seas. And God saw that it was good. **11** Then God said, “Let the earth put forth vegetation: plants yielding seed, and fruit trees of every kind on earth that bear fruit with the seed in it.” And it was so. **12** The earth brought forth vegetation: plants yielding seed of every kind, and trees of every kind bearing fruit with the seed in it. And God saw that it was good. **13** And there was evening and there was morning, the third day.

14 And God said, “Let there be lights in the dome of the sky to separate the day from the night; and let them be for signs and for seasons and for days and years, **15** and let them be lights in the dome of the sky to give light upon the earth.” And it was so. **16** God made the two great lights—the greater light to rule the day and the lesser light to rule the night—and the stars. **17** God set them in the dome of the sky to give light upon the earth, **18** to rule over the day and over the night, and to separate the light from the darkness. And God saw that it was good. **19** And there was evening and there was morning, the fourth day.

20 And God said, “Let the waters bring forth swarms of living creatures, and let birds fly above the earth across the dome of the sky.” **21** So God created the great sea monsters and every living creature that moves, of every kind, with which the waters swarm, and every winged bird of every kind. And God saw that it was good. **22** God blessed them, saying, “Be fruitful and multiply and fill the waters in the seas, and let birds multiply on the earth.” **23** And there was evening and there was morning, the fifth day.

24 And God said, “Let the earth bring forth living creatures of every kind: cattle and creeping things and wild animals of the earth of every kind.” And it was so. **25** God made the wild animals of the earth of every kind, and the cattle of every kind, and everything that creeps upon the ground of every kind. And God saw that it was good.

26 Then God said, “Let us make humankind in our image, according to our likeness; and let them have dominion over the fish of the sea, and over the birds of the air, and over the cattle, and over all the wild animals of the earth, and over every creeping thing that creeps upon the earth.”

27 So God created humankind in his image, in the image of God he created them; male and female he created them.

28 God blessed them, and God said to them, “Be fruitful and multiply, and fill the earth and subdue it; and have dominion over the fish of the sea and over the birds of the air and over every living thing that moves upon the earth.” **29** God said, “See, I have given you every plant yielding seed that is upon the face of all the earth, and every tree with seed in its fruit; you shall have them for food. **30** And to every beast of the earth, and to every bird of the air, and to everything that creeps on the earth, everything that has the breath of life, I have given every green plant for food.” And it was so. **31** God saw everything that he had made, and indeed, it was very good. And there was evening and there was morning, the sixth day.

2 Thus the heavens and the earth were finished, and all their multitude. **2** And on the seventh day God finished the work that he had done, and he rested on the seventh day from all the work that he had done. **3** So God blessed the seventh day and hallowed it, because on it God rested from all the work that he had done in creation.

The Book of Genesis

The Yahwist Author, 2:4b–2:25
New Revised Standard Version Bible

2 In the day that the LORD God made the earth and the heavens, **5** when no plant of the field was yet in the earth and no herb of the field had yet sprung up—for the LORD God had not caused it to rain upon the earth, and there was no one to till the ground; **6** but a stream would rise from the earth, and water the whole face of the ground—**7** then the LORD God formed man from the dust of the ground, and breathed into his nostrils the breath of life; and the man became a living being. **8** And the LORD God planted a garden in Eden, in the east; and there he put the man whom he had formed. **9** Out of the ground the LORD God made to grow every tree that is pleasant to the sight and good for food, the tree of life also in the midst of the garden, and the tree of the knowledge of good and evil.

10 A river flows out of Eden to water the garden, and from there it divides and becomes four branches. **11** The name of the first is Pishon; it is the one that flows around the whole land of Havilah, where there is gold; **12** and the gold of that land is good; bdellium and onyx stone are there. **13** The name of the second river is Gihon; it is the one that flows around the whole land of Cush. **14** The name of the third river is Tigris, which flows east of Assyria. And the fourth river is the Euphrates.

15 The LORD God took the man and put him in the garden of Eden to till it and keep it. **16** And the LORD God commanded the man, “You may freely eat of every tree of the garden; **17** but of the tree of the knowledge of good and evil you shall not eat, for in the day that you eat of it you shall die.”

18 Then the LORD God said, “It is not good that the man should be alone; I will make him a helper as his partner.” **19** So out of the ground the LORD God formed every animal of the field and every bird of the air, and brought them to the man to see what he would call them; and whatever the man called every living creature, that was its name. **20** The man gave names to all cattle, and to the birds of the air, and to every animal of the field; but for the man there was not found a helper as his partner. **21** So the LORD God caused a deep sleep to fall upon the man, and he slept; then he took one of his ribs and closed up its place with flesh. **22** And the rib that the LORD God had taken from the man he made into a woman and brought her to the man. **23** Then the man said,

“This at last is bone of my bones
and flesh of my flesh;
this one shall be called Woman,
for out of Man this one was taken.”

24 Therefore a man leaves his father and his mother and clings to his wife, and they become one flesh. **25** And the man and his wife were both naked, and were not ashamed.

Notes and Questions

1. *Creation Myths.* “A creation myth is a cosmogony, a narrative that describes the original ordering of the universe. . . . Like all myths, creation myths are etiological—they use symbolic narrative to explain beginnings because the culture at one point lacked the information to explain things scientifically.” David Adams Leeming & Margaret Adams Leeming, *A Dictionary of Creation Myths* vii (1994). Are the Priestly and Yahwist accounts of creation in Genesis myths? Are they etiological or scientific? For example, did creation really take place in six days? Does each day represent a different geological era in the world’s development? Or were there no days of creation at all? Are the days of creation actual and literal, or metaphorical, analogical, symbolic or poetic?

2. *Creation ex nihilo.* According to Leeming and Leeming, “[t]he basic creation story, then, is that of the process by which chaos becomes cosmos, no-thing becomes some-thing. . . . Creation occurs primarily in one of five ways: 1) from chaos or nothingness (*ex nihilo*), 2) from a cosmic egg or primal maternal mound, 3) from world parents who are separated, 4) from a process of earth-diving, or 5) from several stages of emergence from other worlds.” Id. at viii. Which type of myth are these creation stories from Genesis? Does it matter if creation occurs out of chaos or *ex nihilo*, out of nothing? Or are chaos and nothingness the same thing? See Ernan McMullin, ed., *Evolution and Creation* 8 (1985) (the Jewish creation myth was distinctive in the ancient world because of God’s creation of humans out of nothing instead of out of some existing material). Most Christians believe that Genesis supports a doctrine of creation *ex nihilo*. See David Kelsey, “The Doctrine of Creation from Nothing,” in id. at 176. Mormons, however, believe that chaos was already present and that God’s creation put order

into the chaos or matter that was already there; this distinguishes them from the traditional Christian theology of creation *ex nihilo*. See Francis J. Beckwith, Carl Mosser & Paul Owen, eds., *The New Mormon Challenge* 99–107 (2002). According to the traditional Mormon theology, “God ‘created’ the world by organizing, shaping, or forming preexistent matter and was limited in what he could create by matter’s inherent nature.” Jim W. Adams, *The God of Abraham, Isaac, and Joseph Smith?: God, Creation, and Humanity in the Old Testament and Mormonism*, in *id.* at 180.

In this the Mormons follow in the footsteps of St. Augustine, who subscribes to the Priestly narrative and argues that in the beginning “was not absolute nothingness,” but formlessness. See, e.g., Augustine, *Confessions* 247 (Henry Chadwick trans., 1991). According to Leeming and Leeming, sometimes it is hard to distinguish between creation from nothing and creation from chaos. This ambiguity is evident in, for example, ibn Rushd’s (Latin name Averroes) statement that the world is “made by God” and “did not come to be by chance or by itself.” Averroes, *Faith and Reason in Islam* 78 (Ibrahim Y. Najjar trans., 2001). By contrast, Moses Maimonides, the author of the *Mishneh Torah* (the first attempt at a codification of Jewish law) and a major, if not the major, authority within the Jewish tradition, says unambiguously in *The Guide of the Perplexed* that “all who believe in the Law of Moses our Master” hold that God created the world *ex nihilo*. Moses Maimonides, *The Guide of the Perplexed* 281 (Shlomo Pines trans., 1963).

What do you think the text of Genesis says about creation out of nothing or out of something? What does this early Hindu text from the Rig-Veda say about creation *ex nihilo*? Is it consistent with Genesis?

There was neither aught nor naught, nor air, nor sky beyond.
 What covered all? Where rested all? In watery gulf profound?
 Nor death was then, nor deathlessness, nor change of night and day.
 The One breathed calmly, self-sustained; nought else beyond it lay.
 Gloom, hid in gloom, existed first—one sea, eluding view.
 That One, a void in chaos wrapt, by inward fervour grew.
 Within it first arose desire, the primal germ of mind,
 Which nothing with existence links, as sages searching find.
 The kindling ray that shot across the dark and drear abyss—
 Was is beneath? or high aloft? What bard can answer this?
 There fecundating powers were found, and mighty forces strove—
 A self-supporting mass beneath, and energy above.
 Who knows, who ever told, from whence this vast creation rose?
 No gods had then been born—who then can e’er the truth disclose?
 Whence sprang this world, and whether framed by hand divine or no—
 Its lord in heaven alone can tell, if even he can show.

W.J. Wilkins, *Hindu Mythology, Vedic and Puranic* 342–43 (2d ed. 1973). See also *id.* (reporting that later generations then tried to shed more light on what happened at creation by developing different creation myths).

3. *Alternative Stories of Origins.* China’s “most colourful creation myth centres on the giant Coiled Antiquity (Pan Gu), the first-born, semi-

divine human being. It tells how he lay dying and as his life ebbed away his breath became the winds and clouds, his voice thunder, his eyes the sun and moon, and his limbs mountains. His bodily fluids turned into rain and rivers, his flesh into the soil. His head hair became the stars, his body hair became vegetation. His teeth, bones and marrow turned into minerals. The insects on his body became human beings. This myth is made up of a series of metamorphoses in which the various parts of the body became analogous parts of the universe. It is one of many myths of the cosmological human body from around the world, and it contains the important myths of the dying god and the nurturing god, who gave his body for the benefit of humankind.” Anne Birrell, *Chinese Myths* 19 (2000).

Atrahasis is an old, pre-Genesis Babylonian myth from about 1700 B.C.E. in which “the chief gods were Anu, Enlil, and Enki. When the gods cast lots and divided the world, Anu took the sky, Enlil the earth, and Enki the waters below the earth. . . . The labor of agriculture was imposed on a class of gods called the Igigu. The first section of the myth deals with the rebellion of these worker gods, which led the high gods to concede that their workload was too heavy. Consequently, Enki and the mother-goddess created humanity ‘to bear the load of the gods.’ They slaughtered ‘a god who had intelligence’ (probably the god who had the idea for the rebellion), and Nintu mixed clay with his flesh and blood. From this mixture, she fashioned seven males and seven females.” John J. Collins, *Introduction to the Hebrew Bible* (2004); see also Stephanie Dalley, *Myths from Mesopotamia: Creation, the Flood, Gilgamesh and Others* 4 (1989) (*Atrahasis* . . . “may be compared with that in the *Epic of Creation*, in which Marduk used the blood of Qingu, the evil leader of the enemy gods whom he had slain, to create mankind with the help of Ea; clay is not mentioned, and no birth-goddess takes part, but the purpose of man’s creation is again to toil on the gods’ behalf. Neither account mentions the creation of animals, which is an important preliminary to man’s creation in Genesis (Priestly source).”). How does Genesis compare with these creation myths?

4. According to the *Jewish Study Bible*, in Genesis 2:7, “man has a lowlier origin than in the parallel in 1:26–28. He is created not in the image of God but from the dust of the earth.” Adele Berlin & Marc Zvi Brettler, eds., *The Jewish Study Bible* 15 n.7 (2004). Does that mean that the Yahwist account is closer to evolutionary theory than the Priestly account? Is the following excerpt from Charles Darwin consistent with the Book of Genesis? Is this consistency literal or metaphorical?

2. EVOLUTION

The Origin of Species

Charles Darwin.
371, 395–96 (1996), originally published 1859.

That many and serious objections may be advanced against the theory of descent with modification through natural selection, I do not deny. I

have endeavored to give them their full force. Nothing at first can appear more difficult to believe than that the more complex organs and instincts should have been perfected, not by means superior to, though analogous with, human reason, but by the accumulation of innumerable slight variations, each good for the individual possessor. Nevertheless, this difficulty, though appearing to our imagination insuperably great, cannot be considered real if we admit the following propositions, namely,—that gradations in the perfection of any organ or instinct which we may consider, either do now exist or could have existed, each good of its kind,—that all organs and instincts are, in ever so slight of a degree, variable,—and, lastly, that there is a struggle for existence leading to the preservation of each profitable deviation of structure or instinct. The truth of these propositions cannot, I think, be disputed. . . .

It is interesting to contemplate an entangled bank, clothed with many plants of many kinds, with birds singing on the bushes, with various insects flitting about, and with worms crawling through the damp earth, and to reflect that these elaborately constructed forms, so different from each other, and dependent on each other in so complex a manner, have all been produced by laws acting around us. These laws, taken in the largest sense, being Growth with Reproduction; Inheritance, which is almost implied by reproduction; Variability, from the indirect and direct action of the external conditions of life, and from use and disuse; a Ratio of Increase so high as to lead to a Struggle for Life, and as a consequence to Natural Selection, entailing Divergence of Character and the Extinction of less-improved forms. Thus, from the war of nature, from famine and death, the most exalted object which we are capable of conceiving, namely, the production of the higher animals, directly follows. There is a grandeur in this view of life, with its several powers, having been originally breathed *by the Creator** into a few forms or into one; and that, whilst this planet has gone cycling on according to the fixed law of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been, and are being, evolved.

Notes and Questions

1. *What is evolution?* According to Eugenie Scott,

The broad definition of evolution is “a cumulative change through time,” and refers to the fact that the universe has had a history—that if we were able to go back into time, we would find different stars, galaxies, planets, and different forms of life on Earth. Stars, galaxies, planets, and living things have changed through time. There is astronomical evolution, geological evolution, and biological evolution. Evolution, far from being “Man evolved from monkeys,” is thus integral to astronomy, geology, and biology. It is relevant to physics and chemistry as well. . . . In biology, evolution is the inference that living things

* Emphasis added. Darwin added the “by the Creator” to the second edition of his book; it was not present in the original. Darwin, *supra*, at xxiv.

share common ancestors and have, in Darwin's words, "descended with modification" from these ancestors. The main—but not the only—mechanism of biological evolution is natural selection. . . .

Natural selection is the term given by Charles Darwin to what he—and almost all modern evolutionary biologists—considered to be the most powerful force of evolutionary change. In fact, the thesis that evolution is primarily driven by natural selection is sometimes called Darwinism. Unfortunately, many people misapply the term to refer to the concept of descent with modification itself, which is erroneous. Natural selection is not the same as *evolution*. . . . [T]here is a conceptual difference between a phenomenon and the mechanisms or processes that bring it about.

Eugenie C. Scott, *Evolution vs. Creationism: An Introduction* 24–25, 34 (2004).

2. Charles Darwin added the words "by the Creator" to the second edition of his book; they were not present in the original. Darwin, *supra*, at xxiv. According to Edward Larson, "Despite Darwin's closing concession, *Origin of Species* dealt a body blow to traditional Western religious thought. At a superficial level, Darwin's chronology for the origin of species differed on its face from that set forth in Genesis. Species evolved from preexisting species over vast periods of time, he asserted; God did not separately create all of them in a few days." Edward J. Larson, *Evolution: The Remarkable History of a Scientific Theory* 88–89 (2004); see also Daniel C. Dennett, *Darwin's Dangerous Idea: Evolution and the Meanings of Life* 59 (1995) ("Here then is Darwin's dangerous idea: the algorithmic level *is* the level. . . . No matter how impressive the products of an algorithm, the underlying process always consists of nothing but a set of individually mindless steps succeeding each other without the help of any intelligent supervision; they are 'automatic' by definition: the workings of an automaton. They feed on each other, or on blind chance—coin flips, if you like—and on nothing else.").

Whether it dealt a "body blow" to Christian thought or not, evolution has been the subject of much controversy since the publication of *Origin of Species* in 1859. In his book *Trial and Error: The American Controversy Over Creation and Evolution*, Edward J. Larson provides a detailed history of the debate about Darwinism in the United States. Indeed his chapter titles summarize the story of that development: Evolution before 1920; Outlawing, 1920–25; Enforcing, 1925–60; Legalizing, 1961–70; Equal Time, 1970–81; Outlawing Creation, 1981–90; and Mandating Evolution, 1990s and beyond. (3rd ed. 2003). Larson reports that it took until the 1880s for Darwin's ideas to reach the basic biology textbooks as core scientific knowledge. After that, teaching Darwin was uncontroversial until the 1920s, when fundamentalist Christians initiated legislation in several southern states to ban Darwin from the schoolbooks. Most noteworthy was the State of Tennessee, which in 1925 passed legislation (sometimes called the "monkey law") making it a crime to teach evolution in the public schools. Although the Progressive former presidential candidate, William

Jennings Bryan, led the campaign against evolution, even Bryan questioned the criminal penalty, preferring Florida's earlier law because no test case could be brought if there was no penalty. See Edward J. Larson, *Summer for the Gods: The Scopes Trial and America's Continuing Debate Over Science and Religion* 47–50 (1997). For a comprehensive history of creationism, see Ronald L. Numbers, *The Creationists: The Evolution of Scientific Creationism* (1992).

The test case came in Tennessee. In response to advertisements by the American Civil Liberties Union seeking plaintiffs to challenge the anti-evolution law, residents of Dayton, Tennessee, initiated a prosecution of John Scopes for teaching evolution in defiance of state law. The trial put Dayton on the map; the national media focused on the Scopes trial, where Bryan, aiding the state, battled Scopes' famous lawyer Clarence Darrow. A jury took nine minutes to convict Scopes. Darrow did not get the appellate reversal that he desired; instead, the Supreme Court of Tennessee reversed Scopes' conviction because the judge, not the jury, had imposed the \$100 fine. See *Scopes v. Tennessee*, 154 Tenn. 105, 289 S.W. 363 (1927). Because of this technical error, Scopes had no conviction to appeal to the United States Supreme Court, and the anti-evolution bill remained on the books until its repeal in 1967. See *Epperson v. Arkansas*, 393 U.S. 97, 102 (1968).

Larson reports that the anti-evolution acts had their desired effects from the 1930s to the 1960s, as publishers removed controversial evolutionary materials from the books. Larson, *Trial and Error*, supra, at 230–31. "By 1930, only five years after the Scopes trial, an estimated 70 percent of American classrooms omitted evolution, and the amount diminished even further thereafter." Eugenie C. Scott, *Evolution vs. Creationism: An Introduction* 97 (2004). So things remained until the 1960s, when teachers challenged the bans on teaching evolution and Americans became more interested in improving science education so they could compete with the Russians in sending men to the moon. In 1968, Susan Epperson won her challenge to a 1928 Arkansas law that forbade the teaching of evolution in public schools. See *Epperson v. Arkansas*, 393 U.S. 97 (1968). The Arkansas law made it a misdemeanor, punishable by dismissal, to teach or use a textbook stating "mankind ascended or descended from a lower order of animals." *Id.* at 99. Justice Abe Fortas' opinion concluded that the law violated the Establishment Clause because it proscribed teaching evolution "for the sole reason that it is deemed to conflict with a particular religious doctrine," namely, the Book of Genesis. *Id.* at 103.

Justice Hugo Black concurred in *Epperson* because he thought the statute was vague, but he raised the question why the state could not simply decide to take controversial subjects such as evolution out of the schools in order to avoid controversy. *Id.* at 113. Indeed, Bryan's original strategy had been to keep both evolution and creationism from the schools. Do you agree with efforts to keep both evolution and creationism out of the classroom in order to avoid the intense disagreements about their merits?

Instead of "neutrality by silence," in the 1960s the teaching of evolution in the classrooms accelerated and creationists demanded equal time in

the classroom for creationism. In Tennessee, a 1974 statute required that *biblical* creationism must be included equally whenever evolution was taught; that law was invalidated as a violation of the Establishment Clause. See *Daniel v. Waters*, 515 F.2d 485 (6th Cir. 1975); *Steele v. Waters*, 527 S.W.2d 72 (Tenn. 1975). Then Yale law student Wendell Bird wrote a note that identified a different equal time strategy. See *Freedom of Religion and Science Instruction in Public Schools*, 87 *Yale L.J.* 515 (1977–78). Instead of requiring *biblical* creationism, Bird argued that teaching evolution alone violated the free exercise of opponents of evolution and proposed that *scientific* creationism be taught whenever evolution was. *Id.* at 517–18. Equal time statutes were introduced in some twenty-seven states in the 1980s but passed only in Louisiana and Arkansas. See Eugenie C. Scott, *Evolution vs. Creationism: An Introduction* 106 (2004). The Arkansas Balanced Treatment for Creation–Science and Evolution–Science Act was invalidated by a federal district court in the following case.

3. EVOLUTION AND CREATION–SCIENCE

McLean v. Arkansas Board of Education

United States District Court, Eastern District of Arkansas, 1982.
529 F.Supp. 1255.

MEMORANDUM OPINION

■ OVERTON, DISTRICT JUDGE.

Introduction

On March 19, 1981, the Governor of Arkansas signed into law Act 590 of 1981, entitled the “Balanced Treatment for Creation–Science and Evolution–Science Act.” The Act is codified as Ark.Stat. Ann. § 80–1663, *et seq.* (1981 Supp.). Its essential mandate is stated in its first sentence: “Public schools within this State shall give balanced treatment to creation-science and to evolution-science.” On May 27, 1981, this suit was filed challenging the constitutional validity of Act 590 on three distinct grounds.

First, it is contended that Act 590 constitutes an establishment of religion prohibited by the First Amendment to the Constitution, which is made applicable to the states by the Fourteenth Amendment. Second, the plaintiffs argue the Act violates a right to academic freedom which they say is guaranteed to students and teachers by the Free Speech Clause of the First Amendment. Third, plaintiffs allege the Act is impermissibly vague and thereby violates the Due Process Clause of the Fourteenth Amendment.

The individual plaintiffs include the resident Arkansas Bishops of the United Methodist, Episcopal, Roman Catholic and African Methodist Episcopal Churches, the principal official of the Presbyterian Churches in Arkansas, other United Methodist, Southern Baptist and Presbyterian clergy, as well as several persons who sue as parents and next friends of

minor children attending Arkansas public schools. One plaintiff is a high school biology teacher. All are also Arkansas taxpayers. Among the organizational plaintiffs are the American Jewish Congress, the Union of American Hebrew Congregations, the American Jewish Committee, the Arkansas Education Association, the National Association of Biology Teachers and the National Coalition for Public Education and Religious Liberty, all of which sue on behalf of members living in Arkansas.

The defendants include the Arkansas Board of Education and its members, the Director of the Department of Education, and the State Textbooks and Instructional Materials Selecting Committee. . . .

The trial commenced December 7, 1981, and continued through December 17, 1981. This Memorandum Opinion constitutes the Court's findings of fact and conclusions of law. . . .

[The court applied the three part *Lemon* test, supra, p. 60: "First, the statute must have a secular legislative purpose; second, its principal or primary effect must be one that neither advances nor inhibits religion . . . ; finally, the statute must not foster 'an excessive government entanglement with religion.'" See *Lemon v. Kurtzman*, 403 U.S. 602, 612-13, 91 S.Ct. 2105, 2111, 29 L.Ed.2d 745 (1971).]

II.

The religious movement known as Fundamentalism began in nineteenth century America as part of evangelical Protestantism's response to social changes, new religious thought and Darwinism. Fundamentalists viewed these developments as attacks on the Bible and as responsible for a decline in traditional values.

The various manifestations of Fundamentalism have had a number of common characteristics,⁴ but a central premise has always been a literal interpretation of the Bible and a belief in the inerrancy of the Scriptures. Following World War I, there was again a perceived decline in traditional morality, and Fundamentalism focused on evolution as responsible for the decline. One aspect of their efforts, particularly in the South, was the promotion of statutes prohibiting the teaching of evolution in public schools. In Arkansas, this resulted in the adoption of Initiated Act 1 of 1929.

Between the 1920's and early 1960's, anti-evolutionary sentiment had a subtle but pervasive influence on the teaching of biology in public schools.

4. The authorities differ as to generalizations which may be made about Fundamentalism. For example, Dr. Geisler testified to the widely held view that there are five beliefs characteristic of all Fundamentalist movements, in addition, of course, to the inerrancy of Scripture: (1) belief in the virgin birth of Christ, (2) belief in the deity of Christ, (3) belief in the substitutional atonement of Christ, (4) belief in the second com-

ing of Christ, and (5) belief in the physical resurrection of all departed souls. Dr. Marsden, however, testified that this generalization, which has been common in religious scholarship, is now thought to be historical error. There is no doubt, however, that all Fundamentalists take the Scriptures as inerrant and probably most take them as literally true.

Generally, textbooks avoided the topic of evolution and did not mention the name of Darwin. Following the launch of the Sputnik satellite by the Soviet Union in 1957, the National Science Foundation funded several programs designed to modernize the teaching of science in the nation's schools. The Biological Sciences Curriculum Study (BSCS), a nonprofit organization, was among those receiving grants for curriculum study and revision. Working with scientists and teachers, BSCS developed a series of biology texts which, although emphasizing different aspects of biology, incorporated the theory of evolution as a major theme. The success of the BSCS effort is shown by the fact that fifty percent of American school children currently use BSCS books directly and the curriculum is incorporated indirectly in virtually all biology texts. []

In the early 1960's, there was again a resurgence of concern among Fundamentalists about the loss of traditional values and a fear of growing secularism in society. The Fundamentalist movement became more active and has steadily grown in numbers and political influence. There is an emphasis among current Fundamentalists on the literal interpretation of the Bible and the Book of Genesis as the sole source of knowledge about origins.

The term "scientific creationism" first gained currency around 1965 following publication of *The Genesis Flood* in 1961 by Whitcomb and Morris. There is undoubtedly some connection between the appearance of the BSCS texts emphasizing evolutionary thought and efforts by Fundamentalists to attack the theory. []

In the 1960's and early 1970's, several Fundamentalist organizations were formed to promote the idea that the Book of Genesis was supported by scientific data. The terms "creation science" and "scientific creationism" have been adopted by these Fundamentalists as descriptive of their study of creation and the origins of man. Perhaps the leading creationist organization is the Institute for Creation Research (ICR), which is affiliated with the Christian Heritage College and supported by the Scott Memorial Baptist Church in San Diego, California. The ICR, through the Creation-Life Publishing Company, is the leading publisher of creation science material. Other creation science organizations include the Creation Science Research Center (CSRC) of San Diego and the Bible Science Association of Minneapolis, Minnesota. In 1963, the Creation Research Society (CRS) was formed from a schism in the American Scientific Affiliation (ASA). It is an organization of literal Fundamentalists who have the equivalent of a master's degree in some recognized area of science. A purpose of the organization is "to reach all people with the vital message of the scientific and historic truth about creation." [] Similarly, the CSRC was formed in 1970 from a split in the CRS. Its aim has been "to reach the 63 million children of the United States with the scientific teaching of Biblical creationism." [] . . .

Creationists view evolution as a source of society's ills, . . . Creationists have adopted the view of Fundamentalists generally that there are only two positions with respect to the origins of the earth and life: belief in the

inerrancy of the Genesis story of creation and of a worldwide flood as fact, or belief in what they call evolution. . . .

The creationist organizations consider the introduction of creation science into the public schools part of their ministry. The ICR has published at least two pamphlets containing suggested methods for convincing school boards, administrators and teachers that creationism should be taught in public schools. The ICR has urged its proponents to encourage school officials to voluntarily add creationism to the curriculum.

Citizens For Fairness In Education is an organization based in Anderson, South Carolina, formed by Paul Ellwanger, a respiratory therapist who is trained in neither law nor science. Mr. Ellwanger is of the opinion that evolution is the forerunner of many social ills, including Nazism, racism and abortion. [] About 1977, Ellwanger collected several proposed legislative acts with the idea of preparing a model state act requiring the teaching of creationism as science in opposition to evolution. One of the proposals he collected was prepared by Wendell Bird, who is now a staff attorney for ICR. From these various proposals, Ellwanger prepared a “model act” which calls for “balanced treatment” of “scientific creationism” and “evolution” in public schools. He circulated the proposed act to various people and organizations around the country.

Mr. Ellwanger’s views on the nature of creation science are entitled to some weight since he personally drafted the model act which became Act 590. His evidentiary deposition with exhibits and unnumbered attachments (produced in response to a subpoena *duces tecum*) speaks to both the intent of the Act and the scientific merits of creation science. Mr. Ellwanger does not believe creation science is a science. In a letter to Pastor Robert E. Hays he states, “While neither evolution nor creation can qualify as a scientific theory, and since it is virtually impossible at this point to educate the whole world that evolution is not a true scientific theory, we have freely used these terms—the evolution theory and the theory of scientific creationism—in the bill’s text.” [] He further states in a letter to Mr. Tom Bethell, “As we examine evolution (remember, we’re not making any scientific claims for creation, but we are challenging evolution’s claim to be scientific). . . .” []

Ellwanger’s correspondence on the subject shows an awareness that Act 590 is a religious crusade, coupled with a desire to conceal this fact. In a letter to State Senator Bill Keith of Louisiana, he says, “I view this whole battle as one between God and anti-God forces, though I know there are a large number of evolutionists who believe in God.” And further, “. . . it behooves Satan to do all he can to thwart our efforts and confuse the issue at every turn.” Yet Ellwanger suggests to Senator Keith, “If you have a clear choice between having grassroots leaders of this statewide bill promotion effort to be ministerial or non-ministerial, be sure to opt for the non-ministerial. It does the bill effort no good to have ministers out there in the public forum and the adversary will surely pick at this point . . . Ministerial persons can accomplish a tremendous amount of work from behind the scenes, encouraging their congregations to take the organiza-

tional and P.R. initiatives. And they can lead their churches in storming Heaven with prayers for help against so tenacious an adversary.” []

Ellwanger shows a remarkable degree of political candor, if not finesse, in a letter to State Senator Joseph Carlucci of Florida:

“2. It would be very wise, if not actually essential, that all of us who are engaged in this legislative effort be careful not to present our position and our work in a religious framework. For example, in written communications that might somehow be shared with those other persons whom we may be trying to convince, it would be well to exclude our own personal testimony and/or witness for Christ, but rather, if we are so moved, to give that testimony on a separate attached note.” []

The same tenor is reflected in a letter by Ellwanger to Mary Ann Miller, a member of FLAG (Family, Life, America under God) who lobbied the Arkansas Legislature in favor of Act 590:

“... we’d like to suggest that you and your co-workers be very cautious about mixing creation-science with creation-religion... Please urge your co-workers not to allow themselves to get sucked into the ‘religion’ trap of mixing the two together, for such mixing does incalculable harm to the legislative thrust. It could even bring public opinion to bear adversely upon the higher courts that will eventually have to pass judgment on the constitutionality of this new law.” []

... It was out of this milieu that Act 590 emerged. The Reverend W. A. Blount, a Biblical literalist who is pastor of a church in the Little Rock area and was, in February, 1981, chairman of the Greater Little Rock Evangelical Fellowship, was among those who received a copy of the model act from Ellwanger.¹²

At Reverend Blount’s request, the Evangelical Fellowship unanimously adopted a resolution to seek introduction of Ellwanger’s act in the Arkansas Legislature. A committee composed of two ministers, Curtis Thomas and W. A. Young, was appointed to implement the resolution. Thomas obtained from Ellwanger a revised copy of the model act which he transmitted to Carl Hunt, a business associate of Senator James L. Holsted, with the request that Hunt prevail upon Holsted to introduce the act.

Holsted, a self-described “born again” Christian Fundamentalist, introduced the act in the Arkansas Senate. He did not consult the State Department of Education, scientists, science educators or the Arkansas Attorney General. The Act was not referred to any Senate committee for hearing and was passed after only a few minutes’ discussion on the Senate floor. In the House of Representatives, the bill was referred to the Education Committee which conducted a perfunctory fifteen minute hearing.

¹². The model act had been revised to insert “creation science” in lieu of creationism because Ellwanger had the impression

people thought creationism was too religious a term. (Ellwanger Depo. at 79.)

No scientist testified at the hearing, nor was any representative from the State Department of Education called to testify.

Ellwanger's model act was enacted into law in Arkansas as Act 590 without amendment or modification other than minor typographical changes. The legislative "findings of fact" in Ellwanger's act and Act 590 are identical, although no meaningful fact-finding process was employed by the General Assembly.

Ellwanger's efforts in preparation of the model act and campaign for its adoption in the states were motivated by his opposition to the theory of evolution and his desire to see the Biblical version of creation taught in the public schools. There is no evidence that the pastors, Blount, Thomas, Young or The Greater Little Rock Evangelical Fellowship were motivated by anything other than their religious convictions when proposing its adoption or during their lobbying efforts in its behalf. Senator Holsted's sponsorship and lobbying efforts in behalf of the Act were motivated solely by his religious beliefs and desire to see the Biblical version of creation taught in the public schools.¹⁴

The State of Arkansas, like a number of states whose citizens have relatively homogeneous religious beliefs, has a long history of official opposition to evolution which is motivated by adherence to Fundamentalist beliefs in the inerrancy of the Book of Genesis. This history is documented in Justice Fortas' opinion in *Epperson v. Arkansas*, 393 U.S. 97, 89 S.Ct. 266, 21 L.Ed.2d 228 (1968), which struck down Initiated Act 1 of 1929, Ark.Stat. Ann. §§ 80-1627-1628, prohibiting the teaching of the theory of evolution. To this same tradition may be attributed Initiated Act 1 of 1930, Ark.Stat. Ann. § 80-1606 (Repl.1980), requiring "the reverent daily reading of a portion of the English Bible" in every public school classroom in the State.¹⁵

It is true, as defendants argue, that courts should look to legislative statements of a statute's purpose in Establishment Clause cases and accord such pronouncements great deference. [] Defendants also correctly state the principle that remarks by the sponsor or author of a bill are not considered controlling in analyzing legislative intent. []

Courts are not bound, however, by legislative statements of purpose or legislative disclaimers. *Stone v. Graham*, 449 U.S. 39, 101 S.Ct. 192, 66 L.Ed.2d 199 (1980); *Abington School Dist. v. Schempp*, 374 U.S. 203, 83

14. Specifically, Senator Holsted testified that he holds to a literal interpretation of the Bible; that the bill was compatible with his religious beliefs; that the bill does favor the position of literalists; that his religious convictions were a factor in his sponsorship of the bill; and that he stated publicly to the *Arkansas Gazette* (although not on the floor of the Senate) contemporaneously with the legislative debate that the bill does presuppose the existence of a divine creator. There is no doubt that Senator Holsted knew he

was sponsoring the teaching of a religious doctrine. His view was that the bill did not violate the First Amendment because, as he saw it, it did not favor one denomination over another.

15. This statute is, of course, clearly unconstitutional under the Supreme Court's decision in *Abington School Dist. v. Schempp*, 374 U.S. 203, 83 S.Ct. 1560, 10 L.Ed.2d 844 (1963).

S.Ct. 1560, 10 L.Ed.2d 844 (1963). In determining the legislative purpose of a statute, courts may consider evidence of the historical context of the Act, *Epperson v. Arkansas*, 393 U.S. 97, 89 S.Ct. 266, 21 L.Ed.2d 228 (1968), the specific sequence of events leading up to passage of the Act, departures from normal procedural sequences, substantive departures from the normal, [] and contemporaneous statements of the legislative sponsor. []

The unusual circumstances surrounding the passage of Act 590, as well as the substantive law of the First Amendment, warrant an inquiry into the stated legislative purposes. The author of the Act had publicly proclaimed the sectarian purpose of the proposal. The Arkansas residents who sought legislative sponsorship of the bill did so for a purely sectarian purpose. These circumstances alone may not be particularly persuasive, but when considered with the publicly announced motives of the legislative sponsor made contemporaneously with the legislative process; the lack of any legislative investigation, debate or consultation with any educators or scientists; the unprecedented intrusion in school curriculum; and official history of the State of Arkansas on the subject, it is obvious that the statement of purposes has little, if any, support in fact. The State failed to produce any evidence which would warrant an inference or conclusion that at any point in the process anyone considered the legitimate educational value of the Act. It was simply and purely an effort to introduce the Biblical version of creation into the public school curricula. The only inference which can be drawn from these circumstances is that the Act was passed with the specific purpose by the General Assembly of advancing religion. The Act therefore fails the first prong of the three-pronged test, that of secular legislative purpose, as articulated in *Lemon v. Kurtzman*, *supra*, and *Stone v. Graham*, *supra*.

III.

If the defendants are correct and the Court is limited to an examination of the language of the Act, the evidence is overwhelming that both the purpose and effect of Act 590 is the advancement of religion in the public schools.

Section 4 of the Act provides:

Definitions. As used in this Act:

- (a) "Creation-science" means the scientific evidences for creation and inferences from those scientific evidences. Creation-science includes the scientific evidences and related inferences that indicate: (1) Sudden creation of the universe, energy, and life from nothing; (2) The insufficiency of mutation and natural selection in bringing about development of all living kinds from a single organism; (3) Changes only within fixed limits of originally created kinds of plants and animals; (4) Separate ancestry for man and apes; (5) Explanation of the earth's geology by catastrophism, including the occurrence of a worldwide flood; and (6) A relatively recent inception of the earth and living kinds.

(b) “Evolution-science” means the scientific evidences for evolution and inferences from those scientific evidences. Evolution-science includes the scientific evidences and related inferences that indicate: (1) Emergence by naturalistic processes of the universe from disordered matter and emergence of life from non-life; (2) The sufficiency of mutation and natural selection in bringing about development of present living kinds from simple earlier kinds; (3) Emergence by mutation and natural selection of present living kinds from simple earlier kinds; (4) Emergence of man from a common ancestor with apes; (5) Explanation of the earth’s geology and the evolutionary sequence by uniformitarianism; and (6) An inception several billion years ago of the earth and somewhat later of life.

(c) “Public schools” mean public secondary and elementary schools.

The evidence establishes that the definition of “creation science” contained in 4(a) has as its unmentioned reference the first 11 chapters of the Book of Genesis. Among the many creation epics in human history, the account of sudden creation from nothing, or *creatio ex nihilo*, and subsequent destruction of the world by flood is unique to Genesis. The concepts of 4(a) are the literal Fundamentalists’ view of Genesis. Section 4(a) is unquestionably a statement of religion, with the exception of 4(a)(2) which is a negative thrust aimed at what the creationists understand to be the theory of evolution.

Both the concepts and wording of Section 4(a) convey an inescapable religiosity. Section 4(a)(1) describes “sudden creation of the universe, energy and life from nothing.” Every theologian who testified, including defense witnesses, expressed the opinion that the statement referred to a supernatural creation which was performed by God.

Defendants argue that: (1) the fact that 4(a) conveys ideas similar to the literal interpretation of Genesis does not make it conclusively a statement of religion; (2) that reference to a creation from nothing is not necessarily a religious concept since the Act only suggests a creator who has power, intelligence and a sense of design and not necessarily the attributes of love, compassion and justice;¹⁸ and (3) that simply teaching about the concept of a creator is not a religious exercise unless the student is required to make a commitment to the concept of a creator.

The evidence fully answers these arguments. The ideas of 4(a)(1) are not merely similar to the literal interpretation of Genesis; they are identical and parallel to no other story of creation.¹⁹

18. Although defendants must make some effort to cast the concept of creation in non-religious terms, this effort surely causes discomfort to some of the Act’s more theologically sophisticated supporters. The concept of a creator God distinct from the God of love and mercy is closely similar to the Marcion and Gnostic heresies, among the deadliest to

threaten the early Christian church. These heresies had much to do with development and adoption of the Apostle’s Creed as the official creedal statement of the Roman Catholic Church in the West. (Gilkey.)

19. The parallels between Section 4(a) and Genesis are quite specific: (1) “sudden creation from nothing” is taken from Gene-

The argument that creation from nothing in 4(a)(1) does not involve a supernatural deity has no evidentiary or rational support. To the contrary, “creation out of nothing” is a concept unique to Western religions. In traditional Western religious thought, the conception of a creator of the world is a conception of God. Indeed, creation of the world “out of nothing” is the ultimate religious statement because God is the only actor. As Dr. Langdon Gilkey noted, the Act refers to one who has the power to bring all the universe into existence from nothing. The only “one” who has this power is God.

The leading creationist writers, Morris and Gish, acknowledge that the idea of creation described in 4(a)(1) is the concept of creation by God and make no pretense to the contrary. The idea of sudden creation from nothing, or *creatio ex nihilo*, is an inherently religious concept. (Vawter, Gilkey, Geisler, Ayala, Blount, Hicks.)

The argument advanced by defendants’ witness, Dr. Norman Geisler, that teaching the existence of God is not religious unless the teaching seeks a commitment, is contrary to common understanding and contradicts settled case law. *Stone v. Graham*, 449 U.S. 39, 101 S.Ct. 192, 66 L.Ed.2d 199 (1980); *Abington School District v. Schempp*, 374 U.S. 203, 83 S.Ct. 1560, 10 L.Ed.2d 844 (1963).

The facts that creation science is inspired by the Book of Genesis and that Section 4(a) is consistent with a literal interpretation of Genesis leave no doubt that a major effect of the Act is the advancement of particular religious beliefs. The legal impact of this conclusion will be discussed further at the conclusion of the Court’s evaluation of the scientific merit of creation science.

IV.(A)

The approach to teaching “creation science” and “evolution science” found in Act 590 is identical to the two-model approach espoused by the Institute for Creation Research and is taken almost verbatim from ICR writings. It is an extension of Fundamentalists’ view that one must either accept the literal interpretation of Genesis or else believe in the godless system of evolution.

The two model approach of the creationists is simply a contrived dualism²² which has no scientific factual basis or legitimate educational

sis, 1:1–10 (Vawter, Gilkey); (2) destruction of the world by a flood of divine origin is a notion peculiar to Judeo-Christian tradition and is based on Chapters 7 and 8 of Genesis (Vawter); (3) the term “kinds” has no fixed scientific meaning, but appears repeatedly in Genesis (all scientific witnesses); (4) “relatively recent inception” means an age of the earth from 6,000 to 10,000 years and is based on the genealogy of the Old Testament using the rather astronomical ages assigned to the patriarchs (Gilkey and several of defendants’

scientific witnesses); (5) separate ancestry of man and ape focuses on the portion of the theory of evolution which Fundamentalists find most offensive, *Epperson v. Arkansas*, 393 U.S. 97, 89 S.Ct. 266, 21 L.Ed.2d 228 (1968).

22. Morris, the Director of ICR and one who first advocated the two model approach, insists that a true Christian cannot compromise with the theory of evolution and that the Genesis version of creation and the theo-

purpose. It assumes only two explanations for the origins of life and existence of man, plants and animals: It was either the work of a creator or it was not. Application of these two models, according to creationists, and the defendants, dictates that all scientific evidence which fails to support the theory of evolution is necessarily scientific evidence in support of creationism and is, therefore, creation science “evidence” in support of Section 4(a).

IV.(B)

The emphasis on origins as an aspect of the theory of evolution is peculiar to creationist literature. Although the subject of origins of life is within the province of biology, the scientific community does not consider origins of life a part of evolutionary theory. The theory of evolution assumes the existence of life and is directed to an explanation of *how* life evolved. Evolution does not presuppose the absence of a creator or God and the plain inference conveyed by Section 4 is erroneous.

As a statement of the theory of evolution, Section 4(b) is simply a hodgepodge of limited assertions, many of which are factually inaccurate. . . .

IV.(C)

In addition to the fallacious pedagogy of the two model approach, Section 4(a) lacks legitimate educational value because “creation science” as defined in that section is simply not science. Several witnesses suggested definitions of science. A descriptive definition was said to be that science is what is “accepted by the scientific community” and is “what scientists do.” The obvious implication of this description is that, in a free society, knowledge does not require the imprimatur of legislation in order to become science.

More precisely, the essential characteristics of science are:

- (1) It is guided by natural law;
- (2) It has to be explanatory by reference to natural law;
- (3) It is testable against the empirical world;
- (4) Its conclusions are tentative, i.e., are not necessarily the final word; and

ry of evolution are mutually exclusive. Px 31, Morris, *Studies in the Bible & Science*, 102–103. The two model approach was the subject of Dr. Richard Bliss’s doctoral dissertation. (Dx 35). It is presented in Bliss, *Origins: Two Models—Evolution, Creation* (1978). Moreover, the two model approach merely casts in educationalist language the dualism which appears in all creationist literature—creation (i.e. God) and evolution are presented as two alternative and mutually exclusive theories. See, e.g., Px 75, Morris, *Scientific Creation-*

ism (1974) (public school edition); Px 59, Fox, *Fossils: Hard Facts from the Earth*. Particularly illustrative is Px 61, Boardman, et al, *Worlds Without End* (1971), a CSRC publication: “One group of scientists, known as creationists, believe that God, in a miraculous manner, created all matter and energy. . . .

“Scientists who insist that the universe just grew, by accident, from a mass of hot gases without the direction or help of a Creator are known as evolutionists.”

(5) It is falsifiable. (Ruse and other science witnesses).

Creation science as described in Section 4(a) fails to meet these essential characteristics. First, the section revolves around 4(a)(1) which asserts a sudden creation “from nothing.” Such a concept is not science because it depends upon a supernatural intervention which is not guided by natural law. It is not explanatory by reference to natural law, is not testable and is not falsifiable.

If the unifying idea of supernatural creation by God is removed from Section 4, the remaining parts of the section explain nothing and are meaningless assertions.

Section 4(a)(2), relating to the “insufficiency of mutation and natural selection in bringing about development of all living kinds from a single organism,” is an incomplete negative generalization directed at the theory of evolution.

Section 4(a)(3) which describes “changes only within fixed limits of originally created kinds of plants and animals” fails to conform to the essential characteristics of science for several reasons. First, there is no scientific definition of “kinds” and none of the witnesses was able to point to any scientific authority which recognized the term or knew how many “kinds” existed. One defense witness suggested there may be 100 to 10,000 different “kinds.” Another believes there were “about 10,000, give or take a few thousand.” Second, the assertion appears to be an effort to establish outer limits of changes within species. There is no scientific explanation for these limits which is guided by natural law and the limitations, whatever they are, cannot be explained by natural law.

The statement in 4(a)(4) of “separate ancestry of man and apes” is a bald assertion. It explains nothing and refers to no scientific fact or theory.

Section 4(a)(5) refers to “explanation of the earth’s geology by catastrophism, including the occurrence of a worldwide flood.” This assertion completely fails as science. The Act is referring to the Noachian flood described in the Book of Genesis. The creationist writers concede that any kind of Genesis Flood depends upon supernatural intervention. A worldwide flood as an explanation of the world’s geology is not the product of natural law, nor can its occurrence be explained by natural law.

Section 4(a)(6) equally fails to meet the standards of science. “Relatively recent inception” has no scientific meaning. It can only be given meaning by reference to creationist writings which place the age at between 6,000 and 20,000 years because of the genealogy of the Old Testament. [] Such a reasoning process is not the product of natural law; not explainable by natural law; nor is it tentative.

Creation science, as defined in Section 4(a), not only fails to follow the canons defining scientific theory, it also fails to fit the more general descriptions of “what scientists think” and “what scientists do.” The scientific community consists of individuals and groups, nationally and internationally, who work independently in such varied fields as biology, paleontology, geology and astronomy. Their work is published and subject

to review and testing by their peers. The journals for publication are both numerous and varied. There is, however, not one recognized scientific journal which has published an article espousing the creation science theory described in Section 4(a). Some of the State's witnesses suggested that the scientific community was "close-minded" on the subject of creationism and that explained the lack of acceptance of the creation science arguments. Yet no witness produced a scientific article for which publication had been refused. Perhaps some members of the scientific community are resistant to new ideas. It is, however, inconceivable that such a loose knit group of independent thinkers in all the varied fields of science could, or would, so effectively censor new scientific thought. . . .

The methodology employed by creationists is another factor which is indicative that their work is not science. A scientific theory must be tentative and always subject to revision or abandonment in light of facts that are inconsistent with, or falsify, the theory. A theory that is by its own terms dogmatic, absolutist and never subject to revision is not a scientific theory.

The creationists' methods do not take data, weigh it against the opposing scientific data, and thereafter reach the conclusions stated in Section 4(a). Instead, they take the literal wording of the Book of Genesis and attempt to find scientific support for it. . . .

The Court would never criticize or discredit any person's testimony based on his or her religious beliefs. While anybody is free to approach a scientific inquiry in any fashion they choose, they cannot properly describe the methodology used as scientific, if they start with a conclusion and refuse to change it regardless of the evidence developed during the course of the investigation.

IV.(D)

. . . The proof in support of creation science consisted almost entirely of efforts to discredit the theory of evolution through a rehash of data and theories which have been before the scientific community for decades. The arguments asserted by creationists are not based upon new scientific evidence or laboratory data which has been ignored by the scientific community. . . .

The testimony of Marianne Wilson was persuasive evidence that creation science is not science. Ms. Wilson is in charge of the science curriculum for Pulaski County Special School District, the largest school district in the State of Arkansas. Prior to the passage of Act 590, Larry Fisher, a science teacher in the District, using materials from the ICR, convinced the School Board that it should voluntarily adopt creation science as part of its science curriculum. The District Superintendent assigned Ms. Wilson the job of producing a creation science curriculum guide. Ms. Wilson's testimony about the project was particularly convincing because she obviously approached the assignment with an open mind and no preconceived notions about the subject. She had not heard of creation science until about a year ago and did not know its meaning before she began her research.

Ms. Wilson worked with a committee of science teachers appointed from the District. They reviewed practically all of the creationist literature. Ms. Wilson and the committee members reached the unanimous conclusion that creationism is not science; it is religion. They so reported to the Board. The Board ignored the recommendation and insisted that a curriculum guide be prepared. . . .

It is easy to understand why Ms. Wilson and other educators find the creationists' textbook material and teaching guides unacceptable. The materials misstate the theory of evolution in the same fashion as Section 4(b) of the Act, with emphasis on the alternative mutually exclusive nature of creationism and evolution. Students are constantly encouraged to compare and make a choice between the two models, and the material is not presented in an accurate manner. . . .

The conclusion that creation science has no scientific merit or educational value as science has legal significance in light of the Court's previous conclusion that creation science has, as one major effect, the advancement of religion. The second part of the three-pronged test for establishment reaches only those statutes having as their *primary* effect the advancement of religion. Secondary effects which advance religion are not constitutionally fatal. Since creation science is not science, the conclusion is inescapable that the only real effect of Act 590 is the advancement of religion. The Act therefore fails both the first and second portions of the test in *Lemon v. Kurtzman*, 403 U.S. 602, 91 S.Ct. 2105, 29 L.Ed.2d 745 (1971).

IV.(E)

Act 590 mandates "balanced treatment" for creation science and evolution science. The Act prohibits instruction in any religious doctrine or references to religious writings. The Act is self-contradictory and compliance is impossible unless the public schools elect to forego significant portions of subjects such as biology, world history, geology, zoology, botany, psychology, anthropology, sociology, philosophy, physics and chemistry. Presently, the concepts of evolutionary theory as described in 4(b) permeate the public school textbooks. There is no way teachers can teach the Genesis account of creation in a secular manner.

The State Department of Education, through its textbook selection committee, school boards and school administrators will be required to constantly monitor materials to avoid using religious references. The school boards, administrators and teachers face an impossible task. How is the teacher to respond to questions about a creation suddenly and out of nothing? How will a teacher explain the occurrence of a worldwide flood? How will a teacher explain the concept of a relatively recent age of the earth? The answer is obvious because the only source of this information is ultimately contained in the Book of Genesis.

References to the pervasive nature of religious concepts in creation science texts amply demonstrate why State entanglement with religion is inevitable under Act 590. Involvement of the State in screening texts for

impermissible religious references will require State officials to make delicate religious judgments. The need to monitor classroom discussion in order to uphold the Act's prohibition against religious instruction will necessarily involve administrators in questions concerning religion. These continuing involvements of State officials in questions and issues of religion create an excessive and prohibited entanglement with religion. []

[The court dismissed the arguments that the statute was vague, that it violated academic freedom, and that teaching evolution violated Free Exercise or Establishment.]

The Court closes this opinion with a thought expressed eloquently by the great Justice Frankfurter:

“We renew our conviction that ‘we have staked the very existence of our country on the faith that complete separation between the state and religion is best for the state and best for religion.’ *Everson v. Board of Education*, 330 U.S. at 59 (67 S.Ct. at 532). If nowhere else, in the relation between Church and State, ‘good fences make good neighbors.’” *McCollum v. Board of Education*, 333 U.S. 203, 232, 68 S.Ct. 461, 475, 92 L.Ed. 649 (1948).

An injunction will be entered permanently prohibiting enforcement of Act 590.

Notes and Questions

1. Are you surprised that the plaintiffs were Jewish and Christian members of the community who presumably respected the Book of Genesis? Were the defenders of the Act all Fundamentalists? What is a Fundamentalist? How is a Fundamentalist different from an Evangelical Christian? Do all Evangelical Christians oppose evolution? See David N. Livingstone, *Darwin's Forgotten Defenders: The Encounter Between Evangelical Theology and Evolutionary Thought* (1987) (explaining how many Evangelical scientists and theologians accepted Darwinism in the nineteenth century).

2. *Secular and Sectarian Purpose*. Why is the conduct of Paul Ellwanger relevant to the court's decision? Does the court need to examine the motivations of the legislators who passed Act 590? If the court decided that the wording of the act itself was unconstitutional because it promoted a religious theory of origins, why did it need to examine the motivations of the act's sponsors? Should all legislation passed for a sectarian purpose be invalidated? Are you influenced by what you read about religion and politics in Chapter VII?

3. *Religion or Science*. What made the court conclude that the statute's description of creation-science was religion and not science? Did you find all the features of creation-science in your readings from the Book of Genesis, *supra*? Is it unscientific to believe in creation *ex nihilo*? To believe that the earth's geology resulted from a worldwide flood? To believe that

the earth's origin is recent? To believe in a separate ancestry for man and apes? Is Section 4(a)(2) of Act 590 in the Book of Genesis?

Hebrew Bible expert Father Bruce Vawter of DePaul University testified about Genesis at the trial. "On recross, [he] listed again the six elements of the Genesis account relevant to the case: ex nihilo, the use of the phrase 'all living kinds,' fixity of species, separate ancestry, the Noachic flood, and recent creation.

'Are these in Genesis?'

'Yes.'

'Are they in Act 590?'

'Yes.'

'Are there any other views of origins that contain these elements, or these elements together in this way?'

'No, there are none.' "

See Langdon Gilkey, *Creationism On Trial: Evolution and God at Little Rock* 87 (1985). Does Vawter's testimony persuade you Act 590 was unconstitutional?

4. What is the relevance of the reference to Christian heresy in footnote 18 supra, p. 579?

5. Do you understand what Judge Overton means by the "contrived dualism" of the creation scientists' two-model approach? The judge writes that the two-model approach "is an extension of Fundamentalists' view that one must either accept the literal interpretation of Genesis or else believe in the godless system of evolution." What are the alternatives to a two-model approach? Would a different creation story from another religious tradition provide a different model and so disprove the two-model approach? Would a belief by some Jews and Christians that *Genesis* is consistent with evolution disprove the two-model approach?

6. *Religious Acceptance of Evolution?* How can mainline Protestant churches sponsor an "Evolution Sunday"? See Neela Banerjee & Anne Berryman, *At Churches Nationwide, Good Words for Evolution*, N.Y. Times, Feb. 13, 2006, at A14. As Judge Overton points out in the opinion, many Christians cannot accept evolution because it is inconsistent with their faith, yet other believers accept it. What religious alternatives are there to a fundamentalist rejection of evolution? Professor Ian Barbour contrasted traditionalist and modernist approaches to evolution with the fundamentalist. Fundamentalists, as we learn in the *McLean* decision, believe that the Bible should be interpreted literally and that the biblical stories provide the truth about creation. Traditionalists are less literal, and move beyond the biblical text by arguing that God works in nature and that God's work can be seen in human evolution. Modernists accept modern science and use it to correct biblical and theological teachings. See Ian G. Barbour, *Issues in Science and Religion* 99-101 (1966). Within religious traditions, fundamentalists, traditionalists and modernists dispute among themselves which is the proper reading of creation. Within Islam,

for example, “[d]ebate about the theory of evolution has pitted traditional religious scholars against modernists. The theory is denounced by most Muslim scholars, even some early modernists such as Afghani, as a refutation of Quranic theories of creation.” John L. Esposito, *Evolution, Theory of, and Islam*, *The Oxford Dictionary of Islam* 77 (2003) (also reporting that evolution is taught in Turkey, Egypt, Iraq, Iran and Indonesia, but forbidden in Pakistan, Saudi Arabia and Sudan).

What do you think of the argument that evolution can be accepted as true as long as there is an acknowledgment that God intervened at some point to give human beings a soul? Or the argument that Darwinian natural selection is not random, but planned?

Are the following arguments about evolution fundamentalist, traditionalist or modernist? Do they reconcile evolution and religious belief?

- a. . . . Whatever the intention of the individual accounts of creation may have been, it is clear from the Bible as a whole that its compilers were not overly concerned with the *details* of the creation story in the first chapter of Genesis. They incorporated several accounts of creation in the Bible even though no two accounts agree in detail with Genesis 1 or with each other. Genesis 1 describes the creation of the world in six days. The second account of creation is the story of Adam and Eve in the Garden of Eden (Genesis 2). Several other accounts are found in poetic form in Psalms, Proverbs, and Job. Genesis 1 says that man was the last living creature created; Genesis 2 says that he was the first. Genesis 1 speaks of the prehistoric waters in purely naturalistic terms and says that God merely commanded them to gather in a single spot so that dry land could appear. But in poetic passages the ancient waters are personified as rebellious sea-monsters which threatened to swamp the dry land, until God subdued them and created the seashore as a boundary which they were prohibited from crossing. The most notable difference between Genesis and all the other accounts is that none of the others mentions the idea that the world was created in six days. This idea—which is the centerpiece of the whole creationist movement—was apparently not considered important enough in the Bible to be repeated in other accounts of creation.

The fact that so many differing accounts were all accepted in the Bible shows that its compilers were not concerned about these details. They undoubtedly assumed that the differences could be reconciled, but they left this task to the ingenuity of exegetes. . . . What matters in Judaism are the *concepts* shared by all these stories: that the world was created by God, that He planned it carefully and designed it to be hospitable to man. These are the very conclusions to which astronomy now points.

Jeffrey H. Tigay, *Genesis, Science, and “Scientific Creationism,”* 40:2 *Conservative Judaism* 20 (Winter 1987–1988).

- b. . . . Pius XII stressed this essential point: if the human body takes its origin from pre-existent living matter, the spiritual soul is immediately created by God. . . .

Consequently, theories of evolution which, in accordance with the philosophies inspiring them, consider the mind as emerging from the forces of living matter, or as a mere epiphenomenon of this matter, are incompatible with the truth about man. Nor are they able to ground the dignity of the person.

With man, then, we find ourselves in the presence of an ontological difference, an ontological leap, one could say. However, does not the posing of such ontological discontinuity run counter to that physical continuity which seems to be the main thread of research into evolution in the field of physics and chemistry? Consideration of the method used in the various branches of knowledge makes it possible to reconcile two points of view which would seem irreconcilable. The sciences of observation describe and measure the multiple manifestations of life with increasing precision and correlate them with the time line. The moment of transition to the spiritual cannot be the object of this kind of observation, which nevertheless can discover at the experimental level a series of very valuable signs indicating what is specific to the human being. But the experience of metaphysical knowledge, of self-awareness and self-reflection, of moral conscience, freedom, or again, of aesthetic and religious experience, falls within the competence of philosophical analysis and reflection, while theology brings out its ultimate meaning according to the Creator's plans.

We are called to enter eternal life.

John Paul II, *The Pope's Message on Evolution to the Pontifical Academy of Sciences*, 72 Q. Rev. Biology 381, 382 (1997).

- c. Reason implies, as one old hymn puts it, that "new occasions teach new duties." We believe that revelation continues, that God continues to be active in creation, and that all of the many ways of knowing—including geology, evolutionary biology, philosophy, and arts such as opera, punk rock or painting—can be vehicles through which God and human beings partner in continuing creation.

Given this worldview, we are compelled to use the resources God has given us. Not to use our brains in understanding the world around us seems a cardinal sin. . . .

The vast preponderance of scientific evidence, including geology, paleontology, archaeology, genetics and natural history, indicates that Darwin was in large part correct in his original hypothesis.

I simply find it a rejection of the goodness of God's gifts to say that all of this evidence is to be refused because it does not seem to accord with a literal reading of one of the stories in Genesis. Making any kind of faith decision is based on accumulating the

best evidence one can find—what one’s senses and reason indicate, what the rest of the community has believed over time, and what the community judges most accurate today.

That is not to say that the tradition or community understanding is always correct, as we might note in the aftermath of Galileo’s discoveries. When the various sources of authority seem to be in tension, we must use all our rational and spiritual faculties to discern the direction in which a preponderance of the evidence points. To do otherwise is to repudiate the very gifts God has given us.

Katharine Jefferts Schori, Bishop of the Episcopal Diocese of Nevada, *The Origins of Life: An Episcopal View*, National Public Radio, Aug. 8, 2005, available at npr.org.

- d. For modern science, at least from a philosophical point of view, the critical divide seems to be between inanimate matter and the origin of living organisms, while for Buddhism the critical divide is between non-sentient matter and the emergence of sentient beings. . . . Buddhism draws the critical division differently—i.e., between sentience and non-sentience—because it is primarily interested in the alleviation of suffering and the quest for happiness. In Buddhism, the evolution of the cosmos and the emergence of the sentient beings within it—indeed, effectively everything within the purview of the physical and life sciences—belong within the domain of the first of the Four Noble Truths. . . . [which] state that within the realm of impermanent phenomena there is suffering, suffering has an origin, the cessation of suffering is possible, and there is a path to the cessation of suffering. As I see it, science falls within the scope of the first truth. . . .

The Dalai Lama, *The Universe in a Single Atom: The Convergence of Science and Spirituality* 104–05 (2005).

Would a modernist have to reject any part of Scripture that disagreed with evolutionary theory? For other religious interpretations of evolution see Ernan McMullin, ed., *Evolution and Creation* (1985); Ronald L. Numbers & John Stenhouse, eds., *Disseminating Darwinism: The Role of Place, Race, Religion, and Gender* (1999).

7. When Religion Becomes Science and Science Becomes Religion. Langdon Gilkey, a professor at the University of Chicago Divinity School, was an expert witness in the *McLean* case and wrote a book describing that experience. See Langdon Gilkey, *Creationism On Trial: Evolution and God at Little Rock* (1985). Gilkey testified about the important distinction between religious and scientific knowledge and argued that creation-science was not science, but religion, and that evolution was not religion, but science. Sometimes science makes religious claims, and sometimes religions make scientific claims, but those are mistakes; science and religion are different spheres. According to Gilkey:

This religious penumbra surrounding much of modern science, what one might call its “naturalistic aura,” means, however, neither that creationism represents a “scientific” alternative to evolution nor that “evolutionary science” is simply a religious rival to belief in creation. On the contrary, the creationist concept of creation, being essentially a *religious* concept, and the scientific interpretation of the development of the physical universe, being essentially a set of *scientific* theories, represent significantly different levels of ideas or forms of conceptuality—and it soon became clear that this was what we would have to establish in court. Perhaps the trickiest intellectual problem of the trial—far more subtle than just proving creation science wrong or even unscientific—would be to distinguish the scientific from the religious elements of *both* creationism and evolutionary science, so that while the truth of this point about the religious dimensions of much science could be admitted, the radical distinction *on the scientific level* between the two could be unequivocally asserted.

Id. at 25; see also Langdon Gilkey, *Blue Twilight: Nature, Creationism, and American Religion* (2001). When does a scientific theory turn into a religion? Does evolution proclaim the religion of atheism or agnosticism or secularism?

Gilkey explained the distinction between the two theories on the *scientific* level by distinguishing between theories of ultimate origins and proximate origins. Creationism is a theory of ultimate origins, which explains where everything comes from, while Darwinian evolution, as science, is more limited; it describes only how species developed from one point to another while remaining silent on questions of ultimate origins. As Gilkey explained the mistake of the creation-scientists: “No distinction is made between the question of *proximate origins* (how did something arise out of something else, e.g., the solar system out of a general gaseous state, life out of non-life, one species out of preceding forms of life?—that is scientific questions), and the question of *ultimate origins* (how did the *whole* system of the universe arise, what is its ultimate or final source, ground or principle?—that is, speculative, philosophical, or religious/theological questions of origins).” Id. at 34; see also Scott, *supra*, at 27 (“Although some people confuse the origin of life itself with evolution, the two are conceptually separate. Biological evolution is defined as the descent of living things from ancestors from which they differ. Life had to precede evolution! . . . We know much more about evolution than about the origin of life.”). See also The Dalai Lama, *The Universe in a Single Atom: The Convergence of Science and Spirituality* 115 (2005) (“Regardless of how persuasive the Darwinian account of the origins of life may be, as a Buddhist, I find it leaves one crucial area unexamined. This is the origin of sentience—the evolution of conscious beings who have the capacity to experience pain and pleasure.”).

Do these distinctions make sense to you? Do they persuade you that the district court was correct in its decision in *McLean*? Or were the creationists correct that evolution is a religion of atheism or secularism?

After establishing that creation-science was a religion, Gilkey argued that, within the field of religion, creationism adopted one sectarian Christian interpretation of creation that was disputed not only by non-Christians but also by other Christians with different theologies. Because creation-science was not a scientific equivalent to evolution, and was only one of an array of religious theories of origins, Gilkey concluded that it should not be taught in the science classroom as the sole alternative to evolution.

Should a legislator who listened to Gilkey's testimony conclude that she should propose a bill requiring the teaching of all Christian accounts of creation whenever evolution is taught? Would the Balanced Acts of Arkansas or Louisiana become constitutional if they included other stories of origin in addition to Genesis? Or would these stories remain unscientific? Would it be constitutional for the state to mandate that creationism, the Chinese myth of Pan Gu and the Mesopotamian myth of Atrahasis be taught?

If a professor of religious studies or theology wanted to design a course in creation, what should the students read? Should numerous stories of origins be added to the science classroom so that students get a rounded education? Or would it be better for students to learn these stories of origin in a religious studies or social science classroom because they are not scientific? See Jay D. Wexler, *Darwin, Design, and Disestablishment: Teaching the Evolution Controversy in Public Schools*, 56 *Vand. L. Rev.* 751 (2003) (recommending that origins stories be taught as religious studies or social science). How many stories should be taught in this course in "comparative origins"? See *id.* at 788–89 (Genesis, Gilgamesh, Hindu cycles of creation, Native American stories).

Gilkey testified that in Christian theology, creation is "even more religious than Christmas" because there are no secular or human components to it; not even Mary was present at creation, but God alone. *Id.* at 103. Is this a persuasive argument?

Is it a mistake for creationists and other believers to try to turn religion into science? See Steven Goldberg, *Seduced by Science: How American Religion Has Lost Its Way* 33 (1999) ("Creation science has not succeeded in shaping mainstream science or in winning a place in the nation's public school classrooms for the book of Genesis. What it has done instead is to further the troubling notion that American religion must adorn itself in the trappings of science in order to be taken seriously.") See also Sarah Lyall, *Anglican Leader Says the Schools Shouldn't Teach Creationism*, *N.Y. Times*, Mar. 22, 2006, at A3 (Archbishop of Canterbury "believes that portraying the Bible as just another theory devalues it.") and Tigay, *supra*, note 6, at 25 (arguing that literalism is a disservice to the Bible because it "forces the Bible to compete as science, and in such a competition it cannot win. . . . The religious message is precisely the realm in which science cannot compete, and those devoted to the cause of the Bible would do far better service to their cause by stressing its unique religious message.").

Historian and philosopher of science Michael Ruse also testified in Little Rock. He also distinguished science from religion by explaining that science is empirical, looks for laws that offer explanations and predictions, is subject to testability and confirmation, and is also tentative. Scientists, Ruse concluded, must be prepared to change their minds in the face of empirical evidence. In his words, “[i]n this regard, the scientists differ from both the philosophers and the theologians. Nothing in the real world would make the Kantian change his mind, and the Catholic is equally dogmatic, despite any empirical evidence about the stability of bread and wine. Such evidence is simply considered irrelevant.” See Michael Ruse, *Creation–Science Is Not Science*, in Marcel Chotkowski La Follette, ed., *Creationism, Science, and the Law: The Arkansas Case* 150–53 (1983). Do Ruse’s comments suggest that science is an alternative religion or that evolutionists are hostile to religion in a manner that violates *Lukumi*?

8. *Edwards v. Aguillard. McLean* was not appealed. As Arkansas debated its balanced treatment law, Louisiana considered a similar equal time law. A first draft of the Louisiana bill required the teaching of creation *ex nihilo*; a second draft defined creation-science in the same manner as Section 4 of the Arkansas Act in *McLean*. After the *McLean* complaint was filed, however, the Louisiana Senate deleted that longer definition of creation-science from the bill. Thereafter the Louisiana statute required teaching “the scientific evidences for [creation or evolution] and inferences from those scientific evidences.” *Edwards v. Aguillard*, 482 U.S. 578, 600–01 (1987). Does the new language mean that the Louisiana bill is constitutional under *McLean*? Or would the Court think that “the world is not made brand new every morning,” as Justice Souter wrote in the Texas Ten Commandments case, *Van Orden v. Perry*, 545 U.S. 677 (2005), from Chapter VI, and find that the legislature lacked a secular purpose?

A district court dismissed the Louisiana case on summary judgment for the state, without ever holding the detailed trial conducted by Judge Overton in *McLean*. The United States Supreme Court upheld the lower court, ruling that the Louisiana law violated the Establishment Clause because it failed the secular purpose prong of the *Lemon* test. In finding that there was no secular purpose, the Court focused on the religious motivations of the legislators who passed the bill. Was the Court wrong to focus on the religious motivation of Senator Keith and other sponsors of the bill? Did the amendments to the Act post-*McLean* prove that the bill was secular and not religious? See *id.* at 604 (Powell, J., concurring) (“That the statute is limited to the scientific evidences supporting the theory does not render its purpose secular.”); but see *id.* at 611 (Scalia, J., dissenting) (observing that without a trial record the court needed to await state court interpretations of the statute and its passage).

Louisiana argued that the purpose of the bill was to protect academic freedom. Is that a secular purpose that should survive Establishment Clause scrutiny? See *id.* at 587 (academic freedom is not fostered by narrowing the science curriculum); but see *id.* at 628 (dissenting argument that the legislation protects the academic freedom of students to hear competing arguments). Should a religious motivation by legislators suffice to invalidate a statute? See Stephen L. Carter, *The Culture of Disbelief*:

How American Law and Politics Trivialize Religious Devotion 111 (1993) (arguing that the mistake in *Aguillard* was to rule that the statute was unconstitutional because of the motivations of the legislature).

Was a trial necessary to invalidate the Arkansas Act, or should the district court have done so on summary judgment?

9. *A Constitutional Right to Teach Creation–Science? Post-Aguillard* a high school biology teacher argued that the school district violated Establishment and Free Exercise by forcing him to teach evolution when he wanted to teach students that evolution was not a valid scientific theory and that creationism was an acceptable alternative. The Ninth Circuit concluded that evolution was not a religion, rejected the claim that the district established religion by requiring that evolution be taught, and upheld restrictions on the teacher’s right to discuss religious matters with his students. See *Peloza v. Capistrano Unified Sch. Dist.*, 37 F.3d 517 (9th Cir. 1994); see also *Webster v. New Lenox Sch. Dist.*, No. 122, 917 F.2d 1004 (7th Cir. 1990) (social studies teacher does not have a First Amendment right to teach nonevolutionary theories in the classroom).

May government fund private schools that teach creation science through vouchers under *Zelman*, from Chapter VI, *supra*, p. 347? See Robert T. Pennock, ed., *Intelligent Design Creationism and Its Critics: Philosophical, Theological, and Scientific Perspectives* (2001).

10. *Disclaimers.* In response to the preceding cases, several states required disclaimers to be presented to students whenever evolution is taught. Louisiana teachers, for example, were expected to present the following disclaimer:

It is hereby recognized by the Tangipahoa Board of Education, that the lesson to be presented, regarding the origin of life and matter, is known as the Scientific Theory of Evolution and should be presented to inform students of the scientific concept and not intended to influence or dissuade the Biblical version of Creation or any other concept.

It is further recognized by the Board of Education that it is the basic right and privilege of each student to form his/her own opinion and maintain beliefs taught by parents on this very important matter of the origin of life and matter. Students are urged to exercise critical thinking and gather all information possible and closely examine each alternative toward forming an opinion.

Is there any secular purpose to such disclaimers? The courts ruled that the Louisiana disclaimers violated the Establishment Clause. See *Freiler v. Tangipahoa Parish Bd. of Educ.*, 185 F.3d 337 (5th Cir. 1999), cert. denied, 530 U.S. 1251 (Scalia, J., dissenting from denial of cert.) (disclaimers advance freedom of thought). Is the following disclaimer from Georgia constitutional or unconstitutional? “This textbook contains material on evolution. Evolution is a theory, not a fact, regarding the origin of living things. This material should be approached with an open mind, studied carefully, and critically considered.” Should disclaimers be given at other times in Georgia science classes, e.g., when Einstein’s theory of relativity is taught? See *Selman v. Cobb County Sch. Dist.*, 390 F.Supp.2d 1286 (N.D. Ga. 2005) (district court invalidated under prongs two and three of *Lemon* despite finding of secular purpose); vacated and remanded by 449 F.3d 1320 (11th Cir. 2006) (remanding for factual findings).

11. *Creation at the Zoo.* A resident of Tulsa, Oklahoma, asked the City Parks Board to install a creationism exhibit, based on the Book of Genesis, at the City Zoo. Did the Board members violate the Establishment Clause when they approved the exhibit? Does it affect your analysis that the zoo has a globe at its entrance that is inscribed “The Earth is our mother. The sky is our father.”? Or that outside the zoo’s elephant house is a statue of the Hindu deity Ganesha? See Greg Allen, Morning Edition: Tulsa Zoo Considering Adding a Display Providing the Biblical Account of How the Earth Began (NPR radio broadcast, July 6, 2006).

12. *The Next Era: Intelligent Design.* Did *Aguillard* and *McLean* close the doors of the public school to creationism? In *Aguillard* the Court observed that “teaching a variety of scientific theories about the origins of humankind to schoolchildren might be validly done with the clear secular intent of enhancing the effectiveness of science instruction.” 482 U.S. at 594. Did that case leave a “loophole” for proponents of creationism? See Scott, *supra*, at 114. According to Professor Francis Beckwith,

Although the *Edwards* Court sounded the death-knell for creationism as part of the science curriculum in public schools, it neither prohibited public schools from teaching alternatives to evolution, nor prevented schools from offering to their students theories that may be consistent with, and lend support to, a religious perspective. Both of these qualifications, combined with other factors, suggest that ID [intelligent design] may be offered as part of a public school science curriculum or voluntarily by a teacher without violating the Establishment Clause, for, as we shall see, ID is an alternative to evolution that is consistent with, and lends support to, a number of philosophical and religious points of view. Unlike creationism, however, ID is not derived from a particular religion’s special revelation, but is the result of arguments whose premises include empirical evidence, well-founded conceptual notions outside of the natural sciences, and conclusions that are supported by these premises.

Francis J. Beckwith, *Science and Religion Twenty Years After McLean v. Arkansas: Evolution, Public Education, and the New Challenge of Intelligent Design*, 26 Harv. J.L. & Pub. Pol’y 456 (2003). Is Professor Beckwith correct? Is ID a *scientific* alternative to evolution or a *philosophical* one? See also Francis J. Beckwith, *Law, Darwinism, and Public Education: The Establishment Clause and the Challenge of Intelligent Design* (2003).

4. INTELLIGENT DESIGN

Kitzmiller v. Dover Area School District

United States District Court for the Middle District of Pennsylvania, 2005.
400 F.Supp.2d 707.

MEMORANDUM OPINION

■ JONES, District Judge.

INTRODUCTION:

On October 18, 2004, the Defendant Dover Area School Board of Directors passed by a 6–3 vote the following resolution:

Students will be made aware of gaps/problems in Darwin's theory and of other theories of evolution including, but not limited to, intelligent design. Note: Origins of Life is not taught.

On November 19, 2004, the Defendant Dover Area School District announced by press release that, commencing in January 2005, teachers would be required to read the following statement to students in the ninth grade biology class at Dover High School:

The Pennsylvania Academic Standards require students to learn about Darwin's Theory of Evolution and eventually to take a standardized test of which evolution is a part.

Because Darwin's Theory is a theory, it continues to be tested as new evidence is discovered. The Theory is not a fact. Gaps in the Theory exist for which there is no evidence. A theory is defined as a well-tested explanation that unifies a broad range of observations.

Intelligent Design is an explanation of the origin of life that differs from Darwin's view. The reference book, *Of Pandas and People*, is available for students who might be interested in gaining an understanding of what Intelligent Design actually involves.

With respect to any theory, students are encouraged to keep an open mind. The school leaves the discussion of the Origins of Life to individual students and their families. As a Standards-driven district, class instruction focuses upon preparing students to achieve proficiency on Standards-based assessments.

For the reasons that follow, we hold that the ID Policy is unconstitutional pursuant to the Establishment Clause of the First Amendment of the United States Constitution and Art. I, § 3 of the Pennsylvania Constitution. . . .

[The court employed both the *Lemon* and the endorsement tests, see Chapter VI, to conclude that the disclaimer violated the Establishment Clause. Reprinted here are the sections of the opinion that explain: 1) why ID is a religion and 2) why ID is not a science.]

E. *Application of the Endorsement Test to the ID Policy*

1. *An Objective Observer Would Know that ID and Teaching About "Gaps" and "Problems" in Evolutionary Theory are Creationist, Religious Strategies that Evolved from Earlier Forms of Creationism*

. . . The concept of intelligent design (hereinafter "ID"), in its current form, came into existence after the *Edwards* case was decided in 1987. For the reasons that follow, we conclude that the religious nature of ID would be readily apparent to an objective observer, adult or child.

We initially note that John Haught, a theologian who testified as an expert witness for Plaintiffs and who has written extensively on the subject of evolution and religion, succinctly explained to the Court that the argument for ID is not a new scientific argument, but is rather an old religious argument for the existence of God. He traced this argument back to at least Thomas Aquinas in the 13th century, who framed the argument as a syllogism: Wherever complex design exists, there must have been a designer; nature is complex; therefore nature must have had an intelligent designer. [] Dr. Haught testified that Aquinas was explicit that this intelligent designer “everyone understands to be God.” [] The syllogism described by Dr. Haught is essentially the same argument for ID as presented by defense expert witnesses Professors Behe and Minnich who employ the phrase “purposeful arrangement of parts.”

Dr. Haught testified that this argument for the existence of God was advanced early in the 19th century by Reverend Paley and defense expert witnesses Behe and Minnich admitted that their argument for ID based on the “purposeful arrangement of parts” is the same one that Paley made for design. [] The only apparent difference between the argument made by Paley and the argument for ID, as expressed by defense expert witnesses Behe and Minnich, is that ID’s “official position” does not acknowledge that the designer is God. However, as Dr. Haught testified, anyone familiar with Western religious thought would immediately make the association that the tactically unnamed designer is God, as the description of the designer in *Of Pandas and People* (hereinafter “*Pandas*”) is a “master intellect,” strongly suggesting a supernatural deity as opposed to any intelligent actor known to exist in the natural world. Moreover, it is notable that both Professors Behe and Minnich admitted their personal view is that the designer is God and Professor Minnich testified that he understands many leading advocates of ID to believe the designer to be God. []

Although proponents of the IDM [Intellectual Design Movement] occasionally suggest that the designer could be a space alien or a time-traveling cell biologist, no serious alternative to God as the designer has been proposed by members of the IDM, including Defendants’ expert witnesses. [] In fact, an explicit concession that the intelligent designer works outside the laws of nature and science and a direct reference to religion is *Pandas*’ rhetorical statement, “what kind of intelligent agent was it [the designer]” and answer: “On its own science cannot answer this question. It must leave it to religion and philosophy.” []

A significant aspect of the IDM is that despite Defendants’ protestations to the contrary, it describes ID as a religious argument. In that vein, the writings of leading ID proponents reveal that the designer postulated by their argument is the God of Christianity. Dr. Barbara Forrest, one of Plaintiffs’ expert witnesses, is the author of the book *Creationism’s Trojan Horse*. She has thoroughly and exhaustively chronicled the history of ID in her book and other writings for her testimony in this case. Her testimony, and the exhibits which were admitted with it, provide a wealth of state-

ments by ID leaders that reveal ID's religious, philosophical, and cultural content. The following is a representative grouping of such statements made by prominent ID proponents.⁵

Phillip Johnson, considered to be the father of the IDM, developer of ID's "Wedge Strategy," which will be discussed below, and author of the 1991 book entitled *Darwin on Trial*, has written that "theistic realism" or "mere creation" are defining concepts of the IDM. This means "that God is objectively real as Creator and recorded in the biological evidence. . . ." [] In addition, Phillip Johnson states that the "Darwinian theory of evolution contradicts not just the Book of Genesis, but every word in the Bible from beginning to end. It contradicts the idea that we are here because a creator brought about our existence for a purpose." [] ID proponents Johnson, William Dembski, and Charles Thaxton, one of the editors of *Pandas*, situate ID in the Book of John in the New Testament of the Bible, which begins, "In the Beginning was the Word, and the Word was God." [] Dembski has written that ID is a "ground clearing operation" to allow Christianity to receive serious consideration, and "Christ is never an addendum to a scientific theory but always a completion." [] Moreover, in turning to Defendants' lead expert, Professor Behe, his testimony at trial indicated that ID is only a scientific, as opposed to a religious, project for him; however, considerable evidence was introduced to refute this claim. Consider, to illustrate, that Professor Behe remarkably and unmistakably claims that the *plausibility of the argument for ID depends upon the extent to which one believes in the existence of God.* [] (emphasis added). As no evidence in the record indicates that any other scientific proposition's validity rests on belief in God, nor is the Court aware of any such scientific propositions, Professor Behe's assertion constitutes substantial evidence that in his view, as is commensurate with other prominent ID leaders, ID is a religious and not a scientific proposition.

Dramatic evidence of ID's religious nature and aspirations is found in what is referred to as the "Wedge Document." The Wedge Document,

5. Defendants contend that the Court should ignore all evidence of ID's lineage and religious character because the Board members do not personally know Jon Buell, President of the Foundation for Thought and Ethics (hereinafter "FTE"), the publisher of *Pandas*, or Phillip Johnson, nor are they familiar with the Wedge Document or the drafting history of *Pandas*. Defendants' argument lacks merit legally and logically.

The evidence that Defendants are asking this Court to ignore is exactly the sort that the court in *McLean* considered and found dispositive concerning the question of whether creation science was a scientific view that could be taught in public schools, or a religious one that could not. The *McLean* court considered writings and statements by creation science advocates like Henry Morris

and Duane Gish, as well as the activities and mission statements of creationist think-tanks like the Biblical Science Association, the Institution for Creation Research, and the Creation Science Research Center. *McLean*, 529 F.Supp. at 1259-60. The court did not make the relevance of such evidence conditional on whether the Arkansas Board of Education knew the information. Instead, the court treated the evidence as speaking directly to the threshold question of what creation science was. Moreover, in *Edwards*, the Supreme Court adopted *McLean's* analysis of such evidence without reservation, and without any discussion of which details about creation science the defendant school board actually knew. *Edwards*, 482 U.S. at 590 n. 9, 107 S.Ct. 2573.

developed by the Discovery Institute's Center for Renewal of Science and Culture (hereinafter "CRSC"), represents from an institutional standpoint, the IDM's goals and objectives, much as writings from the Institute for Creation Research did for the earlier creation-science movement, as discussed in *McLean*. [] The Wedge Document states in its "Five Year Strategic Plan Summary" that the IDM's goal is to replace science as currently practiced with "theistic and Christian science." [] As posited in the Wedge Document, the IDM's "Governing Goals" are to "defeat scientific materialism and its destructive moral, cultural, and political legacies" and "to replace materialistic explanations with the theistic understanding that nature and human beings are created by God." [] The CSRC expressly announces, in the Wedge Document, a program of Christian apologetics to promote ID. A careful review of the Wedge Document's goals and language throughout the document reveals cultural and religious goals, as opposed to scientific ones. [] ID aspires to change the ground rules of science to make room for religion, specifically, beliefs consonant with a particular version of Christianity.

In addition to the IDM itself describing ID as a religious argument, ID's religious nature is evident because it involves a supernatural designer. The courts in *Edwards* and *McLean* expressly found that this characteristic removed creationism from the realm of science and made it a religious proposition. *Edwards*, 482 U.S. at 591–92, 107 S.Ct. 2573; *McLean*, 529 F.Supp. at 1265–66. Prominent ID proponents have made abundantly clear that the designer is supernatural.

Defendants' expert witness ID proponents confirmed that the existence of a supernatural designer is a hallmark of ID. First, Professor Behe has written that by ID he means "not designed by the laws of nature," and that it is "implausible that the designer is a natural entity." [] Second, Professor Minnich testified that for ID to be considered science, the ground rules of science have to be broadened so that supernatural forces can be considered. [] Third, Professor Steven William Fuller testified that it is ID's project to change the ground rules of science to include the supernatural. [] Turning from defense expert witnesses to leading ID proponents, Johnson has concluded that science must be redefined to include the supernatural if religious challenges to evolution are to get a hearing. [] Additionally, Dembski agrees that science is ruled by methodological naturalism and argues that this rule must be overturned if ID is to prosper. []

Further support for the proposition that ID requires supernatural creation is found in the book *Pandas*, to which students in Dover's ninth grade biology class are directed. *Pandas* indicates that there are two kinds of causes, natural and intelligent, which demonstrate that intelligent causes are beyond nature. [] Professor Haught, who as noted was the only theologian to testify in this case, explained that in Western intellectual tradition, non-natural causes occupy a space reserved for ultimate religious explanations. [] Robert Pennock, Plaintiffs' expert in the philosophy of science, concurred with Professor Haught and concluded that because its basic proposition is that the features of the natural world are produced by a

transcendent, immaterial, non-natural being, ID is a religious proposition regardless of whether that religious proposition is given a recognized religious label. [] It is notable that not one defense expert was able to explain how the supernatural action suggested by ID could be anything other than an inherently religious proposition. Accordingly, we find that ID's religious nature would be further evident to our objective observer because it directly involves a supernatural designer.

A "hypothetical reasonable observer," adult or child, who is "aware of the history and context of the community and forum" is also presumed to know that ID is a form of creationism. [] The evidence at trial demonstrates that ID is nothing less than the progeny of creationism. What is likely the strongest evidence supporting the finding of ID's creationist nature is the history and historical pedigree of the book to which students in Dover's ninth grade biology class are referred, *Pandas*. *Pandas* is published by an organization called FTE, as noted, whose articles of incorporation and filings with the Internal Revenue Service describe it as a religious, Christian organization. [] *Pandas* was written by Dean Kenyon and Percival Davis, both acknowledged creationists, and Nancy Pearcey, a Young Earth Creationist, contributed to the work. []

As Plaintiffs meticulously and effectively presented to the Court, *Pandas* went through many drafts, several of which were completed prior to and some after the Supreme Court's decision in *Edwards*, which held that the Constitution forbids teaching creationism as science. By comparing the pre and post *Edwards* drafts of *Pandas*, three astonishing points emerge: (1) the definition for creation science in early drafts is identical to the definition of ID; (2) cognates of the word creation (creationism and creationist), which appeared approximately 150 times were deliberately and systematically replaced with the phrase ID; and (3) the changes occurred shortly after the Supreme Court held that creation science is religious and cannot be taught in public school science classes in *Edwards*. This word substitution is telling, significant, and reveals that a purposeful change of words was effected without any corresponding change in content, which directly refutes FTE's argument that by merely disregarding the words "creation" and "creationism," FTE expressly rejected creationism in *Pandas*. In early pre-*Edwards* drafts of *Pandas*, the term "creation" was defined as "various forms of life that began abruptly through an intelligent agency with their distinctive features intact—fish with fins and scales, birds with feathers, beaks, and wings, etc," the very same way in which ID is defined in the subsequent published versions. [] This definition was described by many witnesses for both parties, notably including defense experts Minnich and Fuller, as "special creation" of kinds of animals, an inherently religious and creationist concept. [] Professor Behe's assertion that this passage was merely a *description* of appearances in the fossil record is illogical and defies the weight of the evidence that the passage is a conclusion about how life began based upon an *interpretation* of the fossil record, which is reinforced by the content of drafts of *Pandas*.

The weight of the evidence clearly demonstrates, as noted, that the systemic change from “creation” to “intelligent design” occurred sometime in 1987, *after* the Supreme Court’s important *Edwards* decision. This compelling evidence strongly supports Plaintiffs’ assertion that ID is creationism re-labeled. Importantly, the objective observer, whether adult or child, would conclude from the fact that *Pandas* posits a master intellect that the intelligent designer is God.

Further evidence in support of the conclusion that a reasonable observer, adult or child, who is “aware of the history and context of the community and forum” is presumed to know that ID is a form of creationism concerns the fact that ID uses the same, or exceedingly similar arguments as were posited in support of creationism. One significant difference is that the words “God,” “creationism,” and “Genesis” have been systematically purged from ID explanations, and replaced by an unnamed “designer.” Dr. Forrest testified and sponsored exhibits showing six arguments common to creationists. [] Demonstrative charts introduced through Dr. Forrest show parallel arguments relating to the rejection of naturalism, evolution’s threat to culture and society, “abrupt appearance” implying divine creation, the exploitation of the same alleged gaps in the fossil record, the alleged inability of science to explain complex biological information like DNA, as well as the theme that proponents of each version of creationism merely aim to teach a scientific alternative to evolution to show its “strengths and weaknesses,” and to alert students to a supposed “controversy” in the scientific community. [] In addition, creationists made the same argument that the complexity of the bacterial flagellum supported creationism as Professors Behe and Minnich now make for ID. [] The IDM openly welcomes adherents to creationism into its “Big Tent,” urging them to postpone biblical disputes like the age of the earth. [] Moreover and as previously stated, there is hardly better evidence of ID’s relationship with creationism than an explicit statement by defense expert Fuller that ID is a form of creationism. []

Although contrary to Fuller, defense experts Professors Behe and Minnich testified that ID is not creationism, their testimony was primarily by way of bare assertion and it failed to directly rebut the creationist history of *Pandas* or other evidence presented by Plaintiffs showing the commonality between creationism and ID. The sole argument Defendants made to distinguish creationism from ID was their assertion that the term “creationism” applies only to arguments based on the Book of Genesis, a young earth, and a catastrophic Noach flood; however, substantial evidence established that this is only one form of creationism, including the chart that was distributed to the Board Curriculum Committee, as will be described below. [] . . .

[The Court then concluded that an objective *student* would see the disclaimer as a “strong official endorsement of religion.”] . . . The overwhelming evidence at trial established that ID is a religious view, a mere re-labeling of creationism, and not a scientific theory. As the Fifth Circuit Court of Appeals held in *Freiler*, an educator’s “reading of a disclaimer that

not only disavows endorsement of educational materials but also juxtaposes that disavowal with an urging to contemplate alternative religious concepts implies School Board approval of religious principles.” *Freiler*, 185 F.3d at 348. . . . [Other features of the manner the disclaimer’s presentation to students were relevant to the court’s analysis. Because some teachers refused to present the disclaimer, school administrators had to enter the classroom to present it. Moreover, the “administrators made the remarkable and awkward statement, as part of the disclaimer, that ‘there will be no other discussion of the issue and your teachers will not answer questions on the issue.’” Finally, students who did not want to hear the disclaimer had to opt out of the classroom presentation.] Accordingly, we find that the classroom presentation of the disclaimer, including school administrators making a special appearance in the science classrooms to deliver the statement, the complete prohibition on discussion or questioning ID, and the “opt out” feature all convey a strong message of religious endorsement. . . .

In summary, the disclaimer singles out the theory of evolution for special treatment, misrepresents its status in the scientific community, causes students to doubt its validity without scientific justification, presents students with a religious alternative masquerading as a scientific theory, directs them to consult a creationist text as though it were a science resource, and instructs students to forego scientific inquiry in the public school classroom and instead to seek out religious instruction elsewhere. Furthermore, as Drs. Alters and Miller testified, introducing ID necessarily invites religion into the science classroom as it sets up what will be perceived by students as a “God-friendly” science, the one that explicitly mentions an intelligent designer, and that the “other science,” evolution, takes no position on religion. [] Dr. Miller testified that a false duality is produced: It “tells students . . . quite explicitly, choose God on the side of intelligent design or choose atheism on the side of science.” [] Introducing such a religious conflict into the classroom is “very dangerous” because it forces students to “choose between God and science,” not a choice that schools should be forcing on them. []

[The court also concluded that members of the community would perceive an endorsement of religion because of a School Board newsletter sent to members of the community and local news coverage.]

We have now found that both an objective student and an objective adult member of the Dover community would perceive Defendants’ conduct to be a strong endorsement of religion pursuant to the endorsement test. Having so concluded, we find it incumbent upon the Court to further address an additional issue raised by Plaintiffs, which is whether ID is science. To be sure, our answer to this question can likely be predicted based upon the foregoing analysis. While answering this question compels us to revisit evidence that is entirely complex, if not obtuse, after a six week trial that spanned twenty-one days and included countless hours of detailed expert witness presentations, the Court is confident that no other tribunal in the United States is in a better position than are we to traipse

into this controversial area. Finally, we will offer our conclusion on whether ID is science not just because it is essential to our holding that an Establishment Clause violation has occurred in this case, but also in the hope that it may prevent the obvious waste of judicial and other resources which would be occasioned by a subsequent trial involving the precise question which is before us.

4. *Whether ID is Science*

After a searching review of the record and applicable caselaw, we find that while ID arguments may be true, a proposition on which the Court takes no position, ID is not science. We find that ID fails on three different levels, any one of which is sufficient to preclude a determination that ID is science. They are: (1) ID violates the centuries-old ground rules of science by invoking and permitting supernatural causation; (2) the argument of irreducible complexity, central to ID, employs the same flawed and illogical contrived dualism that doomed creation science in the 1980's; and (3) ID's negative attacks on evolution have been refuted by the scientific community. As we will discuss in more detail below, it is additionally important to note that ID has failed to gain acceptance in the scientific community, it has not generated peer-reviewed publications, nor has it been the subject of testing and research.

Expert testimony reveals that since the scientific revolution of the 16th and 17th centuries, science has been limited to the search for natural causes to explain natural phenomena. (9:19–22 (Haught); 5:25–29 (Pennock); 1:62 (Miller)). This revolution entailed the rejection of the appeal to authority, and by extension, revelation, in favor of empirical evidence. (5:28 (Pennock)). Since that time period, science has been a discipline in which testability, rather than any ecclesiastical authority or philosophical coherence, has been the measure of a scientific idea's worth. (9:21–22 (Haught); 1:63 (Miller)). In deliberately omitting theological or "ultimate" explanations for the existence or characteristics of the natural world, science does not consider issues of "meaning" and "purpose" in the world. (9:21 (Haught); 1:64, 87 (Miller)). While supernatural explanations may be important and have merit, they are not part of science. (3:103 (Miller); 9:19–20 (Haught)). This self-imposed convention of science, which limits inquiry to testable, natural explanations about the natural world, is referred to by philosophers as "methodological naturalism" and is sometimes known as the scientific method. (5:23, 29–30 (Pennock)). Methodological naturalism is a "ground rule" of science today which requires scientists to seek explanations in the world around us based upon what we can observe, test, replicate, and verify. (1:59–64, 2:41–43 (Miller); 5:8, 23–30 (Pennock)).

As the National Academy of Sciences (hereinafter "NAS") was recognized by experts for both parties as the "most prestigious" scientific association in this country, we will accordingly cite to its opinion where appropriate. [] NAS is in agreement that science is limited to empirical, observable and ultimately testable data: "Science is a particular way of knowing about the world. In science, explanations are restricted to those that can be inferred from the confirmable data—the results obtained

through observations and experiments that can be substantiated by other scientists. Anything that can be observed or measured is amenable to scientific investigation. Explanations that cannot be based upon empirical evidence are not part of science.” []

This rigorous attachment to “natural” explanations is an essential attribute to science by definition and by convention. [] We are in agreement with Plaintiffs’ lead expert Dr. Miller, that from a practical perspective, attributing unsolved problems about nature to causes and forces that lie outside the natural world is a “science stopper.” [] As Dr. Miller explained, once you attribute a cause to an untestable supernatural force, a proposition that cannot be disproven, there is no reason to continue seeking natural explanations as we have our answer. []

ID is predicated on supernatural causation, as we previously explained and as various expert testimony revealed. [] ID takes a natural phenomenon and, instead of accepting or seeking a natural explanation, argues that the explanation is supernatural. [] Further support for the conclusion that ID is predicated on supernatural causation is found in the ID reference book to which ninth grade biology students are directed, *Pandas*. *Pandas* states, in pertinent part, as follows:

Darwinists object to the view of intelligent design *because it does not give a natural cause explanation* of how the various forms of life started in the first place. Intelligent design means that various forms of life began abruptly, through an intelligent agency, with their distinctive features already intact—fish with fins and scales, birds with feathers, beaks, and wings, etc.

[] Stated another way, ID posits that animals did not evolve naturally through evolutionary means but were created abruptly by a non-natural, or supernatural, designer. Defendants’ own expert witnesses acknowledged this point. (21:96–100 (Behe); P-718 at 696, 700) (“implausible that the designer is a natural entity”); 28:21–22 (Fuller) (“... ID’s rejection of naturalism and commitment to supernaturalism ...”); 38:95–96 (Minnich) (ID does not exclude the possibility of a supernatural designer, including deities).

It is notable that defense experts’ own mission, which mirrors that of the IDM itself, is to change the ground rules of science to allow supernatural causation of the natural world, which the Supreme Court in *Edwards* and the court in *McLean* correctly recognized as an inherently religious concept. *Edwards*, 482 U.S. at 591–92, 107 S.Ct. 2573; *McLean*, 529 F.Supp. at 1267. First, defense expert Professor Fuller agreed that ID aspires to “change the ground rules” of science and lead defense expert Professor Behe admitted that his broadened definition of science, which encompasses ID, would also embrace astrology. [] Moreover, defense expert Professor Minnich acknowledged that for ID to be considered science, the ground rules of science have to be broadened to allow consideration of supernatural forces. []

Prominent IDM leaders are in agreement with the opinions expressed by defense expert witnesses that the ground rules of science must be changed for ID to take hold and prosper. William Dembski, for instance, an IDM leader, proclaims that science is ruled by methodological naturalism and argues that this rule must be overturned if ID is to prosper. [] (“Indeed, entire fields of inquiry, including especially in the human sciences, will need to be rethought from the ground up in terms of intelligent design.”).

The Discovery Institute, the think tank promoting ID whose CRSC developed the Wedge Document, acknowledges as “Governing Goals” to “defeat scientific materialism and its destructive moral, cultural and political legacies” and “replace materialistic explanations with the theistic understanding that nature and human beings are created by God.” [] In addition, and as previously noted, the Wedge Document states in its “Five Year Strategic Plan Summary” that the IDM’s goal is to replace science as currently practiced with “theistic and Christian science.” [] The IDM accordingly seeks nothing less than a complete scientific revolution in which ID will supplant evolutionary theory.¹⁴

Notably, every major scientific association that has taken a position on the issue of whether ID is science has concluded that ID is not, and cannot be considered as such. [] Initially, we note that NAS, the “most prestigious” scientific association in this country, views ID as follows:

Creationism, intelligent design, and other claims of supernatural intervention in the origin of life or of species are not science because they are not testable by the methods of science. These claims subordinate observed data to statements based on authority, revelation, or religious belief. Documentation offered in support of these claims is typically limited to the special publications of their advocates. These publications do not offer hypotheses subject to change in light of new data, new interpretations, or demonstration of error. This contrasts with science, where any hypothesis or theory always remains subject to the possibility of rejection or modification in the light of new knowledge.

14. Further support for this proposition is found in the Wedge Strategy, which is composed of three phases: Phase I is scientific research, writing and publicity; Phase II is publicity and opinion-making; and Phase III is cultural confrontation and renewal. []. In the “Five Year Strategic Plan Summary,” the Wedge Document explains that the social consequences of materialism have been “devastating” and that it is necessary to broaden the wedge with a positive scientific alternative to materialistic scientific theories, which has come to be called the theory of ID. “Design theory promises to reverse the stifling dominance of the materialist worldview, and to replace it with a science consonant with Christian and theistic convictions.” [].

Phase I of the Wedge Strategy is an essential component and directly references “scientific revolutions.” Phase II explains that alongside a focus on influential opinion-makers, “we also seek to build up a popular base of support among our natural constituency, namely, Christians. We will do this primarily through apologetics seminars. We intend these to encourage and equip believers with new scientific evidence that support the faith, as well as to ‘popularize’ our ideas in the broader culture.” [] Finally, Phase III includes pursuing possible legal assistance “in response to resistance to the integration of design theory into public school science curricula.” []

[] Additionally, the American Association for the Advancement of Science (hereinafter “AAAS”), the largest organization of scientists in this country, has taken a similar position on ID, namely, that it “has not proposed a scientific means of testing its claims” and that “the lack of scientific warrant for so-called ‘intelligent design theory’ makes it improper to include as part of science education. . . .” [] Not a single expert witness over the course of the six week trial identified one major scientific association, society or organization that endorsed ID as science. What is more, defense experts concede that ID is not a theory as that term is defined by the NAS and admit that ID is at best “fringe science” which has achieved no acceptance in the scientific community. []

It is therefore readily apparent to the Court that ID fails to meet the essential ground rules that limit science to testable, natural explanations. [] Science cannot be defined differently for Dover students than it is defined in the scientific community as an affirmative action program, as advocated by Professor Fuller, for a view that has been unable to gain a foothold within the scientific establishment. Although ID’s failure to meet the ground rules of science is sufficient for the Court to conclude that it is not science, out of an abundance of caution and in the exercise of completeness, we will analyze additional arguments advanced regarding the concepts of ID and science.

ID is at bottom premised upon a false dichotomy, namely, that to the extent evolutionary theory is discredited, ID is confirmed. [] This argument is not brought to this Court anew, and in fact, the same argument, termed “contrived dualism” in *McLean*, was employed by creationists in the 1980’s to support “creation science.” The court in *McLean* noted the “fallacious pedagogy of the two model approach” and that “[i]n efforts to establish ‘evidence’ in support of creation science, the defendants relied upon the same false premise as the two model approach . . . all evidence which criticized evolutionary theory was proof in support of creation science.” *McLean*, 529 F.Supp. at 1267, 1269. We do not find this false dichotomy any more availing to justify ID today than it was to justify creation science two decades ago.

ID proponents primarily argue for design through negative arguments against evolution, as illustrated by Professor Behe’s argument that “irreducibly complex” systems cannot be produced through Darwinian, or any natural, mechanisms. [] However, we believe that arguments against evolution are not arguments for design. Expert testimony revealed that just because scientists cannot explain today how biological systems evolved does not mean that they cannot, and will not, be able to explain them tomorrow. [] As Dr. Padian aptly noted, “absence of evidence is not evidence of absence.” [] To that end, expert testimony from Drs. Miller and Padian provided multiple examples where *Pandas* asserted that no natural explanations exist, and in some cases that none could exist, and yet natural explanations have been identified in the intervening years. It also bears mentioning that as Dr. Miller stated, just because scientists cannot explain

every evolutionary detail does not undermine its validity as a scientific theory as no theory in science is fully understood. []

As referenced, the concept of irreducible complexity is ID's alleged scientific centerpiece. Irreducible complexity is a negative argument against evolution, not proof of design, a point conceded by defense expert Professor Minnich. [] (irreducible complexity "is not a test of intelligent design; it's a test of evolution"). Irreducible complexity additionally fails to make a positive scientific case for ID, as will be elaborated upon below.

We initially note that irreducible complexity as defined by Professor Behe in his book *Darwin's Black Box* and subsequently modified in his 2001 article entitled "Reply to My Critics," appears as follows:

By irreducibly complex I mean a single system which is composed of several well-matched, interacting parts that contribute to the basic function, wherein the removal of any one of the parts causes the system to effectively cease functioning. An irreducibly complex system cannot be produced directly by slight, successive modifications of a precursor system, because any precursor to an irreducibly complex system that is missing a part is by definition nonfunctional. . . . Since natural selection can only choose systems that are already working, then if a biological system cannot be produced gradually it would have to arise as an integrated unit, in one fell swoop, for natural selection to have anything to act on.

[] Professor Behe admitted in "Reply to My Critics" that there was a defect in his view of irreducible complexity because, while it purports to be a challenge to natural selection, it does not actually address "the task facing natural selection." [] Professor Behe specifically explained that "[t]he current definition puts the focus on removing a part from an already-functioning system," but "[t]he difficult task facing Darwinian evolution, however, would not be to remove parts from sophisticated pre-existing systems; it would be to bring together components to make a new system in the first place." [] In that article, Professor Behe wrote that he hoped to "repair this defect in future work;" however, he has failed to do so even four years after elucidating his defect. []

In addition to Professor Behe's admitted failure to properly address the very phenomenon that irreducible complexity purports to place at issue, natural selection, Drs. Miller and Padian testified that Professor Behe's concept of irreducible complexity depends on ignoring ways in which evolution is known to occur. Although Professor Behe is adamant in his definition of irreducible complexity when he says a precursor "missing a part is by definition nonfunctional," what he obviously means is that it will not function in the same way the system functions when all the parts are present. For example in the case of the bacterial flagellum, removal of a part may prevent it from acting as a rotary motor. However, Professor Behe excludes, by definition, the possibility that a precursor to the bacterial flagellum functioned not as a rotary motor, but in some other way, for example as a secretory system. []

As expert testimony revealed, the qualification on what is meant by “irreducible complexity” renders it meaningless as a criticism of evolution. [] In fact, the theory of evolution proffers exaptation as a well-recognized, well-documented explanation for how systems with multiple parts could have evolved through natural means. Exaptation means that some precursor of the subject system had a different, selectable function before experiencing the change or addition that resulted in the subject system with its present function. [] For instance, Dr. Padian identified the evolution of the mammalian middle ear bones from what had been jawbones as an example of this process. [] By defining irreducible complexity in the way that he has, Professor Behe attempts to exclude the phenomenon of exaptation by definitional fiat, ignoring as he does so abundant evidence which refutes his argument.

Notably, the NAS has rejected Professor Behe’s claim for irreducible complexity by using the following cogent reasoning:

[S]tructures and processes that are claimed to be “irreducibly” complex typically are not on closer inspection. For example, it is incorrect to assume that a complex structure or biochemical process can function only if all its components are present and functioning as we see them today. Complex biochemical systems can be built up from simpler systems through natural selection. Thus, the “history” of a protein can be traced through simpler organisms. . . . The evolution of complex molecular systems can occur in several ways. Natural selection can bring together parts of a system for one function at one time and then, at a later time, recombine those parts with other systems of components to produce a system that has a different function. Genes can be duplicated, altered, and then amplified through natural selection. The complex biochemical cascade resulting in blood clotting has been explained in this fashion.

As irreducible complexity is only a negative argument against evolution, it is refutable and accordingly testable, unlike ID, by showing that there are intermediate structures with selectable functions that could have evolved into the allegedly irreducibly complex systems. [] Importantly, however, the fact that the negative argument of irreducible complexity is testable does not make testable the argument for ID. [] Professor Behe has applied the concept of irreducible complexity to only a few select systems: (1) the bacterial flagellum; (2) the blood-clotting cascade; and (3) the immune system. Contrary to Professor Behe’s assertions with respect to these few biochemical systems among the myriad existing in nature, however, Dr. Miller presented evidence, based upon peer-reviewed studies, that they are not in fact irreducibly complex.

[The court reviewed those studies.]

We find that such evidence demonstrates that the ID argument is dependent upon setting a scientifically unreasonable burden of proof for the theory of evolution. As a further example, the test for ID proposed by both Professors Behe and Minnich is to grow the bacterial flagellum in the laboratory; however, no-one inside or outside of the IDM, including those

who propose the test, has conducted it. [] Professor Behe conceded that the proposed test could not approximate real world conditions and even if it could, Professor Minnich admitted that it would merely be a test of evolution, not design. []

We therefore find that Professor Behe's claim for irreducible complexity has been refuted in peer-reviewed research papers and has been rejected by the scientific community at large. [] Additionally, even if irreducible complexity had not been rejected, it still does not support ID as it is merely a test for evolution, not design. []

We will now consider the purportedly "positive argument" for design encompassed in the phrase used numerous times by Professors Behe and Minnich throughout their expert testimony, which is the "purposeful arrangement of parts." Professor Behe summarized the argument as follows: We infer design when we see parts that appear to be arranged for a purpose. The strength of the inference is quantitative; the more parts that are arranged, the more intricately they interact, the stronger is our confidence in design. The appearance of design in aspects of biology is overwhelming. Since nothing other than an intelligent cause has been demonstrated to be able to yield such a strong appearance of design, Darwinian claims notwithstanding, the conclusion that the design seen in life is real design is rationally justified. [] As previously indicated, this argument is merely a restatement of the Reverend William Paley's argument applied at the cell level. Minnich, Behe, and Paley reach the same conclusion, that complex organisms must have been designed using the same reasoning, except that Professors Behe and Minnich refuse to identify the designer, whereas Paley inferred from the presence of design that it was God. [] Expert testimony revealed that this inductive argument is not scientific and as admitted by Professor Behe, can never be ruled out. []

Indeed, the assertion that design of biological systems can be inferred from the "purposeful arrangement of parts" is based upon an analogy to human design. Because we are able to recognize design of artifacts and objects, according to Professor Behe, that same reasoning can be employed to determine biological design. [] Professor Behe testified that the strength of the analogy depends upon the degree of similarity entailed in the two propositions; however, if this is the test, ID completely fails.

Unlike biological systems, human artifacts do not live and reproduce over time. They are non-replicable, they do not undergo genetic recombination, and they are not driven by natural selection. [] For human artifacts, we know the designer's identity, human, and the mechanism of design, as we have experience based upon empirical evidence that humans can make such things, as well as many other attributes including the designer's abilities, needs, and desires. [] With ID, proponents assert that they refuse to propose hypotheses on the designer's identity, do not propose a mechanism, and the designer, he/she/it/they, has never been seen. In that vein, defense expert Professor Minnich agreed that in the case of human artifacts and objects, we know the identity and capacities of the human designer, but we do not know any of those attributes for the designer of

biological life. [] In addition, Professor Behe agreed that for the design of human artifacts, we know the designer and its attributes and we have a baseline for human design that does not exist for design of biological systems. [] Professor Behe's only response to these seemingly insurmountable points of disanalogy was that the inference still works in science fiction movies. []

It is readily apparent to the Court that the only attribute of design that biological systems appear to share with human artifacts is their complex appearance, i.e. if it looks complex or designed, it must have been designed. [] This inference to design based upon the appearance of a "purposeful arrangement of parts" is a completely subjective proposition, determined in the eye of each beholder and his/her viewpoint concerning the complexity of a system. Although both Professors Behe and Minnich assert that there is a quantitative aspect to the inference, on cross-examination they admitted that there is no quantitative criteria for determining the degree of complexity or number of parts that bespeak design, rather than a natural process. [] As Plaintiffs aptly submit to the Court, throughout the entire trial only one piece of evidence generated by Defendants addressed the strength of the ID inference: the argument is less plausible to those for whom God's existence is in question, and is much less plausible for those who deny God's existence. []

Accordingly, the purported positive argument for ID does not satisfy the ground rules of science which require testable hypotheses based upon natural explanations. [] ID is reliant upon forces acting outside of the natural world, forces that we cannot see, replicate, control or test, which have produced changes in this world. While we take no position on whether such forces exist, they are simply not testable by scientific means and therefore cannot qualify as part of the scientific process or as a scientific theory. []

It is appropriate at this juncture to address ID's claims against evolution. ID proponents support their assertion that evolutionary theory cannot account for life's complexity by pointing to real gaps in scientific knowledge, which indisputably exist in all scientific theories, but also by misrepresenting well-established scientific propositions. []

Before discussing Defendants' claims about evolution, we initially note that an overwhelming number of scientists, as reflected by every scientific association that has spoken on the matter, have rejected the ID proponents' challenge to evolution. Moreover, Plaintiffs' expert in biology, Dr. Miller, a widely-recognized biology professor at Brown University who has written university-level and high-school biology textbooks used prominently throughout the nation, provided unrebutted testimony that evolution, including common descent and natural selection, is "overwhelmingly accepted" by the scientific community and that every major scientific association agrees. [] As the court in *Selman* explained, "evolution is more than a theory of origin in the context of science. To the contrary, evolution is the dominant scientific theory of origin accepted by the majority of scientists." *Selman*, 390 F.Supp.2d at 1309 (emphasis in original). Despite the scientific

community's overwhelming support for evolution, Defendants and ID proponents insist that evolution is unsupported by empirical evidence. Plaintiffs' science experts, Drs. Miller and Padian, clearly explained how ID proponents generally and *Pandas* specifically, distort and misrepresent scientific knowledge in making their anti-evolution argument.

In analyzing such distortion, we turn again to *Pandas*, the book to which students are expressly referred in the disclaimer. Defendants hold out *Pandas* as representative of ID and Plaintiffs' experts agree in that regard. [] A series of arguments against evolutionary theory found in *Pandas* involve paleontology, which studies the life of the past and the fossil record. Plaintiffs' expert Professor Padian was the only testifying expert witness with any expertise in paleontology. His testimony therefore remains unrebutted. Dr. Padian's demonstrative slides, prepared on the basis of peer-reviewing scientific literature, illustrate how *Pandas* systematically distorts and misrepresents established, important evolutionary principles.

We will provide several representative examples of this distortion. First, *Pandas* misrepresents the "dominant form of understanding relationships" between organisms, namely, the tree of life, represented by classification determined via the method of cladistics. [] Second, *Pandas* misrepresents "homology," the "central concept of comparative biology," that allowed scientists to evaluate comparable parts among organisms for classification purposes for hundreds of years. [] Third, *Pandas* fails to address the well-established biological concept of exaptation, which involves a structure changing function, such as fish fins evolving fingers and bones to become legs for weight-bearing land animals. [] Dr. Padian testified that ID proponents fail to address exaptation because they deny that organisms change function, which is a view necessary to support abrupt-appearance. [] Finally, Dr. Padian's unrebutted testimony demonstrates that *Pandas* distorts and misrepresents evidence in the fossil record about pre-Cambrian-era fossils, the evolution of fish to amphibians, the evolution of small carnivorous dinosaurs into birds, the evolution of the mammalian middle ear, and the evolution of whales from land animals. []

In addition to Dr. Padian, Dr. Miller also testified that *Pandas* presents discredited science. Dr. Miller testified that *Pandas*' treatment of biochemical similarities between organisms is "inaccurate and downright false" and explained how *Pandas* misrepresents basic molecular biology concepts to advance design theory through a series of demonstrative slides. [] Consider, for example, that he testified as to how *Pandas* misinforms readers on the standard evolutionary relationships between different types of animals, a distortion which Professor Behe, a "critical reviewer" of *Pandas* who wrote a section within the book, affirmed. [] In addition, Dr. Miller refuted *Pandas*' claim that evolution cannot account for new genetic information and pointed to more than three dozen peer-reviewed scientific publications showing the origin of new genetic information by evolutionary processes. [] In summary, Dr. Miller testified that *Pandas* misrepresents molecular biology and genetic principles, as well as the current state of scientific knowledge in those areas in order to teach

readers that common descent and natural selection are not scientifically sound. []

Accordingly, the one textbook to which the Dover ID Policy directs students contains outdated concepts and badly flawed science, as recognized by even the defense experts in this case. [The court then explained that ID was not supported by peer-reviewed publications.] . . .

After this searching and careful review of ID as espoused by its proponents, as elaborated upon in submissions to the Court, and as scrutinized over a six week trial, we find that ID is not science and cannot be adjudged a valid, accepted scientific theory as it has failed to publish in peer-reviewed journals, engage in research and testing, and gain acceptance in the scientific community. ID, as noted, is grounded in theology, not science. Accepting for the sake of argument its proponents', as well as Defendants' argument that to introduce ID to students will encourage critical thinking, it still has utterly no place in a science curriculum. Moreover, ID's backers have sought to avoid the scientific scrutiny which we have now determined that it cannot withstand by advocating that the *controversy*, but not ID itself, should be taught in science class. This tactic is at best disingenuous, and at worst a canard. The goal of the IDM is not to encourage critical thought, but to foment a revolution which would supplant evolutionary theory with ID.

To conclude and reiterate, we express no opinion on the ultimate veracity of ID as a supernatural explanation. However, we commend to the attention of those who are inclined to superficially consider ID to be a true "scientific" alternative to evolution without a true understanding of the concept the foregoing detailed analysis. It is our view that a reasonable, objective observer would, after reviewing both the voluminous record in this case, and our narrative, reach the inescapable conclusion that ID is an interesting theological argument, but that it is not science. . . .

Remarkably, the 6–3 vote at the October 18, 2004 meeting to approve the curriculum change occurred with absolutely no discussion of the concept of ID, no discussion of how presenting it to students would improve science education, and no justification was offered by any Board member for the curriculum change. [] Furthermore, Board members somewhat candidly conceded that they lacked sufficient background in science to evaluate ID, and several of them testified with equal frankness that they failed to understand the substance of the curriculum change adopted on October 18, 2004. []

In fact, one unfortunate theme in this case is the striking ignorance concerning the concept of ID amongst Board members. Conspicuously, Board members who *voted for* the curriculum change testified at trial that they had utterly no grasp of ID. . . .

Although Defendants attempt to persuade this Court that each Board member who voted for the biology curriculum change did so for the secular purpose of improving science education and to exercise critical thinking skills, their contentions are simply irreconcilable with the record evidence.

Their asserted purposes are a sham, . . . [thereby violating the first prong of *Lemon*. The court concluded that the policy also violated the other prongs of the *Lemon* test.]

NOW, THEREFORE, IT IS ORDERED THAT:

1. A declaratory judgment is hereby issued in favor of Plaintiffs pursuant to 28 U.S.C. §§ 2201, 2202, and 42 U.S.C. § 1983 such that Defendants' ID Policy violates the Establishment Clause of the First Amendment of the Constitution of the United States and Art. I, § 3 of the Constitution of the Commonwealth of Pennsylvania.

2. Pursuant to Fed.R.Civ.P. 65, Defendants are permanently enjoined from maintaining the ID Policy in any school within the Dover Area School District.

3. Because Plaintiffs seek nominal damages, Plaintiffs shall file with the Court and serve on Defendants, their claim for damages and a verified statement of any fees and/or costs to which they claim entitlement. Defendants shall have the right to object to any such fees and costs to the extent provided in the applicable statutes and court rules.

Notes and Questions

1. *Secular Purpose*. As we learned in Chapters II and VI, the secular purpose prong of the *Lemon* test has been repeatedly challenged. In the context of evolution, Justice Scalia criticized the majority in *Edwards v. Aguillard*, *supra*, for focusing on the motivations of the legislators and concluding that there was no secular purpose even though no trial had been held. Does *Kitzmiller* persuade you that courts should not rely on the secular purpose test? Did the court focus too much on the purposes and motives of the Dover School Board? Does the scientific material about ID persuade you that it is good science, and therefore the motivations of the legislators were irrelevant? If you compare the Arkansas and Dover enactments, is it clear that the former is religious and the latter is secular?

2. *McLean*. How does the court make use of the *McLean* case in this opinion? Is this case any different from *McLean*, or are the facts and the courts' reasoning the same? Why does Judge Jones write that there is "contrived dualism" in *Kitzmiller* as in *McLean*? At one point, Judge Jones writes that ID may be true, but it is not science. What does that mean? Is that the same conclusion that Judge Overton reached in *McLean*?

Should Judge Jones have stopped his opinion after the section on the endorsement test, without reaching the question whether ID is science? Did *McLean* require him to reach the question of ID's scientific status, or is the scientific part of the opinion unnecessary to the court's holding? Does the court have the expertise to decide if ID is a science or not?

Was Judge Jones correct about ID and science? According to Thomas Kuhn's famous work, *The Structure of Scientific Revolutions* (2d ed. 1970), science does not always progress incrementally, step-by-step, by deductive logic and discovery. Scientists rely heavily on theory within accepted

paradigms, and there can be periods when scientists cling to current theories even in the face of problematic facts. When individual scientists confront anomalies that challenge their theories, he explains, they do not always abandon those theories. Instead, they resist change and continue to consider defenses of their theory. “Though they may begin to lose faith and then to consider alternatives, they do not renounce the paradigm that has led them into crisis. . . . [O]nce it has achieved the status of paradigm, a scientific theory is declared invalid only if an alternate candidate is available to take its place.” *Id.* at 77. At that point, however, there are radical paradigm shifts where new theories are offered that do a better job of addressing the facts at hand and lead to a massive change in theory.

Is it possible that evolutionary biologists are stubbornly resisting the new paradigm of ID, which is a science? Or have they justifiably rejected ID, as Judge Jones did, because ID is not science? Is ID unscientific because it starts with a paradigm, the design of nature, and defends the paradigm no matter how many anomalies confront it? Is one difference between religion and science that religion’s job is to defend the truth of its propositions against external criticism while scientists’ task is to defend their theories until a better alternative appears? Can a religion undergo a paradigm shift, or would that entail the destruction of the religion? Recall Professor Smart’s description of religion in Chapter I. Is religion’s purpose to reaffirm traditional insights in every generation without subjecting them to scientific scrutiny?

3. *Theological Sources of Intelligent Design.* How important is it to be clear on the origins of ID? The court defers to Professor Haught’s tracing the lineage of ID back to Thomas Aquinas. Aquinas was a Christian Aristotelian. Aristotle had taught that there is a First Mover, and he called this First Mover “God.” He developed that teaching within what we today would call his “natural science,” his physics, and his metaphysics. Is Aristotle’s teaching “scientific” or “religious”?

Some creationists base their opposition to evolution on the Bible, arguing that the Bible provides the truth about God’s creation, and that it should be preferred to science. Under such a biblical theology, God’s revelation occurs in Scripture. An alternative or supplement to biblical theology is natural theology, which emphasizes God’s revelation in nature, where humans may experience God and also learn God’s truth about creation. A seminal work in natural theology was William Paley’s 1802 book *Natural Theology*. Paley (1734–1805), who was Archdeacon of Carlisle in England, had a strong influence on nineteenth-century American theologians. They relied on Paley in developing their preferred approach to proving God’s existence: “the argument from design.” According to a historian of American religion E. Brooks Holifield:

Paley found evidence for design when he discovered distinct parts of a mechanism working toward a common end, and every instance of design indicated an intelligent designer. The argument was analogical. Just as the mechanical intricacy of a watch disclosed the intelligence of a human watchmaker, so the infinitely more complex contrivances of

the natural world, from the marvels of the eye to the vastness of the cosmic harmony, required a benevolent intelligence beyond human capacity. By the middle of the nineteenth century, most American theologians, nurtured on Paley, agreed that “the central idea in natural theology” was that “design, apparent in the phenomena of creation, indicates an intelligent Designer.”

E. Brooks Holifield, *Theology in America: Christian Thought from the Age of the Puritans to the Civil War 181, 180–86* (2003). Theologians who followed Paley’s teaching believed that science “would confirm the argument from design.” Why was Archdeacon Paley relevant to the court’s analysis of ID? Is intelligent design just a newer version of natural theology, and thus, like creation-science, religion and not science?

Professor Haught testified at the *Kitzmiller* trial that there was even an older argument from design, propounded by the Catholic Dominican priest St. Thomas Aquinas in the thirteenth century. How did that testimony affect Judge Jones? See also John F. Haught, *God After Darwin: A Theology of Evolution* (2001).

Professor Tigay, *supra*, recounts the following conversation from the *Midrash Terumah*. Does it propose an argument from design? Is it different from ID?

A sectarian once came to Rabbi Akiba and asked him, “Who created this world?” Rabbi Akiba replied: “The Holy One, blessed be He.” So the sectarian said, “Show me a clear proof.” Rabbi Akiba replied, “Come back to me tomorrow.”

On the next day the sectarian returned and Rabbi Akiba asked him, “What are you wearing?” The man replied, “A garment.” Rabbi Akiba asked him, “Who made the garment?” The man replied, “A weaver.” Rabbi Akiba replied, “I don’t believe you. Show me a clear proof.” The sectarian replied, “What can I show you? Don’t you realize that a weaver made it?” Rabbi Akiba answered, “And don’t you know that the Holy One, blessed be He, created His world?”

When the sectarian left, Rabbi Akiba’s students asked him, “What’s the clear proof?” He answered them, “My sons, just as a house indicates that there’s a builder, and a garment indicates that there’s a weaver, and a door that there’s a carpenter—so the world indicates that there is a creator, the Holy One, blessed be He.”

Jeffrey H. Tigay, *Genesis, Science, and “Scientific Creationism,”* 40:2 *Conservative Judaism* 20, 20–21 (Winter 1987–1988) (citing *Midrash Temurah*, J.D. Eisenstein, ed., *Otzar Midrashim* 2:583). The official Vatican newspaper stated that *Kitzmiller* was correct in ruling that ID is not a scientific alternative to evolution. Does that indicate that Judge Jones’ ruling was correct? See Ian Fisher & Cornelia Dean, In “Design” vs. Darwinism, *Darwin Wins Point in Rome*, *N.Y. Times*, Jan. 29, 2006, at A9.

4. *Is ID science?* What are the strongest arguments in support of the position that ID is a science? Why was Judge Jones not persuaded by them? Does the existence of ID prove that there is a dispute in the scientific

community about science, or is the disagreement really about religion? Consider Father Vawter's testimony in *McLean*, that the tenets of the Arkansas Act were religious. Is it correct that the idea of an intelligent designer is always a religious idea? See Jay D. Wexler, Of Pandas, People, and the First Amendment: The Constitutionality of Teaching Intelligent Design in the Public Schools, 49 *Stan. L. Rev.* 439 (1996–97). How exactly would one distinguish a scientific statement from a religious one? In the philosophy of science, there are two general approaches to demarcating a "scientific" statement: the verificationist approach (a scientific statement is one that can be verified by experiment or experience), popular among the logical positivists of the Vienna Circle, and the falsifiability approach (a scientific statement is one that can be falsified), which is associated with the philosopher of science Karl Popper. See Karl R. Popper, *The Logic of Scientific Discovery* (1959). Does either of these approaches help you draw a line between scientific and religious statements? See generally Sahotra Sarkar & Jessica Pfeifer, eds., *The Philosophy of Science: An Encyclopedia* (2005).

5. *Is Evolution Just Another Creation Myth?* University of California at Berkeley law professor Phillip E. Johnson, author of *Darwin on Trial* (2d ed. 1993), is one of the leaders of the ID movement. According to Johnson, evolution is another religion with its own myth of creation:

The continual efforts to base a religion or ethical system upon evolution are not an aberration, and practically all the most prominent Darwinist writers have tried their hand at it. Darwinist evolution is an imaginative story about who we are and where we came from, which is to say it is a creation myth. As such it is an obvious starting point for speculation about how we ought to live and what we ought to value. A creationist appropriately starts with God's creation and God's will for man. A scientific naturalist just as appropriately starts with evolution and with man as a product of nature.

In its mythological dimension, Darwinism is the story of humanity's liberation from the delusion that its destiny is controlled by a power higher than itself. Lacking scientific knowledge, humans at first attribute natural events like weather and disease to supernatural beings. As they learn to predict or control natural forces they put aside the lesser spirits, but a more highly evolved religion retains the notion of a rational Creator who rules the universe.

At last the greatest scientific discovery of all is made, and modern humans learn that they are the products of a blind natural process that has no goal and cares nothing for them.

Phillip E. Johnson, *Darwin on Trial* 133 (2d ed. 1993). Based on your reading of Genesis and other creation myths, is Johnson accurate that evolution is a religion with its own creation myth?

Professor Johnson also observes that evolutionists share religion's desire to proselytize. Recall that at the *McLean* trial, Professor Gilkey argued that evolution is not a religion, but a science. He acknowledged,

however, that some scientists turn evolution into a religion by seeing it as a broad theory that explains life's origins and presumes atheism. Did Judge Jones, by focusing on ID's status as a science, ignore the fact that evolution is also a religion? For additional readings about intelligent design, see Michael J. Behe, *Darwin's Black Box: The Biochemical Challenge to Evolution* (10th ann. ed. 2006); Richard Dawkins, *The Blind Watchmaker* (1986).

6. *The Status of Naturalism.* Professor Johnson also argues that the appropriate contrast is between creationism and naturalism. "All persons who affirm that 'God creates' are in an important sense creationists, even if they believe that the Genesis story is a myth and that God created gradually through evolution over billions of years. This follows from the fact that the theory of evolution in question is *naturalistic* evolution, meaning evolution that involves no intervention or guidance by a creator outside the world of nature." Darwin on Trial, *supra*, at 64. Although evolutionists believe that they are scientists who exclude creationist arguments because creationist arguments are not scientific, Johnson insists that naturalism is not a science, but a philosophical presupposition that "there is nothing outside of nature." Thus creationism and naturalism are two competing philosophies of life, not one religion and one science. See Phillip E. Johnson, *Evolution as Dogma: The Establishment of Naturalism* 59–76 in Pennock, *supra*. Do you find Johnson's argument persuasive? How do you think Langdon Gilkey, who testified at the McLean trial, would respond?

Philosopher Robert Pennock responds that Johnson confuses two types of naturalism, namely ontological naturalism (ON) and methodological naturalism (MN). ON makes claims about what sorts of being do and do not exist, while MN is merely a method of inquiry. According to Pennock, Johnson pretends that evolution is ON, but it is MN. Pennock accuses Johnson of employing another "dual model" tactic. See Robert T. Pennock, *Naturalism, Evidence, and Creationism: The Case of Phillip Johnson*, 77–97, in Pennock, *supra*. Would Judge Overton agree?

Is ON a religion? Is ON a theory of ultimate origins, or proximate origins, to use Gilkey's terminology? Can an evolutionist subscribe to MN without affirming ON?

The Kansas State Board of Education, which in 2000 tried to abolish the teaching of evolution in public schools, promulgated a new definition of science while it was revising the state's science standards in 2005. According to the old definition, "[s]cience is the human activity of seeking natural explanations for what we observe in the world around us." According to the new definition, science is "a systematic method of continuing investigation that uses observation, hypothesis testing, measurement, experimentation, logical argument and theory building to lead to more adequate explanations of natural phenomena." See Dennis Overbye, *Philosophers Notwithstanding, Kansas School Board Redefines Science*, N.Y. Times, Nov. 15, 2005, at D3. Is this change in definition significant? Critics of the old definition of science argue that it "promotes materialism, secular humanism, atheism and leads to the idea that life is accidental." Will the new definition "open

the door to supernatural explanations” of life? Can supernatural explanations of life be scientific?

7. *Rawlsian Evolution?* Does the discussion of ON and MN help you to decide whether evolution and ID are comprehensive doctrines as John Rawls identified them in Chapter VII? Recall the discussion of John Rawls’ *Political Liberalism* from our discussion of political morality. According to Rawls, citizens hold a variety of comprehensive, religious and philosophical doctrines, and it is wrong to force their fellow citizens to live by those perspectives.

Philosopher Alvin Plantinga proposes a Rawlsian approach to the teaching of evolution. See Alvin Plantinga, *Creation and Evolution: A Modest Proposal*, in Robert T. Pennock, ed., *Intelligent Design Creationism and Its Critics: Philosophical, Theological, and Scientific Perspectives* 779–91 (2001). Under Rawls’ theory, Plantinga argues, it would be unjust and unfair for one comprehensive doctrine to be taught as true in the public schools. Therefore, just as it is unfair to teach evangelical Christianity as the truth in public schools, it is equally unfair to teach evolution as truth.

Plantinga develops his argument in the following stages. Citizens in a democracy, under Rawls’ social contract, have a basic right (BR):

(BR) Each of the citizens party to the contract has the right not to have comprehensive beliefs taught to her children that contradict her own comprehensive beliefs.

In response to this basic right, scientists will argue that science is empirical, or factual, or true and that:

(PC) The right way to answer questions of empirical fact—for example, questions about the origin of life, the age of the earth, whether human beings have evolved from earlier forms of life—is by way of science, or scientific method.

Plantinga insists, however, that (PC) is not an empirical commitment, but a *philosophical commitment*, and therefore a comprehensive doctrine. For that reason, Rawlsian scientists may not impose their comprehensive worldview on others. See *id.* at 781, 786. Do you agree with Professor Plantinga’s analysis?

Plantinga concludes that both creationism and evolution can be taught in the public schools as long as they are taught *conditionally*. Do you agree? Should students be allowed to opt out of such classes if their religion is offended by it? See *Mozert v. Hawkins County Bd. of Educ.*, 827 F.2d 1058 (6th Cir. 1987).

8. *Philosophy of Design.* A high school teacher in California offered a *philosophy* course on creationism, evolution and ID called “The Philosophy of Intelligent Design.” According to the course description, “[t]his class will take a close look at evolution as a theory and will discuss the scientific, biological and biblical aspects that suggest why Darwin’s philosophy is not rock solid.” Local parents sued after *Kitzmiller* was decided. The teacher changed the name of the course to “The Philosophy of Design.” Is it

constitutional for the teacher to offer this course in a public school? See Laurie Goodstein, California Parents File Suit Over High School Course, N.Y. Times, Jan. 11, 2006, at A16. The school district cancelled the class because of the complaints. See School District Pulls ID Course After Suit, Christian Century, Feb. 7, 2006 at 14.

9. *Alternative Courses.* A public school teacher, following Darwin's ideas and relying on modern developments in neuroscience, added a section on neuroscience to her biology class. According to class readings, "the experience of God can be explained as nothing more than the effect of a particular state of brain organization" and the "Golden Rule . . . is a product not of divine decree but of evolved instinct." The students learn that religious sensations arise from the areas of the brain that are specialized for religious emotion and thought. See Kelly Bulkeley, ed., *Soul, Psyche, Brain: New Directions in the Study of Religion and Brain-Mind Science* 4 (2005). Does the teacher violate the free exercise rights of her religious students by teaching the neuroscience segment of the course? May the teacher include in the course readings from neurotheology, a discipline that claims that "the human brain itself is revelatory of information about God," because God hardwired our brains to seek meaning? See Charlene P.E. Burns, *Cognitive Science and Christian Theology*, in id. at 176–79. Must she include readings in neurotheology? May the state legislature require the teacher to teach neurotheology in her course? See also Kelly Bulkeley, *The Wondering Brain: Thinking About Religion With and Beyond Cognitive Neuroscience* (2005).

Some writers argue that religions themselves undergo an evolutionary process of "supernatural selection": "The religious movements that have survived over the years tend to be the ones that promote health, mate selection, and security." See Michael S. Gazzaniga, *The Ethical Brain* 154 (2005); David Sloan Wilson, *Darwin's Cathedral: Evolution, Religion, and the Nature of Society* (2002). Where would you teach that thesis—in a science course, a religious studies course, a theology course, an economics of religion course, or not at all?