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PUBLIC SCHOOL EDUCATION ABOUT BEGINNINGS: CREATIONISM, NO! TRUTH ABOUT SCIENCE, YES!

DANIEL G. GIBBENS*

I. Introduction

The legal stirring of the pot continues regarding the origin-of-life and origin-of-cosmos ingredients of public school curricula. Controversy continues over teaching what is known, not known, and seemingly unknowable based on current scientific knowledge.¹ This controversy over teaching the origins of life and the cosmos erupted in the famous 1927 *Scopes* trial, where a jury convicted a public school teacher for teaching the theory of evolution in violation of the Tennessee Anti-Evolution Act.² The essential disagreement

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1. See *Moeller v. Schrenko*, 554 S.E.2d 198 (Ga. Ct. App. 2001); David K. DeWolf et al., *Teaching the Origins Controversy: Science, or Religion, or Speech?*, 2000 UTAH L. REV. 39; Coleen M. McGrath, Note, *Redefining Science to Accommodate Religious Beliefs: the Constitutionality of the 1999 Kansas Science Education Standards*, 45 N.Y.L. SCH. L. REV. 297 (2000); Frances R.A. Paterson & Lawrence F. Rossow, "Chained to the Devil's Throne": *Evolution & Creation Science as a Religio-Political Issue*, 61 AM. BIOLOGY TCHR. 358 (1999); Scott Stephens, *Panel Approves Science Guidelines*, PLAIN DEALER (Cleveland), Oct. 15, 2002, available at <http://www.discovery.org/viewDB/index.php3?program=CRSCstories&command=view&id=1317> (last visited Jan. 30, 2003); Christian Law Ass'n, *Different Approaches*, at http://www.christianlaw.org/different_approach.html (last visited Feb. 17, 2003).

2. See *Scopes v. State*, 289 S.W. 363, 363 n.1 (Tenn. 1927). The Tennessee Anti-Evolution Act of 1925 provided:

An act prohibiting the teaching of the evolution theory in all the Universities, normals and other public schools of Tennessee, which are supported in whole or in part by the public school funds of the state, and to provide penalties for the violations thereof.

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

seems to be polarized in this way: (1) public schools should present only science-based information about origins; (2) when teaching about origins, public schools should teach attribution to a creative deity as a rational alternative.³

One generally accepted resolution of the disagreement is to separate the two treatments of origins and clearly specify that any religious explanation is nonscientific.⁴ This resolution is pragmatically commendable. However, the proposal that follows is based on the proposition that such a solution satisfies neither intellectual honesty nor the Establishment Clause.⁵ This essay argues that science curricula must also make clear that current scientific knowledge, informative as it is, provides no rational explanation of the origins of either the physical cosmos or of living creatures.

As for creationism as a rational alternative, schools cannot include it in the science curricula because it has no basis in science. Further, because science has no answers to questions about actual origins, it makes no sense to treat creationism as an "alternative." Similarly, it should not be used to cast doubt on what is actually scientifically known. Aside from science curricula, whether and/or when schools should teach creationism (or "intelligent

Section 2. Be it further enacted, that any teacher found guilty of the violation of this act, shall be guilty of a misdemeanor and upon conviction shall be fined not less than one hundred (\$100.00) dollars nor more than five hundred (\$500.00) dollars for each offense.

Section 3. Be it further enacted, that this act take effect from and after its passage, the public welfare requiring it.

1925 Tenn. Pub. Acts ch. 27 (repealed 1967). The Tennessee Supreme Court held that the statute was constitutionally valid, but reversed the conviction on a technical ground, that the sentencing judge had exceeded his power. The court further recommended that there be no further prosecution as best serving "the peace and dignity of the state." *Scopes*, 289 S.W. at 367. The wonderful 1960 film, *Inherit the Wind*, made the trial even more famous. See also *Epperson v. Arkansas*, 393 U.S. 97 (1968).

3. Perhaps because of their sensitivity and/or the lack of a comfortable middle-ground, widely disseminated "consensus" materials do not address this issue. See CHARLES C. HAYNES, A TEACHER'S GUIDE TO RELIGION IN THE PUBLIC SCHOOLS (First Amendment Center 1999), available at <http://www.freedomforum.org/templates/document.asp?documentID=3964> (last visited Jan. 30, 2003); U.S. Secretary of Education Richard W. Riley, Religious Expression in Public Schools (Aug. 10, 1995), available at <http://www.ed.gov/Speeches/08-1995/religion.html> (last visited Jan. 30, 2003).

As this essay sides with neither polarity, typically neither viewpoint will likely find it palatable.

4. See Religion in the Public Schools: A Joint Statement of Current Law (Apr. 21, 1995), available at <http://www.ed.gov/Speeches/04-1995/prayer.html> (last visited Jan. 30, 2003).

5. The Establishment Clause provides, "Congress shall make no law respecting an establishment of religion" U.S. CONST. amend. I.

design"⁶) is beyond the scope of this essay. This essay focuses on what schools can, and indeed must, teach in the science curricula.

II. Needed Ingredients: Teaching Scientific Knowledge, Possibilities, Values

We have scientific knowledge about how the physical universe has developed and is developing — expansion through an incredible expanse of space at incredible speed.⁷ We have scientific knowledge about how life has developed and is developing — evolution. These amazing quantities of knowledge are properly taught in our public schools because it is important to understand as much as we can about ourselves as living creatures and where we live. Equally important, and equally interesting, are the two related questions about which we have no knowledge: how these two observed phenomena — the physical cosmos and life within it — began.

There are two prevailing theories. First, for the physical cosmos, scientists have reliably observed there are a multitude of distant giant galaxies rushing away from each other. This suggests that at one time the galaxies were all in the same place, hence the "big bang" theory.⁸ The obvious unknown is what went into the "big bang." Where did this unimaginable quantity of matter and/or energy out of which the universe is expanding actually come from? Equally fascinating and equally unknown is the source of the incredible amount of space into which the galaxies are moving.⁹ Second, for the origin of life, scientists have found a variety of fossilized creatures. An examination of these fossils shows that the creatures we know today have developed step by step, over eons of time.¹⁰ Additionally, scientists have learned that various types of plants and animals can be improved by genetic engineering.¹¹ These

6. See *infra* note 28 and accompanying text.

7. See NASA, Big Bang Cosmology, at http://map.gsfc.nasa.gov/m_uni/uni_101bb1.html (last updated May 10, 2002) ("The Big Bang Model is a broadly accepted theory for the origin and evolution of our universe. It postulates that 12 to 14 billion years ago, the portion of the universe we can see today was only a few millimeters across. It has since expanded from this hot dense state into the vast and much cooler cosmos we currently inhabit. We can see remnants of this hot dense matter as the now very cold cosmic microwave background radiation which still pervades the universe and is visible to microwave detectors as a uniform glow across the entire sky."); see also U.S. NEWS & WORLD REP., MYSTERIES OF SCIENCE 6-7 (Special Collector's Edition, 2002) [hereinafter MYSTERIES OF SCIENCE].

8. MYSTERIES OF SCIENCE, *supra* note 7, at 6-7.

9. *Id.* at 5-11.

10. See RICHARD FORTEY, LIFE: A NATURAL HISTORY OF THE FIRST FOUR BILLION YEARS OF LIFE ON EARTH 33-46 (1997).

11. See Center for Plant Biotechnology Research, College of Agricultural, Environ-

scientific discoveries substantiate the theory of "evolution," *i.e.*, that plant and animal life have and presumably are developing and, by natural selection and accident, improving. As for how this evolutionary process began, some scholars speculate that an accidental interaction of lifeless matter and energy occurred, resulting in the first simple life forms.¹² Out of these simple forms, life as we know it has developed through the eons.¹³ But, as with the "big bang" theory, we have no scientific clue where that initially existing matter and/or energy came from.¹⁴

There is no better way to determine the source of these phenomena, either scientifically or by applying common sense, than to trace events backward in time using currently available evidence. Science has perfected this method in the twentieth century, and presumably important new insights will come in the twenty-first.¹⁵ Our scientific observations to date not only substantiate our

mental, and Natural Sciences, Tuskegee University, <http://agriculture.tusk.edu/Biotech/biotech.html> (last visited Jan. 30, 2003); VetGen, <http://www.vetgen.com> (last modified Nov. 4, 2002).

12. FORTEY, *supra* note 10, at 38-40.

13. *Id.*

14. In this respect, the beginnings questions may be similar to other vital human pursuits. Medical science has provided incredible, life-extending procedures, and yet without any expectation that, in the end, we will be able to live healthy and happy lives eternally. Our investments in crime control (some highly technical, *i.e.*, scientific) undoubtedly yield safety benefits for all. We continually increase these investments in hopes of increasing safety for all. And, it is not beyond the realm of the possible that someday we will rid the world of crime and criminals. But, that possibility is no more foreseeable at this time than life eternal. Furthermore, many of us, although apparently a minority of the world's population, have lived long lives without being subjected to the horrors of war. Clearly, American creativity and effort, in cooperation with the creativity and effort of our world friends, have borne good fruit. And we are committed to continuing such costly human investments to the end that generations to come will live free from the risk of war. Perhaps we should teach each of these uncertainties to public school children. But common wisdom cautions us, because of the risk of resulting anxiety, pessimism, and possible lethargy. We want generations to come to commit to the same or improved creativity and effort in each of these life-related activities.

15. NASA launched the Microwave Anisotropy Probe (MAP) on June 30, 2001. NASA, Mission Status, at http://map.gsfc.nasa.gov/m_mm/ms_status.html (last updated Jan. 30, 2003).

According to NASA,

The MAP mission will reveal conditions as they existed in the early universe by measuring the properties of the cosmic microwave background radiation over the full sky.

This microwave radiation was released approximately 300,000 years after the birth of the universe. MAP will create a picture of the microwave radiation using temperature difference measured from opposite directions (anisotropy).

current understanding of processes, but also validate continuing the efforts. Teaching as much as possible about these observations and their significance is surely the best way to encourage the commitment of coming generations to continue these efforts.

However, equally important is making clear the absence of scientific answers to the questions about beginnings, and further, that, based on current observations, science offers speculations, but no clues, to the answers. Otherwise, the implied message is, given the progress thus far, that the answers will eventually come from science. There is no scientific basis for that message. Further, unless we make explicit the absence of answers and clues, we imply that answers can only come from science — again scientifically baseless. Our awareness of the marvelous products of scientific knowledge, unimaginable in preceding generations,¹⁶ immeasurably strengthens this implication, making clear that future scientific discoveries, unimaginable today, are quite likely.

The Establishment Clause applies in two distinct ways to a requirement of teaching unknowns in the science curriculum: (1) teaching scientific theories about origins without also teaching the scientific unknowns violates the Clause; and (2) unlike the teaching of "creationism," teaching the unknowns as a part of the science curriculum does not violate the Establishment Clause. These are treated separately, as follows.

The content of this image will tell us much about the fundamental structure of the universe.

NASA, Microwave Anisotropy Probe (MAP), at <http://map.gsfc.nasa.gov/aboutmap.html> (last visited Jan. 15, 2003); see also NASA, The MAP Goal: A Detailed Picture of the Early Universe, at http://map.gsfc.nasa.gov/m_mm.html (last visited Jan. 30, 2003) ("The cosmic microwave background (CMB) radiation is the radiant heat left over from the Big Bang. It was first observed in 1965 by Arno Penzias and Robert Wilson at the Bell Telephone Laboratories in Murray Hill, New Jersey. The properties of the radiation contain a wealth of information about physical conditions in the early universe and a great deal of effort has gone into measuring those properties since its discovery. This radiation (and by extension, the early universe) is remarkably featureless; it has virtually the same temperature in all directions in the sky.").

16. As one personal example, the writer credits the development of the heart-lung machine and the resulting possibility of coronary bypass surgery as dramatically improving and probably significantly extending his life. Additional less invasive procedures are reportedly and undoubtedly on the way. With respect to biological chemistry, continuing development of medications with life-extending/improving effects has yielded the current controversy about how to ensure that senior citizens have access to needed drugs and medical services. See, e.g., *Medicare: Industry, Democrats, Respond to Bush's Plan*, AM. HEALTH LINE, Jan. 6, 2003, available at LEXIS, News Library, News Group File; Michael Casey, *Republicans and Democrats Agree That a Prescription Drug Plan Is Needed for Medicare, But That Is Where All Similarities About Improving Care End*, MED. INDUSTRY TODAY, Sept. 13, 2000, available at LEXIS, News Library, News Group File.

III. Effect of the Establishment Clause: Restrictions on Messages Inhibiting Religion

By prohibiting governmental controls "respecting an establishment of religion,"¹⁷ the Establishment Clause prohibits the government from inhibiting as well as promoting religion.¹⁸ Powerful inhibitions and promotions occur by nonverbal messages, i.e., by implication.¹⁹ Children are more uncritical of, and thus more vulnerable to, nonverbal messages.²⁰ Thus, children have particular need for the Establishment Clause protections against messages imposed by government actions in setting the content of public school curricula.

With respect to the origins questions, the message that answers can come only from science effectively inhibits the possibility that religious answers are a rational alternative.²¹ The rationality of many religious answers is apparent

17. U.S. CONST. amend. I.

18. See *Zelman v. Simmons-Harris*, 122 S. Ct. 2460, 2465 (2002); see also *id.* at 2476 (O'Connor, J., concurring) ("A central tool in our analysis of cases in this area has been the *Lemon* test. As originally formulated, a statute passed this test only if it had 'a secular legislative purpose,' if its 'principal or primary effect' was one that 'neither advance[d] nor inhibit[ed] religion,' and if it did 'not foster an excessive government entanglement with religion.' . . . The test today is basically the same as that set forth . . . over 40 years ago.") (first and second alteration in original) (quoting *Lemon v. Kurtzman*, 403 U.S. 602, 612-13 (1971)). The "inhibit" part of the *Lemon* test is regularly included but may be considered dictum in the sense that the Court has not found Establishment Clause violations involving government inhibition of religion, possibly because government inhibitions have usually been treated under the Free Exercise Clause.

19. The power of "messages" sent by implication is a key concept in First Amendment expression cases. See *Lee v. Weisman*, 505 U.S. 577 (1992) (message sent by inclusion of prayers in graduation exercise). In *Weisman*, the word "message" was used more than thirteen times in the several opinions. *Id.* at 594, 597; *id.* at 604 n.5, 605, 606, 607 n.9 (Blackmun, J., concurring); *id.* at 617, 618, 619, 622, 625, 630 n.8, 631 (Souter, J., concurring); see also *City of Erie v. Pap's A.M.*, 529 U.S. 277, 291 (2000) (message conveyed by nude dancing); *Capitol Square Review & Advisory Bd. v. Pinette*, 515 U.S. 753, 771 (1995) (message sent by Ku Klux Klan cross on government property); *County of Allegheny v. Am. Civil Liberties Union Greater Pittsburgh Chapter*, 492 U.S. 573, 625 (1989) (O'Connor, J., concurring) (message sent by Christmas holiday displays on government property); *Wallace v. Jaffree*, 472 U.S. 38, 59, 61 (1985) (message sent by minute of silence statute); *Roberts v. Madigan*, 921 F.2d 1047 (10th Cir. 1990) (message sent by ostentatious handling of Bible in class).

For well-known demonstrations of the power of nonverbal and subliminal messages, consider television commercials — and the amount of money that businesses spend on advertising each year.

20. See *Good News Club v. Milford Cent. Sch.*, 533 U.S. 98, 116 (2001); *Lee v. Weisman*, 505 U.S. 577, 593 (1992). But cf. John H. Garvey, *Religion and the Public Schools after Lee v. Weisman: Cover Your Ears*, 43 CASE W. RES. L. REV. 761 (1993).

21. See THE WILLIAMSBURG CHARTER (1988), reprinted in ARTICLES OF FAITH,

in that they are based squarely on the same understanding of causation applied by science.²²

Both science and religion use similar methodologies or processes in their pursuit of the origins of life and the universe. Both activities start with what is now known to probe further and explain what is not yet known. Probably most Americans, because of their historical environment, have some acquaintance with the Biblical account of creation found in *Genesis*.²³ Further, although not asked about the literal Biblical account, when asked "about the origin and development of the human race," 82% of 2001 Gallup poll respondents chose responses that God either created humans or guided their development.²⁴ In the same poll, given a choice between the "theory of creationism" and the "theory of evolution," only 57% chose the creationism response.²⁵ In any event, there is no doubt that because of our knowledge of science, many, if not most, reject the literal "Adam and Eve" and "seven days" accounts.²⁶

There are also people who explain the scientific explorations to understand origins by reasoning that the human creativity and effort that go into this activity were, and are, provided by a creative deity. Again, the focus is causation: whatever caused the existence of the incredible cosmos also must have caused our awareness of it. One other explanation, of course, is that both are pure accidents.²⁷ But for many, the strong commitment to the concept of

ARTICLES OF PEACE: THE RELIGIOUS LIBERTY CLAUSES AND THE AMERICAN PUBLIC PHILOSOPHY 127, 136 (James Davison Hunter & Os Guinness eds., 1990) ("[C]onstitutional jurisprudence has tended, in the view of many, to move toward the de facto semi-establishment of a wholly secular understanding of the origin, nature and destiny of humankind . . .").

22. See, e.g., STEPHEN L. CARTER, *THE CULTURE OF DISBELIEF* 175-76 (1993) ("[C]reationism is as rational an explanation as any other.").

23. *Genesis* 1:1-31; 2:7, 18-22.

24. See Deborah Jordan Brooks, *Creation-Evolution Poll Released (slightly excerpted)*, at <http://www.asa3.org/archive/asa/200103/0031.html> (last visited Jan. 30, 2003); see also Rodger Doyle, *Down with Evolution!*, *SCI. AM.*, Mar. 24, 2002 ("40 percent of American Catholics in a 2001 Gallup poll said they believed that God created human life in the past 10,000 years. Indeed, fully 45 percent of all Americans subscribe to this creationist view."), available at <http://www.sciam.com/article.cfm?articleID=0006D234-4BE9-1CC6-B4A8809EC588EEDF&pageNumber=1&catID=2> (last visited Jan. 30, 2003); see also CARTER, *supra* note 22, at 159-60.

25. *Id.*

26. See CARTER, *supra* note 22, at 161-62; see also Doyle, *supra* note 24 ("In 1996 Pope John Paul II reaffirmed the Catholic Church's commitment to evolution, first stated in 1950, saying that his inspiration for doing so came from the Bible.").

27. Strangely (no doubt an intellectual anachronism), in legal discourse accidents where no one is at fault are sometimes referred to as "acts of God."

causation yields the existence of some incredibly infinite power (e.g., capable of "intelligent design").²⁸ Among religious Americans, such creative power is generally referred to as "God." Moreover, what infuses the public school controversy about origins with such fervor is a direct mental linkage, for some, between God as creator and God as a daily prayer-companion.²⁹

Thus, if public schools send the message that any answers to the origins questions necessarily depend on science, religion as an alternative source is inhibited. Public school administrators and teachers are essentially elements of government, and thus the government is ultimately responsible for such messages. Accordingly, to avoid the inhibiting message, the Establishment Clause requires that schools teach the absence of scientific answers to the questions of origins. Indeed, the Supreme Court's recognition of the susceptibility of children to messages contained in their environment³⁰ emphasizes the importance of teaching the unknowns.

Schools may seek to avoid this constitutional problem by treating the question of origins as unimportant because it is humanly (scientifically) unanswerable at this time. Undoubtedly, many schools are exercising this option as an easy way out. But this implies that such questions are non-existent, uninteresting, and/or irrelevant to our daily lives. It denies the facility of our mental processes to generate such questions, to want answers, and to be curious about our very existence. There is no doubt that these

28. DeWolf et al., *supra* note 1, at 59-66. Some religious individuals extrapolate that a creative entity of such vast power ("God") might even have an interest in the details of its creation, e.g., humans — an interest possibly evidenced by communication with them. Christian thinking additionally extrapolates the possibility that to facilitate such communication, such a God might take on human form and enter into human history. Given the hypotheses (1) that a power capable of authoring the cosmos is beyond human comprehension and imagination; and (2) that humans have the capacity to generate such questions and related beliefs and doubts, such extrapolations are judged by some to be quite rational.

29. The linkage is direct, i.e., if there is no God with incredible creative power, then there is no God with the incredible capability of communicating with humans in a highly personal way. *See id.* Seeking knowledge about origins is an abstract, intellectual adventure, quite a contrast with prayer, a personal, daily-living intellectual adventure. *See, e.g.,* CARTER, *supra* note 22, at 183-88. Carter states:

Prayer is a crucial part of our family life. We pray before important events: meals, trips, sleep. . . . For us, prayer is an affirmation of our connectedness to God. . . . [T]he activity of prayer is our tradition as well as our comfort, and we cannot, as a family, imagine life without it.

Id. at 185; *cf.* JESSE H. CHOPER, *SECURING RELIGIOUS LIBERTY* 64-86, 103-05 (1995).

30. *See* *Good News Club v. Milford Cent. Sch.*, 533 U.S. 98, 115 (2001) ("[The] 'experience [of] 'children of tender years' is limited and [their] beliefs consequently are the function of environment as much as of free and voluntary choice' . . .") (quoting *Sch. Dist. of Grand Rapids v. Ball*, 473 U.S. 373, 390 (1985)).

mental processes do occur and that such questions are both important and interesting, as evidenced by the existence of devices such as the Hubble Telescope and interplanetary probes.³¹

IV. The Effect of the Establishment Clause: Restrictions on Messages Promoting Religion

The need to include the important unknowns in the science curriculum, as discussed above, is based on avoiding inhibiting religion. However, does requiring such teachings, in effect, promote religion? Some commentators will undoubtedly urge this perspective, as was done in *Brown v. Gilmore*,³² the "minute of silence" case. In *Brown*, the Fourth Circuit acknowledged that requiring students to participate in a minute of silence has a religious purpose,³³ but the court importantly found that such a moment serves useful, secular purposes as well.³⁴ Similarly, the requirement of teaching "no scientific answers" regarding beginnings has both a religious and secular purpose. In both cases, the religious purpose is to provide opportunities to exercise religious beliefs by persons so inclined, *i.e.*, to pray during the minute of silence and to hold the belief that there is a creator God.³⁵ But,

31. See *supra* note 15.

32. 258 F.3d 265 (4th Cir. 2001), *cert. denied*, 533 U.S. 1301 (2001).

33. *Id.* at 277.

34. *Id.*

35. The Fourth Circuit's treatment of the Supreme Court moment of silence precedent, *Wallace v. Jaffree*, 472 U.S. 38 (1985), is analogous to the applicability of the Supreme Court's origins precedent. See *infra* notes 42-44 and accompanying text. In *Brown*, the Fourth Circuit stated:

The factual record of the case before us stands in stark contrast to the one presented to the Supreme Court in *Wallace*. First, there is no evidence that the Commonwealth of Virginia acted in open defiance of federal constitutional law. To the contrary, its debates reflected serious consideration of relevant Supreme Court precedents and concern that it act constitutionally in enacting its proposed statute. . . .

In addition, the legislators clearly debated and acknowledged both religious and secular purposes for the proposed statute, describing the benefits of a minute of silence even for students who would not use the allotted time to pray.

Finally, unlike the Alabama teachers who admitted to leading their students in religious chants and prayers without even waiting for the passage of a State law authorizing such conduct, the Virginia teachers were operating under cautious guidelines circulated five years earlier. Moreover, after passage of the 2000 amendment, the superintendent of schools in Virginia directed a memorandum to all teachers, admonishing them not to permit the minute of silence to become a religious observance. There is no evidence in this record that Virginia teachers have used the minute of silence, or any other occasion, to lead their students in collective prayer, as was the case in *Wallace*.

teaching "no scientific answers" also promotes the secular purpose of intellectual honesty, *i.e.*, demonstrating the value of accuracy in reporting scientific endeavors.³⁶

Further, the Constitution does not prevent the government from acknowledging the fact that religion is important to some people. In *Good News Club v. Milford Central School*,³⁷ the Court made clear that, consistent with the Establishment Clause, religious activities can be visible on public school grounds, even at times when they will be observed by other students.³⁸ Similarly, the Court has made clear that teaching about the Bible³⁹ and about the Ten Commandments⁴⁰ is not only permissible but encouraged.⁴¹

Brown, 258 F.3d at 280-81.

36. Moreover, both of these religious opportunities are entirely mental, requiring no verbal action or accompaniment.

37. 533 U.S. 98 (2001).

38. *Id.* at 115. In *Good News Club*, the Court stated that whatever significance we may have assigned in the Establishment Clause context to the suggestion that elementary school children are more impressionable than adults, . . . we have never extended our Establishment Clause jurisprudence to foreclose private religious conduct during nonschool hours merely because it takes place on school premises where elementary school children may be present.

Id. (citations omitted).

39. *See Sch. Dist. of Abington v. Schempp*, 374 U.S. 203, 300 (1963) (Brennan, J., concurring) ("The holding of the Court today plainly does not foreclose teaching about the Holy Scriptures or about the differences between religious sects in classes in literature or history. Indeed, whether or not the Bible is involved, it would be impossible to teach meaningfully many subjects in the social sciences or the humanities without some mention of religion.").

40. *See Stone v. Graham*, 449 U.S. 39 (1980); *see also infra* note 44 and accompanying text.

41. Such teaching is consistent with the Court's pervasive Establishment Clause principles of "neutrality" and "accommodation." *See, e.g., Lee v. Weisman*, 505 U.S. 577, 627-28 (1992) (Souter, J., concurring). Justice Souter states:

This principle against favoritism and endorsement has become the foundation of Establishment Clause jurisprudence, ensuring that religious belief is irrelevant to every citizen's standing in the political community and protecting religion from the demeaning effects of any governmental embrace. Now, as in the early Republic, "religion & Govt. will both exist in greater purity, the less they are mixed together." Our aspiration to religious liberty, embodied in the First Amendment, permits no other standard.

That government must remain neutral in matters of religion does not foreclose it from ever taking religion into account. The State may "accommodate" the free exercise of religion by relieving people from generally applicable rules that interfere with their religious callings. Contrary to the views of some, such accommodation does not necessarily signify an official endorsement of religious observance over disbelief.

The Supreme Court, in *Edwards v. Aguillard*,⁴² addressed the Establishment Clause's restriction on required teachings about origins. In *Edwards*, the Court struck down Louisiana's Creationism Act, which required schools to teach Genesis' story of human creation if evolution was taught, with this crisp explanation:

If the Louisiana Legislature's purpose was solely to maximize the comprehensiveness and effectiveness of science instruction, it would have encouraged the teaching of all scientific theories about the origins of humankind. But under the Act's requirements, teachers who were once free to teach any and all facets of this subject are now unable to do so. Moreover, the Act fails even to ensure that creation science will be taught, but instead requires the teaching of this theory only when the theory of evolution is taught. Thus we agree with the Court of Appeals' conclusion that the Act does not serve to protect academic freedom, but has the distinctly different purpose of discrediting "evolution by counterbalancing its teaching at every turn with the teaching of creationism" ⁴³

The Court further declared that schools can teach and critique a variety of scientific theories of human origin without running afoul of the Establishment Clause:

We do not imply that a legislature could never require that scientific critiques of prevailing scientific theories be taught. Indeed, the Court acknowledged in *Stone* that its decision forbidding the posting of the Ten Commandments did not mean that no use could ever be made of the Ten Commandments, or that the Ten Commandments played an exclusively religious role in the history of Western Civilization. In a similar way, 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. But because

Id. (citations omitted) (footnote omitted) (quoting Letter from James Madison to Edward Livingston (July 10, 1822), reprinted in 5 THE FOUNDERS' CONSTITUTION 105, 106 (Phillip B. Kurland & Ralph Lerner eds., 1987)).

42. 482 U.S. 578 (1987).

43. *Id.* at 588-89 (alteration in original) (footnote omitted) (quoting *Aguillard v. Edwards*, 765 F.2d 1251, 1257 (5th Cir. 1985)); see also *Wallace v. Jaffree*, 472 U.S. 38 (1985) (a statutorily required daily period of silence for "mediation or voluntary prayer," with clear legislative history that the state adopted the statute to promote prayer, violated the Establishment Clause); *supra* note 35.

the primary purpose of the Creationism Act is to endorse a particular religious doctrine, the Act furthers religion in violation of the Establishment Clause.⁴⁴

Mandating the teaching of scientific unknowns is clearly a species of a critique. Further, this required teaching clearly does not endorse any religious doctrine. Thus, teaching "no scientific answers" fits squarely within the confines of the Establishment Clause as it relates to teaching the origins of life and the cosmos.

V. How to Institute This Curriculum Requirement

Schools should teach the absence of answers to the beginnings questions in the context of all the important knowledge science has generated. Indeed, to make clear that there are important questions to which science provides no answer, and no clues of answers, does not diminish the powers of science. Further, schools should make clear that the answers to these questions about beginnings are not necessarily forever scientifically unknowable. The marvels of scientific knowledge, unimaginable in preceding generations,⁴⁵ make clear that future scientific discoveries, unimaginable today, are quite likely tomorrow.

Schools may implement these teachings in one of two ways. Clearly, school administrators can implement this curriculum requirement, relying if they wish on advisory committees.⁴⁶ It is also clear from *Brown v. Gilmore*⁴⁷ that state legislatures can implement this sort of requirement. Legislative action may be preferable in situations where communities have already thoroughly discussed and debated the issues related to the teaching of the origins of life and the cosmos. If such community debate is unable to resolve the issue, it may be advantageous to use the slightly insulated role of state legislators (perhaps the genius of representative government) to institute a curriculum that both comports with the mandates of the Establishment Clause and is intellectually honest.

VI. Conclusion

Public school science curricula cannot include creationism or intelligent design. Nor can these theories be used to cast doubt on scientific knowledge about the developing cosmos or the life within it. However, the Establish-

44. *Edwards*, 482 U.S. at 593-94 (citation omitted).

45. See *supra* note 16.

46. See McGrath, *supra* note 1; Stephens, *supra* note 1.

47. See *supra* note 33-34 and accompanying text; *supra* note 35.

ment Clause and intellectual honesty both mandate that science curricula include the truth about the current limitations of scientific knowledge about the origins of these phenomena. Specifically, science has provided reliable information about the processes and development of the physical universe and life within it. No scientific information, however, exists about how these processes began. Although unimaginable at this time, it is possible that knowledge about these origins may eventually come from science. Equally unimaginable is that knowledge about these origins may come from some other intellectual activity devoted to the pursuit of causation, such as religion. Until such knowledge occurs, if it ever does, education about these origins should not explicitly or implicitly indicate that such knowledge can come only from science. Specifically, the science curricula must include clear communication that science provides no information about these origins. This is true regardless of whether schools teach creationism or intelligent design elsewhere in nonscience curricula.

