

The Evolutionary Threat Of Creationism: THE KANSAS BOARD OF EDUCATION'S OMISSION OF EVOLUTION FROM PUBLIC SCHOOL CURRICULA

I. Introduction

On August 12, 1999, the Kansas Board of Education released a set of comprehensive science standards for public school teachers to follow.¹ The guidelines included many of the traditional curriculum requirements in the areas of chemistry, biology and physics. There was, however, the conspicuous omission of guidelines regarding the theory of evolution.² Although the Board enumerated requirements for teaching "micro-evolution" in Kansas high schools, the Board deliberately eliminated the requirement

1. The science standards can be found on the Kansas State Department of Education's web site: http://www.ksbe.state.ks.us/outcomes/science_12799.html.

2. The theory of evolution is based in large part on Charles Darwin's theory of natural selection published in 1859. His seminal work, *The Origin of Species*, illustrates how species, including humans, evolved from other animals in an effort to adapt to changing environmental factors. See generally, CHARLES DARWIN, *THE ORIGIN OF SPECIES* (Gillian Beer ed., Oxford Univ. Press 1996),

Natural selection, as has just been remarked, leads to divergence of character and to much extinction of the less improved and intermediate forms of life. On these principles, I believe, the nature of the affinities of all organic beings may be explained. It is a truly wonderful fact—the wonder of which we are apt to overlook from familiarity—that all animals and all plants throughout all time and space should be related to each other in group subordinate to group. . . .

Id. at 105–06. Darwin goes on to remark, "In this chapter I have attempted to show. . . the nature of the relationship, by which all living and extinct beings are united by a complex, radiating, and circuitous lines of affinities into one grand system." *Id.* at 369. See also *McLean v. Arkansas Bd. of Educ.*, 529 F. Supp. 1255 (E.D. Ark. 1982),

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 nonlife; (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.

Id. at 1265.

that "macro-evolution" be taught as part of the State's required curriculum.³ The Board of Education's omission sent shock waves through school boards and classrooms across the country. By labeling evolution as an untestable "theory," the Board put the rigorously tested scientific principles of evolution on the same level as the story of creation described in the first chapter of the Bible.⁴

The greatest impact, however, is not on the minds of high school students in Kansas. While the Board eliminated the requirement that instructors teach evolution, teachers are still free to exercise their own discretion in deciding whether to include evolution in their curricula.⁵ The greatest impact, rather, is felt by the burgeoning group of scholars, clergy and judges who have vigorously debated the principles underlying the separation of church and state since the *Scopes*⁶ trial in 1927. The Kansas Board of Education's decision to view evolution as a scant theory analogous to the creation story was the latest step in the creationists' struggle to impose Fundamentalist Christian views upon students in America's public schools.⁷ However, like many previous attempts to homogenize the diverse religious beliefs espoused by American students, the Board of Education's latest effort violated a fundamental Constitutional principle: government can neither endorse nor promote an establishment of religion.⁸

This Note will identify the Constitutional obstacles that impede the Kansas Board's efforts by tracing the history of the creationists' struggle with the Supreme Court, the scientific community and society at large. Part II will provide a background to the Kansas standards by outlining the scope and the limits of the Board's 1999 resolution. State legislative and administrative trends leading up to Kansas' 1999 resolution will put the Kansas standards in historical context with earlier curricular efforts by creationists. Part III will analyze the Constitutional test for determining whether the state sponsors a religious activity identified in 1971 by the Supreme Court in *Lemon v. Kurtzman*.⁹ Cases subsequently decided on principles outlined by the *Lemon* test will be analyzed in conjunction with the Kansas Board's decision to remove the evolution re-

3. See, e.g., Carey Gillam, *Kansas Eliminates Evolution From Public School Curricula*, WASH. POST, Aug. 12, 1999, at A13. See *infra*, Part IV(B), for a discussion of how scientists do not draw a distinction between so-called micro-evolution and macro-evolution. The difference has apparently been contrived by creationists in an attempt to correspond observable biological changes (which they accept) with long-term evolutionary developments between species (which they refuse to acknowledge). See also Pam Belluck, *Board for Kansas Deletes Evolution from Curriculum*, N.Y. TIMES, Aug. 12, 1999, at A1.

4. See generally, Belluck, *supra* note 3.

5. See, e.g., Interview by Ray Suarez, host of Talk of the Nation, with Russell Lewis (National Public Radio broadcast, Aug. 16, 1999).

6. *Scopes v. Tennessee*, 289 S.W. 363 (Tenn. 1927).

7. See Lawrence S. Lerner, *Good Science, Bad Science: Teaching Evolution in the States* (Thomas B. Fordham Foundation, Sept. 2000). This document can be found on the Fordham Foundation website at: <<http://www.edexcellence.net/library/lerner/gsbsteits.html>>. An Adobe Acrobat formatted copy of the report is available at: <<http://www.edexcellence.net/library/lerner/lerner.pdf>>. Anti-evolutionists are a very diverse group. Protestant Fundamentalists, however, constitute the majority of Americans who oppose evolution. See *id.* at 6-7. "Although most Protestant Evangelicals probably are not anti-evolutionists, those who are certainly constitute the largest and most significant bloc that opposes teaching of evolution in public schools." *Id.* at 7.

8. See U.S. CONST. amend. I.

9. 403 U.S. 602 (1971).

quirement from the curriculum for ostensibly secular purposes. Part IV of the Note will analyze the scientific merits of both creationism and evolution in an effort to demonstrate creationism's overtly religious characteristics. In this way, it will be clear that the Board's decision to drop the evolution requirement from the school curriculum was motivated by purely religious intentions rather than the effort to promote scientific integrity and fairness. Finally, Part V will survey the status of teaching evolution in other states. Focusing primarily on Lawrence S. Lerner's recent report on state evolution standards,¹⁰ the Note will illustrate how the unique problem of finding evolution absent from school curricula has affected states other than Kansas.

II. The Scope and Context of the Curriculum Proffered by the Kansas Board of Education

A. The Kansas Board's Science Curriculum

In 1999, the Kansas Board of Education deleted questions testing the concept of "macro-evolution" from its high school assessment tests.¹¹ The Board distinguished macro-evolution from "micro-evolution" by defining macro-evolution as evolution between species. Primates evolving into humans (through numerous intermediary species) exemplifies what the Board regarded as macro-evolution. The Board defined micro-evolution, on the other hand, to include both molecular modifications (mutations) as well as the adaptations species make to their environments. For example, bacteria's increased resistance to new drugs would fall under the auspices of micro-evolution because the genetic make-up of the new bacteria has mutated into a resistant form.

The science standards passed by the Kansas Board significantly reduces the amount of emphasis the state requires teachers to give to the theory of evolution.¹² What the National Science Teachers Association describes as "a major unifying concept of science,"¹³ the requirement to teach the theory of evolution has been conspicuously re-

10. See Lerner, *supra* note 7.

11. These assessment tests examine students' knowledge of the State's required curriculum. See Kansas State Standards, *supra* note 1.

12. See Lerner, *supra* note 7, at 1.

Statewide standards serve as the foundation for a host of curricular activities that affect what goes on in a state's classrooms. District curricula and teachers' lesson plans are often written with the standards in mind. So are the increasingly popular statewide exams administered at certain grade levels, often with such fateful consequences as pupil promotion or graduation hinging on exam scores. Textbook publishers shape the content of their products according to the standards of some of the larger states. *Id.*

13. Statement of the National Science Teachers Association in Response to the Kansas State Board of Education's Actions to Remove Evolution from State Standards (Aug. 13, 1999). Available at <http://www.kcfs.org/NSTA_Statement_on_Kansas_Boards_Action.html>. See also, Lerner, *supra* note 7, at 4.

In particular, the sciences are characterized by central organizing principles. For classical physics, these principles are centered on Newton's laws; for modern physics, Newton's laws are extended into and subsumed by the principles of relativity and quantum mechanics. For chemistry, the central principles are conservation of mass and energy, the periodic law and table of the elements, and the laws of quantum mechanics. For geology, the central principle is the theory of plate tectonics and its underlying mechanisms. And for the life sciences, the central principle is biological evolution. *Id.*

moved from the Kansas science curriculum. "Beginning in the 2000-2001 school year, the state tests in 7th- and 10th-grade science will not ask students questions about the theories that multiple species have evolved from a common ancestor and that the universe originated in an explosion, or Big Bang,"¹⁴ The only rationale that the Kansas Board gave for their omission was that the theoretical nature of evolution negated its standing as an absolute dogmatic principle. In other words, the Board believes that teachers should not rely so heavily upon a scientific theory muddled with contradictory evidence.

Although omitting evolution from the required curriculum ostensibly allows for other origination theories to surface, the only "theory" that the Board had in mind was creationism.¹⁵ This is apparent from the administrative history preceding the Board's submission of the standards. According to the Washington Post, the Creation Science Association for Mid-America helped write Kansas's curriculum proposal.¹⁶ Steven Abrams, a Kansas School Board member and admitted creationist, was instrumental in the Board's controversial decision to eliminate evolution.¹⁷ The decision was the result of a clear religious agenda, rather than an effort to promote academic freedom. It is for this reason, as discussed in part III.B., that the Kansas science standards unconstitutionally entangle government and religion.

The Kansas Board did not specifically define creationism in its science standards. The court in *McLean v. Arkansas*¹⁸, however, defined creation science as:

[T]he 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 developments of all living kinds from a single organism; (3) Changes only within fixed limits of originally created plants and apes; (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.¹⁹

Creationism finds evidence for its theory in the Bible. According to the book of Genesis, God created the world in six days and caused a great flood that permanently altered the Earth's geological formations.²⁰ Creation scientists, however, have not produced any independent scientific evidence confirming the origin of the Earth as told in the book of Genesis. They merely look for flaws in the current evolutionary theory to support the premise that evolution is "wrong." They interpret evolution's flaws as evidence that

14. Jacques Steinberg, *Evolution Struggle Shifts to Kansas School Districts*, N.Y. TIMES, Aug. 25, 1999, at A1.

15. The science standards state: "No evidence contradicting a current scientific theory shall be censored." Kansas State Department of Education, *supra* note 1. See also Gillam, *supra* note 3.

16. See Gillam, *supra* note 3.

17. *Id.*

18. 529 F. Supp 1255 (1982).

19. *Id.* at 1264.

20. See 1 Genesis 1-31, 7:1-24.

creationism is the only reasonable explanation of the Earth's origin.²¹

B. History of Creationists' Approaches

The Kansas Board's omission of evolution from its science curriculum is the latest attempt by creationists to impel their personal religious view of the Earth's origin into public school curricula. The First Amendment to the Constitution reads "Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof. . . ."²² The framers' intent for including this provision in the 1791 Bill of Rights was to prohibit a single state church from imposing its religious views upon American citizens.²³ Clearly the framers of the Constitution believed in the separation of church and state.²⁴

The debate over teaching evolution in public schools increased dramatically in the 1920s.²⁵ Schools began teaching Darwin's theory of evolution to a large number of American high school students.²⁶ This led to a backlash from Fundamentalist Christian supporters of creationism and eventually led to the famous 1927 *Scopes*²⁷ trial. Tennessee charged John Scopes, a public school teacher, with teaching evolution in violation of the Tennessee law prohibiting the teaching of evolution in the schools.²⁸ The Supreme Court of Tennessee upheld the statute, holding that a state or government "as an incident to its power to authorize and enforce contracts for public services, 'may require that they shall be carried out only in a way consistent with its views of public policy, and may punish a departure from that way.'"²⁹ Further, the court deferred all responsibility for

21. See G. Brent Dalrymple, *The Creationist Attack on Science: Radiometric Dating and the Age of the Earth: A Reply to Scientific Creationism*, Address Before the American Societies of Experimental Biology (April 19, 1982), in 42 FED'N PROCEEDINGS 3033, 3036 (1983).

22. U.S. CONST. amend. I. The Fourteenth Amendment extends this proscription to the States:

No state shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States; nor shall any State deprive any person of life, liberty, or property, without due process of law; nor deny to any person within its jurisdiction the equal protection of the laws.

U.S. CONST. amend. XIV, § 1; See also *Cantwell v. Connecticut*, 310 U.S. 296 (1940).

23. See *School Dist. of Abington v. Schempp*, 374 U.S. 203, 214 n.6 (1963) (quoting Roger Williams).

24. The court in *Daniel v. Waters*, 515 F.2d 485 (6th Cir. 1975), remarked that the separation of church and state is "fundamental to freedom." *Id.* at 490. "Government in our democracy, state and national, must be neutral in matters of religious theory, doctrine, and practice. It may not be hostile to any religion or to the advocacy of no-religion; and it may not aid, foster, or promote one religion or religious theory against another. *Id.*

25. See generally *McLean*, 529 F. Supp. at 1259-60.

26. According to law professor Edward J. Larson, author of the Pulitzer Prize-winning book *SUMMER OF THE GODS: THE SCOPES TRIAL AND AMERICA'S CONTINUING DEBATE OVER SCIENCE AND RELIGION* (Harvard University Press 1997), there are three primary reasons for the increased debate over teaching evolution in public schools. First, the release of Charles Darwin's *ORIGIN OF THE SPECIES* in 1859 sent shock waves throughout American and European classrooms. No longer was the Bible's story of creation the unequivocal version of how life began. Second, beginning in the 1920s, the government required mandatory education through the level of high school. Finally, there was a marked increase in the fossil evidence linking primates to humans through intermediate species. (Interview of Edward J. Larson by Ira Flatow, host, *Talk of the Nation* (National Public Radio broadcast, July 21, 2000)).

27. *Scopes v. Tennessee*, 289 S.W. 363 (Tenn. 1927).

28. See *id.*

29. *Id.* at 365 (quoting *Ellis v. United States*, 206 U.S. 246, 256 (1907)).

making curricular decisions to the state legislature.³⁰

In the late 1950s, there was a resurgence in public science education in response to the Soviet Cold War threat.³¹ Evolution was a primary focus of many new biology textbooks. In response to this, creationists attempted a variety of techniques to include creationism in public school classrooms. Legislatures in Tennessee and Arkansas tried to reintroduce Tennessee's approach in *Scopes* by prohibiting the teaching of evolution in schools.³² By this point, however, the Supreme Court found more power in the Constitution's protections than the Tennessee court found in *Scopes*. The Supreme Court justified judicial influence in school curricular decisions stating that "[t]he vigilant protection of constitutional freedoms is nowhere more vital than in the community of American schools."³³ Furthermore, the Court held that the Constitution "does not permit the State to require that teaching and learning must be tailored to the principles or prohibitions of any religious sect or dogma."³⁴ The Tennessee and Arkansas statutes were found unconstitutional.

In Tennessee and Texas, creationists dubbed evolution a religion—passing off theories and beliefs as absolute facts—that violated the right of Fundamentalist Christians to freely exercise their creationist religious beliefs.³⁵ Courts rejected this argument because evolution is "peripheral to the matter of religion."³⁶ More recently, legislatures in Louisiana and Arkansas required teachers to give balanced treatment and emphasis to both evolution and creationism in their science classrooms.³⁷ The Court found balanced treatment statutes to violate the establishment clause.³⁸ Creationism is not a scientific subject and the introduction of the creation story into science classrooms serves a clearly religious purpose.³⁹

The Kansas Board of Education's decision to omit evolution from the Kansas science curriculum is the latest attempt by creationists to subvert Constitutional limitations on religion in the classroom. Like the challenged laws in *Epperson* and *Daniel*, Kansas is trying to remove a topic from the science curriculum that is objectionable to one particular religious group. Unlike previous cases, however, the omission of evolution from the Kansas curriculum is at the option of each school district.⁴⁰ Kansas is not mandating the removal of evolution from its curriculum. Rather, the State is placing the teaching of

30. See *id.* at 366.

31. See Eugenie C. Scott, *Antievolution and Creationism in the United States*, 26 ANN. REV. ANTHROPOLOGY 263 (1997); See also *McLean*, 529 F. Supp. at 1259 (describing the development of national biology standards in response to the Soviet Union's launch of the satellite Sputnik).

32. *Epperson v. Arkansas*, 393 U.S. 97 (1968); *Daniel v. Waters*, 515 F.2d 485 (6th Cir. 1975).

33. *Epperson*, 393 U.S. at 104 (quoting *Shelton v. Tucker*, 364 U.S. 479, 487 (1960)).

34. *Id.* at 106.

35. See *Mozert v. Hawkins County Bd. of Educ.*, 827 F.2d 1058 (6th Cir. 1987); *Wright v. Houston Indep. Sch. Distr.*, 366 F. Supp. 1208 (S.D. Texas 1972).

36. *Wright*, 366 F. Supp. at 1211.

37. See *Edwards v. Aguillard*, 482 U.S. 578 (1987); *McLean*, 529 F. Supp. 1255.

38. *Edwards*, 482 U.S. at 596-97.

39. *Id.*

40. See Belluck, *supra* note 3 at A1.

evolution among a group of optional topics which a teacher may cover if time allows during the school year. Realistically removing evolution from the required curriculum at best places a disincentive upon teachers to use precious class time on a subject that will not be included on state science exams. At worst, removing evolution from the curriculum, allows teachers and school districts to take personal initiative—no doubt based in part upon their own religious ideologies—to remove references to the evolutionary theory entirely.

III. The Constitution and the *Lemon* Test

A. Religion in the Classroom

The Supreme Court has consistently recognized the importance of keeping religion out of public school classrooms. The Court in *Edwards* stated, “families entrust public schools with the education of their children, but condition their trust on the understanding that the classroom will not purposely be used to advance religious views that may conflict with the private belief of the student or his or her family.”⁴¹ Justice Frankfurter agreed in his concurring opinion to *Illinois ex rel. McCollum v. Board of Education* observing that “the public school is at once the symbol of our democracy and the most pervasive means for promoting our common diversity. In no activity of the State is it more vital to keep out divisive forces than in its schools. . . .”⁴² Consequently, the Court invariably heightens judicial scrutiny of school initiatives that incorporate religious perspectives into the curriculum.⁴³

The Court has repeatedly emphasized that the “mere exposure to ideas or beliefs that are offensive to or supportive of any religious belief does not necessarily violate the establishment clause.”⁴⁴ There are numerous ideas taught in public schools that violate certain students’ religious ideologies. For example, Mormons do not believe in traditional notions of gender equality,⁴⁵ and not until 1973 did members of the Mormon Church believe in full racial equality.⁴⁶ In opposition to the Mormon ideology, however,

41. *Edwards*, 482 U.S. at 584.

42. 333 U.S. 203, 231 (1948).

43. See Nadine Strossen, ‘Secular Humanism’ and ‘Scientific Creationism’: Proposed Standards for Reviewing Curricular Decisions Affecting Students’ Religious Freedom, 47 OHIO ST. L.J. 333, 364 (1986).

44. *Harris v. McRae*, 448 U.S. 297, 319-20 (1980).

45. See GORDON SHEPARD AND GARY SHEPARD, A KINGDOM TRANSFORMED: THEMES IN THE DEVELOPMENT OF MORMONISM 36-39 (University of Utah Press 1984).

There are, [Mormon leaders] insist, natural differences—emotional and psychological as well as physical—between men and women; whatever else they might aspire to or accomplish, women’s paramount roles in life are as mothers and homemakers; men are not superior—it is merely their role in God’s scheme of things to bear responsibility for making ultimate decisions; women are meant, in contemporary fashion, to render their support, and so on.

Id. at 37-38.

46. See generally *id.* at 36-37. “Unofficial explanations and widely held Mormon folk beliefs almost always concluded that blacks were denied the priesthood on earth because of their ‘unworthiness’ in the pre-earth existence and that the loss of priesthood privileges must therefore have been a form of punishment for prior transgressions.” *Id.* at 267, n.52.

public schools steadily emphasize the intrinsic equality of people from all races and religions. To give another example, members of the Christian Scientist faith object to the belief that health and disease are affected by medical science.⁴⁷ Nevertheless, Christian Scientist students are continually exposed to medical paradigms in public school science classes. The Constitution's prohibition against religious conduct in the classroom justifies "eliminating curricular material only if it was intended or reasonably perceived as conveying the schools' approval or disapproval of arguably religious beliefs."⁴⁸ Teaching racial equality and scientifically proven health techniques promotes the social, physical and educational welfare of public school students. The intent of teaching these subjects is not to promote or denigrate a particular religious belief. Any conflict with certain religious beliefs is unintended and purely incidental.

The difference that creationism poses in science classrooms is that the primary intent of teaching creationism is to promote Fundamentalist Christian beliefs. No legitimate scientific purposes are furthered by teaching creationism in a science class. The attorney for the plaintiffs in *McLean* stated that, "It was always our position, not that creationism was bad science, but that it was not science at all. Rather, we argued, it was religious apologetics, and a particular religious viewpoint at that."⁴⁹ Creationism, at its core, is meant only to indoctrinate students with unequivocal religious propaganda.⁵⁰ Unlike scientific theories, including the theory of evolution, creationism cannot be disproved or challenged. It is an absolute principle based entirely upon the book of Genesis.⁵¹ It is not subject to the scientific method, nor is it independently verifiable. In no

47. See JOHN DEWITT, *THE CHRISTIAN SCIENCE WAY OF LIFE*, with, ERWIN D. CANHAM, *A CHRISTIAN SCIENTIST'S LIFE* 18-19 (Prentice Hall 1965):

The fundamental assumptions of Christian Science are opposite to those of medical theory: for example [Christian Scientists believe] that all disease is essentially a mental condition, and that man, in his true nature, is essentially a spiritual being and not a material organism.

What [Christian Scientists] are 'against,' however, is dictation by the state or by organized private interests to accept medical methods. Over the years [Christian Scientists] have resisted efforts to compel them to adopt medical measures, on the ground that they should have the right to live their religion and rely upon it for healing. *Id.* Nevertheless, Christian Scientists do not object to the idea that people with different beliefs utilize medical technology. Christian Scientists only oppose the government's attempt to force all Americans to use medical methods. *See id.*

48. Strossen, *supra* note 43, at 373, citing the "clarified version" of the *Lemon* Test, proposed by Justice O'Connor in *Lynch v. Donnelly*, 465 U.S. 668 (1984) (Justice O'Connor concurring).

49. Jack D. Novik, *The Creationist Attack on Science: Litigating the Religion of Creation Science*, Address Before the American Societies of Experimental Biology (April 19, 1982), in *FED'N PROCEEDINGS* 3039, 3039 (1983).

50. The political nature of creationist ideology is apparent by the lack of any debate at the university level. Lerner comments on this disparity by commenting,

Curriculum at the university level is more or less fully under the control of the faculty. As they are experts in their fields, they share the consensus as to basics that is a hallmark of the sciences. In contrast, K-12 instruction is subject to considerable intervention from persons such as school board members and legislators with no expertise in—and often little or no knowledge of—the fields whose curricula they govern. Such persons can and often do consult with experts, but some do not and others flatly reject what experts have to say. Absent an understanding of the compelling logic of the sciences, these persons are liable to be influenced by other pressures.

Lerner, *supra* note 7, at 6.

51. "The genus of biblical literalists asserts that all scientific conclusions must bear the test of concord

respect is creationism a scientific principle worthy of inclusion in a science curriculum. Any deference to the principles of creationism in a science classroom clearly evinces a distinctly religious objective.

B. *Lemon v. Kurtzman*

In 1971, the Supreme Court identified three criteria that a court should evaluate when determining whether an ostensibly secular law actually violates the Establishment Clause's prohibition against state sponsored religious activity. In *Lemon*, Rhode Island and Pennsylvania passed statutes providing for state subsidization of private school teacher salaries.⁵² Chief Justice Burger reasoned that although a state law may not "establish" a state religion, it may "respect" a religious end, thereby violating the First Amendment.⁵³ The Court specified a three prong test that courts must employ when determining whether a state action violates "the three main evils against which the Establishment Clause was intended to afford protection: 'sponsorship, financial support, and active involvement of the sovereign in religious activity;'"⁵⁴

1. The statute must have a secular legislative purpose;
2. Its principle or primary effect must be one that neither advances nor inhibits religion;
3. The statute must not foster 'an excessive government entanglement with religion.'⁵⁵

The Court in *Lemon* found the two state statutes to present an excessive entanglement between government functions and religion.⁵⁶ The Court went on to analyze the factors important in determining whether a state statute involves excessive entanglement with religious activity.⁵⁷

Using the principles outlined in *Lemon*, the court in *McLean v. Arkansas Board of Education* found an Arkansas law requiring the balanced treatment of evolution and creationism in science classrooms to violate Constitutional principles.⁵⁸ Providing a detailed history of the foundation and initiatives of the Fundamentalist Christian movement, the court found that creationism in no way resembles a valid scientific theory.⁵⁹ Consequently, the court found the act violated both the first and second prong of the *Lemon* test.⁶⁰ Not only did the Arkansas law have a religious purpose, but the primary

with the Bible, especially the first nine chapters of Genesis and the time scale that can be inferred from the genealogies of the Old Testament." Lerner, *supra* note 7, at 33.

52. See *Lemon*, 403 U.S. at 602-03.

53. See *id.* at 612.

54. *Id.* (quoting *Walz v. Tax Comm'n*, 397 U.S. 664, 668 (1970)).

55. *Id.* at 612-13. (citing *Board of Education v. Allen*, 392 U.S. 236, 243 (1968), (quoting *Walz*, 397 U.S. at 674).

56. See *id.* at 614.

57. See *id.* at 615-25.

58. 529 F. Supp. 1255 (E.D. Ark. 1982).

59. See *id.* at 1267-69.

60. See *id.* at 1272.

effect of the balanced treatment law was to advance the Fundamentalist Christian agenda.⁶¹ As a result, the statute violated the Constitution.

More recently, the Supreme Court in *Edwards v. Aguillard*⁶² employed the *Lemon* test in finding that a similar Louisiana law requiring balanced treatment of evolution and creationism violated Constitutional standards. "Out of many possible science subjects taught in public schools, the legislature chose to affect the teaching of the one scientific theory that has historically been opposed by certain religious sects."⁶³ Interpreting the first prong of the *Lemon* test, the Court stated that a religious purpose may be evinced by either the "promotion of religion in general, or by advancement of a particular religious belief."⁶⁴ Based on the facts and the legislative history surrounding the law, the Court found the purpose of the Louisiana statute to "clearly" advance a particular religious viewpoint.⁶⁵ In fact, it was clear that promotion of creationism in public schools in no way furthers a more complete and accurate understanding of scientific principles.⁶⁶

C. Constitutionality of Removing Evolution From Public School Curricula

The purpose behind the Kansas Board of Education's decision to omit evolution from school curricula violates the standards enumerated by the Supreme Court in *Lemon*. Evidence indicates that the purpose of removing evolution was to advocate a religious agenda.⁶⁷ Board member, Steve Abrams, objected to teaching evolution in public schools, stating that he believed evolution was not "good science."⁶⁸ As a result, Abrams procured the help of creationists to delete almost two pages of evolution standards formerly included in the Kansas science curriculum.⁶⁹ Abrams' purpose was overtly religious, thereby violating the first prong of the *Lemon* test.⁷⁰ Furthermore,

61. *See id.*

62. 482 U.S. 578 (1987).

63. *Id.* at 593.

64. *Id.* at 585, (citing *Wallace v. Jaffree*, 472 U.S. 38, 52-53 (1985); *Stone v. Graham*, 449 U.S. 39, 41 (1980); *Epperson v. Arkansas*, 393 U.S. 97, 106 (1968)).

65. *Id.* at 591-92.

66. *See id.* at 586.

67. "To ascertain a statute's purpose [it is] appropriate to consider the legislative history of the statute and the specific sequence of events leading up to the adoption of the statute." *Bown v. Gwinnett County Sch. Dist.*, 112 F.3d 1464, 1469 (11th Cir. 1997).

68. Belluck, *supra* note 3.

69. *See id.* The issue of the Board's intent is ultimately a factual question. Abram's active involvement with conservative Christian groups, however, offers strong evidence of his religious motivations. *See, e.g.*, Kate Beem, *At Odds Over Education*, KAN. CITY STAR, May 9, 1999, at A1.

70. "In determining a statute's purpose, the court should inquire into 'whether [the] government's actual purpose is to endorse or disapprove of religion.'" *Bown*, 112 F.3d at 1469 (quoting *Wallace v. Jaffree*, 472 U.S. 38, 56 (1985)). "A court usually should be deferential to the state's articulation of a secular purpose, but the secular purpose must be sincere and not a sham." *Bown*, 112 F.3d at 1469 (citing *Edwards*, 482 U.S. at 586-87). *But see*, *Lynch v. Donnelly*, 465 U.S. 668 (1984) where the Court suggests that any secular purpose behind the government act is sufficient to satisfy the *Lemon* test:

"The city contends that the purposes of the display are 'exclusively secular.' We hold only that Pawtucket has a secular purpose for its display, which is all that [*Lemon*] requires. Were the test that the government must have 'exclusively secular' objectives, much of the conduct and legislation this Court has approved in the past

since creationism has no scientific foundation, the Board's decision to remove evolution from the required curriculum evinced a complete absence of any secular objective.

Likewise, the Board's new science standards violated the second prong of the *Lemon* test. Echoing the observation made by the Court in *Edwards*, the Kansas Board "chose to affect the teaching of the one scientific theory that historically has been opposed by certain religious sects."⁷¹ The primary, if not sole, effect of removing evolution from science classes was to promote a particular religious belief. Although the principles of creationism would not be objectionable if discussed abstractly in a history or social studies class,⁷² including creationism—or in this case omitting evolution—in a science class implicitly legitimizes a clearly religious belief.⁷³ The principle effect of omitting the evolution requirement was to advance a Christian ideology.

Omitting evolution from the curriculum has the same effect as promoting creationism as a valid scientific topic. Although the Kansas Board is not affirmatively endorsing creationism, the *Lemon* test looks at both the underlying purpose and the subsequent effect of passing an essentially religious law. The purpose behind the curricular decision and the subsequent effect of removing a religiously objectionable topic from the curriculum clearly violates the first two facets of the *Lemon* test. The Court in *Epperson* observed that the Establishment Clause "forbids alike the preference of a religious doctrine or the prohibition of a theory which is deemed antagonistic to a particular dogma."⁷⁴ The fact that a religiously objectionable topic was removed from, rather than included in, the curriculum is inconsequential.⁷⁵ Removal of a topic from the school curriculum to promote a religious objective is unconstitutional.

On a pragmatic level, denigrating evolution to the level of an "optional" subject will inevitably lead to a decreased emphasis on teaching evolution in an effort to include required fields in the curriculum. Teachers already face stringent time constraints when educating students on the vast and ever growing field of science. Even if a teacher strongly believes in the benefits of teaching evolution, there may be pressure from parents and administrators to cut back on what is considered an unessential area of science.⁷⁶ In any event, the seemingly innocuous effect of removing evolution from the list

would have been invalidated." *Id.* at 681, n.6. Compare Justice O'Connor's concurrence in *Lynch*, "The purpose prong of the *Lemon* test requires that a government activity have a secular purpose. The requirement is not satisfied, however, by the mere existence of some secular purpose, however dominated by religious purposes." 465 U.S. at 690-91 (O'Connor, J., concurring).

71. *Edwards*, 482 U.S. at 593.

72. See *School District of Abington Township v. Schempp*, 374 U.S. 203, 225 (1963).

73. "The test may be stated as follows: what are the purpose and primary effect of the enactment? If either is the advancement or inhibition of religion then the enactment exceeds the scope of legislative power as circumscribed by the Constitution." *Id.* at 222.

74. 393 U.S. at 106-07 (emphasis added).

75. See Strossen, *supra* note 43 at 393-394 n.297, citing L. TRIBE, AMERICAN CONSTITUTIONAL LAW §14-4 at 822-23.

Although it is at least arguable that the free exercise clause requires some accommodation in public schools to the views of persons religiously opposed to teaching or learning about the theory of evolution, no plausible argument could be advanced to the effect that the clause mandates total exclusion of that theory from the public school curriculum; such exclusion therefore goes too far. *Id.*

76. In fact, Linda Holloway, the vice chair of the Kansas Board of Education when the curricular changes were made, conceded that she doesn't know how many local Kansas school districts have chosen to

of required topics will surely have disturbing consequences for students who pursue higher education in the field of science and medicine.⁷⁷

IV. Creationism's Inability to Adhere to the Scientific Method

A. Religion v. Science

By pointing out creationism's inherent scientific weaknesses, it is important to note that scientists are not necessarily passing judgment on the theological merits of creationism. Many scientists are strong religious followers who dedicate a significant portion of their lives to religion.⁷⁸ Creationism is a theological explanation for the origin of life and the earth. Evolution, on the other hand, is a theory employing the scientific method and is supported by observation, experimentation and empirical evidence. "The two [approaches] merely seek their answers from different sources: science looking to the precise logic of the material world and religion looking to revelation from beyond the natural."⁷⁹ Creationism has an important place in theological discussions in America. However, as a religious belief, creationism has no place in a science classroom.

The notably religious characteristics of creationism have led many scholars to the quick conclusion that creationism is not science. It is important, however, to specifically enumerate the reasons why creationism is not a scientific theory thereby prohibiting its inclusion in a science curriculum. Scientific principles are never absolute (with the exception of a few "laws" such as gravity, relativity, etc.). By its very nature, science is a method of examining the world and making observations based on the available data. Scientific conclusions do not purport to be absolutely "accurate," they merely suggest conclusions based on quantifiable and empirical evidence.⁸⁰ The American Institute of Biological Sciences issued a statement in 1994 substantiating the merits of evolution. They described a scientific theory as "not a speculative hypothesis but a coherent body of explanatory statements supported by evidence."⁸¹ The court in *McLean* recognized that 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 (5) It is falsifiable.'"⁸²

omit evolution from their curricula. Nevertheless, she stated that she does not "expect" any local districts to bypass the teaching of evolution. Interview by Bryant Gumbal, co-host, *The Early Show with Linda Holloway* (CBS Television broadcast, Aug. 1, 2000).

77. See e.g., *McLean*, 529 F. Supp. at 1273.

78. See generally, C. Julian Bartlett, *Evolution Viewed in the Light of Religion*, Address Before American Societies of Experimental Biology (April 19, 1982), in 42 FED'N PROCEEDINGS 3031 (1983).

79. Novik, *supra* note 49, at 3040.

80. See *id.* at 3041-42.

81. Resolution passed by the American Institute of Biological Sciences Board of Directors (Oct. 1994) (quoted in *Creationism is Not Science*, 45 BIOSCIENCE 97 (1995)).

82. *McLean*, 529 F. Supp. 1267.

Creationism, on the other hand, is rooted in the Biblical book of Genesis.⁸³ It is a religious perspective based on faith. "Faith is the substance of things hoped for, the evidence of things not seen."⁸⁴ Consequently, creationism cannot be disproved, altered, or evaluated. It is a belief rooted in the absolute inerrancy of the word of God.⁸⁵ "A theory that is by its own terms dogmatic, absolutist and never subject to revision is not a scientific theory."⁸⁶ The American Institute of Biological Sciences noted that, "[b]ecause creationism is based almost solely on religious dogma stemming from faith rather than demonstrable facts, it does not lend itself to the scientific process."⁸⁷

B. Inability to Replicate Evolution

Creationists, on the other hand, argue that *evolution* is not a valid scientific theory for a variety of reasons.⁸⁸ One problem that the Kansas Board had with the principles of evolution was that the theory cannot be replicated in a laboratory, thereby violating a fundamental tenet of the scientific method.⁸⁹ However, this is not entirely true. The Kansas Board broke down the theory of evolution into "micro-evolution" and "macro-evolution." While the Board does not dispute the fact that scientists can replicate micro-evolution in a laboratory, they object to the idea that scientists can empirically test macro-evolution. Creationists claim that "since [macro-]evolution cannot be observed or replicated in a laboratory, there is no evidence that it actually occurred."⁹⁰ Macro-evolution, however, is simply an extension of the principles of micro-evolution. Mutations and molecular modifications that occur on a daily basis in animals result in changes to their external structures. Micro-evolution uses this fact to explain the difference between organisms that have adapted to their respective environments. For example, bacteria constantly evolve to develop resistances to antibiotics.⁹¹ Macro-evolution

83. See Genesis, *supra* note 20.

84. Hebrews 11:1 (King James).

85. See *supra* note 51 and accompanying text; See also, Lerner, *supra* note 7, at 33 (pointing to problems with viewing creationism as science).

86. *McLean*, 529 F. Supp. at 1269.

87. American Institute of Biological Sciences, *supra* note 81 at 97.

88. See, e.g., Wayne Moyer, *The Creationist Attack on Science: Evolution and Young-Earth Creationism: A Manufactured Controversy*, Address Before the American Societies of Experimental Biology (April 19, 1982), in FED'N PROCEEDINGS 3025, 3026 (1983).

89. "It's deception," [Tom] Willis [the director of the Creation Science Association for Mid-America] said prior to the vote. 'You can't go into a laboratory or the field and make the first fish. When you tell students that science has determined [evolution to be true], you're deceiving them.'" Gillam, *supra* note 3.

90. Belluck, *supra* note 3.

91. In fact, Darwin's theory of evolution is based on numerous observations of micro-evolution. The same principles that are responsible for micro-evolutionary changes *within* a species are ultimately responsible for macro-evolutionary changes *between* species. The only difference between the ideas of micro-evolution and macro-evolution involves the element of time.

But whenever we have the means of instituting a comparison, the same laws appear to have acted in producing the lesser differences between varieties of the same species, and the greater differences between species of the same genus. . . . Specific characters—that is, the characters which have come to differ since the several species of the same genus branched off from a common parent—are more variable than generic characters, or those which have long been inherited, and have not differed within this same period.

Darwin, *supra* note 2, at 137-138. See also Lerner, *supra* note 7, at 16, 47-48, n.30.

[Using Darwin's finches or the peppered moths of Manchester to exemplify micro-evolution is] a typical

postulates that these adaptations and mutations have occurred over billions of years, resulting in dramatic changes in all animals. These "adaptations" spurred the development of new species, thus explaining today's vast variety of different animals.

By its very nature, scientists cannot replicate macro-evolution in a laboratory. Macro-evolution has spanned billions of years. Our limited experimental time frame makes macro-evolution impossible to recreate.⁹² Furthermore, creationists point to gaps in an imperfect fossil record to disparage the idea that animals evolved through intermediary species.⁹³ The essence of macro-evolution involves a protracted time period. Since scientists are not able to recreate a billion-year time span, they must rely upon the fossil record to evince gradual changes between species.

C. Positivist View of Evolutionary Principles

Creationists also argue that evolutionists' belief in evolution is as fundamentalist and positivistic as creationists' belief in creationism.⁹⁴ This sentiment confuses the concept of what constitutes science and what constitutes religion. "For the scientist an explanation is accepted as tentatively true when carefully collected observations fail to falsify it. For the fundamentalist Christian, explanations are accepted as true when they support the revealed truth of the Bible."⁹⁵ Scientists are all too willing to find flaws in their theory. In fact, the principles of the scientific method mandate continued experimentation and verification of theories in an effort to expose the theory's weaknesses.⁹⁶ The "fundamentalist" view of scientists is not the result of unwavering reliance upon

creationist misuse of the technical term microevolution, which denotes the process that leads to variation within a species. While the variation over time of the average color of the wings of the peppered moth is an example of microevolution, the radiation of the pioneer stock of Galapagos finches into thirteen distinct species comprising four genera is by definition an example of macroevolution. Most creationists admit the possibility of microevolution but deny that the process can proceed so as to result in diverse species, let alone still broader spectra of living things. *Id.* at 47-48, n.30.

92. The world exhibits at least four scientific dimensions: the three physical dimensions as well as the dimension of time. *See generally*, DAVID HALLIDAY, ET AL., FUNDAMENTALS OF PHYSICS 1108-1109 (4th ed. 1993). The Kansas Board is willing to accept biological events that approach the limit of the three physical dimensions. For example, scientists use research techniques to empirically verify the occurrence of tiny molecular interactions that are otherwise impossible to "see" directly. The Board is unwilling, however, to accept ideas of macro-evolution which approach the limits of the fourth dimension—a prolonged time period. This is duplicitous because, like micro-evolutionary experiments, scientists have an abundance of empirical evidence to support the occurrence of evolutionary events over a prolonged period of time.

93. Creationists counter that gaps in this imperfect fossil record denigrate any theory that animals evolved through intermediary species. *But see* Darwin, *supra* note 2, at 275-276. Darwin acknowledges that the gaps in the fossil record are due to a myriad of complications in fossil preservation, migration of species and discovery of fossils. *See id.* Nevertheless, the evidence is sufficiently complete to support the theory of Natural Selection. *See id.*

94. *See, e.g.*, Jonathan Zimmerman, *Relatively Speaking: Creationism's Political Evolution*, NEW REPUBLIC, Sept. 6, 1993, at 14; *See also* Patrick Glynn, *Monkey on Our Backs: Evolution and Creationism in Kansas*, NATIONAL REVIEW, Sept. 13, 1999 at 42; *See generally* Tom Willis, *Evolution is Religion*, USA Today, Aug. 3, 2000, at 18A.

95. Moyer, *supra* note 88, at 3026.

96. "To the scientist, theories are to be disproved." *Id.*

unverified propositions. It is the result of centuries of experimentation that has led scientists to their current tentative explanation of the natural world. For thousands of years, scientists have continually searched for theories to explain the natural world. These theories have gradually changed as new technology unveiled previously undiscovered phenomena, forcing scientists to rethink and adopt their theories to the new findings.

The fundamentalist beliefs of creationists, on the other hand, are rigidly based on the unequivocal word of the Bible. The theory has not changed for thousands of years and because of the inherent infallibility of the Bible, the story of creation will never change.⁹⁷ This steadfast reliance upon an unproven and empirically unsound explanation violates even the most basic principles of what it means to adhere to scientific principles. "[The creationist] brand of science invariably falls short of even the minimum standards of scholarship, accuracy, and objectivity necessary for true, rational science."⁹⁸ This "fundamentalist" approach is the exact opposite of the (mistakenly labeled) "fundamentalist" tactic employed by evolutionists.

The stoic views of evolutionists and creationists promote two separate agendas. Evolutionists employ standards of measurement and observation that allow them to develop a comprehensive definition of natural phenomena. Many creationists, however, refute evolution not on its scientific merits, but on its underlying insult to religious ideologies.

Mark Looy of Answers in Genesis, a creationist group, said: 'Students in public schools are being taught that evolution is fact, that they're just products of survival of the fittest. There's not meaning in life if we're just animals in a struggle for survival. It creates a sense of purposelessness and hopelessness, which I think leads to things like pain, murder and suicide.'⁹⁹

This plea to omit the "positivistic" theory of evolution from the curriculum lacks any scientific integrity. In addition to the obvious omission of any empirical evidence for this assertion, this plea for creationism gives no reasonable basis for omitting evolution. The objective of science is not to give meaning and hope to society. If this were the case, it's doubtful whether Copernicus would have investigated the notion that the sun, rather than the earth, is at the center of our solar system. As a scientist, Copernicus sought to explain the nature of the universe. Nevertheless, "fundamentalists" in the sixteenth century objected to a heliocentric model of God's universe.¹⁰⁰

D. Evolution's Infallibility

Finally, creationists suggest evolution's fallibility by pointing to inconsistencies in

97. See *McLean*, 529 F. Supp. at 1259. A "central premise" of Christian Fundamentalism "has been a literal interpretation of the Bible and a belief in the inerrancy of the Scriptures." *Id.*

98. Dalrymple, *supra* note 18, at 3038.

99. Belluck, *supra* note 3.

100. In fact, Tom Willis has gone so far as to say that "[e]volutionist myths destroyed Germany and the communist bloc and have undermined U.S. social fabric possibly beyond repair." Tom Willis, *Evolution is Religion*, USA TODAY, Aug. 3, 2000, at 18A.

the theory.¹⁰¹ For example, creationists point to inconsistent geological dating figures obtained from Mount St. Helens volcanic rock to demonstrate the inaccuracy of radiometric dating procedures.¹⁰² "There is, however, not one scientific journal which has published an article espousing the creation theory. . . ."¹⁰³ Creationists interpret currently unexplained scientific phenomena as evidence of evolution's inherent flaws. Again, this confuses the fundamental principles of science. The fact that science has yet to determine every individual nuance of the evolution theory does not mean that the theory is incorrect. For example, a creationist commented that recent developments in molecular biology hint at creationism, "Life equals matter and information. DNA is, in effect, a message coded in matter. Matter cannot create information. Therefore, where does the information come from?"¹⁰⁴ The fact that biologists have yet to discern the exact means by which the genetic code transpired does not mean that creation is the necessary answer. As the court in *McLean* observed,

While the statistical figures may be impressive evidence against the theory of chance chemical combinations as an explanation of origins, it requires a leap of faith to interpret those figures so as to support a complex doctrine which includes a sudden creation from nothing, a worldwide flood, separate ancestry of man and apes, and a young earth.¹⁰⁵

The fact that there are inconsistencies in the current theory does not advocate the complete acceptance of the unproven and clearly theological theory of creationism by the scientific community. In fact, the inconsistencies in the evolutionary theory that scientists debate do not question the validity of evolution as a whole. Scientists are merely debating the detailed mode of evolution.¹⁰⁶

Creationists have no empirical evidence to support the preposition as described in Genesis. Creationists look only to the unexplained aspects of evolution to proclaim the veracity of creationism. This is not only irresponsible "science," but is a clear distortion of the evidence in support of the evolutionary theory. Not only is the theory of evolution buttressed by a mound of empirical data, but the scientific evidence against the creationist position is remarkably strong.¹⁰⁷

101. See Dalrymple, *supra* note 21, at 3036; *McLean*, 529 F. Supp. at 1269.

102. See, e.g., Belluck, *supra* note 3.

103. *McLean*, 529 F. Supp. at 1268.

104. Glynn, *supra* note 94 at 42.

105. *McLean*, 529 F. Supp. at 1269.

106. See American Institute of Biological Sciences 1994 position paper, *supra* note 81:

Biologists may disagree about the details of the history and mechanism of evolution. Such debate is a normal, healthy, and necessary part of scientific discourse and in no way negates the theory of evolution. [However] as a community, biologists agree that evolution occurred and that the forces driving the evolutionary process are still active today. This consensus is based on more than a century of scientific data gathering and analysis. *Id.*

107. See Lerner, *supra* note 7, at 34.

To give another example, young-earthers must account for the arrival of light at Earth telescopes from sources billions of light-years away during the few thousand years they allow since the Creation. The "expla-

Science involves making observations and studying the facts that can be deduced from these observations. Scientists continuously test and empirically verify their various theories. It is clear that creationism does not adhere to these methodological principles. As a result, by definition, creationism—although a worthy theological position—has no place in the corridors of scientific teachings. It is unmistakably not science, and probably never will be. There can be only one explanation for the Board's actions: the Board's decision to drop evolution from the school curriculum was motivated by purely religious intentions rather than an effort to promote scientific integrity and fairness. Consequently, the Kansas Board of Education's decision to drop evolution from the curriculum because it contradicts creationist theory violates the Establishment Clause of the Constitution.

V. Current State of the Issue

Many state legislatures and school boards are currently exploring the possibility of removing evolution from the required science curriculum. The West Virginia legislature has introduced a bill that requires schools to give equal weight to both creation science and evolution science.¹⁰⁸ Also, in the last four years, school boards in Arizona, Alabama, Illinois, New Mexico, Texas, Kansas and Nebraska have attempted to either completely remove or substantially denigrate the theory of evolution in their state science curricula.¹⁰⁹ Schools in Oklahoma and Alabama require textbooks to display a sticker indicating that evolution is a "controversial theory."¹¹⁰

Nevertheless, creationists are clearly losing ground on the scientific front. New discoveries in genetic and chemical processes continue to confirm the theory of evolution. Surprisingly, however, creationism is not losing ground in the popular culture. A 1996 survey conducted by the National Science Board found that 44% of Americans do not believe that humans descended from earlier species of animals.¹¹¹ Religious opposition fuels society's repudiation of evidence supporting the theory of evolution. In a few states, this opposition has successfully pervaded the agendas of administrative and legis-

nation" asserts that the speed of light has decreased markedly over time, so that a distance of billions of light-years could previously be traversed in much less time than billions of years. Of the many objections to this assertion, the Planck formula $E = hc/\lambda$ requires that light of a given wavelength (say, visible light) must consist of quanta whose energies E increase proportional to any increase in the value of c , the speed of light. The inference, then, is that Adam and Eve would have fried instantly under the bombardment of visible-light photons that in their day had the clout of present-day gamma rays. This is a typical example of how the tight interconnectedness of scientific theory prevents one from distorting one item without forcing distortion of a host of others, too. *Id.*

108. See H. Bill 2160, 75th Leg. (W. Va. 2000).

109. See Hanna Rosin, *Kansas Schools May Zap Evolution State Board Proposal Backed by Creationists*, COM. APPEAL, Aug. 9, 1999, at A1. Note, however, that recently New Mexico made evolution the sole theory to be taught in schools. See N.M. ADMIN. CODE tit. 6, § 3.2.12 (2000). Other states also specifically include the theory evolution in their high school curricula. See, e.g., MINN. R. 3501.0446, 8710.4750 (1999); NEV. ADMIN. CODE ch. 389, §§ 244, 256, 399, 411, 2947, 4915 (2000); 19 TEX. ADMIN. CODE §§ 112.43, 112.48 (2000); 22 TEX. REG. § 7671 (2000).

110. See Lou Carlozo, *Monkeying with Evolution: Debate Over Scientific Theory Could Affect What You're Taught*, CHI. TRIBUNE, Jan. 18, 2000, § 7, at 3; See also Belluck, *supra* note 3.

111. Cited in Scott, *supra* note 31, at 263-64.

lative representatives.¹¹²

The American Association for the Advancement of Science released a report on Sept. 26, 2000, evaluating the condition of evolution education in 49 states.¹¹³ The Thomas B. Fordham Foundation sponsored Lawrence S. Lerner, a Professor Emeritus in the College of Natural Sciences and Mathematics at California State University, Long Beach, to survey the status of evolution education in America's public schools.¹¹⁴ Lerner discovered that schools object to evolutionary teachings in two general ways: (1) The use of the word "evolution" is avoided or used only briefly when describing the changing state of nature; and (2) the subject of evolution is avoided altogether in the curriculum.¹¹⁵

According to the survey, thirty-one states have science standards that do a satisfactory or better job of covering evolution.¹¹⁶ Unfortunately, eighteen states currently employ standards that are "unsatisfactory" or "useless."¹¹⁷ Kansas finds itself on the bottom of the state standards with coverage of evolution described as "a disgraceful paean to antiscience."¹¹⁸ Lerner described the Kansas Board of Education's decision to remove evolution from it required curriculum as a "gross subversion."¹¹⁹

112. For example, 68% of Americans favor teaching both creationism and evolution in the public schools. 1999 Gallup Poll cited in Lerner, *supra* note 7, at viii. However, while 68% of Americans believe that evolution and creationism should both be taught in public schools, 69% of Americans believes that only evolution should be taught as science. Poll conducted by DYG, Inc. for People For the American Way. <<http://www.pfaw.org/issues/education/creationism-poll.pdf>>. (Cited in Lerner, *supra* note 7, at 8).

113. See Tanya Schevitz, *California Gets 'A' in Evolution Education*, S.F. CHRON., Sept. 27, 2000, at A2. The American Association for the Advancement of Science, publishers of the weekly journal *Science*, released the report commissioned by the Thomas B. Fordham Foundation on Sept. 26, 2000. Note that Iowa was not included in Lerner's survey because Iowa does not write statewide academic science standards. See Lerner, *supra* note 7, at 10.

114. The report carefully explains the methodology employed in the survey. In short, Lerner looked to eight curricular factors. Each category was weighed relative to a 110 point scale. The eight categories (with maximum point values) were: [1] general use of the word "evolution" in science books (20); [2] specific treatment of biological evolution (40); [3] specific treatment of human evolution (10); [4] specific treatment of geological evolution (20); [5] specific treatment of cosmological or astronomical evolution (10); [6] evolutionary connections among various scientific fields (10); use of creationist jargon (-20); presence of a disclaimer on textbooks denigrating the theory of evolution (-25). Lerner, *supra* note 7, at 12-13.

115. Lerner, *supra* note 7, at xi. See also *id.* at 37-39 for the state science standards used in this study. The Indiana Department of Education has a link to every states' department of education. <<http://doe.state.in.us/htmls/states.html>>.

116. California, Connecticut, Delaware, Hawaii, Indiana, New Jersey, North Carolina, Pennsylvania, Rhode Island and South Carolina received grades of "excellent" or "very good." See *id.* at 10. Arizona, Colorado, District of Columbia, Idaho, Massachusetts, Michigan, Minnesota, Missouri, Montana, Oregon, South Dakota, Utah, Vermont and Washington received a grade of "good." See *id.* at 11. Louisiana, Maryland, Nebraska, Nevada, New Mexico, New York and Texas received a grade of "satisfactory." See *id.*

117. Alaska, Arkansas, Illinois, Kentucky, Virginia and Wisconsin received a grade of "unsatisfactory." See *id.* Alabama, Florida, Georgia, Maine, Mississippi, New Hampshire, North Dakota, Ohio, Oklahoma, Tennessee, West Virginia and Wyoming require a standard of evolution teaching that is "useless or absent." See *id.*

118. *Id.* at 14.

119. *Id.* at 16. "One [state] (Kansas) goes still further, shunning biological evolution while also deleting all references, direct or indirect, to the age of the earth or the universe, including even radioactive decay; for this it has received an 'F-.'" *Id.* at xii.

VI. Conclusion

The Kansas Board of Education's decision to omit significant portions of the theory of evolution from the mandatory state science curriculum is unconstitutional. Since 1971, numerous courts have employed the standard enumerated by the Supreme Court in *Lemon v. Kurtzman*. Any integration of religion into public school curricula done for clearly religious purposes or having the primary effect of advancing a religious viewpoint is unconstitutional. It is irrelevant whether the state alters the public school curriculum by mandating creationism or omitting evolution. The result in each case is the same: the state is respecting an establishment of religion and in doing so is indirectly endorsing the beliefs of that particular faith in violation of the Constitution.

The effect of removing evolution from any science curriculum is clear. The court in *McLean* observed:

Evolution is the cornerstone of modern biology, and many courses in public schools contain subject matter relating to such varied topics as the age of the earth, geology and relationships among living things. Any student who is deprived of instruction as to the prevailing scientific thought on these topics will be denied a significant part of science education. Such a deprivation through the high school level would undoubtedly have an impact upon the quality of education in the state's colleges and universities, especially including the pre-professional and professional programs in health sciences.¹²⁰

The proposition that creationism is science has faced the courts at least since the 1982 *McLean* case. This proposition has persuaded lawmakers in many states to question the validity of evolution. The scientific evidence, however, overwhelmingly supports the theory of evolution. If Fundamentalist Christians are allowed to fallaciously pass creationism off as legitimate science, the debate over the place of evolution in public schools will continue to linger into the distant future. On the other hand, if the courts, legislatures and school boards accept the definitive conclusion that creationism, by its nature, is not science, then these curricular decisions affecting the minds of millions of America's public school students will end. Future generations of students will learn about the evolution of creationism's struggle to find legitimacy in the public schools. Hopefully for them, the argument will have long been extinct.

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120. *McLean*, 529 F. Supp. at 1273.

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